

“Edward Vincent Jr. Park Maintenance Facility”

DIVISION II

SPECIAL SPECIFICATIONS / TECHNICAL SPECIFICATIONS

NOTE: all items in these specifications are generic in nature and could be used for general purposes. Please ignore those sections that are not applicable to the project.

SPECIAL SPECIFICATIONS / TECHNICAL SPECIFICATIONS
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PART 1 – SPECIAL SPECIFICATIONS

Section 1.1 SCOPE OF WORK

The work will consist, but not limited to, furnishing all equipment, tools, materials, and labor necessary to perform project administration, site visit and or investigation, notification, coordination, approved traffic control system, Federal, State and local safety devices, survey work, excavations, backfill and compaction, shoring, abandonment or removal of existing structures, walls, roofs, foundations, stairs, and installation of new structures, compaction, pad ready measures, foundation, flooring, walls, columns, ceiling, roofing, gutters, doors, windows, skylights, fans, storage structures, painting, restroom sinks, toilet bowls, mirrors, soap dispensers, hand dryers, and toilet paper holders, HCAV system, electrical conduits, fittings, wiring, lighting with LED light bulbs, power poles, hardware, outlets, pipes, BMPs, tees, elbows, cleanouts, backflow preventers, water meters, manholes and connections; installation of concrete work, pavement striping, temporary pavement, permanent pavement; construction of driveway approaches, fencing, retaining walls, stairs, ramps, curb, curb and gutter, bollards, EV chargers; protection of existing structures, repair of damaged structures caused by contractor operation, cleaning and disposal of all materials from the site.

Work shall also include administration, mobilization and demobilization, obtain required permits, safety, NPDES compliance, work schedule and shop drawing submittals, attend all meetings, submit reports, submit photos, documentation, restoration of areas, and all other incidentals to complete the project.

The aspects of the work includes all work stated in the Measurement and Payment, the Bid Schedule, All related works per plans and specifications including the referenced standard specifications.

All work shall be in accordance with OSHA Standard including the Confine Space Safety Standard.

Section 1.2 SITE CONDITIONS

The Contractor shall visit the sites and thoroughly check details of work and working condition, Verify dimensions and the location of all works in the field and advice Engineer of any discrepancy before ordering material and equipment or performing work. The Contractor shall keep the site at all times in a neat and clean condition and free from accumulation of material. The Contractor shall contain the drilling fluids and cuttings on site, then remove and dispose of them at an approved landfill when work is completed unless otherwise directed by the City. Dewatering, if needed, is the responsibility of the Contractor.

Section 1.3 PUBLIC CONVENIENCES AND SAFETY

The Contractor's operations shall cause no unnecessary inconvenience to the public. The access rights of the public shall be considered at all times. Unless otherwise authorized, traffic shall be permitted to pass through the work, or an approved detour shall be provided. All safety devices shall be installed to safeguard the public.

CONFINED SPACES

- A. For all areas identified as a confined space, the contractor shall submit a notarized letter signed by a principal officer of the Corporation certifying the CONTRACTOR is certified and fully complies with California Code of Regulations pertaining to the work in confined space including, but not limited to, the following:
- | | |
|--|--------------------|
| 1. Illness Injury Prevention Program | CSO/GISO 1508/3203 |
| 2. Confined Space Plan | GISO 5156/5159 |
| 3. Respiratory Protection | CSO/GISO 1531/5144 |
| 4. Hazard Communication | GISO 5194 |
| 5. Rolling Scaffolds | CSO 1646 |
| 6. Employee Safety Instruction | CSO 1510 |
| 7. Emergency Medical Service | CSO 1512 |
| 8. Dusts, Fumes, Mists, Vapors & Gases | CSO 1528 |
- B. In accordance with the requirements of OSHA Safety and Health Standards for Construction (29 CFR1926) and the applicable requirements of regulatory agencies having jurisdiction, as well as manufacturer's printed instructions and appropriate technical bulletins and manuals, the contractor shall provide and require the use of personnel protective lifesaving equipment for persons working inside the tanks. All regulations relating to working in confined spaces shall be strictly enforced.
- C. Head and Face Protection and Respiratory Devices
1. Equipment shall include protective helmets that shall be worn by all persons while in the vicinity of the work.
 2. During working operations, nozzle men shall wear U.S. Bureau of Mines approved positive pressure air supplied helmets. All other persons who are exposed to dust/debris shall wear respiratory protection determined necessary by the exposure assessment of a Certified Industrial Hygienist. Positive pressure air fed hoods and/or masks shall be supplied by an air source currently certified to produce a "Class D Breathing Air".
 3. CONTRACTOR shall at all times during the work maintain onsite current documentation to substantiate the quality of the breathing air.
 4. Barrier creams shall be used on any exposed areas of skin for personnel during working operations.
- D. Ventilation

1. Forced air during working operations is mandatory unless otherwise instructed by Contractor's Safety personnel.
2. Ventilation system shall be furnished and installed by the CONTRACTOR in accordance with these Specifications.
3. The CONTRACTOR shall make modifications to the ventilation system as required by Cal OSHA to ensure a safe working environment and complete removal of all solvent vapors. Upon completion, as determined by the City and ENGINEER, the CONTRACTOR shall remove the ventilation system.
4. The exhaust blower capacity shall be sufficient to maintain air changes within tank interior in accordance with Cal OSHA, manufacturer's recommendations, and AQMD regulations.

E. Illumination

1. CONTRACTOR to provide minimum 25-foot (270 lx) of lighting on working environment in confined space.
2. Spark-proof artificial lighting shall be provided for all work in confined spaces.
3. Light bulbs shall be guarded to prevent breakage.
4. Lighting fixtures and flexible cords shall comply with the requirements of NFPA 70 "National Electric Code" for the atmosphere in which they will be used.
5. Whenever required by the City Engineer, the Contractor shall provide additional illumination and necessary supports to cover all areas to be inspected.
6. The level of illumination for inspection purposes shall be determined by the City Engineer.

F. Temporary Ladders and Scaffolding (if needed)

1. All temporary ladders and scaffolding shall conform to applicable safety requirements. They shall be erected where requested by the City Engineer to facilitate inspection and shall be moved by the contractor to locations as requested by the City Engineer.

G. Toxicity and Explosiveness

1. In the event that the solvents used that are explosive at low concentrations and are highly toxic, the maximum allowable concentration of vapor shall be kept below the maximum safe concentration for eight-hour exposure, while strictly maintaining the Lower Explosive Limit (L.E.L).
 2. All regulations related to safety of personnel and handling of such materials shall be strictly followed. Cost of handling and disposing of such materials will be borne by the Contractor.
 3. Contractor's responsibility for meeting all regulations relating to toxic and hazardous materials includes, but is not limited to, obtaining all permits and EPA numbers, processing paperwork, blood testing of personnel, sampling and testing of wastes, paying fees, handling and packaging of wastes at site, and delivering materials to the selected Class I dumpsite using licensed hazardous materials transporters.
- H. Protective Clothing
1. Coating materials may be irritating to the skin and eyes. Workmen shall wear gloves and eye shields when handling and mixing coatings.
- I. Fire
1. During mixing and application of all materials, all flames, welding and smoking shall be prohibited in the vicinity.
 2. Appropriate type fire abatement devices shall be provided by Contractor and shall be readily available at the jobsite during all operations.
- J. Sound Levels
1. Whenever the occupational noise exposure exceeds the maximum allowable sound levels, the Contractor shall provide and require the use of approved ear protective devices.
 2. General sound levels for project shall be those that will not affect routine facility or neighborhood activities.

Section 1.4 SURVEYING

Unless otherwise provided herein, lines and grades for construction shall be the responsibility of the Contractor, with the following provisions:

All work under this Contract shall be built in accordance with the base lines and to the elevations shown on the plans or as directed by the ENGINEER. Field survey for the control of construction shall be the responsibility of the Contractor. All such surveys shall be under the supervision of a California licensed Land Surveyor.

The Contractor shall provide a copy of the engineering calculations, grade sheets and supporting field data to the ENGINEER for approval prior to construction of improvements. The Contractor shall be responsible for any errors in the finished work and shall notify the

ENGINEER within twenty-four (24) hours of any discrepancies or design errors discovered during the staking.

All field books, notes, and other data developed by the Contractor in performing surveys that are required, as part of the Work shall remain available to the ENGINEER for examination throughout the construction period. All such data shall be submitted to the ENGINEER with the other documentation required for final acceptance of the Work.

The payment for surveying, construction staking, professional services, engineering calculations, furnishing all labor, materials, equipment, tools and incidentals, and for doing all work involved shall be considered as included in the various items of work, and no additional compensation will be allowed.

Section 1.5 LINES AND GRADE

All work shall conform to the lines, elevations, and grades shown on the Plans and the existing condition. These lines shall be used as datum for the Work. All additional survey, layout, and measurement Work shall be performed by the Contractor, if necessary, as a part of the Work.

Section 1.6 MAINTAINING STORM DRAIN SERVICE

The necessity of keeping existing storm drain facilities open for use requires the utmost cooperation and coordination of all concerned. The Contractor's schedule and sequencing of the WORK shall be such that construction proceeds at a reasonable rate and avoids undue risks that jeopardize the health, safety and welfare of the public.

The ENGINEER'S approval of temporary diversions of sewer flow shall not relieve the Contractor of the responsibility for flooding, backups, or any other damages that result from the diversions.

Unless otherwise specified by the ENGINEER and/or required by the project, the Contractor shall have, on the job site at all times during the progress of the storm drain work, two (2) or more pumps constituting a minimum total rated capacity of 1,890 liters (500 gallons) per minute against a total head of 4.6 meters (15 feet). These pumps shall be maintained in good working order at all times together with adequate lengths of suction and discharge hoses to allow pumping of wastewater from one maintenance hole to another.

Section 1.7 PIPE MATERIALS AND INSTALLATION - NOT APPLICABLE ON THIS PROJECT

Bedding, pipe installation, field jointing, testing and inspection shall be in accordance with section 306 of SSPWC "Green book" (latest edition).

a. Reinforced Concrete Pipe (RCP)

Reinforced Concrete Pipe shall conform to specifications of ASTM designation C76M and shall be a minimum of class III. Portland cement and aggregate shall conform to SSPWC section 201-1.2.1 and 201-1.2.2. Fly Ash shall conform to SSPWC section 201-1.2.5. Nominal length shall be not less than 8 feet except as otherwise required for bends and special joints that is approved by the City

Engineer. Variations in length shall not be more than 1/8 inches per foot. All other materials and testing requirements for use of RCP shall conform to SSPWC section 207-2.

Pipe shall be installed in true line and grade per plan and specs. Pipe laying shall proceed from downstream to upstream with the bell upstream and spigot downstream. Trench excavation, backfill and compaction shall conform to section 306 of SSPWC Green book.

b. Corrugated Steel Pipe (CSP)

The material from corrugated steel pipe, pipe arches, and spiral rib pipe and coupling band shall be zinc coated or aluminum coated or polymer pre-coated steel sheet conforming to AASHTO M218/ASTM A444/A 444M or AASHTOM27/ASTM A819 or AASHTO M246/ASTM A 742/A 742M. Coupling Band shall be as shown in the plan or per section 207-11.2 of the Green book. Fabrication, coating and lining shall conform to section 207 of the Green book.

c. Corrugated Aluminum Pipe (CAP)

Corrugated aluminum pipe, pipe arches, and connectors shall conform to the requirements of AASHTO M196, M197. Aluminum sheets shall conform to the requirements of ASTM B 209M and mechanical properties per section 207-13.2.1 of the Green book.

Fabrication, Coating and lining shall conform to the requirements of section 207.13.3 of the Green book.

d. ABS Solid Wall Pipe (ABS)

Pipes, fittings and joints shall conform to the requirements of ASTM D 2751. Minimum wall thickness shall correspond to SDR 35. Pipe and fittings shall be made of ABS plastic that meet the min. cell classification of 1-3-3, 3-2-2 or 2-2-3 as defined in ASTM specifications D 1788 and having the chemical compositions conform to section 207-15.2 of the Green book.

e. ABS or PVC Composite Pipe

ABS or PVC composite pipe and fittings shall conform to ASTM D 2680. The maximum ID of pipe, as determined by ASTM D2122, shall be per section 207-16.1 of the Green book. ABS resin shall be per section 207-15.3 of the Green book and the PVC resin shall be per section 207-17.5 of the Green book.

f. PVC Plastic Pipe

Pipe, fittings and couplings and joints shall conform to the requirements listed in table 207-17.1. Cell classification, joining, and testing of materials shall be per section 207-17.2.2, 207-17.3 and 207.17.4 of the Green book.

g. Polyethylene (PE) Solid Wall Pipe

Pipe and fittings shall conform to the requirements of section 207-19.1. Materials composition, marking and chemical resistance and testing shall conform to section 207-19.2, 19.3, 19.4 and 19.5 of the Green book.

Section 1.8 MANHOLE MATERIALS AND INSTALLATION - NOT APPLICABLE ON THIS PROJECT

Manhole shall be installed in the location shown in the plan. The min. diameter of the manhole will be 48 inches and shall meet the requirements of ASTM C-478. Provide steps per drawing. Install manhole, if required, per American Public Works Association (APWA) and Standard Specification for Public Works Construction (SSPWC).

Section 1.9 BACKFILL AND COMPACTION

Backfill materials shall not be placed and compacted over utilities until the bedding under the utility has been compacted to the required density and provides firm support. Materials obtained from the site can be used as backfill materials provided that it is not contaminated, free from rubbish and debris. All backfill materials and compaction methods shall conform to the requirements of the SSPWC – Green book standard section 306-1.3.

Section 1.10 PAVEMENTS

The contractor shall saw-cut all concrete and/or asphalt pavements prior to excavation. Subsequent to excavation and prior to resurfacing, all trenches shall be re-cut at least 150 mm. (6 inches) on both sides or to the broken edges, to bridge the new pavement on undisturbed soil. If the edge of the trench is less than 0.3 meters (1 foot) from a property line or 0.6 meters (2 feet) from a curb or gutter, all of the old asphalt shall be removed and replaced. The Contractor shall pave up to the saw-cut line or edge of a gutter, as necessary. The Contractor shall remove and replace concrete to match existing.

Prior to the base course of asphalt paving, a tack coat shall be applied to all surfaces. The base course shall consist of B-AR-8000 125 mm. (5 inches) thick or 25 mm. (1 inch) thicker than the existing pavement thickness, whichever is greater.

Prior to the final resurfacing of asphalt concrete pavement, a tack coat of Grade SS-lh emulsified asphalt at an approximate rate of 0.21 to 0.42 liter per meter-square (0.05 to 0.10-gallon per square yard) shall be uniformly sprayed upon the base course preceding the placement of the D2-AR-4000 asphalt concrete wearing surface. The completed wearing surface shall extend 0.3 meters (1 foot) beyond the edge of the resurfaced area or to the curb, gutter or property line. A self-propelled roller is required for all permanent asphalt concrete compaction.

Resurfacing of concrete sidewalks or pavement shall be per American Public Works Construction (APWA) or SSPWC-Green book.

Section 1.11 EXPANSION JOINTS

Expansion joints shall be constructed in curbs, gutters, and sidewalks and shall be in accordance with City of Inglewood Standard Drawing No. DS-15, or Section 303-5.4.2 of the "Greenbook" (latest edition).

Section 1.12 PROTECTIONS AND RESTORATION OF EXISTING IMPROVEMENTS

The project site shall be restored per Section 7-9 of the "Green book" (latest edition) at no additional cost to the CITY.

Section 1.13 PERMITS, TESTING, INSPECTIONS AND ANALYSIS

All permits, inspections, soil and chemical analysis required by the City shall be the responsibility of the Contractor. No Backfill is allowed unless the sewer pipes and manholes are tested per Standard Specifications for Public Works Construction (Green book), Latest Edition.

Section 1.14 CLEANUP AND DUST CONTROL

Refer to Section 36 of Division I - Special Provisions of Specifications and Mitigations from Air Basin Fugitive Dust Control by South Coast Air Quality Management District (SCAQMD). The Contractor shall conduct his operations and activities to provide dust and smoke controls as follows: No fuel shall be used nor shall any operation be conducted which emits into the atmosphere any smoke that is defined as equal to Ringlemann No. 2 or darker, and no operation shall be conducted which emits into the atmosphere any flying dust or dirt that is harmful to humans or that might constitute a nuisance.

Section 1.15 SUBMITTALS

- A. Submit construction schedule, revised construction schedule, shop drawings or product Catalog, samples and all materials information sheets for the products intend to be use in the project. Submittals shall be in 5 sets for review and approval by the City Engineer.
- B. Submit: Site Photos before start of the work, during the course of the work and after permanent pavement. Photos during the course of the work shall include but not limited to excavation, existing pipes, newly installed pipes, backfilled area, conflicts and other important scope of work per Contractors determination or City Engineers request.
- D. Submit Potholing reports in areas where there is a possible conflict.
- E. Submit schedule of values for review and approval and will be use as a method of payment for contractors..
- G. Submit Request for Information (RFI), Request for Change Order (RFCO) for clarification of any conflict and before additional work or change condition work will be perform.
- H. Submit compaction test report on backfill areas in accordance with Standard Specifications for Public Works Construction (Green Book).
- I. Submit As - Built Drawing every payment request, signed final as-built drawing, photos and all document requested by the City Engineer before, during and at the end of the project.
- J. Submit statement and warranty sheets as provided by the manufacturer.

Section 1.16 STANDARD REFERENCES

Standard Specifications for Public Works Construction (Green book) – latest edition

Work Area Traffic Control Handbook – WATCH Manual latest edition

California Building Code (CBC), California Electrical Code, Uniform Plumbing Code (UPC), National Electrification Code (NEC), CALTRANS Standards, American Public Works Standard (APWA), International Building Code, California Mechanical and Air Conditioning Code, La County Flood Control Standard, LA County Sanitation District Standard and all Federal, State and Local codes.

American Waterworks Association (AWWA) Specifications and Standards - including latest amendments.

American Society for Testing and Materials (ASTM)

Federal Specifications: OSHA 1910.144 – Safety Color Code for Marking Physical Hazards.

Section 1.17 – EXECUTIONS

- A. All work shall be performed in a safe excavated area. Earthworks including pipe laying works and backfill with temporary paving shall be completed at the end of the day. In the event the contractor fails to take corrective action to ensure compliance of safety regulations, The City have the right to undertake safety measures to ensure public safety and all cost incurred will be charged to the contractor.
- B. Contractor shall enforce strict discipline and good order among its employees or sub-contractor's employees. Contractor, through the judgment of the City Engineer that the employee is a nuisance to the worksite and requested to be remove, shall be remove without any cost to the City.
- C. Contractor shall perform Demolition, excavation, pipe laying, backfill, compaction, testing and disinfection, paving and connections in accordance with all reference standards prescribed in these specifications. Correction shall be made for any defective materials or defects in works immediately upon receipt of the notice. Failure to correct any defects within the time provided in the notice, the City will do the correction or hire another firm to do the correction and all cost incurred will be charge to the Contractor.
- G. If suspected contaminated soil or Hazardous materials has been encountered; contractor shall notify the City Engineer for specific instructions. Contractor shall remove and dispose contaminated or Hazardous materials from site.

Section 1.18 MEASUREMENT AND PAYMENT

See Section 1.19 for materials and installation.

Payment for all type of work shall include full compensation to finish the project. Type of work includes all work stated in the plans and specifications including the referenced standard plans and specifications.

the Bid of the work is intended to establish a total cost for the complete work of the project. Should any relocation or modification of an existing improvement be required to permit the Contractor to utilize specialized equipment, he shall include the costs within that of the appropriate bid item. Skilled craftsmen under experienced supervision shall be used on all work.

1. Mobilization and set up (Bid schedule line item no. 1).

Payment for this item shall include, but not limited to administration cost, insurances, notifications, coordination (throughout the completion of the project), permits, construction yards and/or staging area, locating existing utilities, Potholing works, fencing, site photos, mobilization of labor, tools, equipment and materials and all other incidentals required for the project that are not identified in the bid line items.

Payment will be made at the unit price of Lump Sum for the entire work.

2. Demolition (Bid Schedule line item no. 2).

Payment for this item shall include but not limited to, providing all labors, materials, tools, equipment, transport services, delivery, site photos, earthworks, excavation, backfill, compaction, saw-cutting of pavement, grinding or removal of pavement (AC or Concrete), removal of obstructing structures to clear the way for constructing all structures as shown in the plans and specifications, removal of existing buildings including walls, roof structure, stairs, foundation, other structural components, lights, pull boxes, conduits, raceways, duct bank, wirings, supports, hardware, fittings, and other electrical appurtenances, removal of fencing and gates, removal of walls (CMU or concrete), removal of trees, root system, and landscaping, dewatering, shoring, importing suitable materials, construction staking, bedding, traffic control system, NPDES compliance, Cal-OSHA compliance, daily cleaning and hauling off site of unwanted materials, removal/safekeeping and disposal of hazardous material, protection of adjacent utilities or structures, repair or restoration of damaged utilities or structures caused by contractor's operation, and all other works required to complete the demolition. Contractor shall pay for all permits and required for inspection (i.e. demolition and others).

Payment will be made at the unit price of Lump Sum for the entire demolition

work.

3. Survey work (Bid Schedule line item no. 3).

Payment for this item shall include, but not limited to, providing all labors, materials, tools, equipment, drawings to survey entire site including buildings, walls, landscaping area, trees, fencing, gates, pavement, driveways, curbs, property lines, right-of-way lines, building setback lines, easements, underground utilities, transformers, manholes, inlets, elevations, contours, benchmark, northing and eastings and all other works required to complete the surveying works required for constructing all structures as shown in the plans and specifications. All work shall conform to all other Federal, State, and local codes.

Payment will be made at the unit price of Lump Sum for the entire surveying work.

4. Grading and earthwork (Bid Schedule line item no. 4).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, drawings, submittals, transport services, delivery, site photos, grading and earthworks, excavation, backfill, compaction, NPDES compliance, cleaning and hauling off site of unwanted materials, safekeeping and disposal of hazardous material per City Engineer instructions, protection of adjacent utilities or structures, repair or restoring damaged utilities or structures caused by contractors operation, OSHA safety standard implementation, and all other works associated to complete the grading and earthwork. All work shall conform to all other Federal, State, and local codes. Earthworks include adjusting the grade elevation to maintain longitudinal slope of 5% and cross slope of 2% for driveway pavement and 2% in all directions for sidewalk.

Payment will be made at the unit price of Lump Sum for the entire Grading and Earthworks.

5. Construction of Building 1 – Workshop (Bid Schedule line item no. 5).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, materials required for the construction of new building 1 as shown in the plan and specifications, including excavations, foundation, flooring, walls, columns, ceiling, roofing system, gutters, doors, windows, painting, restroom and all other appurtenances, HVAC system, electrical system, conduits, fittings, wiring, lighting with LED light bulbs, all required hardware, testing, inspection, NPDES compliance, cleaning and hauling off site of unwanted materials, safekeeping and disposal of hazardous material, protection of adjacent utilities or structures, repair or restoring damaged utilities or structures caused by contractor's operation, confined space or OSHA safety standard, and all other works associated to complete the construction of the building.

Payment will be made at the unit price of Lump Sum for the entire work.

6. Construction of Building 2 – Office (Bid Schedule line item no. 6).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, materials required for the construction of new building 2 as shown in the plan and specifications, including excavations, foundation, flooring, walls, columns, ceiling, roofing system, gutters, doors, windows, painting, restroom and all other appurtenances, HVAC system, electrical system, conduits, fittings, wiring, lighting with LED light bulbs, all required hardware, testing, inspection, NPDES compliance, cleaning and hauling off site of unwanted materials, safekeeping and disposal of hazardous material, protection of adjacent utilities or structures, repair or restoring damaged utilities or structures caused by contractor's operation, confined space or OSHA safety standard, and all other works associated to complete the construction of the building.

Payment will be made at the unit price of Lump Sum for the entire work.

7. Construction of Building 3 – Office (Bid Schedule line item no. 7).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, materials required for the construction of new building 3 as shown in the plan and specifications, including excavations, foundation, flooring, walls, columns, ceiling, roofing system, gutters, doors, windows, painting, restroom and all other appurtenances, HVAC system, electrical system, conduits, fittings, wiring, lighting with LED light bulbs, all required hardware, testing, inspection, NPDES compliance, cleaning and hauling off site of unwanted materials, safekeeping and disposal of hazardous material, protection of adjacent utilities or structures, repair or restoring damaged utilities or structures caused by contractor's operation, confined space or OSHA safety standard, and all other works associated to complete the construction of the building.

Payment will be made at the unit price of Lump Sum for the entire work.

8. Construction of Building 4 – Storage (Bid Schedule line item no. 8).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, materials required for the construction of new building 4 as shown in the plan and specifications, including excavations, foundation, flooring, walls, columns, ceiling, roofing system, gutters, doors, windows, painting, restroom and all other appurtenances, HVAC system, electrical system, conduits, fittings, wiring, lighting with LED light bulbs, all required hardware, testing, inspection, NPDES compliance, cleaning and hauling off site of unwanted materials, safekeeping and disposal of hazardous material, protection of adjacent utilities or structures, repair or restoring damaged utilities or structures caused by contractor's

operation, confined space or OSHA safety standard, and all other works associated to complete the construction of the building.

Payment will be made at the unit price of Lump Sum for the entire work.

9. Construction of stockpile and trash storage area with 7" AC pavement over 4" CMB pavement per geotechnical report recommendations (Bid Schedule line item no. 9).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, installation of 3,100 S.F. of 7" AC pavement over 4" CMB, construction of 140 linear feet of 4'-6" high concrete wall and foundation, columns, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation of stockpile and trash storage structure.

Payment will be made at the unit price of Lump Sum for the entire work.

10. Construction of complete project Low Impact Development (LID) system, including stormwater pipelines, BMPs and other appurtenances (Bid Schedule line item no. 10).

Payment for this item shall include, but not limited to providing all labor, materials, tools, equipment, transport services, delivery, site photos; excavation, installation of the complete project low impact development (LID) system including bio swale, areas with slopes, plants and trees as part of LID BMP's, rocks and grasses, installation of storm water pipes and required fittings and connection to existing storm drain system; restoration of disturbed areas, importing suitable materials, bedding, inspection, protection of adjacent utilities or structures, repair or restoring damaged utilities or structures caused by contractors operation, temporary or permanent pavement per City Standard, striping, OSHA safety standard implementation, and all other works associated to complete the installation on the LID system.

Payment will be made at the unit price of Lump Sum for the entire work.

11. Remove and replace existing main entrance gate and motor on Warren Lane (Bid Schedule line item no. 11).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, removal of existing gate and motor, demolition of posts and foundations as required, daily cleaning and hauling off site of unwanted materials, removal/safekeeping and disposal of hazardous material, installation of new gate and motor, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation, protection of adjacent utilities or structures, repair or

restoration of damaged utilities or structures caused by contractor's operation and all other works associated to complete the demolition and installation of the new motorized gate at Warren Lane entrance.

Payment will be made at the unit price of Lump Sum for the entire work.

12. Construction of the complete project landscaping area including trees, boulders, plants, shrubs, and grass (Bid Schedule line item no. 12).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, importing planting soil, transport services, delivery of trees and plants, site photos, excavation of planting pits, scarification of pit sides, furnishing and placing planting soil and compost, proper planting of all required plants and trees as shown in the plans and specifications, installation of red mountain boulders, alignment, staking, and mulching, construction of watering berms, initial watering, furnishing and installing tree supports, stakes and ties, application of mulch, cleanup, removal and disposal of nursery containers, root inspection, maintenance during 90-day establishment period, replacement of failed trees during the warranty period, removing obstructing structures along the working area, importing suitable materials, inspection, cleaning and hauling off site of unwanted materials, protection of adjacent utilities or structures, repair or restoring damaged utilities or structures caused by contractors' operation, OSHA safety standard implementation, and all other works associated to complete the planting of trees, plants and landscaping works.

The trees and plants that are part of the LID system should not be included on this payment. This purely for landscaping plants, trees and appurtenances as part of landscaping area.

Payment will be made at the unit price of Lump Sum for the entire work including the replacement of unhealthy or dead trees after 6 months period.

13. Construction of complete project water works system including connections (Bid Schedule line item no. 13).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, construction staking, importing suitable materials, installation of all water pies, fittings, hardware and other required materials per code. Installation must also include thrust blocks, boxes, backflow preventer, connection to existing water meter, testing, abandonment of structures, inspection, NPDES compliance, cleaning and hauling off site of unwanted materials, safekeeping and disposal of hazardous material, protection of adjacent utilities or structures, repair or restoring damaged utilities or structures caused by contractors' operation, temporary or permanent pavement per City Standard, striping, confined space or OSHA safety standard implementation, and all other works associated to complete the installation of the project water works system.

Payment will be made at the unit price of Lump Sum for the entire work.

14. Construction of the complete project sewer works system including connection (Bid Schedule line item no. 14).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, construction staking, importing suitable materials, installation of all sewer pipes, fittings, hardware and other required materials per code. Installation must also include thrust blocks, boxes, backflow preventer, connection to existing sewer line, testing, abandonment of structures, inspection, NPDES compliance, cleaning and hauling off site of unwanted materials, safekeeping and disposal of hazardous material, protection of adjacent utilities or structures, repair or restoring damaged utilities or structures caused by contractors' operation, temporary or permanent pavement per City Standard, striping, confined space or OSHA safety standard implementation, and all other works associated to complete the installation of the project sewer system.

Payment will be made at the unit price of Lump Sum for the entire work.

15. Construction of the complete project mechanical Heating, Ventilation, Air Conditioning System (Bid Schedule line item no. 15).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, construction staking, importing suitable materials, installation of all HVAC systems, electrical wirings, ductwork, refrigerant lines, disconnect boxes, hardware and other required materials required for installation per CBC and IBC requirements, inspection, NPDES compliance, cleaning and hauling off site of unwanted materials, safekeeping and disposal of hazardous material, protection of adjacent utilities or structures, repair or restoring damaged utilities or structures caused by contractors' operation, confined space or OSHA safety standard implementation, and all other works associated to complete the installation of the project sewer system.

Payment will be made at the unit price of Lump Sum for the entire work.

16. Construction of the complete project electrical system (Bid Schedule line item no. 16).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, drawings, submittals, transport services, delivery, site photos, construction staking, importing suitable materials, installation of temporary power poles, lights, pull boxes, conduits, raceways, duct bank, wirings, supports, hardware or required fittings, connection to EV chargers, connection to power source, electrical panel board upgrades as required by the project, compliance to the electrical design by SCE, other electrical appurtenances required to complete the installation of electrical system making it

functional to use per NEC requirements, testing, abandonment of structures, inspection, NPDES compliance, cleaning and hauling off site of unwanted materials, safekeeping and disposal of hazardous material, protection of adjacent utilities or structures, repair or restoring damaged utilities or structures caused by contractors' operation, temporary or permanent pavement per City Standard, and all other works associated to complete the installation of the project electrical system. Contractor must coordinate and work with SCE to complete the installation of electrical system and have it functional for City acceptance.

Payment will be made at the unit price of Lump Sum for the entire work.

17. Construction of 6" curb around Building 1 per SPPWC Std. Plan 120-2, Type A1(150) (Bid Schedule line item no. 17).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, concrete work, installation of 180 LF of 6" concrete curb, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of per linear feet for the entire work.

18. Construction of 6" curb in southern parking area per SPPWC Std. Plan 120-2, Type A1(150) (Bid Schedule line item no. 18).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, concrete work, installation of 595 LF of 6" concrete curb, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of Linear Feet for the entire work.

19. Construction of 6" curb and gutter in northern parking area per SPPWC Std. Plan 120-3, Type A2-6(150) (Bid Schedule line item no. 19).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, concrete work, installation of 97 LF of 6" curb and gutter, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of per linear feet for the entire work.

20. Construction of longitudinal gutter in northern parking area per SPPWC Std.

Plan 122-3 (Bid Schedule line item no. 20).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, concrete work, installation of 242 LF of longitudinal curb and gutter, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of per linear feet for the entire work.

21. Construction of ADA curb ramp per SPPWC Std. Plan 111-5, Case B, Type 1 (Bid Schedule line item no. 21).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, concrete work, installation of four (4) accessible curb ramps including truncated domes per California Building Code Chapter 11-B, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of each for the entire work.

22. Construction of 4" PCC concrete sidewalk pavement over 6" CMB pavement around Building 1 per SPPWC Std. Plan 112-2 (Bid Schedule line item no. 22).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, concrete work, installation of 1,420 SF of 4" PCC concrete sidewalk over 6" CMB pavement, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of per square feet for the entire work.

23. Construction of 4" PCC concrete sidewalk pavement over 6" CMB pavement around Building 2 per SPPWC Std. Plan 112-2 (Bid Schedule line item no. 23).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, concrete work, installation of 350 SF of 4" PCC concrete sidewalk over 6" CMB pavement, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of per square feet for the entire work.

24. Construction of 4" PCC decorative concrete pavement over 6" CMB pavement around Building 2 per SPPWC Std. Plan 112-2 (Bid Schedule line item no. 24).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, concrete work, installation of 1,835 SF of 4" PCC decorative concrete over 6" CMB pavement, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of per square feet for the entire work.

25. Construction of 3" deep stabilized decomposed granite (Bid Schedule line item no. 25).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, installation of 10,510 SF of 3" deep stabilized decomposed granite, compaction to 95%, sealing the decomposed granite by approved sealing materials, compaction, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of per square feet for the entire work.

26. Construction of 3" AC pavement over 6" CMB pavement in northern parking area per Geotechnical Report Recommendations (Bid Schedule line item no. 26).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, concrete work, installation of 12,420 SF of 3" AC over 6" CMB pavement, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of per square feet for the entire work.

27. Construction of 3" AC pavement over 6" CMB pavement in southern parking area per Geotechnical Report Recommendations (Bid Schedule line item no. 27).

27).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, concrete work, installation of 11,930 SF of 3" AC over 6" CMB pavement, compaction, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of per square feet for the entire work.

28. Construction of Building 2 masonry retaining wall per SPPWC Std. Plan 618-3, Type B (Bid Schedule line item no. 28).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, installation of 45 LF of masonry retaining wall, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of per linear feet for the entire work.

29. Construction of eleven (11) parking spaces in the northern parking area (Bid Schedule line item no. 29).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, striping of parking stalls per CALTRANS standard , importing suitable materials, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the striping work.

Payment will be made at the unit price of Lump Sum for the entire work.

30. Construction of sixteen (16) parking spaces in the southern parking area per CALTRANS standard (Bid Schedule line item no. 30).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, striping of parking stalls per CALTRANS standard , importing suitable materials, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the striping work.

Payment will be made at the unit price of Lump Sum for the entire work.

31. Construction of deepened curb south of northern parking area per SPPWC Std. Plan 120-2, Type A1(150) (Bid Schedule line item no. 30).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, concrete work, installation of deepened curb 118 LF of deepened curb, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of per linear feet for the entire work.

32. Construction of 18” high stone wall as shown in the plan and specifications (Bid Schedule line item no. 32).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, concrete work, construction of 96 LF of 18” high stone wall, as shown in the plans and specification, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of per linear feet for the entire work.

33. Construction of 10-foot wide driveway approach for Building 1 per SPPWC Std. Plan 110-2, Type B (Bid Schedule line item no. 33).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, installation of two (2) 10-foot 4” PCC concrete pavement over 6” CMB driveway approaches, concrete work, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of Lump sum for the entire 10’ wide Building 1 driveway approach.

34. Construction of 24-foot wide driveway approach for Building 1 per SPPWC Std. Plan 110-2, Type B (Bid Schedule line item no. 34).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, installation of one 24 feet driveway approach per SSPWC standard plan 110-2, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the

installation work.

Payment will be made at the unit price of Lump Sum for the entire 24' wide building 1- driveway approach.

35. Construction of 14-foot wide driveway approach for Building 4 per SPPWC Std. Plan 110-2, Type B (Bid Schedule line item no. 35).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, installation of one (1) 14-24 feet driveway approach per SSPWC standard plan 110-2, concrete work, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of Lump Sum for the entire 14' wide building 4 - driveway approach.

36. Install 6" bollard including foundation and reinforcement for Buildings 1 and 4 (Bid Schedule line item no. 36).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, concrete work, installation of eight (8) 6" bollards as shown in the plans and specification, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of Each bollard installation.

37. Construction of reinforced concrete stairway per SPPWC Std. Plan 640-4 (Bid Schedule line item no. 37).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, concrete work, installation of concrete stairway including handrails and rebar per SPPWC Std. Plan 640-4, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of Lump Sum for the entire work.

38. Construction of pedestrian ADA ramp north of Building 2 per CBC Chapter 11-B (Bid Schedule line item no. 38).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, concrete work, installation of concrete pedestrian

ramp including handrails and rebar per California Building Code Chapter 11-B, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of Lump Sum for the entire work.

39. Construction of two (2) commercial driveway approaches on southern and northern parking area (Bid Schedule line item no. 39).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, installation of one (1) 19-foot 4" PCC concrete pavement over 6" CMB pavement driveway approach and one (1) 21-foot 4" PCC concrete pavement over 6" CMB driveway approach per city standard DS-5, concrete work, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of Lump Sum for both driveways.

40. Installation of automatic entry gate for southern and northern parking areas (Bid Schedule line item no. 40).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, concrete work, installation of automatic entry gate as shown in the plans, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of Each gate for the entire work.

41. Installation of 5-foot wide pedestrian gate in southeast corner of site (Bid Schedule line item no. 41).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, concrete work, installation of 5-foot wide pedestrian gate per California Building Code Chapter 11-B, importing suitable materials, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of Lump Sum for the entire work.

42. Construction of 4" PCC decorative concrete pavement over 6" CMB pavement on the east side of Building 3 (Bid Schedule line item no. 42).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, concrete work, construction of 185 square feet of 4" PCC sidewalk concrete pavement over 6" CMB pavement per SPPWC Std. Plan 112-2, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of per square feet for the entire work.

43. Installation of expanded metal fencing over new CMU wall south of temporary trash storage area and northeast perimeter as shown in the plan and specifications (Bid Schedule line item no. 43).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, concrete work, installation 260 LF of expanded metal fencing over new CMU wall as shown in the plans and specifications, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of per linear feet for the entire work.

44. Installation of expanded metal fencing over existing CMU wall on northwestern and southwestern perimeter as shown in the plans and specifications (Bid Schedule line item no. 44).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, concrete work, installation 610 LF of expanded metal fencing over existing CMU wall, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of per linear feet for the entire work.

45. Installation of expanded metal fence south of northern parking area and in between Buildings 3 and 4 as shown in the plans and specifications (Bid Schedule line item no. 45).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, installation 55 LF of expanded metal fence, as shown in the plans and specification, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of Linear Feet for the entire work.

46. Construction of EV Chargers in southern parking area (Bid Schedule line item no. 46).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, installation of complete EV chargers including foundation, electrical system, all mechanical system, power connections, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of each EV charger for the entire work.

47. Striping of ADA (Pedestrians) walking path in northern parking area (Bid Schedule line item no. 47).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, striping of ADA path of travel per California Building Code Chapter 11-B, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of Lump Sum for the entire work.

48. Striping of ADA (Pedestrians) walking path in southern parking area (Bid Schedule line item no. 48).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, striping of ADA path of travel per California Building Code Chapter 11-B, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of Lump Sum for the entire work.

49. Construction of six (6) yard dumpsters (Bid Schedule line item no. 49).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, installation of six (6) yard dumpsters, construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of Lump Sum for the entire work.

50. Construction of one (1) commercial driveway approach east of southern parking area for nursery access per City of Inglewood Std. Detail DS-5 (Bid Schedule line item no. 50).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, construction of concrete commercial driveway approach per City of Inglewood standard DS-5 construction staking, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment will be made at the unit price of Lump Sum for the entire work.

51. Design and construction of the complete fire protection system for the entire project area (Bid schedule line item no. 51).

Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, transport services, delivery, site photos, providing services of civil, structural and, mechanical engineers for the design to be approved by the city and fire department including the construction of the complete fire protection system for the entire project and plumbing system in compliance to the NFPA, CBC, UPC and other standard codes for installation of fire protection system, importing suitable materials, bedding, clearing and grubbing for the reparation of the area, testing, inspection, NPDES compliance, OSHA safety standard implementation and all other works associated to complete the installation work.

Payment include piping system, DCDA, distribution line, valves and fittings and connection to existing water main.

Payment will be made at the unit price of Lump Sum for the entire design and construction of the fire protection system.

52. Bulk Excavation – to be determined by the City (Bid schedule line item no. 52).

This is a fixed amount intended for any unforeseen event only. The City Engineer will determine the existence of any bulk excavation onsite. Payment for this item shall include, but not limited to providing all labors, materials, tools, equipment, and all incidentals necessary to pay any bulk excavation onsite.

Payment will be made at the unit price of Lump Sum for the entire work.

Section 1.19: MATERIALS AND INSTALLATIONS

1. Mobilization and setup

- Applied to the entire project from mobilization to completion period
- Verify site condition
- Provide fence and any other protective equipment or devices to protect the public during construction of the project. Removal shall only be after City acceptance of the project
- Provide site erosion control devices during construction
- Provide contractors with own yard and staging area
- Start design work if any
- Provide safety fence and devices during construction
- Remove and dispose encountered hazardous materials (if any)
- Others as part of mobilization stated in construction standard
- Provide temporary SCE meter, post and other required items for temporary power
- Contact and coordinate with SCE, GAS company, City crew and other agencies needed for completing the construction of all structures

2. Demolition

- Install temporary fencing, barricades, and safety signage around work area
- Verify site existing conditions
- Sawcut existing concrete along existing joints to neat, straight edges at limits of removal
- Demolish four (4) existing buildings including walls, roofs, flooring, platforms, steps, foundation and all other structures to clean the way for the proposed construction
- Demolish existing concrete walls including reinforcement, foundation and all other structures to clean the way for the proposed construction
- Demolish existing asphalt and concrete pavement
- Remove underlying aggregate base, if present, to expose subgrade
- Scarify subgrade to a depth of 12 inches below bottom of aggregate base
- Remove any loose or unsuitable material encountered during scarification
- Demolish existing 908 LF of fencing including chain link fencing and posts (see Sheet A051 on Construction Documents for exact location)
- Demolish existing 426 LF of CMU wall including rebar, foundations and other existing structures to clean the way for the proposed construction
- Remove thirteen (15) existing trees
- Verify mature trees designated for removal and confirm limits of work in the field
- Obtain all required permits and coordinate removals with the City
- Remove existing trees as shown on the plans and dispose of material at an approved off-site facility
- All work shall comply with ANSI A300 Tree Care Operations and ISA Best Management Practices
- Locate, mark, and protect all existing utilities prior to excavation
- Perform controlled dismantling of mature trees to prevent damage to adjacent improvements

- Remove trunks, limbs, and debris from the site as work progresses
- Grind stumps and major surface roots to a minimum of 12 inches below finished grade
- Remove remaining root mass as required to accommodate future improvements
- Backfill stump voids with approved material and compact to match surrounding grades
- Demolish existing landscape area
- Import topsoil as required to restore grades
- Remove debris from demolition and dispose of materials at an approved off-site facility
- Restore disturbed areas to match adjacent surface conditions and slopes
- Leave site in a clean, safe, and stable condition upon completion
- Demolish all structures that are obstruction structures to give way for constructing required structures as shown in the plans and specifications. This must be included in demolition payments.
- City will inspect and approve all works

3. Survey Work

- Verify the entire area within limits of work
- Survey works must include all horizontal and vertical surveying works required from earthworks for construction of structures, landscaping, water works, sewer works, storm drain works, electrical system works and other works to complete the entire project.
- City will inspect and approve all works

4. Grading and earthwork

- Verify the area within the limits of work after demolition
- Excavate existing soil, transport in additional soil and move soil onsite as required to meet the proposed elevation per plan provided by the Civil Engineer on the Grading and Drainage Plan, Sheet C201
- All soil transported and existing soil on site shall be per geotechnical report recommendations or replaced by new soil that meet the requirements
- Any structures to be protected in place shall remain undisturbed and the contractor shall alert the City and the Civil engineer if any existing utilities, structures, or structures found on site are not identified on plan
- Removed and Dispose non-suitable soil materials.
- Contain and dispose hazardous soil materials
- City will inspect and approve all works

5. Construction of Building 1 – Workshop

- Construction, materials, and installation shall be per plans and specifications and in compliance to all Reference Standard including California Building Code, Uniform Plumbing Code, California Electrical Code (CEC), National Electrical Code (NEC), National Fire Protection Agency (NFPA) standards, Uniform Plumbing Code, International Conference of Building Official (ICBO), Standard Specification for Public Works Construction (SSPWC), American Public Works Standard (APWA), LA County Sanitation District (LACSD), LA County Flood

Control District (LAFCD), Caltrans Standard, and all other Federal, State and local Codes.

- All materials and hardware's must be new and approved by the City
- Materials Specifications are shown in the plans. City will choose, decide and approved materials that are not specified in the plans and specifications.
- Cons

6. Construction of Building 2 – Office

- Construction, materials, and installation shall be per plans and specifications and in compliance to all Reference Standard including California Building Code, Uniform Plumbing Code, California Electrical Code (CEC), National Electrical Code (NEC), National Fire Protection Agency (NFPA) standards, Uniform Plumbing Code, International Conference of Building Official (ICBO), Standard Specification for Public Works Construction (SSPWC), American Public Works Standard (APWA), LA County Sanitation District (LACSD), LA County Flood Control District (LAFCD), Caltrans Standard, and other Federal, State and local Codes.
- All materials and hardware's must be new and approved by the City
- Materials Specifications are shown in the plans. City will choose, decide and approved materials that are not specified in the plans and specifications.

7. Construction of Building 3 – Office

- Construction, materials, and installation shall be per plans and specifications and in compliance to all Reference Standard including California Building Code, Uniform Plumbing Code, California Electrical Code (CEC), National Electrical Code (NEC), National Fire Protection Agency (NFPA) standards, Uniform Plumbing Code, International Conference of Building Official (ICBO), Standard Specification for Public Works Construction (SSPWC), American Public Works Standard (APWA), LA County Sanitation District (LACSD), LA County Flood Control District (LAFCD), Caltrans Standard, and other Federal, State and local Codes.
- All materials and hardware's must be new and approved by the City
- Materials Specifications are shown in the plans. City will choose, decide and approved materials that are not specified in the plans and specifications.

8. Construction of Building 4 – Storage

- Construction, materials, and installation shall be per plans and specifications and in compliance to all Reference Standard including California Building Code, Uniform Plumbing Code, California Electrical Code (CEC), National Electrical Code (NEC), National Fire Protection Agency (NFPA) standards, Uniform Plumbing Code, International Conference of Building Official (ICBO), Standard Specification for Public Works Construction (SSPWC), American Public Works Standard (APWA), LA County Sanitation District (LACSD), LA County Flood Control District (LAFCD), Caltrans Standard, and other Federal, State and local Codes.
- All materials and hardware's must be new and approved by the City
- Materials Specifications are shown in the plans. City will choose, decide and approved materials that are not specified in the plans and specifications.

9. Construction of stockpile and trash storage area with 7" AC pavement over 4" CMB pavement per geotechnical report recommendations

- Verify the area
- Demolish all structures within the area, scarify subgrade to a depth of 11 inches below bottom of aggregate base
- Compact soil to 95%
- Place 4" base aggregates and compact to 95%
- Pavement: Install 3,070 SF of 7" asphalt concrete over 4" crushed miscellaneous base per geotechnical report recommendations.
- Install formwork, hardware and other materials as required to pave the area.
- Asphalt materials and installation shall conform to standard specification for public Works construction (SSPWC)
- CMU walls materials and installation must comply with SPPWC Std. Plan 618-3
- Columns installation must comply with SPPWC Std. Plan 618-3
- City will inspect and approve all works

10. Construction of the Low Impact Development (LID) system, including stormwater pipelines, inlets, BMPs and other appurtenances

- Verify the LID area including finish grading elevation
- Install all structures required to complete the LID system including but not limited to bio swales, planters, trees or complete landscape system, pavement, pavers, rocks or decomposed granite around the area, piping system, pipes fittings, controllers and connection to existing SD pipes.
- All installation must conform to all standards mentioned in item no. 8 including compliance to the LA County Regional Board – Low Impact Development installation procedures and guidelines.
- Provide 6 months healthy and live plants and trees warranties for all plants and trees.
These means that contractor must replace the plants and or trees if unhealthy and or dying 6 months after planting and acceptance by City
- **See item no. 12 as part of this item**
- City will inspect and approve all works

11. Remove and replace existing main entrance gate and motor with City approved gate and motor on Warren Lane

- Verify the area
- Remove existing gate and motor including foundations, posts, electrical system and all other required structures to remove the existing gate and appurtenances.
- Install approved new gate and motor and other appurtenances similar to the existing condition. Provide pavement loop inside the egress area.
- City will inspect and approve all works

12. Construction of the complete project landscaping area including the complete project irrigation system, trees, boulders, plants, shrubs, and grass

- All materials and installation must be per plan, specifications and applicable standards.
- Tree planting shall be performed under the supervision of a Certified Arborist

- Inspect the area where trees will be planted and verify soil conditions
- Verify existing irrigation within tree well and install irrigation system with required valves, fittings, and apparatuses as necessary per California Plumbing Code (latest edition) and Uniform Plumbing Code (latest edition)
- Connect new tree to existing or new irrigation system per California Plumbing Code (latest edition) and Uniform Plumbing Code (latest edition)
- Irrigation Pipe: 1" PVC or HDPE irrigation piping
- Install emitters, bubblers, or drip devices at each tree location as required
- Install controllers/timers and make electrical connections as required
- Verify proper bedding and support to protect piping from damage
- Pressure-test and flush irrigation lines prior to final backfill
- Abandon, cap, or remove any existing irrigation lines or structures as required
- Protect adjacent utilities and structures during installation
- All work shall comply with ANSI A300 Tree Care Operations, ANSI Z60.1 – American Standard for Nursery Stock, and ISA Best Management Practices for Tree Planting
- Excavate planting pit to accommodate new 24-inch box tree, providing adequate root ball clearance
- Scarify sides of planting pit 6" to allow root penetration and remove all debris and obstructions
- Blend amended topsoil mix consisting of 70% native soil and 30% organic compost
- Place 4" layer of amended backfill at bottom, lightly tamped
 - o Organic compost: clean, well decomposed, stable organic matter free of weed seeds
 - o Topsoil: Sandy loam, or loam, pH 6.0-7.5, free of rocks, clay lumps, and debris
 - o Mulch: shredded bark mulch, 3" depth, natural color, no dyes
- Install trees
- Install grasses
- Install ten (10) red mountain boulders per landscaping plan
- Reject trees that are root-bound, damaged, or undersized
- Rootball shall be fully contained, moist, and free of circling or girdling roots
- Set tree plumb and at proper finished grade with root flare exposed
- Install tree supports for each tree. Tree supports: (2) 8' wood lodgepole stakes, minimum 2" diameter, pressure treated or natural rot-resistant
 - o Stakes to clear lowest branch by 6" minimum
 - o Flexible tree ties, 1" wide, UV resistant, no wire through hose
- Rotate tree for best canopy orientation
- Restore disturbed areas to match adjacent grades and finishes
- Deep water immediately after planting until soil is fully settled
- Maintain consistent moisture (not saturated) for first 90 days
- Contractor is responsible for an establishment period of 90 days. Contractor shall water weekly (or as needed, by climate), check stakes, ties and berms, and replace any tree that dies during establishment at no cost.
- Leave site in a clean, safe, and stable condition upon completion
- City will inspect and approve all works

13. Construction of the complete project water works system including connections

- Visit the area and perform thorough investigation of existing condition
- Verify connection to existing water source. Take required measurements for completing the task.
- All materials and installation must be per plans, specifications and conform to all applicable standards.
- Domestic water connection to the water main required a water meter. Install water service connection per City water standard W-355 sheet 22.
- Landscape and irrigation system connection to the water main required an approved Department of Health (DOH) backflow device after the meter. Likewise, a separate water service line with meter is needed per W-355 sheet 22.
- All water materials and installation inside the property must conform to all standard in item no. 8 including California Building Code and California Plumbing Code or Uniform Plumbing Code.
- City will inspect and approve all works

14. Construction of the complete project sewer works system including connections

- Visit the area and perform thorough investigation of existing condition
- Verify connection to existing water source. Take required measurements for completing the task.
- All materials and installation must be per plans, specifications and conform to all applicable standards like CBC, UPC, LA County SD APWA, and others
- Use VCP and wye for materials outside the property. Use required/approved materials per CBC, UPC and applicable standards for materials inside the property
- City will inspect and approve all works

15. Construction of complete project mechanical Heating, Ventilation and Air Conditioning system

- Visit the area and perform thorough investigation of existing condition
- All materials and installation must be per plans, specifications and conform to all applicable standards like CBC, IBC, IMC, ASHRAE standards and others
- All water materials and installation inside the property must conform to all standards, including California Building Code, International Building Code, International Mechanical Code, and American Society of Heating, Refrigerating, and Air Conditioning Engineers standards
- City will inspect and approve all works

16. Construction of the complete project electrical system

- Visit the area and perform thorough investigation of existing condition
- Verify connection to existing water source. Take required measurements for completing the task.
- All materials and installation must be per plans, specifications and conform to all applicable standards like SCE plans, CBC, NEC and others.
- Contact and coordinate with Southern California Edison (SCE) as soon as possible after the award to strategize the SCE electrical works.
- Install required temporary poles/meters for temporary power and coordinate with

SCE.

- All testing and inspections will be done based on contractors request for inspection.
- Final inspection and meter installation must be coordinated by the contractor at the end of the final approved installation.
- City will inspect and approve all works

17. Construction of 6” curb around Building 1 per SPPWC Std. Plan 120-2 type A1-6(150)

- Verify limits of curb
- Compaction = 95%
- Concrete curb: Install one- 6” high curb per SPPWC Std. Plan 120-2, Type A1-6(150), be installed flush to existing surrounding sidewalk and match proposed grades and finishes, Use 2500 PSI concrete
- Finish concrete surface to match Grading and Drainage Plan, Sheet C200
- Cure concrete in accordance with project specifications including concrete ACI code.
- Protect new concrete from damage until fully cured
- Leave area clean, safe, and flush with adjacent surfaces
- City will inspect and approve all works

18. Construction of 6” curb in southern parking area per SPPWC Std. Plan 120-2, Type A1-6(150)

- Verify limits of curb
- Compaction = 95%
- Concrete curb: Install one- 6” high curb per SPPWC Std. Plan 120-2, Type A1-6(150), be installed flush to existing surrounding sidewalk and match proposed grades and finishes, Use 2500 PSI concrete
- Finish concrete surface to match Grading and Drainage Plan, Sheet C200
- Cure concrete in accordance with project specifications including concrete ACI code.
- Protect new concrete from damage until fully cured
- Leave area clean, safe, and flush with adjacent surfaces
- City will inspect and approve all works

19. Construction of 6” curb and gutter in northern parking area per SPPWC Std. Plan 120-3, Type A2-6(150)

- Verify limits of curb
- Compaction = 95%
- Concrete curb: Install one- 6” high curb per SPPWC Std. Plan 120-3, Type A2-6(150), be installed flush to existing surrounding sidewalk and match proposed grades and finishes, Use 2500 PSI concrete
- Finish concrete surface to match Grading and Drainage Plan, Sheet C200
- Cure concrete in accordance with project specifications including ACI code.
- Protect new concrete from damage until fully cured
- Leave area clean, safe, and flush with adjacent surfaces
- City will inspect and approve all works

20. Construction of longitudinal gutter in northern parking area per SPPWC Std. Plan 122-3

- Verify limits of longitudinal gutter
- Compaction = 95%
- Install formwork as necessary to maintain neat edges and grades
- Concrete longitudinal curb: Install one- 6" high curb per SPPWC Std. Plan 122-3, Type A1-6(150), be installed flush to existing surrounding sidewalk and match proposed grades and finishes, 2500 PSI concrete
- Install #4 bars 18" long dowels for construction joints
- Finish concrete surface to match Grading and Drainage Plan.
- Cure concrete in accordance with project specifications including ACI code
- Protect new concrete from damage until fully cured
- Leave area clean, safe, and flush with adjacent surfaces
- City will inspect and approve all works

21. Construction of ADA curb ramp per SPPWC Std. Plan 111-5, Case B, Type 1

- Verify limits of longitudinal gutter
- Compaction = 95%
- ADA ramp must be per SPPWC Std. Plan 111-5, Case B, Type 1, be installed flush to existing surrounding sidewalk and match proposed grades and finishes, 2500 PSI concrete
- Finish concrete surface to match Grading and Drainage Plan.
- Cure concrete in accordance with project specifications including ACI code
- Protect new concrete from damage until fully cured
- Leave area clean, safe, and flush with adjacent surfaces
- City will inspect and approve all works

22. Construction of 4" PCC sidewalk concrete pavement over 6" CMB pavement around Building 1 per SPPWC Std. Plan 112-2

- Verify limits of sidewalk concrete
- Compaction = 95%
- Concrete pavement: Install 1,420 SF of 4" PCC sidewalk concrete pavement over 6" CMB pavement, 2500 PSI concrete
- Finish concrete surface to match Grading and Drainage Plan, Sheet C200
- Cure concrete in accordance with project specifications including ACI code
- Protect new concrete from damage until fully cured
- Leave area clean, safe, and flush with adjacent surfaces
- City will inspect and approve all works

23. Construction of 4" PCC sidewalk concrete pavement over 6" CMB pavement around Building 2 per SPPWC Std. Plan 112-2

- Verify limits of sidewalk concrete
- Compaction = 95%
- Concrete pavement: Install 350 SF of 4" PCC sidewalk concrete pavement over 6" CMB pavement, 2500 PSI concrete
- Finish concrete surface to match Grading and Drainage Plan, Sheet C200
- Cure concrete in accordance with project specifications

- Protect new concrete from damage until fully cured
- Leave area clean, safe, and flush with adjacent surfaces
- City will inspect and approve all works

24. Construction of 4" PCC decorative concrete pavement over 6" CMB pavement in front of Building 3 per SPPWC Std. Plan 112-2

- Verify limits of sidewalk concrete
- Compaction = 95%
- Install formwork as necessary to maintain neat edges and grades
- Concrete pavement: Install 1,835 SF of 4" PCC decorative concrete over 6" CMB pavement, 2500 PSI concrete
- Decorative Concrete: Davis Colors' Mesa Buff #5447 with Ecocast #5 finish or approved equal
- Finish concrete surface to match Grading and Drainage Plan, Sheet C200
- Cure concrete in accordance with project specifications
- Protect new concrete from damage until fully cured
- Leave area clean, safe, and flush with adjacent surfaces
- City will inspect and approve all works

25. Construction of 3" deep stabilized decomposed granite (DG) around Building 2

- Verify the limit of the area
- Apply decomposed granite and compact with 3" finish thickness
- Seal the DG with City approved sealing materials for DG
- Decomposed Granite: Southwest Boulder and Stone's Desert Gold with soil-secure stabilizer or approved equal
- Type of Sealant: Soil-Secure
- Do not stabilize DG at planting
- Apply water until moisture penetrated total depth of tilled area
- After the surface water disappears, compact area
- City will inspect and approve all works

26. Construction of 3" AC pavement over 6" CMB pavement in northern parking area per Geotechnical Report Recommendations

- Verify limits of sidewalk concrete
- Compaction = 95%
- Concrete pavement: Install 1,420 SF of 4" PCC sidewalk concrete pavement over 6" CMB pavement, 2500 PSI concrete
- Finish concrete surface to match Grading and Drainage Plan, Sheet C200
- Cure concrete in accordance with project specifications including ACI code
- Protect new concrete from damage until fully cured
- Leave area clean, safe, and flush with adjacent surfaces
- City will inspect and approve all works

27. Construction of 3" AC pavement over 6" CMB pavement in southern parking area per Geotechnical Report Recommendations.

- Verify limits of sidewalk concrete
- Compaction = 95%
- Concrete pavement: Install 1,420 SF of 4" PCC sidewalk concrete pavement over

- 6" CMB , 2500 PSI concrete
- Finish concrete surface to match Grading and Drainage Plan, Sheet C200
- Cure concrete in accordance with project specifications including ACI code
- Protect new concrete from damage until fully cured
- Leave area clean, safe, and flush with adjacent surfaces
- City will inspect and approve all works

28. Construction of Building 2 masonry retaining wall per SPPWC Std. Plan 618-3, Type B

- Verify the limit of the area
- Construct masonry wall including materials per SPPWC std. plans 618-3, type B.
- Vertical and Horizontal level must be straight and clean
- Foundation and grouting must be approved by Deputy concrete inspector

29. Striping of eleven (11) parking spaces in northern parking area

- Verify limits of striping area
- Apply cat track for city review and approval per SPPWC Std. Plan 180-0
- Apply 4" wide white non-reflectorized paint or approved equal
- Apply striping per California Building Code Chapter 11-B
- City will inspect and approve all works

30. Striping of sixteen (16) parking spaces in southern parking area

- Verify limits of striping area
- Apply cat track for city review and approval per SPPWC Std. Plan 180-0
- Apply 4" wide white non-reflectorized paint or approved equal
- Apply striping per California Building Code Chapter 11-B
- City will inspect and approve all works

VERIFY PARKING STALL COUNT BETWEEN SHEETS AND WITH NEW DRIVEWAY APPROACH NEAR NURSERY

31. Construction of deepened curb south of northern parking area per SWPPC Std. Plan 120-2, Type A1(150)

- Verify limits of curb
- Compaction = 95%
- Concrete curb: Install deepened curb per SPPWC Std. Plan 120-3, Type A2-6(150), be installed flush to existing surrounding sidewalk and match proposed grades and finishes, Use 2500 PSI concrete
- Finish concrete surface to match Grading and Drainage Plan, Sheet C200
- Cure concrete in accordance with project specifications including ACI code.
- Protect new concrete from damage until fully cured
- Leave area clean, safe, and flush with adjacent surfaces
- City will inspect and approve all works

32. Construction of 18" high stone wall

- Verify area prior to construction of wall

- Construct an 18" high red mountain classic stone veneer wall to proposed stairs south of northern parking area
- Construct wall from proposed CMU wall with expanded metal fencing along eastern perimeter with 46'-10 1/2" linear feet with 38'-6" radius, 28'-8 1/2" linear feet with 94'-5 1/2" radius, 9'-7 1/2" linear feet to proposed stairs south of northern parking area with 1'-9 3/4" linear feet or until end of first step parallel to proposed stairs
- Construct 11 3/4" linear feet parallel to the new stairs or from end of first step then 7'4" linear feet of 18" high red mountain classic stone veneer wall to existing wall south of northern parking area
- Manufacturer: Southwest Boulder & Stone or approved equal
- City will inspect and approve all works

33. Construction of 10-foot wide driveway approach for Building 1 per SPPWC Std. Plan 110-2, Type B

- Verify area prior to construction of driveway approach
- Prepare subgrade; remove unsuitable material as required
- Place 4" base aggregates and compact 90%
- Install formwork as necessary to maintain neat edges and grades
- Install 4" PCC concrete over 6" CMB pavement, 10-foot wide driveway approach per SPPWC standard plan 110-2, Type B, 2500 PSI concrete
- Finish concrete surface to match surrounding improvements
- City will inspect and approve all works

34. Construction of 24-foot wide driveway approach for Building 1 per SPPWC Std. Plan 110-2, Type B

- Verify area prior to construction of driveway approach
- Prepare subgrade; remove unsuitable material as required
- Install formwork as necessary to maintain neat edges and grades
- Install, 24-foot wide driveway approach per SPPWC standard plan 110-2, Type B, 2500 PSI concrete
- Finish concrete surface to match surrounding improvements
- City will inspect and approve all works

35. Construction of 14-foot wide driveway approach for Building 4 per SPPWC Std. Plan 110-2, Type B

- Verify area prior to construction of driveway approach
- Prepare subgrade; remove unsuitable material as required
- Install formwork as necessary to maintain neat edges and grades
- Install 14-foot wide driveway approach per SPPWC standard plan 110-2, Type B, 2500 PSI concrete
- Finish concrete surface to match surrounding improvements
- City will inspect and approve all works

36. Installation of 6" bollard including foundation and reinforcement for Buildings 1 and 4

- Verify area of new sidewalk concrete

- Install 3'-6" minimum deep, 18" diameter 4" PCC concrete foundation for bollard installation
- Install 6" bollard with 6" from bottom of bollard to edge of concrete foundation per manufacturer's instructions
- Install 6" diameter SCH 40 STL Pipe, fill with concrete round top
- Dome top of concrete around new bollard per manufacturer's instructions
- City will inspect and approve all works

37. Construction of reinforced concrete stairway per SPPWC Std. Plan 640-4

- Verify area prior to construction of concrete stairway
- Prepare subgrade; remove unsuitable material as required
- Install formwork as necessary to maintain neat edges and grades
- Install 4" thick PCC concrete pavement over 6" CMB reinforced concrete stairway per SPPWC Std. Plan 640-4, 2500 PSI concrete
- Install #4 rebar at 18" OC under each riser along the length of the stairs
- Install #4 at 12" OC each way at the base of the stairs along the width of the stairs
- Construct 1'-3" tread length per Sheet A060
- Construct 6 ½" riser height per Sheet A060
- Install Steel Round handrail 1 ½" diameter PT09 along length of stairs with 1' overhang with minimum 34" from top of concrete to bottom of handrail height per Sheet A060
- Finish concrete surface to match Grading and Drainage Plan, Sheet C200
- City will inspect and approve all works

38. Construction of pedestrian ADA ramp north of Building 2 per CBC Chapter 11-B

- Verify limits of ADA ramp
- Concrete pavement: Install 350 SF of 4" PCC sidewalk concrete pavement over 6" CMB pavement, 2500 PSI concrete
- Install concrete ramp per California Building Code Chapter 11-B
- North Guardrail: Install Steel Guardrail, PT09 finish, mounted on top of wall 3'-6" minimum height for entire length of ramp with 1'-2" overhang on top and 1' overhang on bottom along north side of ramp per Site Details on Sheet A060
- South Guardrail: Install Steel Guardrail, PT09 finish, mounted on top of curb 3'-6" minimum height for entire length of ramp with 1'-2" overhang on top and continuing until ending flush with perpendicular wall on bottom along south side of ramp per Site Details on Sheet A060
- Handrails: Install Steel round handrails with 1 ½" diameter, PT09 finish, to northern and southern guardrails along length of ramp, 34" to 36" height from concrete ramp per Site Details on Sheet A060
- Steel Plate Connections per Typical Steel Details Sheet S020 and S021
- Finish concrete surface to match Grading and Drainage Plan, Sheet C200
- Cure concrete in accordance with project specifications
- Protect new concrete from damage until fully cured
- Leave area clean, safe, and flush with adjacent surfaces
- City will inspect and approve all works

39. Construction of two (2) commercial driveway approaches in southern and northern parking areas per SPPWC Std. Plan 110-2, Type B

- Verify area prior to construction of driveway approach
- Prepare subgrade; remove unsuitable material as required
- Install formwork as necessary to maintain neat edges and grades
- Install 21' wide and 19' wide driveway approach per SPPWC standard plan 110-2, Type B, 2500 PSI concrete
- Finish concrete surface to match surrounding improvements
- City will inspect and approve all works

40. Installation of automatic entry gate for southern and northern parking area

- Verify area prior to construction of the gate
- Install steel gate with automatic card reader devices per plans, specifications and manufacturer's installation.
- Installation must include all required electrical works and hardware.
- Provide warranty certificate from manufacturer
- Provide 1 day training and orientation to City employees
- City will inspect and approve all works

41. Installation of 5-foot wide pedestrian gate in southeast corner of site

- Verify area prior to construction of the gate
- Install metal fence gate per plans, specifications and matching the adjacent metal fences and gates.
- Installation must include all required hardware.
- Provide warranty certificate from manufacturer
- City will inspect and approve all works

42. Construction of 4" PCC sidewalk concrete pavement over 6" CMB pavement southeastern pedestrian entrance walkway

- Verify limits of sidewalk concrete
- compact 95%
- Concrete pavement: Install 185 SF of 4" PCC sidewalk concrete pavement over 6" CMB pavement, 2500 PSI concrete
- Finish concrete surface to match Grading and Drainage Plan, Sheet C200
- Cure concrete in accordance with project specifications
- Protect new concrete from damage until fully cured
- Leave area clean, safe, and flush with adjacent surfaces
- City will inspect and approve all works

43. Installation of expanded metal fencing over new CMU wall south of temporary trash storage area and northeast perimeter

- Verify area prior to construction of the fence/gate
- Install metal fence per plans, specifications and matching the adjacent metal fences and gates.
- Installation must include all required hardware.
- Provide warranty certificate from manufacturer
- City will inspect and approve all works

44. Installation of expanded metal fencing over existing CMU wall on northwestern and southwestern perimeter

- Verify area prior to construction of the fence/gate
- Install metal fence gate per plans, specifications and matching the adjacent metal fences and gates.
- Installation must include all required hardware.
- Provide warranty certificate from manufacturer
- City will inspect and approve all works

45. Installation of expanded metal fence south of northern parking area and in between Buildings 3 and 4

- Verify area prior to construction of the fence/gate
- Install metal fence gate per plans, specifications and matching the adjacent metal fences and gates.
- Installation must include all required hardware.
- Provide warranty certificate from manufacturer
- City will inspect and approve all works

46. Construction of EV Chargers in southern parking area

- Verify area prior to construction of the fence/gate
- Contact and coordinate with SCE about electrical source and installation
- Install EV charging equipment and stalls and per plans, specifications and manufacturers installation
- Installation must include all required hardware.
- Provide warranty certificate from manufacturer
- Provide 1 day training and orientation to City employees
- City will inspect and approve all works

47. Striping of ADA path of travel in northern parking area

- Verify limits of striping area
- Apply cat track for city review and approval per SPPWC Std. Plan 180-0
- Apply 4" wide white non-reflectORIZED paint or approved equal
- Apply striping per California Building Code Chapter 11-B
- City will inspect and approve all works

48. Striping of ADA path of travel in southern parking area

- Verify limits of striping area
- Apply cat track for city review and approval per SPPWC Std. Plan 180-0
- Apply 4" wide white non-reflectORIZED paint or approved equal
- Apply striping per California Building Code Chapter 11-B
- City will inspect and approve all works

49. Construction of six (6) yard dumpsters

- Verify area prior to construction of the dumpster
- City will inspect and approve all works

50. Construction of one (1) commercial driveway approach east of southern parkway for nurse access per SSPWC standard plan 110-2, type B. 2500 PSI concrete.

- Verify area prior to construction of driveway approach
- Prepare subgrade; remove unsuitable material as required
- Place 4" base aggregates and compact 90%
- Install formwork as necessary to maintain neat edges and grades
- Install 4" thick PCC concrete over 6" CMB pavement, driveway approach per SPPWC standard plan 110-2, Type B. 2500 PSI concrete
- Reinforcement will be ¼" mesh wire
- Finish concrete surface to match surrounding improvements
- City will inspect and approve all works

51. Design and construction of complete fire protection system for the entire project area.

1. ALL Materials and installation shall be per approved design plans and specifications in conformance to all applicable standards like NFPA, Fire Department, CBC, UPC, ICBO, and all other required standards to complete the installation of the complete fire protection system for the project.,
2. Designer and sub-contractor must also be included in the sub-contractor list. Sub-contractor must be a licensed fire system installer
3. SPRINKLER SYSTEMS SHALL COMPLY WITH NFPA-13; IT SHALL BE APPROVED BY CITY PRIOR TO INSTALLATION. (903.2)
4. PROVIDE FIRE EXTINGUISHER AS REQUIRED BY FIRE DEPARTMENT FIELD INSPECTOR. SIZE AND DISTRIBUTION SHALL BE IN ACCORDANCE WITH SECTION

906.3.1-906.3.4

- I. IN GROUP A, E, F, H, I, R-2, R-2.1 OCCUPANCIES
 - II. ON EACH FLOOR OF STRUCTURES UNDER CONSTRUCTION
 - III. WHERE REQUIRED BY T906.1
 - IV. SPECIAL HAZARD AREAS WHERE REQUIRED BY THE FIRE CODE OFFICIAL
5. PORTABLE FIRE EXTINGUISHERS SHALL HAVE A RATING NOT LESS THAN 2-A OR 2-A10BC WITHIN 75 FEET TRAVEL DISTANCE TO ALL PORTIONS OF THE BUILDING
ON EACH FLOOR, ALSO DURING CONSTRUCTION.
 6. PORTABLE FIRE EXTINGUISHERS SHALL HAVE A RATING NOT LESS THAN 10BC FOR KITCHEN, ELECTRICAL ROOM, AND MECHANICAL ROOM, OR PARKING GARAGE.
 7. FIRE DEPARTMENT CONNECTIONS SHALL BE LOCATED ON ADDRESS SIDE OF BUILDING
 8. PROVIDE AN APPROVED FIRE ALARM SYSTEM

9. IN NEW BUILDINGS AND STRUCTURES, AN APPROVED FIRE ALARM SYSTEM INSTALLED IN ACCORDANCE WITH THE PROVISIONS OF THIS CODE AND NFPA 72
 SHALL BE PROVIDED IN ACCORDANCE WITH SECTIONS 907.2.1 THROUGH 907.2.23 AND PROVIDE OCCUPANT NOTIFICATION IN ACCORDANCE WITH SECTION 907.5.
10. ALL INTERRUPTED FIRE SPRINKLER HEADS TO BE RESTORED AND TESTED FOR OPERATION
11. AN AUTOMATIC SPRINKLER SYSTEM SHALL BE PROVIDED AT TOP OF RUBBISH AND LINEN CHUTES AND IN THEIR TERMINAL ROOM.
12. BUILDINGS SHALL HAVE APPROVED RADIO COVERAGE FOR EMERGENCY RESPONDERS. SEE LOS ANGELES FIRE CODE SECTION 510 FOR MORE DETAILS
13. AN AUTOMATIC SPRINKLER SYSTEM SHALL BE INSTALLED AT THE TOP OF RUBBISH AND LINEN CHUTES AND IN THEIR TERMINAL ROOMS. CHUTES SHALL HAVE ADDITIONAL SPRINKLER HEADS INSTALLED AT ALTERNATE FLOORS AND AT THE LOWEST INTAKE.
14. SMOKE ALARMS SHALL BE INTERCONNECTED IN SUCH A MANNER THAT THE ACTIVATION OF ONE ALARM WILL ACTIVATE ALL THE ALARMS IN THE INDIVIDUAL
 UNIT. REQUIRED SMOKE ALARMS SHALL RECEIVE THEIR PRIMARY POWER FROM THE BUILDING WIRING AND SHALL BE EQUIPPED WITH A BATTERY BACKUP.
15. CARBON MONOXIDE DETECTION SHALL BE PROVIDED IN THE FOLLOWING LOCATIONS
 - A. DWELLING UNITS:
 1. OUTSIDE OF EACH SEPARATE SLEEPING AREA
 2. EVERY OCCUPIABLE LEVEL OF A DWELLING UNIT
 3. BEDROOMS WHERE A FUEL-BURNING APPLIANCE IS LOCATED WITHIN OR ITS ATTACHED BATHROOM
 - B. SLEEPING UNITS
16. EMERGENCY VOICE/ALARM COMMUNICATION SYSTEMS REQUIRED BY CODE SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH NFPA 72. THE OPERATION OF ANY AUTOMATIC FIRE DETECTOR, SPRINKLER WATERFLOW DEVICE OR MANUAL FIRE ALARM BOX SHALL AUTOMATICALLY SOUND AN ALERT TONE FOLLOWED BY VOICE INSTRUCTIONS GIVING APPROVED INFORMATION AND DIRECTIONS FOR A GENERAL OR STAGED EVACUATION IN ACCORDANCE WITH THE BUILDING'S FIRE SAFETY AND EVACUATION PLANS REQUIRED BY SECTION 404. IN HIGH-RISE BUILDINGS AND GROUP I-1 OCCUPANCIES HAVING

OCCUPIED FLOORS LOCATED MORE THAN 75 FEET ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS, THE SYSTEM SHALL OPERATE ON AT LEAST THE ALARMING FLOOR, THE FLOOR ABOVE AND THE FLOOR BELOW. SPEAKERS SHALL BE PROVIDED THROUGHOUT THE BUILDING BY PAGING ZONES. AT A MINIMUM, PAGING ZONES SHALL BE PROVIDED AS FOLLOWS:

i.ELEVATOR GROUPS

ii.INTERIOR EXIT STAIRWAYS

iii.EACH FLOOR

iv.AREAS OF REFUGE AS DEFINED IN LABC CHAPTER 2

17. A MANUAL OVERRIDE FOR EMERGENCY VOICE COMMUNICATION SHALL BE PROVIDED ON A SELECTIVE AND ALL CALL BASIS FOR ALL PAGING ZONES

18. THE EMERGENCY VOICE/ALARM COMMUNICATION SYSTEM SHALL ALSO HAVE THE CAPABILITY TO BROADCAST LIVE VOICE MESSAGES BY PAGING

ZONES ON A SELECTIVE AND ALL CALL BASIS

19. THE EMERGENCY VOICE/ALARM COMMUNICATION SYSTEM SHALL NOT BE ALLOWED TO BE USED FOR OTHER ANNOUNCEMENTS.

20. EMERGENCY VOICE/ALARM COMMUNICATIONS SYSTEMS SHALL BE PROVIDED WITH EMERGENCY POWER IN ACCORDANCE WITH LABC SECTION 604. THE

SYSTEM SHALL BE CAPABLE OF POWERING THE REQUIRED LOAD FOR A DURATION OF NOT LESS THAN 24 HOURS.

21. FIRE PROTECTION RATED GLAZING SHALL COMPLY WITH CBC 716.6:

i.RATINGS AS INDICATED IN T716.6

ii.INSTALLED IN FIXED POSITION OR AUTOMATIC CLOSING

22. 3/4 HOUR FIRE PROTECTION RATED GLAZING ALLOWED IN 1 HR FIRE PARTITIONS AND 1 HR FIRE BARRIERS IN ACCORDANCE WITH 707.3.7 AND 707.3.9. TOTAL AREA OF GLAZING SHALL BE LESS THAN OR EQUAL TO 25% OF THE AREA OF COMMON WALL. FIRE RESISTANCE RATED GLAZING TESTED IN ACCORDANCE WITH ASTM E119 OR UL 263 SHALL NOT BE SUBJECT TO LIMITATIONS.

23. All plumbing system including piping system, valves, blocks, fittings, distribution line, DCDA and other plumbing materials shall be in compliance to Federal, State and City standards.

52. Bulk Excavation

- This bid line item cannot be used for any of the above items except for unforeseen event that will be determined by the City. The price is fixed.

Part II – Technical Specifications

Section 01300 Submittal Procedure

1.0 GENERAL

Where required by the specifications, the Contractor shall submit descriptive information which will enable the Owner whether the Contractor's proposed materials, equipment or methods of work are in general conformance to the design concept and in compliance with the drawings and specifications. The information to be submitted shall consist of drawings, specifications, descriptive data, certificates, samples, test results and other such information, all as specifically required in the specifications.

2.0 CONTRACTOR'S RESPONSIBILITIES

Contractor shall be responsible for the accuracy and completeness of the information contained in each submittal and shall assure that the material, equipment or method of work shall be as described in the submittal. Submittals shall contain all required information, including satisfactory identification of items, units and assemblies in relation to the contract drawings and specifications. The Contractor shall verify that the material and equipment described in each submittal conforms to the requirements of the specifications and drawings. Unless otherwise approved by the Owner, submittals shall be made only by the Contractor, who shall indicate by a signed stamp on the submittals, that the Contractor has checked the submittals, and that the work shown conforms to contract requirements and has been checked for dimensions and relationship with work of all other trades involved. If the information shows deviations from the specifications or drawings, the Contractor, by statement in writing accompanying the information shall identify the deviations and state the reason(s) therefore. The Contractor shall insure that there is no conflict with other submittals and shall notify the Owner in each where its submittal may affect the work of another contractor or the Owner. The Contractor shall insure coordination of submittals among the related crafts and subcontractors.

The Contractor may authorize a material or equipment supplier to deal directly with the Owner with regard to a submittal. The Contractor, however, shall be responsible for the accuracy and completeness of information contained in all submittals.

3.0 TRANSMITTAL PROCEDURE

- A. **General:** Submittals regarding material and equipment shall be accompanied by a transmittal form from the Contractor. A separate form shall be used for each specific item, class of material, equipment, and items specified in separate, discrete sections, for which a submittal is required. However, submittals for various items shall be made with a single form only when the items taken together

constitute a manufacturer's package or are so functionally related that expediency indicates checking or review of the group or package as a whole.

Each set of submittals or samples shall be attached to the submittal transmittal form. The submittal number shall be made up of two parts: XXX-ZZ. The XXX shall be sequential number 001 for the first submittal, 002 for the second, etc. The ZZ shall be the sequential number of the submittal. All submittals shall show the contract title, shall indicate the name of the vendor, and shall indicate when the equipment and/or material will be required by the construction schedule. The submittal must be adequate to permit a comprehensive review without further reference to the Contractor. The documents submitted must be separately identifiable on the Contractor's submittal transmittal form.

- B. **Deviation from Contract:** If the Contractor proposes to provide material or equipment which does not conform to the specifications and drawings, it shall indicate so under "deviations" on the submittal transmittal form accompanying the submittal copies.
- C. **Submittal Completeness:** Submittals which do not have all the information required to be submitted, including deviations, shall be considered as not complying with the intent of the contract and are not acceptable and will be returned without review.

4.0 REVIEW PROCEDURE

When the contract requires a submittal, the Contractor shall submit the specified information as follows to the Project Manager for review:

1. Five copies of all the submitted information. When individual sheets in the submittal exceed 8-1/2 inches by 11 inches, one sepia and six (4) copies may be submitted.
2. Only three (1) set of sample materials need to be submitted.

Within 14 calendar days after receipt of the submittal by the Owner, the submittal shall be reviewed and the Owner shall return the marked-up submittal. On complex drawings and equipment the Owner shall acknowledge receipt within 14 days and advise the Contractor when the submittals will be returned. The returned submittal shall indicate one of the following actions.

3. If the review indicates that the material, equipment or work method is in general conformance with the design concept and complies with the drawings and specifications, submittal copies will be marked "NO EXCEPTIONS TAKEN". In this event, the Contractor may begin to implement the work method or incorporate the material or equipment covered by the submittal.

4. If the review indicates limited corrections are required, copies will be marked "MAKE CORRECTIONS NOTED". The Contractor may begin implementing the work method or incorporating the material and equipment covered by the submittal in accordance with the noted corrections. Where submittal information will be incorporated in O&M data, a corrected copy shall be provided.
5. If the review reveals that the submittal is insufficient or contains incorrect data, copies will be marked "AMEND AND RESUBMIT". Except at its own risk, the Contractor shall not undertake work covered by this submittal until the submittal has been revised, resubmitted and returned marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED".
6. If the review indicates that the material, equipment or work method is not in general conformance with the design concept or in compliance with the drawings and specifications, copies of the submittal will be marked "REJECTED - SEE REMARKS". Submittals with deviations which have not been identified clearly may be rejected. Except at its own risk, the Contractor shall not undertake work covered by such submittals until a new submittal is made and returned marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED".

No changes shall be made by the Contractor on re-submittals other than those changes indicated on the reviewed submittals, unless such changes are clearly described in a letter accompanying the re-submittal.

5.0 EFFECT OF REVIEW OF CONTRACTOR'S SUBMITTALS

Review of drawings, methods of work, or information regarding materials or equipment the Contractor proposes to provide, shall not relieve the Contractor of its responsibility for errors therein and shall not be regarded as an assumption of risks or liability by the Engineer or the Owner, or by any officer, employee or subcontractor thereof, and the Contractor shall have no claim under the contract on account of the failure or partial failure, of the method of work, material, or equipment so reviewed. A mark of "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED" shall mean that the Owner has no objection to the Contractor, upon its own responsibility, using the plan or method of work proposed, or providing the materials or equipment proposed.

**** END OF SECTION ****

Section 01310
Construction Progress Schedule

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Format
- B. Content
- C. Revisions to Schedules
- D. Submittals
- E. Distribution

1.2 RELATED SECTIONS

- A. Section 01300 - Submittals: Shop drawings, product data, samples, and schedule of values.

1.3 REFERENCES

- A. AGC (Associated General Contractors of America) publication "The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry".

1.4 FORMAT

- A. Preparation of schedules: Prepare schedules as a horizontal bar chart with separate bar for each major portion of Work or operation, identifying first work day of each week.
- B. Sequence of Listings: The chronological order of the start of each item of Work.
- C. Scale and Spacing: To provide space for notations and revisions.

1.5 CONTENT

- A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- B. Identify each item by specification section number.
- C. Identify Work of separate stages and other logically grouped activities.

- D. Provide sub-schedules to define critical portions of the entire schedule (e.g. connections, tie-ins, shutdowns).
- E. Include meetings in schedule.
- F. Show accumulated percentage of completion of each item, and total percentage of Work completed along with progress schedule and pay estimate, as of the first day of each month.
- G. Provide separate schedule of submittal dates for shop drawings, product data, and samples, including City furnished products and Products identified under Allowances, and dates reviewed submittals will be required from Engineer. Indicate decision dates for selection of finishes.

1.6 REVISIONS TO SCHEDULES

- A. Indicate progress of each activity to date of submittal, and projected completion date of each activity.
- B. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.
- C. Provide narrative report to define problem areas, anticipated delays, and impact on Schedule. Report corrective action taken or proposed and its effect.

1.7 SUBMITTALS

- A. Submit initial schedules within 15 calendar days after date of Notice to Proceed. After review, resubmit required revised data within ten calendar days.

1.8 DISTRIBUTION

- A. Contractor shall distribute copies of reviewed schedules to project site file, subcontractors, suppliers, and other concerned parties.
- B. Contractor shall instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

PART 2 – PRODUCTS (NOT APPLICABLE)

PART 3 – EXECUTION (NOT APPLICABLE)

**** END OF SECTION ****

Section 01400 Quality Control

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Quality Assurance - Control of Installation
- B. Tolerances
- C. References and Standards
- D. Mock-up
- E. Testing Services
- F. Inspection Services

1.2 RELATED SECTIONS

- A. Section 01300 Submittal Procedure
- B. Section 01620 Protection of Materials and Equipment
- C. Section 01660 Installation, Testing and Commissioning

1.3 QUALITY ASSURANCE - CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform Work by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

1.4 TOLERANCES

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

1.5 REFERENCES AND STANDARDS

- A. For products or workmanship specified by association, trade, or other consensus standards comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date of Contract Documents, or date specified in the individual specification sections, except where a specific date is established by code.
- C. Obtain copies of standards where required by product specification sections.
- D. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Engineer shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.6 (NOT USED)

1.7 TESTING SERVICES

- A. Unless specifically noted otherwise on the plans or in the specifications, Contractor will appoint, employ, and pay for specified services of an independent firm to perform testing.
- B. The independent firm will perform tests and other services specified in individual specification sections and as required by the Engineer.
- C. Testing and source quality control may occur on or off the project site. Perform off-site testing as required by the Owner.
- D. Reports will be submitted by the independent firm to the Owner and Contractor, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
- E. Contractor shall cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.

1. Contractor shall notify Engineer and independent firm 24 hours prior to expected time for operations requiring services.
 2. Contractor shall make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.
- F. Testing does not relieve Contractor to perform Work to the requirements of the Contract Documents.
- G. Re-testing required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the Owner. Payment for re-testing will also be charged to the Contractor by deducting testing charges from the progress payment due the Contractor.

1.8 INSPECTION SERVICES

- A. City may appoint, employ, and pay for specified services of an independent firm to perform inspection.
- B. The independent firm will perform inspections and other services specified in individual specification sections and as required by the City.
- C. Inspecting may occur on or off the project site. Perform off-site inspecting as required by the City.
- D. Reports will be submitted by the independent firm to the City and Contractor, indicating inspection observations and indicating compliance or non-compliance with Contract Documents.
- E. Contractor shall cooperate with inspection firm; furnish safe access and assistance by incidental labor as requested.
1. Contractor shall notify independent firm 24 hours prior to expected time for operations requiring services.
- F. Inspecting does not relieve Contractor to perform Work to contract requirements.

1.9 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections or requested by the City, the material, product supplier, or manufacturer shall provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, to initiate instructions when necessary, and to provide written certification that the material or product has been placed or installed with the suppliers recommendations.

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

PART 2 – PRODUCTS (NOT APPLICABLE)

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that existing site conditions are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
- B. Examine and verify specific conditions described in individual specification sections.
- C. Verify that utility services are available, of the correct characteristics, and in the correct locations.

**** END OF SECTION ****

**Section 01501
Contractor Utilities and Controls**

1.0 OFFICE & YARDS

The Contractor shall maintain a suitable office at the site of the Work. Office location and employee parking shall be restricted to the areas designated by the Owner. Acquire site of adequate size for equipment and materials staging area, storage and temporary dumping area including maintenance and public safety.

2.0 POWER

The Contractor shall obtain and pay for power for construction from the commercial power supplier. He shall make arrangements with the commercial power company for power takeoff points, voltage and phasing requirements and transformers. The Contractor shall provide the special connections required for his Work.

3.0 TELEPHONE

The Contractor shall provide telephone service at his construction site office. Superintendent cell phone or emergency contact numbers shall be available to the City, 24 hours and 7 days a week during the tenure of the project.

4.0 SANITARY FACILITIES

The Contractor shall provide toilet and wash-up facilities for his work force at the site of Work. They shall comply with applicable laws, ordinances, and regulations pertaining to the public health and sanitation of dwellings and camps.

5.0 WATER

Contractor will use the City water outlet through the Fire Hydrant by applying for a temporary construction water meter and pay corresponding fees. Use of the City's water will be under the City's control, and the Contractor shall follow any requirements or provisions set forth by the City regarding its use.

**** END OF SECTION ****

**Section 01560
Environmental Controls**

1.0 SITE MAINTENANCE

The Contractor shall keep the Work site clean and free from rubbish and debris. Materials and equipment shall be removed from the site when they are no longer necessary. All cables, slings and other materials used to set the pipe and equipment shall be removed from the project site. Upon completion of the Work and before final acceptance, the Work site shall be cleared of equipment, unused materials, and rubbish to present a clean and neat appearance.

2.0 TEMPORARY DAMS

Except in time of emergency, earth dams are not acceptable at catch basin openings, local depressions, or elsewhere. Temporary dams of sand bags, or other acceptable material will be permitted when necessary to protect the Work, provided their use does not create a hazard or nuisance to the plant. Such dams shall be removed from the site as soon as they are no longer necessary.

3.0 AIR POLLUTION CONTROL

The Contractor shall not discharge smoke, dust, and other contaminants into the atmosphere that violate the regulations of any legally constituted authority. He shall also abate dust nuisance by cleaning, sweeping, and sprinkling with water, or other means as necessary. The use of water, in amounts which result in excessive mud on plant roads, is not acceptable.

4.0 NOISE CONTROL

During construction., noise from Contractor's operations shall not exceed limits established by applicable laws or regulations and in no event shall exceed 86 dBA at a distance of 50 feet from the noise source.

5.0 LOCAL TRAFFIC

The Contractor shall be responsible for maintenance of public safety and traffic control. The maximum length of open trench shall be as specified in SSPWC Section 306-1.1.2 and access to trenches shall be in accordance with SSPWC Section 306-1.1.4. All excavation shall be backfilled as soon as practical and preferably at the end of the same day. No open excavations is allowed for overnight, contractor shall place temporary steel plates and all required safety materials including traffic control devices and lights as needed.

**** END OF SECTION ****

Section 01620
Protection of Materials and Equipment

1.0 GENERAL

Materials and equipment shall be shipped, handled, stored, and installed by methods which will prevent damage to the items. Owner will not be responsible for any damage materials or equipments delivered on site. Owner will only pay for the materials or equipments that has been installed, inspected and accepted.

2.0 PIPE

Pipe and appurtenances shall be handled, stored, and installed as recommended by the manufacturer. Pipes with soft coatings, such as coal tar enamel or the like, or pipes of materials which are subject to deterioration by sunlight or heat, shall be stored to protect the coating or pipe from physical damage or other deterioration and shall only be handled with padded, wide slings. Pipes shipped with interior bracing shall have the bracing removed only when recommended by the pipe manufacturer. Pipes stored on site shall have cover on each end.

3.0 EQUIPMENT

- A. Definition: For the purpose of this section, equipment means any mechanical, electrical, or instrumentation devices, and other items with one or more moving parts requiring an electrical, pneumatic, electronic or hydraulic connection.
- B. Packing and Marking: All equipment shall be adequately and effectively protected against damage from moisture, dust, handling, or other cause during transport from manufacturer's premises to site. Each item or package shall be clearly marked with the number unique to the specification reference covering the item. Each separate portion of plant shall receive, as far as practicable, a fitting or distinguishing mark which shall be shown on the packing lists.

The bearings of motors shall be relieved of load during transport by means of jacks or some other method to prevent brinelling.

Stiffeners shall be used where necessary to maintain shapes and to give rigidity. Parts of equipment shall be delivered in assembled or sub-assembled units where possible.

- C. Identification of Equipment: All equipment items and valves with an assigned equipment number in this project manual shall have affixed to them in a prominent location, a label or tag displaying the assigned equipment number. Equipment item and valves lacking a number shall have a similar tag providing a unique description of the item. Markers shall be of stainless steel or aluminum, affixed to the item in question with stainless steel fasteners or as otherwise approved by the Project Manager. Plastic tape labels will not be acceptable.

- D. Storage of Equipment: During the interval between delivery and installation, all equipment to be incorporated into the project shall be stored to prevent damage or deterioration. Environmental controls such as heaters or protective encapsulation shall be provided to ensure against condensation and moisture damage. In the event prolonged (more than 90 days) storage is required for any item of rotative equipment, the Contractor shall institute a preventive maintenance program which shall include grease protection of bare metal surfaces, periodic indexing of rotating parts, renewal of grease in bearings and any procedures recommended by the manufacturer. The Contractor shall maintain adequate records to demonstrate full compliance with these requirements. All equipment shall be available for inspection by the Project Manager.

To insure adequate protection of all electrical and instrumentation equipment and panels and electric motors, all such equipment shall be stored in a suitable enclosure designed to protect the equipment from dust. The Contractor shall be responsible for maintaining the storage facilities and equipment stored therein and shall make provision for all utilities required. Continuous access shall be provided to the Project Manager for all equipment so stored.

During storage and after installation, all electrical and instrumentation equipment, panels, electric motors, and other equipment subject to damage from dust, shall be covered with visqueen and the covers shall be taped to protect the equipment from dust. The covers shall remain on the equipment at all times during the construction period except when necessary to make connections, adjustments or conduct tests on the equipment. The Contractor shall obtain full coverage insurance covering all stored equipment against loss. Evidences of insurance demonstrating compliance with this requirement shall be filed with the Project Manager.

- E. Protection of Equipment After Installation: After all installation, all equipment shall be protected from damage, including but not limited to, dust, abrasive particles, debris and dirt generated by the placement, chipping, sandblasting, cutting, finishing and grinding of new or existing concrete, terrazzo and metal; and the fumes, particulate matter, and splatter from welding, brazing, and painting of new or existing piping and equipment. The Contractor is advised that as minimum, vacuum cleaning, blowers with filters, protective shieldings, and other dust suppression methods will be required at all times to adequately protect all equipment. During concreting, including finishing, all equipment that may be affected by cement dust must be completely covered. During painting operations, all grease fittings and similar openings shall be covered to prevent the entry of paint. Electrical switchgear, unit substation, and motor load centers shall not be installed until after all concrete work and sandblasting in those areas have been completed and accepted.

4.0 DELIVERY OF MATERIAL OR EQUIPMENT

The Owner's personnel or representatives of the Owner will not accept materials or equipment deliveries for the Contractor.

**** END OF SECTION ****

Section 01700
Restoration of Improvements

1.0 STRUCTURES

The Contractor shall modify existing structures, remove and replace existing vaults or landscape area, as may be necessary for the performance of the Work and shall rebuild the structures thus modified in as good a condition as found with the requirements specified. He shall also repair existing structures which may be damaged as a result of the Work under this contract.

2.0 ROADS

Unless otherwise specified, roads in which the surface is removed, broken, or damaged, or in which the ground has caved or settled during the work under this contract, shall be resurfaced and brought to the original grade and section. Roadways used by the Contractor shall be cleaned and repaired. Restore road in accordance with City standard.

3.0 CULTIVATED AREAS AND OTHER SURFACE IMPROVEMENTS

Cultivated or planted areas and other surface improvements which are damaged by actions of the Contractor shall be restored as nearly as possible to their original condition. Existing guard posts, barricades, and fences shall be protected and replaced if damaged.

4.0 PROTECTION OF EXISTING INSTALLATIONS

The Contractor shall immediately correct or replace existing equipment, controls or systems which are damaged as a result of his operations.

**** END OF SECTION ****

**Section 02050
Demolition**

PART 1 – GENERAL

1.1 WORK OF THIS SECTION

- A. The Contractor shall furnish all materials, equipment and labor necessary to demolish and remove from the site existing equipment, piping, valves, structures, walls, slabs, and appurtenances as shown and as specified.
- B. In areas indicated to be demolished, the Contractor shall cut back flush and seal any pipe stub-outs remaining, and remove exposed piping, conduits, fixtures, junction boxes, light fixtures, water fixtures, and supports. Switches, receptacles, and boxes shall also be removed. Concealed piping and conduits shall be removed as necessary to facilitate the Work. All other items either shown or not shown but interfering with the new installation and not needed to complete the system shall be removed

1.2 RELATED SECTIONS

- A. The Work of the following Sections applies to the Work of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this Work.
 - 1. Section 01300 Submittals
 - 2. Section 02200 Earthwork

1.3 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. The Work of this Section shall comply with the current edition of the Uniform Building Code and California Building Code 2001.
- B. Except as otherwise indicated in this Section, the Contractor shall comply with the latest adopted edition of the Standard Specifications for Public Works Construction (SSPWC).
- C. Other relevant standards reference to this section includes American Waterworks Association (AWWA), National Electrical (NEC), Uniform Mechanical Code (UMC) and Uniform Plumbing Code (UPC).

1.4 CONTRACTOR SUBMITTALS

- A. The Contractor shall submit a demolition schedule in compliance with Section 01300 – Submittals. The demolition schedule shall provide a complete demolition Work including shut-off and continuation of utility services before the start of the

demolition. The schedule shall indicate proposed methods and a detailed sequence of demolition and removal Work to ensure uninterrupted operation of the water treatment plant.

- B. Before completion of the Work, the Contractor shall submit all disposal document including hazardous waste materials and waste disposal to landfill area.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 GENERAL

- A. Structures shall be demolished and removed in compliance with SSPWC subsection 306-5 and other Federal, State and local code. or requirements.

3.2 CLEARING AND GRUBBING

Unless otherwise specified, the Contractor shall remove obstructions such as brush, trees, logs, stumps, roots, heavy sod, vegetation, rock, stones larger than six (6) inches by any dimension, broken or old concrete and pavement, debris, and structures when completion of the Work requires their removal.

Material that is removed and is not to be incorporated in the Work shall be disposed of off the site. Salvaged material shall be delivered to the City per Engineers instruction. See related requirements in Section 02200.

3.3 STRUCTURAL REMOVAL

Unless otherwise shown or specified, demolition of structures shall be carried to the level shown on the plans. Where adjoining structures are to be kept in place, the demolition limit lines shall be neatly saw-cut. Sections to be removed shall be broken out, and the remaining face shall be chipped back to the saw-cut line. The Contractor shall do the necessary Work to provide the remaining face with a finish compatible with the surrounding surfaces.

3.4 EQUIPMENT, CONDUIT AND PIPING REMOVAL

All equipment and piping to be removed shall be properly disconnected from structures, piping, electrical and instrumentation systems. Below ground piping and conduits to be abandoned in place shall be properly capped and or remove. The Contractor shall do all resurfacing and other Work as necessary to comply with the above requirements.

3.5 PAVEMENT REMOVAL

All pavements and concrete pads shall be saw-cut on a neat line at right angles to

the curb face. Remove the whole concrete pavement as needed to install the new structure.

3.6 UTILITY INTERFERENCE

Where existing utilities interfere with the prosecution of the Work, the Contractor shall submit RFI and proposal for modification in accordance with the contract document.

3.7 SALVAGE

The Owner has the right to salvage any items scheduled for removal. The Contractor shall notify the Project Manager five (5) days prior to any salvage or demolition Work to determine the disposition of items to be removed. The Project Manager will mark items to be salvaged. Such items shall be properly disconnected, removed from their foundations, cleaned and stored at a location on the plant site or delivered to a location as directed by the City.

3.8 DISPOSAL OF REMOVED MATERIAL AND DEBRIS

All removed material not designated for salvage and all debris shall become the property of the Contractor and shall be removed from the site and properly disposed of.

Materials and debris generated by demolition activities shall not be allowed to accumulate. Debris shall be removed daily and disposed of in a manner allowed by law. Burning of materials shall not be permitted.

3.9 BACKFILL

Holes or depressions in the ground remaining after demolition of structures, tanks, pipelines, or equipment shall be filled with compacted backfilling materials as specified in Section 02200. Areas that can not be compacted shall be filled in with cement-slurry.

Below-grade areas and voids resulting from demolition of structures shall be completely filled to a minimum of compaction of 90%.

All fill shall be graded to meet adjacent contours and to provide flow to surface drainage structures, or as indicated.

3.10 POLLUTION CONTROL

- A. Water sprinkling, temporary enclosures, chutes, and other suitable methods shall be used for dust suppression in compliance with SSPWC Section 7.
- B. Water shall not be used when it creates hazardous or objectionable conditions such as flooding, erosion, sedimentation, or pollution.

3.11 PROTECTION

- A. Safe passage of persons around the area of demolition shall be provided. Operations shall be conducted to prevent injury to people and damage to adjacent buildings, structures, and other facilities in compliance with SSPWC Section 7.
- B. Interior and exterior shoring, bracing, or supports shall be provided to prevent movement, settlement or collapse of structures to be demolished.
- C. Existing landscaping materials, structures, and appurtenances which are not to be demolished shall be protected and maintained as necessary and in accordance with SSPWC Section 7.
- D. Unless otherwise indicated, the Contractor shall protect and maintain all utilities in the proximity of the facilities to be demolished.
- E. The Contractor shall protect nearby existing equipment from dust caused by demolition activities by covering, drop-curtains and other similar methods.

3.12 DISPOSAL OF NON-FRIABLE ASBESTOS

- A. If non-friable asbestos cement pipe (ACP) is identified, the Contractor shall employ adequate care to maintain the pipe in a non-friable condition. Removal of the ACP shall be in whole sections where possible. Cutting or breaking of ACP to facilitate removal shall be in compliance with California Regulations, Title 8, Section 5208. At a minimum, the Contractor shall follow the following requirements for ACP that is to be cut or broken:
 1. **The Contractor shall evacuate the area of unauthorized and untrained personnel, post warning signs, and provide a demarcation zone and adequate barriers to keep unauthorized personnel out of the area.**
 2. The Contractor shall provide personal protective equipment consisting at least of a respirator and disposable clothing to asbestos accredited workers performing the cutting or breaking of ACP. Respirator protection shall in accordance with the requirements of California Regulations, Title 8, Section 5414.
 3. The area to be cut or broken shall be adequately wetted with amended water to reduce fiber emission. The method employed by the Contractor shall minimize fiber release. Power saw cutting will not be allowed. All related debris from the cutting or breaking of ACP shall be considered friable. The Contractor shall dispose of friable material in accordance with California Regulations Title 22.
 4. All waste generated and ACP shall be wrapped in six (6) mil polyethylene sheeting or bags and shall be properly transported and disposed.

- B. The Contractor is responsible for all ACP removal and associated contamination.
- C. Payment for disposal on non-friable asbestos-containing materials shall be included in this section..

3.13 DISPOSAL OF FRIABLE ASBESTOS

- A. Friable asbestos-containing material is defined as material that can be crumbled, pulverized, or reduced to powder by hand pressure. All friable asbestos-containing materials shall be considered as hazardous waste and shall be transported by a licensed hazardous waste hauler. Friable asbestos containing materials shall be disposed of at an approved hazardous waste landfill.
- B. Upon discovery of friable asbestos, the Contractor shall immediately notify the Engineer.
- C. Payment for the disposal of friable asbestos-containing materials shall be included in this section..

3.14 PATCHING AND REPAIRING

- A. The Contractor shall provide patching, replacing, repairing, and refinishing of damaged areas involved in demolition as necessary to match the existing adjacent surfaces.
- B. The Contractor shall repair all damages caused to adjacent facilities by demolition at the satisfaction of the Engineer and no additional cost to the Owner.
- C. After patching and repairing has been completed, the Contractor shall carefully remove splatterings of mortar from adjoining Work (plumbing fixtures, trim, tile, and finished metal surfaces) and repair any damage caused by such cleaning operations.

3.15 CLEANING

- A. During and upon completion of Work, the Contractor shall promptly remove unused tools and equipment, surplus materials, rubbish, debris, and dust and shall leave areas affected by the Work in a clean condition in accordance with Section 01710 – Final Cleanup.
- B. The Contractor shall clean adjacent structures and facilities of dust, dirt, and debris caused by demolition and return adjacent areas to condition existing prior to start of Work.
- C. The Contractor shall clean and sweep the affected portions of roads, streets, sidewalks and passageways daily.

**** END OF SECTION ****
Section 02200
Earthwork

Part 1 – GENERAL

1.01 Scope of Work

- a. Earthwork includes clearing, grubbing, preparing, grading, excavating, filling, backfilling, compacting of soils, soil protection or control, erosions as necessary to accomplish finished construction as indicated on the drawings.

1.02 References

- a. Standard Specifications for Public Works Construction (SSPWC)
- b. American Society of Testing Materials (ASTM)
 - C131 – Test Method for Resistance to Degradation of small-size Course Aggregate by Abrasion and Impact.
 - C136 – Method for Sieve Analysis of Fine and Coarse Aggregate.
 - D1557 – Test Methods for Moisture-Density Relations of Soils and Soil Aggregate Mixture using 10 lb rammer and 18” drop.
 - D4253 - Test Methods for Maximum Index Density of Soils using Vibratory Table.
 - D4254 – Test Methods for Minimum Index Density of Soils and Calculations of Relative Density.
 - D4318 – Standard Test Method for Liquid Limit.
- c. Code of Federal Regulations (CFR)
 - Title 29 Part 1926.650 – Safety and Health Regulations for Construction.

1.03 Soil Materials

- a. Unsuitable materials shall be removed and disposed of the site without additional payment from the City. However, replacement to suitable materials will be paid in volume including transport but not including backfill and compaction which is a part of the original work.
- b. Suitable Backfill Materials shall conform to the requirements of SSPWC Subsection 300 and 211.
- c. Place Soil Backfill in layers not more than 8” in loose depth except above pipe which may vary from 12” to 18” depending on soil condition. Compact and perform compaction test to achieve 90% on sub grade level. Base aggregate and sub base compaction shall be City pavement standard. Use hand operators tampers above pipe crown.

1.04 Clearing and Grubbing

- a. Clearing and Grubbing shall conform to the requirements of SSPWC Subsection 300-1.

1.05 Unclassified Excavation

- a. Unclassified excavation shall conform to the requirements of SSPWC Subsection 300-2.

1.06 Structure Excavation and Backfill

- a. Structure excavation and Backfill shall conform to the requirements of SSPWC Subsection 300-3.

1.07 Unclassified Fill

- a. Unclassified Fill shall conform to the requirements of SSPWC Subsection 300-4.

1.08 Borrow Excavation

- a. Borrow Excavation shall conform to the requirements of SSPWC Subsection 300-5.

1.09 Earthwork for Debris and Dams and Channels

- a. Earthwork for Debris and Dams shall conform to the requirements of SSPWC Subsection 300-6 and Channels to Subsection 300-7.

1.10 Geotextiles and Erosion Control

- a. Geotextile for Erosion Control – shall conform to SSPWC Subsection 300-9
- b. Geotextile for Separation – shall conform to SSPWC Subsection 300-10
- c. Stonework for Separation Control – shall conform to SSPWC Subsection 300-11.

1.11 Equipments

- a. Contractor shall only use equipments per its function. The City will not allow the use of equipment for variety of purposes. Example: Backhoe for compaction, trencher for pavement cutting and etc.
- b. The use of Pavement Hammer is not allowed. Contractor shall perform pavement saw cut and removal.**

****END OF SECTION****

**Section 02220
Concrete Wash Out**

PART 1 – GENERAL

1.1 TEMPORARY CONCRETE WASHOUT

Temporary concrete washout facilities shall be provided. Temporary concrete washout facilities shall be maintained daily.

Maintaining temporary concrete washout facilities shall include removing and disposing of hardened concrete. Concrete waste materials shall be removed and disposed of in conformance with the provisions in Section 15-3.02, "Removal Methods," of the Standard Specifications.

Temporary concrete washout waste shall be removed and disposed of after each Work shift in conformance with the provisions in Section 15-3.02, "Removal Methods," of the SSPWC.

Materials for temporary concrete washout shall become the property of the Contractor and shall be removed from the site of the Work and disposed of outside of the highway right of way in accordance with section 7-1.13, "Disposal of Material Outside the Highway Right of Way" of the SSPWC.

The Contract shall include the cost for temporary concrete washout and the full cost for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the Work involved in furnishing, placing, maintaining, removing and disposing of concrete waste and temporary concrete washout, as specified in the SSPWC and as directed by the Engineer.

**** END OF SECTION ****

Section 02270
Temporary Soil Erosion and Sediment Control

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. The Contractor shall be fully responsible for furnishing, installing, and maintaining all temporary erosion and sedimentation controls for all earthwork, trenching, clearing and grubbing operations.
- B. For projects with soil disturbances over one acre, erosion and sedimentation control measures shall comply with requirements provided herein, local jurisdictional agency requirements, and applicable requirements in local storm water management programs developed to comply with NPDES permits issued by the Regional Water Quality Control Board. Requirements for temporary erosion control shall be as required by any NPDES requirements.

1.2 RELATED SECTIONS

- A. Section 02200 Earthwork
- B. Section 02373 Rolled Erosion Control Products
- C. Section 02378 Geotextile Silt Fence

1.3 CONTRACTOR SUBMITTALS

- A. Contractor shall submit an applicable Best Management Practice or SWPPP for pollution prevention, control and mitigation

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Provide sand bags, silt fences, desilting basins and other silt materials to control erosion and sedimentation as required.

PART 3 – EXECUTION

3.1 CONSTRUCTION

- A. Construct and implement erosion control measures in accordance with the contract plans and as described herein.
- B. Grade disturbed surfaces to provide positive drainage and prevent ponding of water. Surface water shall be controlled to prevent water damage or deposition of sediment to all adjoining and downstream properties.
- C. Install silt fences, desilting basin, sandbag dikes, stabilized construction entrances and any other erosion control measure to minimize sediment escape from the

construction site and to maintain runoff quality. Prevent construction sediment from entering any streams, ponds or drainage facilities.

D. At a minimum, provide erosion and sedimentation control measures immediately following clearing and grubbing operations in the following locations:

1. At the lowest end of areas disturbed by construction before runoff from storms can reach natural streams.

E. Erosion and sedimentation control measures shall remain in place until such time that the site of Work is prepared for permanent drainage and erosion control measures.

3.2 MAINTENANCE

A. Conduct site inspections of the erosion and sedimentation control measures prior to forecasted storm events, at 24 hour intervals during extended precipitation events; after a precipitation event which causes site runoff; and routinely, a minimum of once every week during the rainy season and once every month during non-rainy season to evaluate the adequacy and effectiveness of such measures. Make and implement modifications as necessary to comply. Submit inspection reports to the Engineer after each storm event. Include in the inspection reports at a minimum, the date of the inspection, the individual(s) who performed the inspection, the observations, and any modifications implemented. Post inspection schedule and reports within Contractor field office.

B. Maintain sedimentation and erosion control measures, ensuring proper operation before, during, and after storm events. Remove sediment from desilting basins as required to ensure their proper operation.

C. Repair all damaged erosion and sedimentation controls. Reinstate to finished condition any erosion damage within the construction area for the duration of the Contract.

D. Annually certify that the construction activity is in compliance with the Specifications. The certification shall be based upon the site inspections required above. The written certification shall be submitted to the Engineer. Immediately notify the Engineer in writing if it is determined, during the annual certification that the construction activity is not, or has not been, in compliance with any of the Specifications. The notification shall identify the type of noncompliance and include a time schedule when compliance will be achieved.

**** END OF SECTION ****

**Section 02500
Paving**

PART 1 – GENERAL

1.1 DESCRIPTION

This Section provides specifications for removal of pavements, curbs, gutters and sidewalk; and construction of repaving and new pavements.

1.2 STANDARDS

Paving shall be in conformance with the requirements of SSPWC and the City Standards.

PART 2 – PRODUCTS

All materials shall be in conformance with the following requirements:

<u>Material</u>	<u>Requirements</u>
Crushed aggregate Base	SSPWC, Section 200-2.2
Asphalt Concrete	SSPWC, Section 203-6
Emulsion-aggregate slurry	SSPWC, Section 203-5

Asphalt concrete pavement shall conform to City standards. Asphalt concrete shall be provided with an emulsion-aggregate slurry seal applied on the completed finish course of the asphalt pavement.

PART 3 – EXECUTION

3.1 ASPHALT CONCRETE PAVEMENT

All asphalt concrete pavement removed, broken or damage shall be repaved in accordance with the City standard. Removal of existing pavements shall be by saw cut and in accordance with SSPWC Subsection 300-1.3.2(a).

Subgrade shall be prepared in accordance with Section 02002. Crushed aggregate base shall be provided as specified in SSPWC Section 301-2. The asphalt concrete pavement shall be placed against a saw cut edge and shall be constructed in accordance with SSPWC Section 3-2-5 after the application of a prime coat on the base course.

Before opening to traffic an emulsion-aggregate slurry coat shall be applied to the pavement in accordance with SSPWC Section 302-4. Thickness of aggregate base and pavement shall be as shown on the Drawings.

3.2 PCC PAVEMENT

All concrete pavements to be removed shall be by saw cut to a minimum depth of 1.5" If the saw cut in concrete pavement falls within 3 feet of the construction joint, cold joint or expansion joint, or edge, the concrete shall be removed to the joint or edge.

Concrete paving shall be in accordance with the plan and SSPWC 201, section 303 and aggregates conform to section 200. Concrete repaving shall be in accordance with the City Standard.

Concrete curing shall be in accordance with SSPWC section 201 and section 303.

3.2 CONCRETE CURBS, GUTTERS, DRIVEWAYS AND SIDEWALKS

Repairs and replacement of concrete curbs, gutters, driveways and sidewalks shall be made by removing and replacing the entire portions between joints or saw cuts and not merely refinishing any damaged parts. Removal shall be in accordance with SSPWC Subsection 300-1.3.2(c) and section 303. Reconstruction shall be of the same kind of material with the same finish and same dimensions as the original work. All work shall match the appearance of existing improvements as nearly as possible. Backfill under undamaged curb and gutter shall be by cement-slurry fill.

**** END OF SECTION ****

**Section 03100
Concrete Formwork**

PART 1 – GENERAL

1.1 SCOPE OF WORK

- A. Formwork for cast-in-place concrete including all associated shoring, bracing, and anchorage required to provide a complete job.
- B. Coordination and providing openings in concrete for other work.
- C. Provide all form accessories required to perform a complete job.
- D. Stripping of forms

1.2 REFERENCES

- A. ACI 301 Structural Concrete for Buildings
- B. ACI 318 Building Code Requirements for Reinforced Concrete
- C. ACI 347 Guide to Formwork for Concrete
- D. PS 1 Construction and Industrial Plywood

1.3 DESIGN REQUIREMENTS

- A. Contractor is solely responsible for design, engineering and construction of formwork, shoring and bracing to conform to design and code requirements; resultant concrete to conform to required shape, line and dimension.
- B. Forming, shoring and bracing designs for footings, walls and roofs shall be provided by the Contractor to meet all requirements specified here-in.
- C. If requested by the Engineer, drawings and calculations shall be submitted verifying the selection of form ties, horizontal and vertical stiff-backs or braces for wall panels, forming and form openings, shoring of roof forms, or any other part of forming, shoring or bracing which may be considered critical by the Engineer.
- D. A civil or structural engineer hired by the Contractor, and registered in the same state in which the project is located must design all falsework and forming requirements for roof support systems. The drawings, with supporting calculations, must each be signed and sealed by the engineer. No Work shall be started until the

roof support and form design has been submitted to the City for records. The falsework design engineer must visit the site and approve the erection of all shoring prior to the placement of any concrete.

- E. The Contractor shall be solely responsible for the adequacy of the forming, shoring and bracing design.
- F. Any formwork installed by Contractor shall be solely at Contractor's risk. The submittal of the design will not lessen or diminish the Contractor's liability.

1.4 SUBMITTAL FOR REVIEW

- A. Section 01300 - Submittals: Procedures for submittals.
- B. Product Data: Provide data on components to be used to demonstrate form materials and accessories meet these Specifications. Submit product data for waterstops.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 347, 301, and 318.
- B. Formwork shall be designed under the direct supervision of a Structural or Civil Engineer experienced in the design of this work and licensed in the State of California.

1.6 DELIVERY, STORAGE AND PROTECTION

- A. Section 01600 - Material and Equipment: Transport, handle, store and protect products.
- B. Deliver void forms and installation instructions in manufacturer's packaging.
- C. Store off ground in ventilated and protected manner to prevent deterioration from moisture.

PART 2 – PRODUCTS

2.1 FORM MATERIALS

- A. Form Materials: Contractor shall select form materials which will produce a smooth, even finish in all exposed surfaces. Form materials which may remain or leave residues on or in the concrete shall be certified as compliant with NSF Standard 61 – Drinking Water system Components.
- B. Wall Form: The wall form design shall be such that wall sections can be poured full height without creating horizontal cold joints and without causing snapping of form ties which shall be of sufficient strength and number to prevent spreading of the

forms during the placement of concrete and which shall permit ready removal of the forms without spalling or damaging the concrete.

- C. Column Form: The column form shall be a fabricated item designed for use as a column form. The pieces of the form, when secured together shall not allow mortar to leak from joints or the bottom of the form.

2.2 FORMWORK ACCESSORIES

- A. Form Ties: Form ties which remain in the corewall of water-retaining structures shall have waterstops and a breakback or cone one-inch minimum in depth.

Snap ties, if used, shall not be broken until the concrete has reached the design concrete strength. Snap ties, designed so that the ends must be broken off before the forms can be removed, shall not be used. The use of tie wires as form ties will not be permitted. Fully threaded stub bolts may be used in lieu of smooth ties with waterstops.

Taper ties with plastic or rubber plugs of an approved and proven design may also be used. The plugs must be driven into the hole with a steel rod, placed in a cylindrical recess made therefore in the plug. The taper ties shall be oriented such that when the tapered plugs are inserted, the pressure of the water will push the plug toward the taper. At no time shall plugs be driven on the flat area outside the cylindrical recess. A-58 SURE PLUG as manufactured by DAYTON SUPERIOR, Santa Fe Springs, CA (phone: (562) 522-3442) meet these specifications.

Ties shall positively secure the wall to the required dimension and hold the wall to that dimension prior to and during concrete placement.

- B. Form Release Agent: Colorless mineral oil which will not stain concrete, or absorb moisture, or impair natural bonding. For steel forms, release agent shall prevent discoloration of the concrete due to rust.
- C. Corners: Chamfer all corners of concrete unless specifically noted otherwise. Provide chamfer strip secured in forms as required.
- D. Nails, Spikes, Lag Bolts, Through Bolts, Anchors: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.
- E. Waterstops: Shall conform to requirements in Section 03251, "Expansion and Construction Joints". The size and location of the waterstop shall be as shown.
- F. Form Size: BURKE, ECONOMY, SYMONS, ALUMA, and regular plywood forms may be used for forming of walls.
- G. Form Stiffeners: Horizontal walers shall consist of structural steel channels, angles or tubing of adequate size to retain the concrete without deflecting.

There shall be at least one waler within 24 inches of the top and bottom of the wall.

Vertical structural steel or wood members shall be used at a minimum horizontal spacing of 72 inches and shall have sufficient rigidity and strength to ensure the proper vertical alignments with the aid of braces under all predictable stress conditions.

In lieu of the above, a different system and spacing may be used if it is satisfactorily demonstrated to the Engineer that it will be equally effective.

- H. Roof Form Supports: Forms and falsework supports for the roof shall be sufficiently rigid and strong enough to support the wet concrete, workers and equipment necessary for its placement without appreciable deflections. A minimum of 40 PSF for live-load shall be considered in the design.

Unless the deflection of roof-forms is limited to 1/300 of the column spacing length, an upward camber shall be provided.

The Contractor shall provide additional camber for beams and slabs to permit the concrete and reinforcing steel to act efficiently without development of deflection cracks.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify lines, elevation levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.
- B. Clean surfaces of all forms to be in contact with concrete of all previous concrete or contaminants prior to erection.

3.2 EARTH FORM

- A. Hand trim sides and bottom of earth forms. Remove loose soil prior to placing concrete. See typical details for additional requirements.
- B. No forming stakes will be permitted in earth forms.

3.3 ERECTION - FORMWORK

- A. Plumb and string lines shall be installed before concrete placement and shall be maintained during placement. Such lines shall be used by Contractor's personnel and by the Engineer and shall be in sufficient number and properly installed. During concrete placement, the Contractor shall continually monitor plumb and string line form positions and immediately correct deficiencies.

- B. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 301.
- C. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.
- D. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. The arrangement of the formwork shall permit the removal of remaining principal shores.
- E. Provide worker protection from protruding reinforcement bars in accordance with applicable safety codes.
- F. Joints not shown on the Plans shall not be permitted without prior approval from the Engineer.
- G. Obtain approval before framing openings in structural members, which are not indicated on Drawings.
- H. Provide fillet and chamfer strips on external corners of beams, walls and slabs unless noted or shown otherwise.
- I. Coordinate this Section with other Sections of Work which require attachment of components to formwork.
- J. If formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement, reinforcing shall be relocated to provide proper coverage.
- K. Formwork shall be placed and secured to produce the concrete sections shown on the drawings.
- L. Wall formwork shall be of sufficient strength and stiffness to permit the placement of the full wall height between vertical construction joints shown on the drawings without the need of additional horizontal construction joint.

3.4 WALL, WALL FOOTING, COLUMN AND COLUMN FOOTING FORMS

- A. All vertical wall and column footing sides shall be formed by methods acceptable to the City, and to the correct elevations and location shown on the Plans.
- B. Pour window openings in wall forms shall be provided to facilitate placement and vibration consideration of the concrete. The minimum pouring opening size shall be 18" x 18". The bottom of the lower openings shall be no more than 48 inches from the top of the wall footing. The vertical centerline distance between horizontal rows of openings shall not exceed 96 inches.

The horizontal centerline distance between such openings shall not exceed 96 inches nor shall the distance between the nearest edge of opening and the

bulkhead for the vertical joint exceed 36 inches.

- C. Pouring of wall concrete may be done through pour openings on one of the wall sides, and may be pumped or poured from the top through the use of "elephant trunks" or tremies.
- D. Under no circumstances shall forming be such that the drop of concrete in the forms will exceed eight (8) feet in any one place.
- E. There shall be no blockouts or other types of wall-openings other than those shown on the Plans.
- F. Contractor shall remove all wood splinters on concrete surfaces after stripping of wood forms.
- G. Bulkheads to form vertical wall joints shall be strong enough to withstand concrete pressures during pouring and vibrating, and shall be properly placed between the forms and against the waterstop to avoid mortar seepage.**
- H. Holes shall be provided in the bulkheads to permit passage of horizontal mild steel reinforcing where required by the Plans.
- I. Unless specifically called for on the Plans, no chamfer strips shall be placed in the corners of vertical construction joints of walls.
- J. Every precaution shall be taken to ensure that all forms are in the proper alignment, plumb, and that all form supports are secure and tight.
- K. Form sills shall be used to facilitate proper alignment of forms. The maximum permissible variation in the horizontal and vertical location of waterstops is plus or minus 1/4 of an inch.
- L. Construction Tolerances:**
 - 1. The maximum permissible variation in the vertical alignment, from the bottom to the top of the wall or columns, is plus or minus 3/8 of an inch.
 - 2. The allowable tolerance in the average wall thickness for poured walls shall not vary more than 1/8 inch either way. All transitions from plus to minus shall be gradual, even and smooth, and without abrupt changes in the surfaces.
 - 3. Adequate time and cooperation shall be provided to the Inspector to verify the compliance of these requirements prior to closing up the forms or pouring concrete.

- M. The use of slip form construction for liquid-retaining walls will not be permitted on any part of the project.**

3.5 ROOF FORMS

- A. The finished form surface shall be smooth, true to elevation and alignment and all joints between boards, plywood sheets or form panels shall be mortar-tight, or be made mortar-tight by taping or other means as the situation calls for, before any concrete pour may be started.
- B. Removal of the forms will be permitted only when the concrete has attained the strength specified in these Specifications or shown on the Plans.

As soon as the forms have been removed, the City will carefully examine the top and bottom surface of the concrete for any defects in the concrete or irregularities in the surface which shall be repaired as required.

- C. The Contractor shall provide either wedges under timber posts, screw jacks under shoring, or provide other means to adjust the forms and relieve the load.**
- D. Unless stated otherwise on the Plans, the permissible tolerance at any point for flat roof form-surfaces shall not exceed plus or minus 1/4 inch from the specified elevation or thickness.**

Any transition between high and low points shall be gradual, smooth and even, and shall be to the satisfaction of the City.

3.6 APPLICATION - FORM RELEASE AGENT

- A. Apply form release agent on formwork in accordance with manufacturer's recommendations.
- B. Care shall be taken not to apply any form release agent to the reinforcing steel, anchoring devices or embedded items in the forms.

3.7 INSERTS, EMBEDDED PARTS AND OPENINGS

- A. Provide formed openings where required for items to pass through concrete work.
- B. Locate and secure in place items, which will be cast directly into concrete prior to the placing of the concrete.
- C. Coordinate with work of other sections in forming and placing openings, slots, recesses, sleeves, bolts, anchors, other inserts and components of the Work.

- D. Install accessories in accordance with manufacturer's instructions, straight level, and plumb. Ensure items are not disturbed during concrete placement.
- E. Install waterstops in accordance with manufacturer's instructions. Secure edges of waterstop to ensure they will not be bent over during the placing of concrete.
- F. Provide temporary ports or openings in formwork where required to facilitate cleaning, inspection, placing and consolidating concrete.
- G. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.

3.8 FORM CLEANING AND MAINTENANCE

- A. Clean forms as erection proceeds, to remove foreign matter within forms to provide a smooth even surface.
- B. Clean formed cavities of debris prior to placing concrete.
- C. Use compressed air to remove remaining foreign matter.
- D. Maintain forms at all times in good condition, particularly as to size, shape, strength, rigidity, tightness and smoothness of surface. Form surfaces shall be treated with a nonstaining mineral oil or other lubricant acceptable to the Engineer. Any excess lubricant shall be satisfactorily removed before placing concrete. Where field oiling of forms is required, the Contractor shall perform the oiling at least two (2) weeks in advance of their use. Care shall be exercised to keep oil off the surfaces of steel reinforcement and other metal items to be embedded in concrete.

3.9 FORMWORK TOLERANCES

- A. Construct formwork to maintain tolerances as stated in this section. If not noted provide as required by ACI 301.
- B. Camber slabs and beams in accordance with ACI 301.

3.10 FIELD QUALITY CONTROL

- A. Inspect erected formwork, shoring and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties, and items are secure and properly located.
- B. Do not patch wood formwork.

3.11 FORM REMOVAL

- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads. The removal criteria given below, serve only as

minimums. It is the sole responsibility of the Contractor to insure the concrete has sufficient strength for forms to be removed.

- B. Forms on sides of footings and encasements may be removed after 24 hours.
- C. Wall forms shall not be removed until a minimum of 12 hours of accumulative time with ambient temperature over 50°F has passed since the concrete was placed and consolidated.
- D. Structural slab forms and shoring shall not be removed for a minimum of ten (10) days and only when concrete test breaks indicate the concrete placed for the slab has reached a minimum of 85% of its required 28-day compressive strength. The Contractor may mold and cure additional concrete cylinders per Section 03300.3.08 to verify the 85% strength has been achieved.
- E. Loosen forms carefully. Do not wedge pry bars, hammers or tools against finish concrete surfaces scheduled for exposure to view.
- F. Store removed forms such that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.
- G. Contractor shall begin to apply curing compounds within one hour after stripping wall forms as outlined in Section 03300.03.09.
- H. All formwork shall be removed before backfill is placed against the formed surface.

3.12 FALSEWORK

- A. The Contractor shall be responsible for the design, engineering, construction, maintenance, and safety of all falsework, including staging, walkways, forms, ladders, and similar appurtenances, which shall equal or exceed the applicable requirements of the provisions of the OSHA Safety and Health Standards for Construction, the requirements of the Construction Safety Orders of the California Division of Industrial Safety, and the requirements herein.

**** END OF SECTION ****

Section 03251
Joints in Concrete

PART 1 – GENERAL

1.1 SCOPE OF WORK

A. The Contractor shall construct all joints in concrete at the locations shown. Joints required in concrete structures are of various types and will be permitted only where shown, unless specifically accepted by the Engineer in writing.

1.2 REFERENCE SPECIFICATIONS, CODES AND STANDARDS.

A. Federal Specifications:

1. TT-S-0227E (3) Sealing Compound, elastomeric type, Multi-component for Caulking, Sealing, and Glazing Buildings and Other Structures.

B. Commercial Standards:

2. ASTM A 775 Specification for Epoxy-Coated Reinforcing Steel Bars
3. ASTM C 920 Specification for Elastomeric Joint Sealants
4. ASTM D 412 Test Methods for Rubber Properties in Tension
5. ASTM D 624 Test Method for Rubber Property -- Tear Resistance
6. ASTM D 746 Test Method for Brittleness Temperature of Plastics and Elastomers by Impact.
7. ASTM D 747 Test Method for Apparent Bending Modulus of Plastics by Means of a Cantilever Beam
8. ASTM D 1056 Specification for Flexible Cellular Materials - Sponge or Expanded Rubber
9. ASTM D 1752 Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
10. ASTM D 2240 Test Method for Rubber Property - Durometer Hardness
11. ASTM D 2241 Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR-Series)

1.3 TYPES OF JOINTS

A. Construction Joints: When fresh concrete is placed against hardened concrete surface, the joint between the two (2) pours is called a construction joint. Unless otherwise specified, all joints in water bearing members shall be provided with a waterstop and/or sealant groove of the shape specified and shown. The surface of the first pour may also be required to receive a coating of bond breaker as shown.

B. Contraction Joints: Contraction joints are similar to construction joints except that the fresh concrete shall not bond to the hardened surface of the first pour,

which shall be coated with a bond breaker. The slab reinforcement shall be stopped four (4) inches from the joint, which is provided with a sleeve-type dowel, to allow shrinkage of the concrete of the second pour. A waterstop and/or sealant groove shall also be provided when specified or shown.

- C. Control Joints: The function of the control joint is to provide a weaker plane in the concrete, where shrinkage cracks will probably occur. A groove, of the shape and dimensions shown, is formed or saw-cut in the concrete. This groove is afterward filled with a joint sealant material as specified in Part 2 entitled "Joint Sealant."

1.4 CONTRACTOR SUBMITTALS

A. Joint Sealant: Prior to ordering the sealant material, the Contractor shall submit to the Engineer for the Engineer's review, sufficient data to show general compliance with the requirements of the Contract Documents.

B. Test Certification: Certified test reports from the sealant manufacturer on the actual batch of material being supplied indicating compliance with the above requirements shall be furnished the Engineer before the sealant is used on the job.

C. Shipping Certification: The Contractor shall provide written certification from the manufacturer as an integral part of the shipping form, to show that all of the material shipped to this project meets or exceeds the physical property requirements of the Contract Documents. Supplier certificates are not acceptable.

1.5 QUALITY ASSURANCE

A. Construction Joint Sealant: The Contractor shall prepare adhesion and cohesion test specimens as specified herein prior to beginning the installation of any sealant joints on the project. The same personnel who shall be performing the sealant joint installation for the project shall prepare the test specimen. If there is a change in personnel installing the sealant joint, the new personnel shall prepare an acceptable test specimen prior to starting work on the project.

B. Test Procedure: The sealant material shall show no signs of adhesive or cohesive failure when tested in accordance with the following procedure in laboratory and field tests:

1. Sealant specimen shall be prepared between two (2) concrete blocks (1-inch by 2-inch by 3-inch). Spacing between the blocks shall be one (1) inch. Coated spacers (2-inch by 1-1/2-inch by 1/2-inch) shall be used to

ensure sealant cross-sections of 1/2-inch by 2 inches with a width of one (1) inch.

2. Sealant shall be cast and cured according to manufacturer's recommendations except that curing period shall be not less than 24 hours.

3. Following curing period, the gap between blocks shall be widened to 1-1/2-inch. Spacers shall be used to maintain this gap for 24 hours prior to inspection for failure.

C. Specimen Acceptance Criteria: If the sealant material fails to fully and properly cure after the manufacturer's recommended curing time for the job conditions of the Work hereunder, it shall be completely removed; the groove shall be thoroughly sandblasted to remove all traces of the previously installed sealant and primer, and the joint shall be re-sealed with the specified joint sealant. All costs of such removal, joint treatment, re-sealing, and appurtenant work shall be at the expense of the Contractor.

D. Contractor Qualifications: A specialty contractor who has a successful record of performance in similar installations shall install all sealant.

E. Manufacturer's Representative: Before Work is commenced, a representative of the sealant manufacturer shall instruct the work crew as to the proper method of application of the specific system to be installed. The instruction from the manufacturer representative shall include instructions on the proper method and degree of mixing required for the products used.

PART 2 – PRODUCTS

2.1 GENERAL

A. All joint materials specified herein which may come in contact with potable water shall be classified as acceptable for potable water use, by the Environmental Protection Agency, after a maximum of 30 days of installation.

2.2 JOINT SEALANT

A. Joint sealant shall be polyurethane polymer designed for bonding to concrete in a continuous submerged condition in water. No material will be accepted which has an unsatisfactory history for bond or joint.

2.3 SEALANT PRIMER

A. Product Compatibility: The same manufacturer supplying the sealant shall manufacture the primer used.

2.4 BOND BREAKER

A. Bond breaker shall be Super Bond Breaker as manufactured by Burke Company, San Mateo, California; Select Cure CRB as manufactured by Select Products Co., Upland, California; or equal. It shall contain a fugitive dye so that areas of application will be readily distinguishable.

2.5 SLIP DOWELS

A. Slip dowels in joints shall be A36 smooth epoxy-coated bars, conforming to ASTM A 775.

PART 3 – EXECUTION

3.1 GENERAL

A. Joint Location: Construction joints, and other types of joints, shall be provided where shown. When not shown, construction joints shall be proposed by the Contractor to the Engineer in writing. This can be provided as part of another submittal (i.e. reinforcing steel shop drawings). The location of all joints, of any type, shall be submitted for acceptance by the Engineer.

B. Joint Preparation: Special care shall be used in preparing concrete surfaces at joints where bonding between two sections of concrete is required. Unless otherwise shown, bonding will be required at all horizontal joints in walls (where horizontal joints are permitted). Surfaces shall be prepared in accordance with the requirements of Section 03310, "Cast-in-Place Concrete."

3.2 CONSTRUCTION JOINT

A. Sealant Groove: Water bearing floor slabs, and elsewhere as shown, shall be provided with grooves which shall be filled with a construction joint sealant.

B. Sealant Application: The material used for forming the grooves shall be left in the grooves until just before the grooves are cleaned and filled with joint sealant. After removing the forms from the grooves, all laitance and fins shall be removed, and the grooves shall be sandblasted. The grooves shall be thoroughly dried, after which they shall be blown out; immediately thereafter, they shall be primed, bond breaker tape placed in the bottom of the groove, and filled with the construction joint sealant.

3.3 CONTRACTION JOINT

A. Reinforcing steel shall be terminated four (4) inches from either side of the joint or as indicated on the Project Drawings. The cast vertical face of the joint shall be cleaned of any fins or burrs on the surface. The surface shall then be coated with

a bond breaker material after the surface has been prepared as specified by the Manufacturer. The coating shall be applied as recommended by the Manufacturer. The concrete of the second placement shall be cast against the joint within the open time of the bond breaker as specified by the manufacturer.

3.4 CONTROL JOINT

A. After the concrete surface has cured to a point when it will not tear when cut with a concrete saw, the concrete shall be cut with a saw blade the size indicated on the Project Drawings or 3/8" thick if not indicated. The cut shall be a minimum of 1 1/2" deep or as indicated on the Project Drawings.

The joint shall not be located within a deepened section of slab or footing. It is permissible for the sawcut to run transverse to a deepen section.

After the concrete has cured, the sawcuts in the concrete surface shall be cleaned out with compressed air and filled with a polyurethane sealant in a continuous bead. The sealant selected shall be appropriate for the exposure of the joint.

**** END OF SECTION ****

Section 03300
Cast-in-Place Concrete

PART 1 – GENERAL

1.1 SCOPE OF WORK

- A. This Section covers cast-in-place concrete including selective finishing and repair work for structures on the project.

1.2 RELATED SECTIONS

- A. Section 03052 Hot Weather Concreting.
- B. Section 03100 Concrete Formwork.
- C. Section 03200 Reinforcing Steel.
- D. Section 03251 Expansion and Construction Joints.
- E. Section 03740 Epoxy Adhesive Injection of Cracks in Concrete Members
- F. Section 09900 Painting and Coating.

1.3 REFERENCES

- A. ASTM C31 Making and Curing Concrete Test Specimens in the Field.
- B. ASTM C33 Specification for Concrete Aggregate.
- C. ASTM C39 Compressive Strength of Cylindrical Concrete Specimens.
- D. ASTM C40 Organic Impurities in Sands for Concrete.
- E. ASTM C88 Soundness of Aggregates by use of Sodium Sulfate or Magnesium Sulfate.
- F. ASTM C94 Specifications for Ready-Mixed Concrete
- G. ASTM C131 Resistance to Degradation of Small Size Course Aggregate by Abrasion and Impact in the Los Angeles Machine.
- H. ASTM C136 Method for Sieve Analysis to Fine and Coarse Aggregate.
- I. ASTM C143 Test Method for Slump of Portland Cement Concrete.
- J. ASTM C150 Standard Specification for Portland Cement.

- K. ASTM C156 Test Method for Water Retention by Concrete Curing Materials.
- L. ASTM C173 Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
- M. ASTM C231 Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
- N. ASTM C233 Standard Method of Testing Air-Entraining Admixtures for Concrete.
- O. ASTM C260 Standard Specifications for Air-Entraining Admixtures for Concrete.
- P. ASTM C289 Standard Test Method for Potential Reactivity of Aggregates (Chemical Method).
- Q. ASTM C441 Standard Test Method for Effectiveness of Mineral Admixtures in Preventing Excessive Expansion of Concrete Due to the Alkali-Aggregate Reaction.
- R. ASTM C457 Microscopical Determination of Air-Void Content and Parameters of the Air-Void System in Hardened Concrete.
- S. ASTM C494 Standard Specifications for Chemical Admixtures for Concrete.
- T. ASTM C618 Standard Specifications for Coal Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
- U. ASTM C670 Preparing Precision Statements for Test Methods for Construction Materials.
- V. ASTM C803 Penetration Resistance of Hardened Concrete.
- W. ASTM C1084 Portland Cement Content of Hardened Hydraulic-Cement Concrete.
- X. ACI 301 Structural Concrete for Buildings.
- Y. ACI 211.1 Recommended Practice for Selecting Proportions for Normal and Heavyweight Concrete.
- Z. ACI 304 Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.

1.4 SUBMITTALS FOR REVIEW

- A. Section 01300 Submittals: Procedures for submittals.
- B. The Shop Drawings shall show complete details and arrangement of reinforcing and embedded items.
- C. Prepare mix design and prove with laboratory 7-day, 14-day and 28-day compressive test, or submit test reports of 7-day, 14-day and 28-day compressive tests of the mix where the same mix has been used on two similar structures. A mix design and trial batch testing shall also be performed for the cement rich mix required at the base of water-bearing walls. Submit mix design and test reports in writing for review by the Engineer at least 15 days before placing of any concrete.
- D. Provide certificate from supplier stating cement complies with ASTM C150 and these Specifications.
- E. Provide certificate that aggregates comply with ASTM C33. State weathering region limits of coarse aggregates: severe, moderate, or negligible. State basis of determining that potential reactivity is negligible.
- F. For concrete admixtures provide manufacturer's certificate of compliance with these Specifications.
- G. Epoxy Bonding Compound: Provide manufacturer's specific instructions for use.
- H. Non-shrink Grout: Provide manufacturer's certificate of compliance with these Specifications and specific instructions for use.
- I. Concrete Shrinkage Test Results: Provide test results from a testing lab documenting the proposed concrete mix designs for water retaining structure are within the acceptable shrinkage limits stated in this Section.
- J. Fine and Coarse Aggregate Test Results: Provide results of required aggregate test stated in Section 2.03 of this Specification.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301.
- B. Acquire cement and aggregate from same source for all Work.
- C. Concrete Mix Designs:
 - 1. All concrete materials shall be proportioned so as to produce a workable mixture in which the water content will not exceed the maximum specified.
 - 2. The exact proportions by weight of all materials entering into the concrete delivered to the jobsite shall conform to the approved mix design unless

specifically so directed by the City or laboratory for improved specified strength or desired density, uniformity and workability.

3. The proportions of such mix design shall be based on a full cubic yard of hardened concrete.
4. The jobsite batch plant shall furnish delivery tickets, signed by a Certified Weighmaster, on which each shall state the weight of aggregates, sand, cement and water and the number of cubic yard of concrete furnished, which will be compared against the approved mix design.
5. There shall be no variation in the weights and proportions of materials from the approved mix design.
6. Contractor shall bear the costs of mix designs.

D. Concrete Shrinkage Testing:

1. Each mix design to be used in the construction of water-bearing structures shall be tested for concrete shrinkage in accordance with ASTM C157. The maximum rate of shrinkage shall be 0.042 at 28-day drying age. The test may be terminated after the 28-day drying age measurement. These tests shall be performed prior to the start of the concrete construction using the same material sources for materials as those to be used for construction.
2. The maximum concrete shrinkage for specimens cast in the field shall not exceed the trial batch maximum shrinkage by more than 25 percent.
3. If the required shrinkage limitation is not met during construction, the Contractor shall take any and all of the following actions, at no additional cost to and to the satisfaction of the Owner, for securing the specified shrinkage requirements. These actions may include changing the source of aggregates, cement and/or admixtures; reducing water content; washing of aggregate to reduce the fines; increase the number of construction joints; modifying the curing requirements; complete removal of the non-conforming concrete; or other actions designed to minimize shrinkage or the effects of shrinkage.

E. Ready Mix Concrete:

1. Ready mixed concrete shall conform to the requirements of ACI 301 and ASTM C 94. In case of conflict, ACI 301 shall govern.

PART 2 – PRODUCTS

2.1 CONCRETE COMPOSITION

- A. Concrete shall be composed of Portland cement, fine aggregate, coarse aggregate, and water, so proportioned and mixed as to produce a plastic solution workable mixture in accordance with requirements of this section of the specifications, and suitable to the specific conditions of placement.

2.2 PORTLAND CEMENT

- A. Portland cement shall be from an approved source and shall conform to the requirements of the current ASTM C-150, for Type V cement. Only one brand of cement from one manufacturing plant may be used.
- B. Cement may be delivered in paper sacks or in bulk.
- C. If cement is delivered in sacks, each sack shall contain not less than 94 pounds of cement, and if delivered in bulk, one barrel of cement shall be considered to weigh 376 pounds.
- D. In order that the cement may not become unduly aged after delivery, the Contractor shall use cement that has been stored on the jobsite before using cement direct from freighting, hauling or transporting operations.
- E. Storage bins for bulk cement shall be watertight and constructed so that there will be no dead storage.
- F. If there is reason to believe that dead storage exists, the bins shall be emptied completely at least once every four (4) months.
- G. Cement bins at the batch plant, and cement storage silos shall be provided with effective dust collectors at the vents to prevent loss of cement.
- H. The Contractor shall designate the source and quantity of cement required for his needs at least 30 days prior to its use, so that appropriate tests, inspection and certification can be made.
- I. Certified mill certificates shall be furnished by the cement supplier with every shipment, giving proof that the above requirements have been met.
- J. In addition, the City may conduct, at its own expense, any tests it considers necessary, to insure that the cement provided meets the specified requirements.
- K. Any cement not meeting the Specifications will be rejected.
- L. The City may direct the use of Portland cement of a type other than that above specified, in which case it will pay the additional cost, if any, for the cement required over the cost of that specified, or shall receive appropriate credit for any cement required of a lesser cost than specified.

2.3 FINE AND COARSE AGGREGATES

- A. Fine aggregate shall be clean, natural sand consisting of hard, strong, durable and uncoated particles. It shall conform to the grading limits specified in ASTM C33.
- B. Material removable by decantation from fine aggregate shall not exceed five percent (5%) by weight.
- C. The moisture content of fine aggregate shall not exceed eight percent (8%) by weight at the time the aggregate is used for the concrete.
- D. Fine aggregate shall be subjected to careful, thorough analysis to determine conformity with all requirements of these Specifications.
- E. Mortar specimens made with the fine aggregate shall have a compressive strength after seven (7) days of at least ninety percent (90%) of the strength of similar specimens made with Ottawa sand having a fineness modulus of 2.40.
- F. Coarse aggregate shall be washed gravel or crushed stone consisting of hard, tough, durable particles free from adherent coating.
- G. It shall contain no vegetable matter of soft, friable, thin, flat or elongated particles in quantities considered deleterious.
- H. A thin, flat or elongated particle is defined as a particle having a maximum dimension in excess of five times its minimum dimension.
- I. Aggregate that has disintegrated or weathered badly under exposure conditions similar to those that will be encountered in the work under consideration shall not be used.
- J. When crushed stone is used, the crusher shall be equipped with a screening system that will entirely separate the dust from the stone and convey it to a separate bin.
- K. The substances designated shall not be present in excess of the following amounts:
 - 1. Soft fragments: 5%
 - 2. Clay lumps: 1.4%
 - 3. Material removed by decantation: 1%
- L. When the material removed by decantation consists essentially of crushed dirt, the maximum amount permitted may be raised to one and one-half percent (1/2%).
- M. Coarse aggregate shall be subjected to a careful, thorough analysis to determine conformity with all requirements of these Specifications.

- N. The maximum size aggregate shall be as required in this Section, the aggregate shall be uniformly well graded from coarse through fine.
- O. Corrective measures to remedy deficiencies in aggregate grading may be used only with the written approval of the City. Coarse aggregate grading shall conform to the requirements of ASTM C33 for the aggregate size number specified in this Section.
- P. The Contractor shall furnish satisfactory evidence to the City that all aggregate used in the work meets the requirements specified herein. Tests shall be performed by a reputable independent testing laboratory and the cost of testing be borne by the Contractor.
- Q. If the City deems that testing of aggregate is necessary, samples may be selected from any of the aggregate delivered to the ready mix plant or jobsite and have them tested by a laboratory of the City's choice at their expense.
- R. If in such tests the material fails to meet the specified requirements, the aggregate will be rejected and the expense of testing shall be borne by the Contractor.
- S. If such tests show the aggregate to be satisfactory, the Contractor shall have no claim for costs due to delays caused by testing.
- T. When tested in accordance with "Organic Impurities in Sands for Concrete" (ASTM C40), the fine aggregate shall provide a color in the supernatant liquid no darker than the reference standard color solution.
- U. When tested in accordance with "Soundness of Aggregates by use of Sodium Sulfate or Magnesium Sulfate" (ASTM C88), the loss resulting after five cycles shall not exceed 10% for fine aggregate and 12% for coarse aggregate when using sodium sulfate.
- V. When tested in accordance with "Resistance to Abrasion of Small Size Coarse Aggregate by use of the Los Angeles Machine" (ASTM C131), the coarse aggregate shall show a loss not exceeding 50% after 500 revolutions or 10% after 100 revolutions.
- W. When tested in accordance with "Potential Reactivity of Aggregates (Chemical Method)" (ASTM C289), the aggregates should be represented by points lying to the left side of the solid line of Figure 2.

2.4 WATER

- A. Water for mixing shall be clean, fresh and free from injurious amounts of oil, acid, chlorides, sulfates, alkali or organic matter. Water shall conform to ACI 301.

2.5 AIR-ENTRAINING AGENTS

- A. Unless specifically required by the City, the concrete may be air-entrained at the option of the Contractor however Class "A" concrete shall not be air-entrained.
- B. Air-entraining agents shall conform to the requirements of ASTM C260 and C233.
- C. The maximum total volumetric air content of the concrete before placement shall be as specified in subsection 2.10, as determined by ASTM C173 or ASTM C231.
- D. Manufacturers and Product
 - 1. Grace Construction Products, Cambridge, MA (877) 423-6491; "DAREX AEA"
 - 2. Master Builders, Cleveland, OH (800) 628-9990, "MB-AE10"
 - 3. SIKA, Santa Fe Springs, CA (562) 903-3648; "AER".

2.6 WATER REDUCING ADMIXTURES

- A. Water reducing additives, which do not affect the ultimate performance of any steel in any way, may be added to the concrete mix design. Water reducing additives shall conform to ASTM C494, Type A or D.
- B. The use of water reducing additives shall not permit the cement content or the air-entrainment to be reduced below the minimum specified in subsection 2.10 below.
- C. Superplasticizers, if allowed by the City, shall conform to ASTM C494, Type F or G, batch plant added using second or third generation only.

2.7 ADMIXTURES

- A. All admixtures used in any mix design shall be manufactured and supplied by the same admixture company to ensure compatibility and shall not contain calcium chloride or triethanolamine.
- B. Flyash shall conform to ASTM C618, Class F, and shall not to exceed 20% of the total cementitious material by weight used in the concrete mix design.
- C. When the air temperature during the pour exceeds 85°F, a concrete retarding admixture shall be added to all Class "A" concrete (as defined in subsection 2.08 below) used for wall construction.
 - 1. Grace Construction Products, Cambridge, MA; "DARATARD-17"
 - 2. Master Builders, Cleveland, OH; "MBL-82".
 - 3. To be considered as equal, any alternate product offered for consideration

shall contain no calcium chloride, and shall be compatible with air-entrained cements and air-entraining admixtures conforming to the applicable ASTM, AASHTO, ANSI and Federal Specifications.

- D. Contractor shall certify that admixtures do not contain calcium chlorides or other corrosive materials.

2.8 CONCRETE CLASSIFICATION

- A. Unless indicated otherwise on the drawings, concrete shall be of the following classes, each meeting the mix and compressive strength requirements as specified hereafter, and shall be used as follows:
 - 1. Class "A": All concrete structures which are water-bearing.
 - 2. Class "B": All other concrete structures.
 - 3. Class "C": Pipe blocks and appurtenances, pipe encasements, masonry building footings, tank and generator foundations, fence and retaining wall footings, slabs-on-grade.
- B. At the Contractor's option, Class "A" concrete may be substituted for Class "B" and "C" concrete. Likewise, Class "B" concrete may be used in lieu of Class "C" concrete. If Class "A" concrete is substituted for Class "B" or "C" concrete, such concrete shall be air-entrained if the Class "B" or "C" concrete is required to be air-entrained.

2.9 MEASUREMENT AND SLUMP

- A. All measurements of material for concrete shall be by weight. However, Contractor, at his own expense, may increase the cement content with a corresponding reduction in weight of aggregate and sand, if there is concern that the minimum strength requirements under these specifications cannot be met.
- B. The amount of water to be used shall be the amount necessary to produce a plastic mixture of the specified slump, but shall not exceed the water-cement ratio stated herein.
- C. Measure slump prior to addition of water-reducing admixtures (if used) in accordance with ASTM C143. Slump shall be within the limits specified in subsection 2.10.

A tolerance of up to one inch above the indicated maximum slump is permitted for individual batches, but the average for all batches or the ten (10) most recent batches tested, whichever is fewer, does not exceed the stated limit. Concrete of lower than usual slump may be used provided it is properly placed and consolidated.

2.10 CONCRETE MIX PARAMETERS

A. Notwithstanding what has been stated here-before, and unless shown otherwise on the Drawings, the concrete shall meet the following requirements:

	<u>Class A</u>	<u>Class B</u>	<u>Class C</u>
B. Min. Compressive Strength	4,500 psi	4,000 psi	3,000 psi
C. Max. Water/Cement Ratio (by weight)	0.40	0.42	0.45
D. Slump (plus or minus 1-inch)		3	3.54
E. Min. Cement Content (94 lb. sack of cement per cubic yard of solid concrete)		7.0 sacks	6.5 sacks 6.0 sacks
F. Maximum Aggregate Size (Size Number 5, ASTM C33)	1 inch (5)	1 inch (5)	1 inch (5)
G. Maximum Total Volumetric Air Content (plus or minus 1 percent)	0%	4%	4%
H. The cement content is required irrespective of resulting compressive strength.			
I. No calcium chlorides are permitted in mix design.			

2.11 WORKABILITY

- A. Concrete shall be of such consistency and composition that it can be worked readily into the forms and around the reinforcement without excessive spading or permitting material to segregate or free water to collect on its surface.
- B. If the concrete is not within the specified slump range, the proportions shall be adjusted to provide a plastic, cohesive mixture. All changes to the approved concrete mix designs shall be approved by the Engineer prior to use.
- C. To avoid unnecessary changes in consistency, the aggregate shall be from a source with uniform quality, moisture content, and grading. Handle materials in such a manner that variations in moisture content will not interfere with production of concrete of the specified degree of uniformity and slump.

2.12 EPOXY ADHESIVE

- A. A non-sag epoxy adhesive shall be applied over all dry-packed holes on the inside surface of walls and the repair honeycomb areas.

B. Manufacturer and Product:

1. Select Products Co., Costa Mesa, CA, phone: (714) 429-0808; "SELECT BOND GP-3000"
2. STO Concrete Restoration, Atlanta, GA, phone (800) 221-2397; "CR635" Sto Epoxy Gel
3. Approved equal materials may be used.

2.13 CURING COMPOUND

- A. If wet curing process is not used on formed concrete surfaces, a curing compound shall be applied immediately after forms have been removed from the concrete surface. If the forms are kept on the concrete for a minimum of seven (7) days, a curing compound is not required.
- B. Curing compounds will be accepted if it is a water-base acrylic, pigmented or colored, such as white, at the time of application, non-yellowing, in conformance with ASTM C 309, Type 1, Class B. and shall be suitable for use in a potable water storage facility.
- C. Regardless of the type of curing compound used, Contractor shall assume complete responsibility for its adequacy and shall remove the compound film from the concrete surface if not compatible with potable water and/or submerged conditions.
- D. Manufacturer and Product:
 1. W.R. Meadows, Inc., Hampshire, Illinois 60140-0338. (800) 342-5976; "SEALTIGHT VOCOMP-20" Water-Base Acrylic Curing and Sealing Compound.
 2. Approved equal

2.14 CONCRETE REPAIR MORTAR

A. Patch material shall be polymer-modified, cementitious, non-sag mortar with corrosion inhibitor properties.

B. Patch material shall meet the following requirements at 73 degrees F and 50 percent R.H.:

- | | |
|----------------------------------|---------------------|
| 1. Work Life | 30 minutes minimum |
| 2. Compressive Strength | 3,000 psi @ 7 days |
| 3. Bonding Strength (ASTM C 882) | 2,200 psi @ 28 days |
| 4. Color | Concrete Gray |

C. The material shall be designed for vertical and overhead application. The patch

material shall be capable of being applied in 2-inch thick applications on vertical surfaces.

D. The patch may be extended with clean sand in accordance with manufacturer's recommendations.

E. Manufacturer and Product:

i. STO Corp., (800) 221-2397 'CR 702'

ii. Fosroc Inc., (800) 645-3954 'Renderoc HB2'

iii. Sika Corporation, (562) 941-0231 'Sika Top 126 PLUS'

iv. Approved equal

PART 3 – EXECUTION

3.1 CONCRETE QUALITY

- A. Concrete shall be composed of Portland cement, sand, coarse aggregate, water, air-entraining solution and admixtures as specified or approved by the Engineer. The required proportions shall be assembled, well mixed, transported, placed, consolidated, finished and cured as here-in-after specified. Concrete shall be uniformly dense and sound, free from faults, cracks, voids, honeycomb and other imperfections.
- B. If not called for specifically and unless specified otherwise hereunder, concrete requirements shall follow ACI 301 where applicable.

3.2 SITE MIXED CONCRETE

- A. Site mixed concrete may only be used for small quantities of Class "C" concrete where approved in writing by the Engineer and shall conform to ACI 304 as modified by these Specifications.
- B. Use a batch-type mixer capable of combining the aggregates, cement, and water within the specified time into a thoroughly mixed and uniform mass and discharging the mixture without segregation.
- C. Use supporting equipment that can accurately proportion the cement, the coarse and fine aggregates, the admixtures, and the water which enters the mixing drum. Proportion the cement and aggregate by weight.
- D. Discharge each entire batch before recharging. Do not allow volume of the mixed materials per batch to exceed the manufacturer's rated capacity of the mixer.
- E. Mixing time shall be as follows:
 - 1. For mixer of a capacity of one (1) cubic yard or less, one and one-half minutes after batching is completed.

2. For mixers of capacities larger than one (1) cubic yard, one and one-half minutes plus one-half minute for each additional 1/2 cubic yard capacity or fraction thereof in excess of one (1) cubic yard.

3. The mixer shall revolve at a uniform rate as specified by the manufacturer for the mixing equipment.

3.3 READY-MIXED CONCRETE

- A. Provide central-mixed concrete conforming to ASTM C94 as modified by these Specifications.
- B. Limit the haul time of central-mixed concrete so that the specified slump is attained without the addition of water onsite which exceeds mix design water-cement ratio specified here-in. In no event shall the time after water and cement are both added at the batch plant to the truck is empty exceed 90 minutes, unless specifically approved by the Engineer.
- C. Use truck-transported, dry-batched concrete or mix on the jobsite when haul time is excessive. Do not retemper partially hardened concrete.

3.4 PLACEMENT OF CONCRETE

- A. Placement shall conform to ACI 304 as modified by these Specifications.
- B. Notify the Owner's representative of readiness, not just intention, to place concrete in any portion of the Work. This notification shall be such time in advance of the operation as the Owner's representative deems necessary to observe the preparations at the location of the proposed concrete placing and schedule the testing agency to be available to obtain the required concrete test specimens.
- C. All forms, steel, anchors, ties, inserts, and other embedded items shall be in place before the Contractor's notification of readiness is given to the Engineer.
- D. Schedule sufficient equipment for continuous concrete placing, program backup equipment, and the actions to be taken in case of an interruption in placing. Provide extra concrete vibrators. Test the concrete vibrators the day before placing concrete.
- E. Concrete in walls shall not be placed in layers thicker than 24 inches (vertical dimension) at any one time except that the bottom layer shall be not thicker than 12 inches. Under no circumstances shall the drop of concrete in wall forms exceed eight (8) feet and when starting a wall placement, the free vertical drop shall not exceed four (4) feet.
- F. Concrete in circular spiral-tied columns shall be deposited in a way to limit the free vertical drop to eight (8) feet or less. All concrete shall be vibrated as required in this

Section. The final quality of the poured concrete column shall be the responsibility of the Contractor. If the quality of the column is found to be unacceptable, the City, at the Contractor's expense, may require the complete removal of the column and may require that an alternate placement method be used.

- G. Each layer of concrete in walls and columns shall be vibrated thoroughly before the next layer may be placed. Vibrators shall be taken through the top layer down through the full thickness of the layer below to insure proper integration of the concrete from separate layers, to avoid the development of cold joints and voids between layers. In other words, each layer of concrete shall be vibrated at least twice.
- H. Each pour for water-bearing walls shall immediately be preceded with a cement rich concrete layer one (1) inch in average thickness consisting of water, and eight (8) sacks of cement per cubic yard. Sand and fine aggregate shall be added equally to create a mix with a maximum slump of eight (8) inches. Compressive strength of concrete shall be the same as that required for the remainder of the pour. The cement rich mix shall be tested at the same time as the concrete test batches are prepared and tested in order to confirm the required compressive strength.
- I. If cold joints in walls and columns occur the wall or column shall be removed and replaced.
- J. Horizontal waterstops in floor and roof slabs, if shown on the Drawings, shall be lifted up, and concrete placed under the waterstop, the waterstop shall then be laid down on that concrete, additional concrete shall be placed on top of that waterstop to the approximate finish level of the concrete, where upon the concrete shall be thoroughly vibrated in one continuous motion from one end of the waterstop to the other end without skipping any areas. Visual observations shall be performed by the Contractor to verify that voids under the waterstops do not exist.
- K. Unspecified cold joints in floor, roof slabs, walls and in wall-footings shall not be permitted. Placed concrete shall be continuously covered with new concrete, and shall be thoroughly integrated through vibration, even if it means that horizontal passes of only six (6) inches in width be made until additional concrete and equipment becomes available to permit wider passes in concrete placement. The presence of such a joint shall be cause for removal and replacement of the entire concrete pour, at no additional cost to the Owner.
- L. Vibrators shall be of the high-frequency internal type, and the number in use shall be ample to consolidate the incoming concrete properly within 15 minutes after it is deposited in the forms. In all cases, at least two vibrators shall be available at the site.
- M. Vibrate concrete to eliminate rock pockets and voids, to consolidate each layer with that previously placed, to completely embed reinforcing bars and fixtures, and to bring just enough fine material to exposed surfaces to produce a smooth, dense,

and even texture. Use external vibrators for consolidating concrete when the concrete is otherwise inaccessible for adequate consolidating, provided the forms are constructed rigidly enough to resist displacement or damage from external vibration.

N. The following minimum equipment, which must be in excellent working condition, shall be available on the site for every concrete placement operation:

1. Conveying: 1 pump and 1 crane.
2. Vibrating: 2 vibrators of 14,000 vibrations per minutes (minimum).
3. Trowelling: 2 power operated trowelling machines (for floor and roof decks only).

The City shall be the sole judge as to the acceptability of the equipment as to its condition and capacity. The Contractor shall assume complete responsibility for having adequate equipment.

O. Do not place concrete during rainstorms. Protect concrete placed immediately before rain to prevent rainwater from coming in contact with it. Keep sufficient protective covering on hand at all times for this purpose.

P. Concrete placed for encasements shall not be backfilled until the concrete has reached at least 50% of its specified 28-day compressive strength confirmed by concrete cylinder tests. The Contractor may mold and cure additional concrete cylinders per this Section to verify when the 50% strength has been achieved, prior to the required seven (7) day compression test. The Contractor shall keep the trench dewatered until that time. The Contractor may use Type III cement (High Early Strength) in lieu of Type II cement in the same batch quantities as specified, at no additional cost to the Owner.

Q. Concrete shall be placed and consolidated in all forms to produce a well-consolidated concrete with no voids or segregation.

R. The temperature of concrete as delivered at the time and location of placement under the following combined ambient conditions, except concrete that will be deposited within wall or column forms, shall not exceed the following temperatures:

Relative humidity less than %	Ambient temperature greater than °F	Maximum concrete temperature °F
80	90	100
70	90	95
60	90	90
50	90	85

40	90	80
30	80	75
20	75	70

3.5 PUMPING CONCRETE

- A. Determine pump size on rate of concrete placement, length of delivery pipe or hose, aggregate size, mix proportions, vertical lift, and slump of concrete.
- B. Minimum inside diameter of pipe or hose shall be based on the maximum aggregate size as follows:
 - 1. 1-inch maximum aggregate: 3 inches minimum I.D.
- C. Do not use aluminum pipes for delivery of concrete to the forms.
- D. Before pumping is started, prime the delivery pipe or hose by pumping mortar through the line using five (5) gallons of mortar for each 50 feet of delivery line. Do not deposit mortar in forms.
- E. Concrete for slump testing will be taken from the delivery end of the hose.

3.6 SURFACE FINISHES

- A. Wood-Float Finish:
 - 1. This requires an integral finish by wood-float after screeding, to compact the surface evenly.
 - 2. Any excess surface water shall be removed before floating and no mortar shall be added for leveling surface.
- B. Steel Trowel Finish:
 - 1. Provide an integral finish obtained by trowelling with a steel trowel after the surface has been floated and allowed to dry until all watersheen on the surface has disappeared.
 - 2. Final trowelling shall be done after the concrete has hardened sufficiently to prevent drawing moisture and fine materials to the surface and when the concrete is sufficiently hard that no mortar accumulates on the trowel while finishing surface.
 - 3. Do not spread cement or mixture of cement and sand on surfaces to absorb excess water or to stiffen the concrete.
 - 4. Trowelling shall produce a dense, smooth, impervious surface free from defects and blemishes.
 - 5. All interior unformed exposed surfaces shall receive a smooth, even, level and hard (so called "burnt") steel trowel finish.

- C. Formed Surfaces Finish:
1. After formwork is removed, surface fins and burrs shall be smoothed.
 2. All formed surfaces shall be smooth, even and regular.
 3. For honeycomb areas, see item H below of this Section.
- D. Unformed Surfaces: Unformed surfaces which will not be exposed in the completed work shall be brought to required finished elevations and left true and regular.
- E. Roof Slabs: All exterior flat roof surfaces, unless shown otherwise on the Drawings, shall receive a steel trowel finish which is subsequently broomed with a steel or hard-bristled broom to leave a fine uniformly scratched concrete surface.
- F. Screeds:
1. Sufficient screeds, unaffected by form deflections under concrete loads, shall be installed to insure an even concrete surface, true to grade and elevation, without unacceptable local depressions of any sort.
 2. Screeds shall be set to the required levels and be approved by the City before any concrete may be placed.
- G. Form Tie Holes:
1. Tie holes shall be thoroughly sandblasted or roughened. After cleaning, vinyl plugs shall be installed in the middle third of the wall width. The tie holes shall be coated with a water insensitive epoxy adhesive, as specified here-in, and properly filled by damp-packing with a mortar of damp-pack consistency by mixing one (1) part of cement to one (1) part of plaster sand. The amount of water to be added to the cement-sand mixture shall be such that the mortar can be properly compacted by driving it into the voids with a hammer. The outside portion of the tie hole shall be filled no sooner than seven (7) days after the inside has been filled.
 2. Embecco or other additives shall not be used for damp-packing such cavities.
 3. Interior surfaces of the damp-packed tie holes in water-bearing walls shall be covered with an approved ten (10) mil. thick water insensitive non-sag epoxy coating, which shall conform to the requirements of this Section.
 4. Finished surfaces shall be free from sand streaks or other voids.
- H. Honeycombed Areas: Defective surfaces, such as honeycomb, shall be cut out entirely until sound homogeneous concrete is met, even if it means going through the entire wall, floor or roof slab.
1. The exposed surface areas shall be coated with an approved epoxy bonding material, which shall be applied in accordance with the

manufacturer's instructions, repair area with concrete repair mortar product. The repair material shall be applied following the recommendations of the manufacturer for the specific repair application.

2. The water content of the concrete repair mortar shall be as recommended by the manufacturer for the repair application.
 3. Concrete repair mortar shall be tamped into place working from the edge of the repair area towards the center and finished to match the adjacent concrete surfaces.
 4. The thickness of the lifts shall be limited to the manufacturer's recommendation to prevent sagging of the repair material.
 5. The bond between a second lift of repair mortar shall be improved through the use of an approved epoxy bonding agent.
 6. Surfaces which have been repaired shall be kept continuously damp during, and for a period of not less than seven days after completing the damp-pack operation, by the curing procedure described in Part 3.09 of this Section.
 7. Under no circumstances shall the Contractor conceal the existence of a honeycombed area in the concrete in any way.
 8. Neither Embecco nor calcium chloride shall be used for repairing honeycomb areas, nor shall they be mixed with the damp-packed materials.
- I. Miscellaneous Surfaces: Miscellaneous surfaces that are not covered herein and not specifically designated on the Drawings shall be finished as directed by the City.
- J. Crack Repair: After concrete has cured, if any cracks larger than 0.02-inches have developed, they shall be repaired at no additional cost to the Owner, following the requirements of Specification Section 03740 - Epoxy Adhesive Injection of Cracks in Concrete Members

3.7 CONCRETE TESTS

- A. Compression test specimens and testing shall conform to ASTM C39.
- B. Proportioning (or chemical analysis) tests shall conform to ASTM C-1084.
- C. Frequency: At least one slump test and five test cylinders shall be taken, under the supervision of the City, by an approved testing lab for every 100 cubic yards or fraction thereof of each class of concrete used at the jobsite each day. Each cylinder shall be coded to identify the date of delivery, the truck number, the location where the concrete has been used and the slump measured upon discharge.
- D. The specimens shall be standard test cylinders, six inches in diameter, twelve inches in length, and they shall be prepared in accordance with ASTM C31. Molds for the standard test cylinders shall be furnished at the expense of the City.

- E. Determine slump of the concrete following procedures from ASTM C 143 for each strength test sample and as required to establish that the concrete slump is consistent.
- F. Determine air content of the concrete using procedures from ASTM C173 or C231 for each strength test sample and as required to establish consistency.
- G. Subject to the conditions outlined in this section, all costs for making and testing of concrete and materials, by an approved recognized reputable testing laboratory, will be borne by the City.
- H. The Contractor shall furnish any necessary labor to assist in obtaining and handling the test specimens. The testing of cylinders shall be performed by an approved testing laboratory that normally engages in the preparation of concrete mix designs and testing of concrete materials.
- I. Contractor shall provide and maintain for the sole use of the City's testing agency adequate facilities for safe storage and proper curing of concrete test specimens on the project site, as required by ASTM C31.
- J. One cylinder compression test shall be made of each group of test of cylinders after 7, 14 and 28 days, at the City's option in accordance with ACI 318-89, Section 5.6.
- K. The evaluation of concrete compressive strength shall meet the following requirements. The average of any three (3) consecutive compressive strength tests shall be equal to or greater than the specified 28-day strength. Not more than 10% of the tests shall be less than specified 28-day strength. No test shall be less than 85% of the specified 28-day strength.
- L. If the 28-day compressive tests fail to meet the specified minimum compressive strength, the concrete will be assumed to be defective and one set of three (3) cores from each area where the low strength concrete has been placed may be taken as selected by the Engineer and in accordance with ASTM C 42.
 - 1. If the concrete in the structure will be dry under service conditions, cores shall be air dried (in temperature 60 to 80°F, relative humidity less than 60 percent) for seven (7) days before testing, and shall be tested dry. If the concrete in the structure will be more than superficially wet under service conditions, cores shall be immersed in water for at least 40 hours prior to testing and tested wet.
 - 2. If the average compressive strength of the three (3) concrete cores from the same location fails to equal 85% 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 and shall be removed and replaced, all at no cost to the City. Costs for coring, testing of the cores, and all required concrete repairs

shall be paid by the Contractor.

- M. If one cylinder in a 28-day test manifests evidence of improper sampling, molding, or testing, other than low strength, discard it and test one of the remaining cylinders for the recorded test result.
- N. If requested by the City, proportioning tests for each class of concrete delivered to the jobsite shall be made from test cylinders designated by the City.
- O. In addition to the test cylinders referred to in this Section, an additional three (3) test cylinders shall be made for each day's pour, or for every 4,000 square feet of roof surface, whichever provides the largest number of cylinders.

They shall be cured in the same manner, and in the same location of the concrete area to be investigated. Before roof-forms may be stripped, at least one cylinder, of each batch of three (3) cylinders, must be tested to verify the in-place concrete strength meets the required compressive strength in order to proceed.

- P. Proportioning tests may then be made, at the discretion of the City, on those groups of cylinders that have shown low readings.
- Q. Any concrete showing a cement content less than the ratio by weight established in the original mix design will be subjected to further testing of concrete cores taken from the concrete in question. Should these tests confirm that the specified requirements have not been met, the extra costs involved in such testing shall be borne by Contractor; and the concrete, at the City's option, and at Contractor's sole expense, may be rejected and must then be removed from the site or may be strengthened with additional shotcrete or concrete as the situation warrants it. Should the core tests indicate that the strength requirements have been met or if the low strength concrete is deemed acceptable to the City, the extra costs involved in such testing shall still be borne by the Contractor.

3.8 CURING

- A. Curing Compound:
 - 1. All formed concrete surfaces shall be sprayed with a concrete curing compound as specified in Section 03300.02.13 of these Specifications at an application rate of 200 square feet per gallon, or as recommended by the product manufacturer, whichever provides the more dense application of the product. This requirement will be waived for formed surfaces if the forms have been left in place for at least seven (7) days after the concrete in the forms has been placed.

2. All concrete surfaces, exposed to drying winds and sunlight, shall be sprayed with a curing compound as specified in Section 03300.02.13 of these Specifications at an application rate of 200 square feet per gallon, or as recommended by the product manufacturer, whichever provides the more dense application of the product.
 3. Horizontal surfaces shall be cured by application of a curing compound, as described above AND by covering with six (6) mil polyethylene sheets as soon as the surface of the concrete is dry to the touch. The polyethylene sheets shall be carefully taped and sealed to the concrete surface. The polyethylene sheets shall be kept on the surface of the concrete for as long as possible, but for at least seven (7) days, to minimize the loss of moisture trapped between the polyethylene sheets and the concrete. Water must be introduced between the polyethylene sheets and the concrete, after the concrete has set, whenever drops of moisture cannot be detected on the concrete side of the sheets.
 4. Apply curing and sealing compound when surface water disappears and concrete surface will not be marred by walking workmen.
 5. Apply curing and sealing compound in a uniform film. Avoid forming puddles of material in low areas.
 6. Protect horizontal surfaces from foot traffic for a minimum of 12 hours after application of curing compound.
- B. Wet Curing: After the concrete surface is dry enough not to be marred, six (6) mil thick polyethylene sheets shall be carefully taped and sealed to all structural concrete slab surfaces and kept in place as long as possible, but for at least seven (7) days, to minimize the loss of moisture trapped between the polyethylene and the concrete. The polyethylene covering will not be required for new wall construction.
1. Water must be introduced between the polyethylene sheeting and the concrete (after the concrete has set) whenever moist drops cannot be detected on the concrete side of the sheeting. Water for curing shall be generally clean and free from any elements that might cause straining or discoloration of the concrete.
- 3.1 **PROTECTION FROM ABRASION OR FIRE:** Every reasonable precaution shall be taken to protect finished surfaces from abrasions or other damage.
- A. Concrete surfaces or edges likely to be injured during the construction period shall be protected by leaving the forms in place or by erecting satisfactory covers. No fire shall be permitted in direct contact with concrete at any time.

**** END OF SECTION ****

Section 03315 Grout

PART 1 – GENERAL

1.1 THE REQUIREMENT

- A. The Contractor shall furnish all materials for grout in accordance with the provisions of this Section and shall form, mix, place, cure, repair, finish, and do all other work as required to produce finished grout, in accordance with the requirements of the Contract Documents.

- B. The following types of grout shall be covered in this Section:
 - 1. Non-Shrink Grout: This type of grout is to be used wherever grout is shown in the Contract Documents, unless another type is specifically referenced.
 - 2. Cement Grout
 - 3. Epoxy Grout

1.2 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. Specifications, codes, and standards shall be as specified in Section 03300, "Cast-in-Place Concrete," and as referred to herein.
- B. Commercial Standards:
 - 1. CRD-C 621 Corps of Engineers Specification for Non-shrink Grout
 - 2. ASTM C 109 Test Method for Compressive Strength of
 - 3. Hydraulic Cement Mortar (Using 2-in or 50-mm Cube Specimens)
 - 4. ASTM C 531 Test Method for Linear Shrinkage and Coefficient Of Thermal Expansion of Chemical- Resistant Mortars, Grouts, and Monolithic Surfacing
 - 5. ASTM C 579 Test Methods for Compressive Strength of Chemical-Resistant Mortars and Monolithic Surfacing.
 - 6. ASTM C 827 Test Method for Early Volume Change of Cementitious Mixtures.
 - 7. ASTM D 696 Test Method for Coefficient of Linear Thermal Expansion of Plastics.

1.3 CONTRACTOR SUBMITTALS

- A. The Contractor shall submit certified test results verifying the compressive strength, shrinkage, and expansion requirements specified herein; and

manufacturer's literature containing instructions and recommendations on the mixing, handling, placement and appropriate uses for each type of non-shrink and epoxy grout used in the work.

1.4 QUALITY ASSURANCE

A. Field Tests:

1. Compression test specimens will be taken during construction from the first placement of each type of grout, and at intervals thereafter as selected by the Engineer to ensure continued compliance with these specifications. The specimens will be made by the Engineer or its representative.
2. Compression tests and fabrication of specimens for cement grout and non-shrink grout will be performed as specified in ASTM C 109 at intervals during construction as selected by the Engineer. A set of three (3) specimens will be made for testing at 7 days, 28 days, and each additional time period as appropriate.
3. Compression tests and fabrication of specimens for epoxy grout will be performed as specified in ASTM C 579, Method B, at intervals during construction as selected by the Engineer. A set of three (3) specimens will be made for testing at seven (7) days, and each earlier time period as appropriate.
4. All grout already placed that fails to meet these Specifications is subject to removal and replacement at the cost of the Contractor.
5. The cost of all laboratory tests on grout will be borne by the Owner, but the Contractor shall assist the Engineer in obtaining specimens for testing. However, the Contractor shall be charged for the cost of any additional tests and investigation on work performed which does not meet the Specifications. The Contractor shall supply all materials necessary for fabricating the test specimens.

- B. Construction Tolerances: Construction tolerances shall be as specified in the Section 03300 - Cast-in-Place Concrete, except as modified herein and elsewhere in the Contract Documents.

PART 2 – PRODUCTS

2.1 CEMENT GROUT

- A. Cement Grout: Cement grout shall be composed of one (1) part cement, three (3) parts sand, and the minimum amount of water necessary to obtain the desired consistency. Where needed to match the color of adjacent concrete, white Portland cement shall be blended with regular cement as needed. The minimum compressive strength at 28 days shall be 4000 psi.
- B. Cement grout materials shall be as specified in Section 03300, "Cast in-Place Concrete."

**** END OF SECTION ****

Section 07900
Joint Sealers

PART 1 – GENERAL

1.1 SCOPE OF WORK

- A. This Section covers the Work necessary for sealed joints not specifically covered by other Sections of these Specifications, including sealant, sealant backup, and associated materials.

1.2 REFERENCES

- A. D 412, Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension.
- B. D 624, Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomer.
- C. C 920, Specification for Elastomeric Joint Sealants.
- D. Federal Specifications, TT-S-00227e.

1.3 SUBMITTALS

- A. Submit the quantity, location and details for the Engineer's approval before materials are delivered to the project site.
- B. Product Data demonstrating conformance with these specifications.
- C. Samples, include color selections.
- D. Manufacturer's Installation Instructions.
- E. Manufacturer's warranty.

1.4 ENVIRONMENTAL CONDITIONS

- A. Environmental Requirements: Do not apply sealant on wet or frosty surfaces or when surface temperature is higher than 120 degrees Fahrenheit or lower than recommended by the manufacturer.

PART 2 – PRODUCTS

2.1 SYNTHETIC RUBBER SEALING COMPOUND (POLYURETHANE)

- A. Sealant shall be in conformance with FS TT-S-00227e, Type I for pourable grade, and Type II for nonsag, Class A; multi-part polyurethane. The sealant shall be able to cure at room temperature to firm, highly resilient rubber and able to perform satisfactory when continuously submerged in water or sewage and exposed to direct sunlight in dry condition. The sealant shall have the following properties determined at 75 degrees Fahrenheit and 50 percent relative humidity:
1. Base: Polyurethane rubber.
 2. Solids: Minimum 97 percent.
 3. Application Time: Minimum 2 hours.
 4. Cure Time: Maximum 3 days.
 5. Tack Free Time: 24 hours.
 6. Ultimate Hardness: 35, within 5 Shore A.
 7. Tensile Strength: Minimum 300 pounds per square inch when tested in accordance with ASTM D 412.
 8. Ultimate Elongation: Minimum 550 percent when tested in accordance with ASTM D 412.
 9. Tear Resistance: Minimum 85 pounds per inch when tested in accordance with ASTM D 624 Die C.
 10. Temperature Service Range: 50 degrees to 200 degrees Fahrenheit.
- B. Color: Gray to match concrete or concrete masonry units unless indicated on the Drawings.
- C. Manufacturers:
1. Polymeric Systems, Inc., PSI 270 or PSI 270 SL.
 2. Pacific Polymers, Garden Grove, CA, Elastothane 227R.
 3. Approved equal

2.2 SILICONE SEALANT

- A. The single component silicone sealant shall be in conformance with ASTM C 920, Type S, Grade NS, Class 25.
- B. Manufacturers:
1. Tremco, Proglaze.

2. Pecora Corp., Number 864.
3. Dow Corning, Number 795
4. General Electric, Number 1200 Series
5. Approved equal

2.3 ACRYLIC-LATEX SEALANT

- A. Permanently flexible, non-staining, and non-bleeding latex modified acrylic sealant compound, colors as selected by Engineer from manufacturer's standard options.
- B. Manufacturers: One of the following or equal:
 1. Tremco, Proglaze.
 2. Pecora Corp., Number 864.
 3. Sonneborn, Sonolac.
 4. Approved equal

2.4 SYNTHETIC SPONGE RUBBER FILLER

- A. Closed-cell expanded sponge rubber manufactured from synthetic polymer neoprene base, or resilient polyethylene foam backer rod.
- B. Characteristics:
 1. Suitable for application intended.
 2. Strength: As necessary for supporting sealing compound during application.
 3. Resiliency: Sufficient resiliency to prevent significant load transfer across joint.
 4. Resistance to environmental conditions of installation.
 5. Bonding: No bonding to the sealing compound.
 6. Structure: Cellular, prevents wicking or absorption of water.
 7. Compatibility with other materials in joint and acceptance by manufacturer of sealing compound.
 8. Size: Minimum 25 percent greater than nominal joint width.
- C. Manufacturers:

1. Presstite, Number 750.3 Ropax Rod Stock.
2. Rubatex Corp., Rubatex-Cord.
3. Approved equal

2.5 RELATED MATERIALS

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive, non-staining, compatible with joint forming materials and as recommended by sealant manufacturer.
- C. Bond Breaker Tape: Pressure-sensitive tape recommended by sealant manufacturer to suit application.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify acceptability of joint dimensions, physical, and environmental conditions.
- B. Verify that surfaces are dry, clean, and free of dirt, grease, curing compound, and other residue which might interfere with adhesion of sealants.
- C. Verify that product is NSF approved whenever in contact with potable water.

3.2 PREPARATION

- A. Allow concrete to cure thoroughly before caulking.
- B. Synthetic Sponge Rubber Filler:
 1. Prepare surfaces designated to receive filler in accordance with manufacturer's installation instructions.
 2. Do not stretch filler beyond its normal length during installation.
- C. Caulking:
 1. Verify that surfaces are dry, clean, and free of dirt, grease, curing compounds, and other residue that might interfere with adhesion of caulking compound.
 2. Concrete, Masonry, Wood, And Steel Surfaces: Clean and prime in accordance with manufacturer's instructions prior to caulking.
- D. Synthetic Rubber Sealing Compound:

1. Ensure surfaces to which synthetic rubber must bond are dry and free of dust, dirt, and other foreign residue.
 2. Heavy sandblasted caulking groove to sound surface, and prime with manufacturer's recommended primer for particular surface.
- E. For sidewalks, pavements, and similar joints sealed with elastomeric sealants and subject to traffic and other abrasion and indentation exposures, fill joints to depth equal to 75 percent of joint width, but neither more than 5/8 inches deep nor less than 3/8 inches deep.
- F. For normal moving building joints sealed with elastomeric sealants not subject to traffic, fill joints to depth equal to 50 percent of joint width, but neither more than 2 inch deep nor less than 1/4 inch deep.
- G. For joints sealed with acrylic-latex sealants, fill joints to depth in range of 75 percent to 125 percent of joint width.
- H. Use joint filler to achieve required joint depths, to allow sealants to perform properly.
- I. Prepare surfaces and install synthetic sponge rubber filler in accordance with manufacturer's recommendations.
- J. Do not stretch filler beyond normal length during installation.
- K. Apply bond breaker when recommended by joint sealer manufacturer.

3.3 INSTALLATION

- A. Synthetic Sponge Rubber Filler: Install filler in accordance with manufacturer's installation instructions.
- B. Caulking, Joints, and Sealing:
1. **Construct expansion, contraction, and construction joints as indicated on the Drawings.**
 2. **Install pipe and conduit in structures as indicated on the Drawings.**
 3. **Caulk doors, windows, louvers, and other items installed in or over concrete openings inside and out.**
 4. **Use synthetic rubber sealing compound for caulking where indicated on the Drawings or as specified, except for masonry construction and where specified otherwise.**
 5. **Complete caulking prior to painting**
 6. **Verify that concrete is thoroughly cured prior to caulking.**

7. **When filler compressible material is used, use untreated type**
8. **Apply caulking with pneumatic caulking gun.**
9. **Use nozzles of proper shape and size for application intended.**
10. **Maintain continuous bond between caulking and sides of joint to eliminate gaps, bubbles, or voids and fill joint in continuous operation without layering of compound.**
11. **Employ experienced applicators to caulk joints and seams in neat workmanlike manner.**
12. **To hasten curing of compound when used on wide joints subject to movement, apply heat with infra-red lamps or other convenient means.**
13. **Apply synthetic rubber sealing compound with pneumatic caulking tool or other acceptable method.**

3.4 CLEANING

- A. Clean surfaces adjacent to sealant as work progresses.
- B. Remove excess uncured sealant by soaking and scrubbing with sealant cleaning solvent.
- C. Remove excess cured sealant by sanding with Number 80 grit sandpaper.
- D. Leave finished work in neat, clean condition.

3.5 SCHEDULE

- A. Synthetic Rubber Sealing Compound (Polyurethane), Non-sag Type II:
 1. Use where indicated on the Drawings.
 2. Water-bearing and earth-bearing concrete structures.
 3. Joints in masonry, concrete vertical surfaces, and metal faced panels in vertical surfaces.
 4. Joints between sheet metal flashing and trim.
 5. Joints between sheet metal flashing and trim, and vertical wall surfaces.
 6. Small voids between materials requiring filling for weathertight performance in vertical surfaces.
 7. Surfaces in contact with bituminous materials in vertical surfaces.

8. Perimeters of frames of doors, windows, louvers, and other openings where bonding is critical to airtight performance.
 9. Expansion and control joints in masonry vertical surfaces.
- B. Synthetic Rubber Sealing Compound (Polyurethane), Self-leveling Type I:
1. Use where indicated on the Drawings.
 2. Expansion and control joints in masonry, concrete horizontal surfaces, and metal panels in horizontal surfaces.
 3. Small voids between materials requiring filling for weathertight performance in horizontal surfaces.
 4. Surfaces in contact with bituminous materials.
 5. Pavement joints.
 6. Perimeters of frames of doors, windows, louvers, and other openings in horizontal surfaces where bonding is critical to airtight performance.
- C. Silicone:
1. Use where indicated on the Drawings.
 2. Joints and recesses formed where window, door, louver and vent frames, and sill adjoin masonry, concrete, stucco, or metal surfaces.
 3. Door threshold bedding.
 4. Moist or wet locations, including joints around plumbing fixtures.
 5. Stainless steel doors and frames, including joints between applied stops and frames, and around anchor bolts.
 6. Plenum joints.
- D. Acrylic Latex:
1. Use where indicated on the Drawings.
 2. Interior joints with movement less than 7.5 percent and not subject to wet conditions.

**** END OF SECTION ****

**Section 10405
Accident Prevention Signs**

PART 1 – GENERAL

1.1 DESCRIPTION

This Section specifies informational and accident prevention signs.

1.2 QUALITY ASSURANCE

A. Operating and Design Requirements:

1. General: Accident prevention signs shall conform as to design with OSHA Section 1910.145 of Subpart J, Part 1910, Chapter XVII, Title 29 of the Code of Federal Regulations.

2. Design Requirements:

a. Size: Sign size shall be as follows:

A - 14-inch x 20-inch

B - 10-inch x 14-inch

C - 7-inch x 10-inch

b. Type: The sign type shall be as follows:

<u>Type</u>	<u>Message</u>
I	Automatic Equipment
II	480 Volts
III	Corrosive Chemical
IV	Do Not Drink
V	No Smoking
VI	Emergency Eyewash and Safety Shower
VII	Keep Out
VIII	Ear Protection Equipment Required Beyond This Point
IX	High Temperature
X	Restricted Area Authorized Personnel Only
XI	Caution Biological Hazard
XII	Radiation Hazard

XIII	Hard Hat Area
XIV	Lock Out Switch Before Working on Equipment
XV	Caution Toxic Gas
XVI	No Swimming
XVII	Caution 15-Foot Vertical Drop
XVIII	Caution Automatic Door
XIX	Inhalation Precautions Required
XX	Do Not Stare at Welding Frame
XXI	Protective Gear Required While Servicing
XXII	Trip Main Breaker Inside Building Prior to Working on Transformer

PART 2 – PRODUCTS

2.1 GENERAL

Sign lettering shall be single stroke and shall contrast in color with the background. For those messages for which there are international symbols, the international symbols shall be used. Chain mounted signs shall have lettering on both sides.

2.2 MATERIALS

Signs shall be 0.060-inch thick fiberglass with embedded fadeproof legends.

PART 3 – EXECUTION

Appropriate signs shall be located on all new equipment and as specified and as directed by the Project Manager. Message, size and mounting details shall be as specified and as directed by the Project Manager. A minimum of 20 signs shall be provided.

**** END OF SECTION ****

**Section 32 12 43
Rubber Pavement**

PART 1 GENERAL

1.1 DESCRIPTION:

Rubber Pavement

1.2 SECTION INCLUDES:

- A.Pavements
- B.Pathways
- C.Fitness Tracks
- D.Walkways
- E.Sidewalks

1.3 DEFINITIONS:

- A.Subbase: A layer in a paving system between the sub-grade and the surface course
- B.Base Reinforcement: The use of a geo synthetic within the aggregate base course to enhance the performance of the paving.
- C.Geogrid: Biaxial or triaxial woven polypropylene material for base course reinforcement and confinement, and subgrade stabilization and increased subgrade load capacity.
- D.Subgrade: The soil prepared and compacted to support a structure or paving system.
- E.Panel: An individual paving slab bordered by joints or slab edges.
- F.Exposure Conditions, Moderate: Exposure to a climate where the paving will not be in a saturated condition when exposed to freezing and will not be exposed to deicing agents or other aggressive chemicals.
- G.Exposure Conditions, Severe: Exposure to deicing chemicals or other aggressive agents or where the paving can become saturated by continual contact with moisture or free water before freezing.

1.4 SUBMITTALS:

- A.Samples:
 - 1.Submit (1) Color chart representing full range of manufacturers color options

2. Submit (1) Specified Rubberway Labeled Sample, Project Specific 4" x 4" square in full thickness of color selected by Architect or Owner
3. Submit (1) Copy of Manufacturers Technical Data Sheets on each product to be used
4. Submit (1) Manufacturer's Installation Overview

B. Shop Drawings: Project specific shop drawing shall include plan view cross section

C. Manufacturer Approved: Installation Contractor's Project References:

1. Certified Rubberway installer is required to have performed an installation within the last 12 months and is to submit a list of 20 successfully completed rubber pavement projects, within the last 7 years. The type of application is required. Project references are required to have a minimum of 8,000 square feet per project name and location and may be combined.

D. Close Out Submittals:

1. Submit (1) Manufacturer standard product materials warranty / Signed by a company officer with a certified signature
2. Submit (1) Standard labor warranty to be provided directly to owner by certified Installer
3. Submit (1) Manufacturer Surface Care and Maintenance Guide which includes the Project Name, Certified Installer Company Name, Contact, Completion Date and Location

1.5 QUALITY ASSURANCE

A. The Manufacturers Qualifications: Manufacturer must have a minimum of 15 years manufacturing with the products specified.

B. Contractors Qualifications: The installing foreman must be a Certified Rubberway installer or with authorized Rubberway agent oversight and have specialized or similar experience installing and performing the work of this section that is required for this project.

C. Rubber Paving system shall be installed by Certified Rubberway authorized and factory trained technicians only, to be warranted.

1.6 DELIVERY AND STORAGE

A. Delivery of Materials: Materials should be delivered to site in manufacturer's unopened container with labels clearly identifying the product name and

manufacturer. See manufacturer's guidelines for temperature requirements for the locale of installation.

B.Storage of Materials: The trade contractor shall provide a secure, clean, dry location for storage of materials at temperatures above 50°F. Under no circumstances should materials be stored outside unless fully protected from moisture with 10 mil polyethylene barrier and tarpaulin. All materials stored outside shall be inspected by dealer for moisture contamination before application. Store out of direct sunlight to avoid moisture and condensation.

1.7 PROJECT SITE CONDITIONS

A.Environmental site conditions must be between 50 and 85 degrees F. Do not install when sub base is saturated or wet or when ground is frozen.

B.Sub-base shall be clean, fully compacted, and constructed with the impermeable liner in place and protected from puncture. Ensure no standing water is present.

C.Protect area after installation to avoid damage- up to 24 hours

D.Upon completion of installation, installer shall remove all unused materials, tools, equipment, and rubbish.

E.No smoking, open flames, or sparks from electrical equipment shall be permitted during the application of materials.

1.8 MATERIAL GUARANTEE

A.The rubber pavement materials shall be guaranteed against defects for ten (10) years.

PART 2 PRODUCTS

2.1 MANUFACTURER

A.Rubberway, Inc.

B.Phone: 877-288-0045

email: info@rubberway.com

web www.rubberway.com

1.All materials are made in the USA and must be obtained through the manufacturer Rubberway, Inc or an approved distributor acceptable to Manufacturer.

A.Substitutions: Substitutions will be considered if in accordance with the product system characteristic requirements as outlined below in Section 2.2. Contractor requesting substitution is required to provide supporting documentation that is performed by accredited 3rd party testing labs upon their request.

B.Requests for substitutions will be considered in accordance with provisions of Section 010 00 –Product equivalent must be requested within 10 days before and prior to the bid date.

2.2 INDEPENDENT 3rd PARTY TESTING SYSTEM CHARACTERISTIC REQUIREMENTS

A.PRODUCT: RUBBERWAY PERVIOUS PAVEMENT TOTAL THICKNESS: 1.5 up to 2”

- 1.ADA Compliant: Pass
- 2.Freeze Thaw Change -25 cycles (+) .44%: No Change in visual
- 3.ASTM D638 Tensile Strength 78% minimum 40%
- 4.Tensile Strength of Binder 2000 PSI
- 5.Elongation at mean 290%
- 6.Slip Resistance C0128 Federal Spec AA60005 Test RR-F-621E: 99 dry and 76 wet
- 7.Proof load test 25,000 lbs- ASTM F970 Static Load Limit –Results: 98.78% recovery
- 8.EPA-TCLP-Method 6010B- Heavy Metal Leachate: Pass
- 9.EPA-STLC- (DHS WET EPA 6010B)-Pass
- 10.EPA 8270C- Pass
- 11.EPA 8260B-Pass
- 12.EPA 7470A- Pass
- 13.EPA 7470A STLC Mercury (DHS WET) Pass
- 14.Fish Bioassay - Results >750 mg/l Analyte was not detected
- 15.SRI- Solar Reflectance Index: 31 when using Grey
- 16.Water Extractable 0% organic extractable No VOC's
- 17.GMAX ASTM F355 A – Results:143

B.LEED CREDITS: This system will qualify for recycled content, heat island effect when using Grey or Tan colors, storm water management, innovation in design and when possible, regional labor and materials.

1. Heavy Metal leaching tests required to meet EPA 1312 standards.
2. Recycled content must exceed 80% postconsumer per unit of product.
3. System must meet a 20 year design life.
4. Local and or regional materials within 500 miles, when feasible.

5. System must be manufactured on site.
6. Solar reflectance Index value exceed- 31 with grey color

2.3 RUBBER PAVEMENT MATERIALS

A.BONDING AGENT: Must have the capacity to bind with: rubber, wood, steel, concrete, asphalt, aluminum, permeable or compacted aggregate. Must be polyurethane based and water repellent. BINDER- Delivered in 5-gallon pails or Drums- Labeled RUBBERWAY 3000

B.RUBBER

1. RUBBER: The type of the rubber, mesh size and the sieve matrix will vary to meet the system characteristic requirements. Rubber will be free of moisture, and any contaminates upon delivery. All Materials will be labeled RUBBERWAY, bagged in 50 lb or 55 lb bags
2. COLOR OPTIONS ARE TO BE SELECTED BY OWNER
3. All system materials are to be purchased directly from Rubberway, Inc, or through a Rubberway, Inc. approved Distributor

2.4 MIX DESIGN

A.Using materials acceptable by the manufacturer, design a tentative mix and test mockup for the consistency intended for use on the system specified. Follow instructions per the manufacturer's installation overview provided at the time of installation.

2.5 FORMS

A.Make forms with temporary wood, steel, concrete curbs, or pressure treated lumber or other material that is sufficiently rigid to maintain specified tolerances, and capable of supporting finished surfacing to specified height.

B.Forms shall be clean and free of debris of any kind, including rust.

C.Form release: Rubberway TXIB finishing solvent

PART 3 EXECUTION

3.1 SUBGRADE PREPARATION

- A. Prepare subgrade as specified in the contract documents and detailed drawings.
- B. Construct subgrade to ensure that the required paving thickness is obtained in all locations.
- C. Keep all traffic off the subgrade during construction to the maximum extent practical. Regrade subgrade disturbed by delivery vehicles or other construction traffic as needed.
- D. Compact the material added to obtain final subgrade elevation, avoiding low spots.

3.2 IMPERMEABLE LINER

- A. Impermeable liner shall be a HDPE or equivalent barrier membrane with minimum 30-mil thickness, continuous sheet, installed to prevent water infiltration into subgrade. Liner shall be wrinkle-free, fully overlapped (minimum 12"), and sealed per manufacturer's requirements.
- B. Install protection board or sand layer over liner where required to prevent puncture during base placement.
- C. Hold liner and protection in place using base aggregate or ballast.

3.3 SUB BASE

- A. Prepare subbase in accordance with contract documents and detail drawings.
- B. Subbase shall conform to grades and cross-sections indicated. Provide 4" minimum compacted Class 2 Aggregate Base or equivalent.
- C. Compact to 95% modified Proctor.
- D. Moisture content per compaction requirements.

3.4 SITE PREPARATION:

- A. The contractor shall strip all debris and organic matter from areas to be graded and shall haul this material off site for legal disposal.
- B. The Contractor shall be responsible for placing and compacting approved base material in accordance with the specifications.

C. The Contractor shall be responsible to have adjacent grass edged and removed from all areas receiving the synthetic surface. Do not apply a liquid herbicide such as Roundup to any adjacent edges of surfacing areas this can discolor the rubber.

D. Turn off any surrounding adjacent sprinklers 1 week prior to work being performed

3.5 BASE MATERIAL

A. Rubber surfacing system shall be installed over a non-permeable assembly consisting of:

1. Impermeable liner
2. Protection board or sand layer
3. 4" minimum Class 2 Aggregate Base or approved equal

B. If asphalt or concrete is used, ensure a full 28-day cure for concrete and proper surface drainage.

3.6 EXAMINATION

A. Do not begin installation until substrates have been properly laid and compacted according to manufacturer's instructions and inspected by an authority approved by the owner.

B. Consulting arborist is recommended for tree root inspection. Roots can be left intact up to 1 ½" from grade (flush to base layer of proposed system detail when installation is specific to sidewalk repair and the sub-base is permeable). Any tree root trimming should be approved and supervised by a consulting arborist.

C. Protect all surrounding areas to avoid damage to adjacent surfaces.

PART 4 INSTALLATION

4.1 PLACING FINISHED PAVING

A. Installation of the rubber paving material shall take place only when proper environmental conditions permit, and the temperature is 50 degrees F and rising. If, in the installer's opinion, the weather or climate conditions are harmful for proper surface installation, work will be delayed until conditions are agreeable.

B. The materials shall be prepared in a mechanical mixer until a homogenous mix is obtained.

C. The paving application is to be cohesive and per the specified depth.

D. Install per manufacturer's installation instructions submitted. On site installation overview or manual will be provided directly to the owner for client/ inspector review.

4.2 EDGING

A. When curbs or steel edging are not used, temporary wood forms or wood sticks can be used and then bevel the edge of the top surface to a 45-degree angle. If concrete curbs are used, prime the interior edges of concrete curbs with binding agent.

4.3 PROTECTION

A. No traffic or other trades shall be allowed on the surface following completion for ample cure time.

B. Other Trades: It shall be the responsibility of the general contractor to protect the surface from damage by other trades before acceptance by the Owner or his agent. Completely cover the paving surface with 4 mil thick polyethylene sheet if necessary, until the project is completed and turned over to the owner.

PART 5 GUARANTEE

The surfacing materials shall be guaranteed against defects for a period of ten (10) years from the date of completion.

The surface installation labor shall be guaranteed against defects in workmanship for a period of one (1) year from the date of completion. This one-year guarantee shall be provided directly to the owner by approved installation company. This guarantee excludes the following as applicable:

- Where materials or the installation is damaged by others or use of improper equipment.
- The surface has not been properly maintained according to manufactures maintenance instructions and recommendations.
- Damage from improper vehicle traffic, other than those specified by manufacturer.
- Failure of the asphalt base, concrete, or aggregate subbase.
- Low spots, ponding, or inadequate drainage.
- Defects caused by vandalism, Force Majeure, or natural disasters.
- Unless other terms and conditions are previously agreed upon by both parties and stipulated in the contract.

This guarantee is in lieu of all other warranties, expressed or implied, including but not limited to any warranty of merchantability or fitness for a particular purpose and shall not include any other damages, either direct or consequential.

**** END OF SECTION ****