

Division 3: Concrete

SECTION 033000 – CAST-IN-PLACE CONCRETE

1.0 GENERAL

1.1 SUMMARY

- A. This Section includes all labor, materials, equipment, operations, or methods listed, mentioned or scheduled on the plans and/or herein specified, including all incidentals necessary and required for completion of work under this Section.
- B. Provide and install Portland cement concrete site work complete, including the following principal items
 - 1. Concrete slab for Tuff Sheds

1.2 RELATED SECTIONS

- A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Special Conditions and Division 1 of these Contract Documents.

1.3 SUBMITTALS FOR REVIEW

- A. Comply with Section 013300, Submittal Procedures.
- B. The Contractor's Testing Laboratory's certificate of compliance.
- C. The Contractor shall submit:
 - 1. Certified copies of mix designs for each concrete class specified including compressive strength test reports.
 - 2. Certification that materials meet requirements specified.
 - 3. Certification from vendor that samples originate from and are representative of each lot proposed for use.
- D. The Testing Agency will submit reports on tests and inspections performed to the County, the Architect and Structural Engineer, the Contractor, and the Division of the State Architect.
- E. Schedule of placing for the Construction Manager's review before starting work.

1.4 QUALITY ASSURANCE

- A. Reference and Standards:

1. Perform work in accordance with all applicable laws, codes and regulations required by the State of California.
2. Reference to "Standard Specifications" shall mean the current Standard Specifications of the State of California, Business and Transportation Agency, Department of Transportation, CALTRANS.
3. The American Concrete Institute (ACI): "Manual of Concrete Practice," Parts 1, 2 and 3.
4. California Code of Regulations (also known as California Building Code (CBC)), Title 24, 2007 edition, DSA/SS/AC provisions.
5. American Society for Testing and Materials (ASTM).

B. Stipulations:

1. The Contractor shall be responsible for quality of concrete in place and shall bear burden of proof that concrete meets minimum requirements. Use the same mix design for all exposed concrete.
2. Placing of concrete by means of pumping will be an acceptable method of placement providing that the Contractor can demonstrate that, specified concrete strengths will be met.

1.5 FIELD SAMPLES AND TESTS

- A. The City's representative will select a qualified testing laboratory to take samples for testing during the course of the work as considered necessary. The County will pay costs for such tests. Contractor shall cooperate in making tests and shall be responsible for notifying the designated laboratory in sufficient time to allow taking of samples at time of pour.
- B. Should tests show that concrete is below specified strength, Contractor shall remove all such concrete, as directed by the Project Inspector. Full cost of removal of low strength concrete, its replacement with concrete of proper specified strength and testing, shall be borne by Contractor.
- C. Testing Laboratory Qualifications: The Testing Laboratory shall be under direction of a Civil Engineer registered in the State of California, shall have operated successfully for four years prior to this work, and shall conform to requirements of ASTM E329.
- D. All samples and testing shall conform with CBC Sections 1903.

1.6 COORDINATION

- A. Coordinate items of other trades. Contractor shall be responsible for the proper installation of all accessories embedded in the concrete and for the provision of holes, openings, etc., necessary to the execution of the work of the trades.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Supply ready mixed concrete throughout. Batch, mix and transport in accordance with ASTM C-94, "Specifications for Ready Mixed Concrete."
- B. Mix and deliver concrete in quantities that will permit immediate use only.
- C. Indiscriminate addition of water for any reason will be cause for rejection of the load.
- D. Ensure storage facilities are weather tight and dry.
- E. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use.
- F. Store bulk cement in bins capable of preventing exposure to moisture.
- G. Use sacked cement in chronological order of delivery. Store each shipment so that it may be readily distinguishable from other shipments.

2.0 PRODUCTS

2.1 REINFORCING MATERIALS

- A. Bar Reinforcement ASTM A615.
 - 1. #3 and smaller: Grade 60.
 - 2. #4 and larger: Grade 60.

2.2 CONCRETE CLASSES

CLASS	STRENGTH	AGGREGATE	WEIGHT	SLUMP
A	3000	3/4	145	4

- A. Class: Identifies all concrete as specified.
- B. Strength: Compressive strength in psi after 28-days when tested in accordance with ASTM C39. All concrete shall develop compression strength specified in 28-days. To

meet above requirements, mix shall be designed such that average compressive strength will exceed specified 28-day strength by an amount as specified by ACI 318.

- C. Aggregate: Maximum size in inches.
- D. Weight: Pounds per cubic foot, air dry.
- E. Slump: In inches when tested in accordance with ASTM C143.

2.3 CONCRETE MATERIALS

A. General Requirements:

- 1. Cement and aggregates shall have proven history of successful use with one another. Sources of cement and aggregate shall remain unchanged throughout work unless the Architect and Structural Engineer approves request for change made at least 10-days prior to anticipated date of casting.
- 2. Ready-mixed concrete shall meet requirements of ASTM C94.
- 3. Deviations in properties of materials tested by Testing Agency shall be cause for their rejection pending additional test results and redesign of mix.
- 4. No frozen aggregates will be permitted.

B. Cements:

- 1. ASTM C150, Type II. Use one brand of cement throughout project unless otherwise acceptable to Architect and Structural Engineer.
- 2. Maximum water/cement ratio of 0.50 for all cast-in-place concrete.

C. Fly Ash: ASTM C618, Type F; maximum 15% replacement of Portland cement.

D. Aggregates:

- 1. Coarse: ASTM C33. Coarse aggregate shall consist of a clean, hard, fine grained, sound crushed rock, or washed gravel or a combination of both. It shall be free from oil, organic matter or other deleterious substances and shall not contain more than two percent by weight of shale or cherty material. "Cleanness value shall not be less than 75 when tested per MM Test Method, 227 and conforming to CBC Section 1903A.4.2.
- 2. Fines: ASTM C33. Sand equivalent shall be not less than 75 when tested as per ASTM D2419.

3. Provide aggregates from a single source for exposed concrete.
- E. Water: Clean and potable, free from impurities detrimental to concrete.
- F. Water-Reducing Admixture: Must be compatible with color pigments where required. ASTM C494, Type A, that does not contain non-lignini sulfonate. Same as Grace Construction Materials' "WRDA" with hycol; Master Builders "Pozzolith" 322N; or equal product substituted per Section 012600, Modification Procedures.
- G. Other Admixtures: Only as accepted by the Architect and Structural Engineer.
- H. Non-Shrink Grout: Premixed high strength grout requiring only addition of water at the site. Same as Master Builder's "Masterflow 928 Grout"; Burke's "Non-Ferrous, Non-Shrink Grout", or equal product substituted per Section 012600, Modification Procedures.
- I. Curing Materials: Curing Compound: ASTM C309. Water loss – not more than 0.55 kg/m² in 72 hours; Light Reflectance – not less than 60%. Same as Grace Construction Materials' "Horn Clear Seal"; Grimes Co.'s "Sealcrete"; Master Builders' "Masterseal W", or equal product substituted per Section 012600, Modification Procedures.

2.4 CONCRETE MIXES

- A. Concrete mixes shall be accepted and shall be in accordance with CalTrans Standard Specifications Section 90. Unless otherwise noted, mix shall be Class "A," 3,000 psi, Type II Portland cement and 3/4-inch maximum aggregate.

2.5 ANCILLARY MATERIALS

- A. Concrete Sealer: As manufactured by L. M. Scofield Co. or silicone-based, non-staining product such as Siloxane as manufactured by Prosoco and available from White Cap (415) 626-3750 and as accepted by Project Inspector.
- B. Water Barrier: NT-100 as manufactured by Mirafi and as accepted by Project Inspector.

2.6 MIXES

- A. General Requirements:
 1. The Contractor shall perform tests or assemble the necessary data indicating conformance with specifications.
 2. For each mix submit data showing that proposed mix will attain the required strength in accordance with requirements of CBC Section 1905.

3. The Contractor shall instruct Laboratory to base mix design on use of materials tested and approved by the Testing Agency.
 4. Mix design shall include compression strength test reports per CBC Section 1905.6.
 5. Mix shall be designed, tested, and adjusted if necessary in ample time before first concrete is scheduled to be placed. Laboratory data and strength test results for revised mix design shall be submitted to Architect and Structural Engineer prior to using in project.
 6. Ensure mix designs will produce concrete to strengths specified and of uniform density without segregation.
 7. If mix yield exceeds 1-cubic yard, modify mix design to no more than one cubic yard without changing cement content.
 8. The Contractor's mix designs shall be subject to review by the Architect and Structural Engineer and by the Testing Agency.
 9. Introduction of calcium chloride will not be permitted.
 10. Unspecified admixtures will not be permitted unless the Architect and Structural Engineer reviews, the Contractor modifies mix designs as necessary, and modifications are accepted by the Testing Agency.
- B. Slab-on-Grade Mix requirements:
1. Maximum water/cement ratio: 0.50.
 2. Minimum fly ash content: N/A
 3. Do not use air entrainment additives.
 4. Use of Water-Reducing admixture is required. Use High Range Water-Reducing admixture (super plasticizer) when required to maintain workability and pumpability.
- C. Patching Mortar: Mix in proportions by volume of one part cement to two parts fine sand.
- D. Non-Shrink Grout: Follow approved manufacturer's printed instructions and recommendations.

2.7 MIXING

- A. Batching Plant Conditions:
1. Ensure equipment and plant will afford accurate weighing, minimize segregation and will efficiently handle all materials to satisfaction of the Architect, Structural Engineer and the Testing Agency.
 2. Replace at no additional expense equipment the Architect, Structural Engineer and the Testing Agency deem inadequate or unsuitable.
 3. Use approved moisture meter capable of determining moisture content of sand.
- B. General Requirements:
1. Thoroughly clean concrete equipment before use for Architectural concrete mixes to avoid contamination.
 2. Mix cement, fine and coarse aggregates, admixtures and water to exact proportions of mix designs. Method of mixing shall comply with CBC Section 1905.8.
 3. Measure fine and coarse aggregates separately according to approved method which provides accurate control and easy checking.
 4. Adjust grading to improve workability; do not add water unless otherwise directed.
 5. Maintain proportions, values, or factors of approved mixes throughout work.
 6. Mix concrete in transit mixers five minutes immediately prior to discharge in addition to mixing as called for by ACI 304 and ASTM C94.
- C. Admixtures: Use automatic metering dispenser to introduce admixture into mix. Dispenser shall be recommended and calibrated by admixture manufacturer.

2.8 SOURCE QUALITY CONTROL

- A. The Testing Agency will:
1. Review mix designs, certificates of compliance, and samples of materials the Contractor proposes to use.
 2. Test and inspect materials, as necessary, in accordance with ACI 318 and CBC Sections 1903, and 1905 for compliance with requirements.
 3. Take samples as required from the Contractor's designated sources.

4. Take one grab sample for each 100 tons of Portland cement except that, when used in bulk loading ready-mix plants where separate bins for pre-tested cement are not available, take grab samples for each shipment of cement placed in bin with not less than one sample being taken for each day's pour and subsequently test such samples if required by the Architect.
 5. Test both coarse and fine aggregate by use of solution of sodium or magnesium sulfate, or both whenever in the judgment of the Architect and Structural Engineer such tests are necessary to determine quality of material. Perform such tests in accordance with ASTM C88. Loss shall not exceed 6-percent of either fine or coarse aggregate. Aggregate failing to comply with this requirement may be used in the Work provided it contains less than 2- percent of shale and other deleterious particles and shows a loss in soundness test of not more than 10-percent when tested in the sodium sulphate solution.
 6. Test for sand equivalent of fine aggregate in accordance with California Test 217.
 7. Test for cleanness value of coarse aggregate in accordance with California Test 227.
 8. Inspect plant prior to any work to verify following:
 - a. Plant is equipped with approved metering devices for determining moisture content of fine aggregate.
 - b. Other plant quality controls are adequate.
 9. Continuously inspect quality and quantity of materials used in transit mixed concrete, in batched aggregates and ready-mixed concrete at mixing plant or other location where other materials are measured.
- B. Waiver of Batch Plant Inspection:
1. Continuous batch plant inspection may be waived if the plant complies with ASTM C94 and has been certified by an agency acceptable to the City of Morgan Hill to comply with the requirements of the National Ready Mix Concrete Association.
 2. When batch plant inspection is waived, the following requirements shall apply:
 - a. Testing Agency shall check the first batching at the start of work and furnish mix proportions to the licensed Weighmaster.
 - b. Licensed Weighmaster shall identify material quantities and certify each load by a ticket.

- c. Project Inspector shall collect truck mix tickets with load identification and maintain a daily record of placement. Trucks without a load ticket identifying the mix shall be rejected. Copies of daily placement record shall be submitted to DSA.
- d. At the end of the project, the Weighmaster shall submit an affidavit to the City of Morgan Hill certifying that all concrete supplied conforms to proportions established by mix designs.

3.0 EXECUTION

3.1 GENERAL REQUIREMENTS

- A. Install all concrete work true to line and grade as indicated on the drawings. Installation shall conform with the standards and requirements of ACI 117-06-Specifications for Tolerance for concrete construction and materials.
- B. Correct irregularities to the satisfaction of the Architect and Structural Engineer.

3.2 PREPARATION

- A. Take every precaution to obtain a subgrade of uniform bearing power by compaction to provide a firm base.
- B. Subgrade shall be kept moist and shall not be allowed to dry out before placement of concrete. Place no material on muddy subgrade.
- C. Obtain acceptance of subgrade from Project Inspector prior to placing steel and concrete.

3.3 FORMS

- A. Forms shall be constructed in accordance with ACI 347 and shall be of sufficient strength and sufficiently tight to prevent visible distortion or leakage of mortar and fines.
- B. Forms for exposed surfaces shall be designed to protect intended finish. Deflection of facing material between studs shall not exceed 0.0025 of the span. Facing material and pattern of joints shall be as accepted by the Project Inspector.
- C. Maintain forms within the following tolerances.
 - 1. Top of Form: Plus or minus 1/8 inch in 10 feet and no abrupt variations; at required elevation to plus 3/8 inch.
 - 2. Face of Form: Plus or minus 1/4 inch in 10 feet longitudinal and no abrupt variations; perpendicular to surface plus or minus 1/8 inch.

- D. Obtain approval of formwork from Project Inspector prior to placing concrete.
- E. Forms may be reused upon cleaning and coating with parting compound to ensure separation from concrete without damage.
- F. After concrete is placed, the following minimum times shall elapse before removal of forms.
 - 1. Footing sides: 24 hours.

3.4 REINFORCEMENT

- A. All concrete shall be steel reinforced unless specifically noted to be "not reinforced." If no reinforcement is shown, reinforce in same manner as that shown in similar places.
- B. Fabricate and place reinforcement as indicated on the Drawings and in accordance with ACI "Detailing Manual" SP-66. No reinforcement shall be placed prior to distribution of the accepted shop drawings.
- C. Secure reinforcement in position by suitable supports and by wiring at intersections with tie wire. Supports shall be of sufficient number and strength to resist crushing or displacement under full load. Metal shall not extend to surface of concrete.
- D. At time of placing concrete, reinforcing shall be free of excessive rust, mill scale, or other bond reducing matter. Immediately before placing concrete, check and adjust position, support and anchorage.

3.5 PLACING CONCRETE

- A. The Architect, Testing Laboratory and DSA shall be notified at least 48 hours before placing concrete.
- B. Place concrete in accordance with CBC Section 1905.
- C. Place concrete in cycles as a continuous operation to permit proper and thorough integration and to complete scheduled placement. Place no concrete where sun, wind, heat, or facilities prevent proper finishing and curing.
- D. Convey concrete as rapidly and directly as practicable to preserve quality and to prevent separation from rehandling and flowing; do not deposit concrete initially set. Cast concrete within ninety (90) minutes after adding water unless otherwise noted. Retempering of concrete which has partially set will not be permitted.
- E. Take precautions to avoid damage to under-slab moisture barrier and displacement of reinforcement and formwork.

- F. Deposit concrete vertically in its final position. Avoid free falls in excess of six feet where reinforcement will cause segregation and in typical conditions unless the Architect and the Structural Engineer approves otherwise.
- G. Keep forms and reinforcement clean above pour line by removing clinging concrete with wire brush before casting next lift. Also remove leakage through forms.
- H. Interruption in casting longer than 60-minutes shall be cause for discontinuing casting for remainder of day. In this event, cut back concrete and provide construction joints as the Architect directs; clean forms and reinforcement as necessary to receive concrete at a later time.
- I. Hot Weather Concreting: Conform to ACI 305 and following requirements when mean daily temperature rises above 75 degrees Fahrenheit.
 - 1. An upper temperature limit of concrete mixes shall be established by the Contractor for each class of concrete. Concrete temperature during placing shall not be so high as to cause difficulty from loss of slump, flash set, or cold joints, and shall not exceed 90°F. Other project climatic conditions detrimental to concrete quality such as relative humidity, wind velocity, and solar radiation shall also be considered.
 - 2. Trial batches of concrete for each mix design shall be made at the limiting mix temperature selected. In lieu of trial batches, compression strength test reports (20 minimum) at the limiting temperature for each proposed mix shall be submitted to the testing laboratory for review.
 - 3. Practices to maintain concrete below maximum limiting temperature shall be in accordance with ACI 305. Concrete ingredients may be cooled before mixing, or flake ice or well-crushed ice of a size that will melt completely during mixing may be substituted for part of the mixing water.
 - 4. Practices to avoid the potential problems of hot weather concreting shall be employed by the Contractor in accordance with ACI 305.
 - 5. When the temperature of the reinforcing steel or steel deck forms is greater than 120°F, reinforcing and forms shall be sprayed with water just prior to placing the concrete.
- J. Cold Weather Concreting:
 - 1. No placement of concrete will be allowed at temperatures below 20 degrees Fahrenheit or if mean daily temperature for curing period is anticipated to be below 20 degrees Fahrenheit.
 - 2. No concrete placement will be allowed on frozen subgrade.

3. Conform to ACI 306 and following requirements when mean daily temperature falls below 40 degrees Fahrenheit.
 - a. Reinforcement, forms or ground to receive concrete shall be completely free from frost.
 - b. Concrete at time of placement for footings shall have temperature no lower than 50 degrees Fahrenheit, for all other concrete this minimum temperature at time of placement shall be 60 degrees Fahrenheit. Maximum temperature shall be 90 degrees Fahrenheit.
 - c. Concrete shall be maintained at temperature no lower than 50 degrees Fahrenheit for minimum 7-day period after placement by means of blanket insulation, heaters, or other methods as approved by the Architect and Structural Engineer.
 - d. Use of calcium chloride or admixtures containing calcium chloride as accelerators will not be permitted.
 - e. The Contractor shall keep a record of concrete surface temperature for first 7-days after each pour. This record shall be open to inspection by the Inspector.
- K. Consolidating:
1. Use vibrators for thorough consolidation of concrete.
 2. Provide vibrators for each location during simultaneous placing to ensure timely consolidation around reinforcement, embedded items and into corners of forms; ensure availability of spare vibrators in case of failures. Vibrate through full depth of freshly placed concrete.
 3. Do not place vibrators against reinforcement, attach to forms, or use to spread concrete.
 4. Exposed Concrete: Vibrate with rubber type heads and, in addition, spade along forms with flat strap or plate.
- L. Construction Joints:
1. Verify location and conformance with typical details; provide only where designated or approved by the Architect and Structural Engineer. Comply with CBC Section 1906.4.

2. All horizontal and vertical construction joints to be thoroughly sandblasted to clean and roughen entire surface to minimum 1/4-inch relief exposing clean coarse aggregate solidly embedded in mortar matrix.
3. Just prior to depositing concrete, the surface of the construction joint shall be thoroughly wetted.

3.6 CURING

A. General Requirements:

1. Take curing measures immediately after casting and for measures other than application of curing compound, extend for seven days. The Architect and Structural Engineer may recommend longer periods based upon prevailing temperature, wind and relative humidity. Comply with CBC Section 1905.11.
2. Avoid alternate wetting and drying and fluctuations of concrete temperature.
3. Protect fresh concrete from direct rays of sun, rain, freezing, drying winds, soiling, and damage.
4. Do not permit curing method to affect adversely finishes or treatments applied to finish concrete.

B. Curing Method, Typical: Obtain the Architect's and Structural Engineer's approval of alternate measures.

1. Keep forms and concrete surfaces moist during period forms are required to remain in place.
2. Apply Creteseal (CS2000) per manufacturers' recommendations.

C. Cure exposed concrete in accordance with CalTrans Standard Specifications Section 90.

D. Only water or curing compounds that impart no permanent color or gloss shall be used for curing concrete.

3.7 CONCRETE SEALING

A. Seal all exposed surfaces according to manufacturer's specifications.

3.8 FIELD QUALITY CONTROL

A. The Testing Laboratory will sample and test cast-in-place concrete as required by the Division of State Architects. Tests, if required, will be made in accordance with ACI 318 and CBC Section 1903.

1. Review concrete mix designs.
 2. Inspect concrete and grout placement continuously.
 3. Test concrete to control slumps according to ASTM C143.
 4. Continuously monitor concrete temperature as it arrives on the site.
 5. Test concrete for required compressive strength in accordance with CBC Section 1905:
 - a. Make and cure three specimen cylinders according to ASTM C31 for each 50 cubic yards, or fraction thereof, of each class poured at site each day.
 - b. Retain one cylinder for 7-day test and two for the 28-day test.
 - c. Number each cylinder 1A, 1B, 1C, 2A, 2B, 2C, etc; date each set; and keep accurate record of pour each set represents.
 - d. Transport specimen cylinders from job to laboratory after cylinders have cured for 24-hours on site. Cylinders shall be covered and kept at air temperatures between 60 and 80 degrees Fahrenheit.
 - e. Test specimen cylinders at age 7-days and age 28-days for specified strength according to ASTM C39.
 - f. Base strength value on average of two cylinders taken for 28-day test.
 6. Test and inspect materials, as necessary, in accordance with ACI 318, MM Test Method 227 (Coarse Aggregates) and MM Test Method 217 (Fine Aggregates), for compliance with requirements specified in this Section.
- B. The Contractor shall:
1. Submit ticket for each batch of concrete delivered to job site. Ticket shall bear the following information:
 - a. Design mix number.
 - b. Signature or initials of ready mix representative.
 - c. Time of batching.
 - d. Weight of cement, aggregates, water and admixtures in each batch with maximum aggregate size.

- e. Total volume of concrete in each batch.
 - f. Notation to indicate equipment was checked for contaminants prior to batching.
2. Pay the Testing Agency for taking core specimens of hardened structure and testing specimen according to ASTM C88 and C42 when laboratory tests of specimen cylinders show compressive strengths below specified minimum.

3.9 CLEANING, PATCHING AND DEFECTIVE WORK

- A. Where concrete is under strength, out of line, level or plumb, or shows objectionable cracks, honeycombing, rock pockets, voids, spalling, exposed reinforcement, signs of freezing or is otherwise defective, and, in the Architect's and Structural Engineer's judgment, these defects impair proper strength or appearance of the work, the Architect and Structural Engineer will require its removal and replacement at the Contractor's expense.
- B. Immediately after stripping and before concrete is thoroughly dry, patch minor defects, form-tie holes, honeycombed areas, etc., with patching mortar. Patch shall match finish of adjacent surface unless otherwise noted. Remove ledges and bulges.
- C. Compact mortar into place and neatly file defective surfaces to produce level, true planes. After initial set, dress surfaces of patches mechanically or manually to obtain same texture as surrounding surfaces.
- D. Rock Pockets:
 - 1. Cut out to full solid surface and form key.
 - 2. Thoroughly wet before casting mortar.
 - 3. Where the Architect and Structural Engineer deems rock pocket too large for satisfactory mortar patching as described, cut out defective section to solid surface, key and pack solid with concrete to produce firm bond and match adjacent surface.
- E. Cleaning
 - 1. Insure removal of bituminous materials, form release agents, bond breakers, curing compounds if permitted and other materials employed in work of concreting which would otherwise prevent proper application of sealants, liquid waterproofing, and other delayed finishes and treatments.

2. Where cleaning is required, take care not to damage surrounding surfaces or leave residue from cleaning agents.

3.10 PROTECTION

- A. Protect concrete from injurious action of the elements and defacement of any nature during construction operations.
- B. Protect exposed corners of concrete from traffic or use which will damage them in any way.
- C. Make provisions to keep all exposed concrete free from laitance caused by spillage or leaking forms or other contaminants. Do not allow laitance to penetrate, stain, or harden on surfaces which have been textured.
- D. Remove and replace pavement that does not comply with requirements in this Section.
- E. Protect pavement from damage. Do not permit construction traffic on concrete pavement. Exclude other traffic from pavement for at least 28 days after placement.
- F. Maintain pavement free of stains, discoloration, dirt, and other foreign material. Sweep pavement not more than two days before date scheduled for Substantial Completion inspections.

3.11 DEFECTIVE CONCRETE

- A. If any concrete work is not formed as indicated, is under strength concrete, is concrete is out of line, level or plumb, or showing objectionable cracks, honeycomb, rock pockets, voids, spalling or exposed reinforcing, it shall be removed, repaired or replaced as directed by the Project Inspector.

3.12 CLEANING

- A. Refer to Section 017400, Construction Cleaning & Waste Management for final cleaning procedures.
- B. During construction, wash off work as quickly as possible when stains or splashes are unavoidable.
- C. Upon completion, clean exposed surfaces carefully. Brushing and cleaning solution, if used, must be preceded and followed with a through rinsing of clear water. No sandblasting will be allowed to clean surfaces.
- D. Remove from premises; equipment, debris and surplus material needed for, or resulting from, this work. Remove all concrete waste from planting areas and legally dispose of it.

- E. All work shall be left in a condition satisfactory to the Project Inspector.
- F. Perform Work under this Section to keep affected portions of building site neat, clean, and orderly. Remove, immediately upon completion of Work under this Section, surplus materials, rubbish, and equipment associated with or used in performance. Be aware that failure to perform clean-up operations within 24 hours of notice by Architect and Structural Engineer will be considered adequate grounds for having work done by others at no added expense to the County

END OF SECTION

Division 8: Openings

SECTION 085169 – GATE HARDWARE

1.0 GENERAL

1.1 SUMMARY

- A. This Section includes all labor, materials, equipment, operations, or methods listed, mentioned or scheduled on the plans and/or herein specified, including all incidentals necessary and required for completion of work under this Section.
 - 1. “Hardware groups” have been assigned to the various doors required for this work, as indicated in the Door Schedule on the Drawings. The hardware groups are described in detail in the “Hardware Schedule,” Section 3.2 A and B of this Section.
 - 2. Unless otherwise approved by the Architect, furnish all finish hardware described in the Hardware schedule and all other finish hardware not described but required for a complete and operable facility.

1.2 RELATED SECTIONS

- A. Documents affecting work of this Section include, but are not necessarily limited to the drawings and project manual.
- C. Section 323113 – Chain Link Fences & Gates

1.3 QUALITY ASSURANCE

- A. Qualifications of Supplier:
 - 1. The finish hardware supplier shall have an AHC member of the American Society of Hardware Consultants who shall be made available for consultation at no additional cost to the District during construction.
 - 2. The AHC shall be present at completion of the work and shall check the installation of finish hardware and shall report to the Architect all obvious misapplication of finish hardware.

1.4 SUBMITTALS

- A. Comply with pertinent provisions of these Contract Documents.
- B. Materials List:
 - 1. Within 15 days after award of Contract, and before any finish hardware is ordered or purchased for this work, submit to the Architect for his approval a complete

list of all finish hardware proposed to be furnished for this work, giving manufacturer's name and catalog number for each item.

2. This shall in no way be construed as permitting substitution of items for the items specified.

1.5 DELIVERY, STORAGE AND PRODUCT HANDLING

A. Delivery:

1. Deliver all finish hardware to the job site with all labels intact and legible.

B. Packaging:

1. Furnish all finish hardware with each unit marked or numbered in accordance with the Hardware schedule.
2. Pack each item complete with all necessary pieces and fasteners.
3. Properly wrap and cushion each item to prevent scratches during delivery and storage.

C. Protection:

1. Use all means necessary to protect materials before, during and after installation and to protect the installed work and materials of other trades.

D. Replacement:

1. In the event of damage, immediately make all repairs and replacements necessary for the approval of the Architect and at no additional cost to the District.

2.0 PRODUCTS

2.1 FASTENINGS

- A. Furnish all finish hardware with all necessary screws, bolts, and other fasteners of suitable size and type to anchor the hardware in position for long life under hard use.
- B. Furnish fastenings where necessary with expansion shields, toggle bolts, hex bolts, and other anchors approved by the Architect, according to the material to which the hardware is to be applied and the recommendation of the hardware manufacturer.
- C. When flush bolts occur in path of travel, provide accessible flush bolt (automatic).
- D. Door closer shall comply with 11B-404.2.8.1, door closer delay time. Minimum Delay Time: 5 seconds to move from 90° to 12° from latch. Maximum closer-effort: 5 pounds exterior doors, 5 pounds interior doors and minimum effort to latch door.

- E. The Authority having Jurisdiction, may increase the maximum effort to operate fire doors to achieve positive latching, but not to exceed 15 lbs max.
- F. All fastenings shall harmonize with the hardware as to material and finish.

2.2 FINISH HARDWARE REQUIREMENTS

- A. Refer to 3.2 A & B of this Section for Schedule.
- B. Thresholds in the path of travel shall conform with 11B-404.2.5.
- C. Hand-activated hardware, including lever-type hardware, panic bars, push-pull activating, shall be between 34" to 44" AFF.
- D. Lever handles for thumb turn dead bolt per 11B-309.4.
- E. Maximum effort to unlatch panic hardware must be 15 lb. in direction of travel.

2.3 KEYING

- A. Construction Keying:
 - 1. Construction key all locks; provide six construction keys and one extractor key.
- B. Final Keying System:
 - 1. All locks keyed per District's instructions.
- C. Deliver all keys to the District.
- D. Contractor shall provide a method independent of the final keying system for securing the building during construction and shall provide the SUHSD Facilities and Operations Department with construction keys and IC control keys.
- E. Primus cylinders should be 0 bitted. When contractor is ready for installing the cylinders, the SUHSD Facilities and Operation Department will pin them according to their keying schedule. Contractor will then install the pinned cylinders.
- F. Keying System:
 - 1. Provide keyed cylinders to provide master and grand master keying system. Based on the Districts direction.

3.0 EXECUTION

3.1 INSTALLATION

- A. Install the work of this Section in strict accordance with the manufacturer's recommendations as approved by the Architect, anchoring all components firmly into position for long life under hard use.
- B. Doorstops must be mounted within 4-inches of wall in path of travel.

3.2 HARDWARE SCHEDULE

A. FINISH HARDWARE

1. General:

- a. Finish throughout to be Dull Chromium
- b. Heavy duty fork latch for all gates except entry gate.
- c. Bull Dog Hinges for all gates.

2. Hardware

a. Gate at Accessible Entry

- 1. Hinge: Bull Dog Hinges
- 2. Kick Plates: IVES 8400 x 10" 2" LDW B4E
- 3. Schlage "D" series passage hardware
- 4. Weld 6"x6" 16GA min. square to gate. Add steel plate to increase thickness for mounting hardware both sides.

3.3 CLEANING

- A. Upon completion, clean the work of this Section in accordance with recommendations of the manufacturers of the materials used.
- B. Provide required protection of products to prevent damage and wear prior to acceptance of the work by the District.

3.4 WARRANTY

- A. The products delivered shall be free from defects.
- B. Manufacturer's standard performance warranty, as available for specified installation and environmental conditions.

END OF SECTION

Division 10: Specialties

SECTION 101400 – SIGNAGE

1.0 GENERAL

1.1 SUMMARY

- A. This Section includes all labor, materials, equipment, operations, or methods listed, mentioned or scheduled on the plans and/or herein specified, including all incidentals necessary and required for completion of work under this Section.
- B. Provide and install post mounted exterior signage for parking herein referred to as "signage."

1.2 RELATED SECTIONS

- A. Documents affecting work of this Section include, but are not necessarily limited to, Volumes 1 and 2 of these Contract Documents.

1.3 REFERENCES

- A. Americans With Disabilities Act (ADA).
- B. American National Standards Institute (ANSI).
- C. 2007 California Building Code (CBC).
 - 1. 1998 ICC/ANSI A117.1 - Accessible and Usable Buildings & Facilities
- D. American Society for Testing and Materials (ASTM):
 - 1. ASTM B209 - Specification for Aluminum and Aluminum-Alloy Sheet and Plate
 - 2. ASTM D4956 - Specification for Retroreflective Sheeting for Traffic Control
- E. American Architectural Manufacturer's Association (AAMA):
 - 1. AAMA 611 - Voluntary Specifications for Anodized Architectural Aluminum
 - 2. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
- F. National Association of Architectural Metal Manufacturers (NAAMM):

1.4 SUBMITTALS

- A. Comply with pertinent provisions of Volumes 1 and 2 of these Contract Documents.
- B. Submit manufacturer's descriptive literature and specifications, including brochures and color samples of material for selection, as applicable for approval
- C. Submit shop drawings listing sign styles, lettering and locations, and overall dimensions of each sign, including methods of construction.
- D. Submit full-size sample of sign type, style and color specified including method of attachment.
- E. Submit Manufacturer's standard warranty information

1.5 QUALITY ASSURANCE

- A. Signage shall comply with all applicable provisions of the 2007 CBC, ADA and ANSI A117.1-1998.
- B. Manufacturer Qualifications: Manufacturer must submit 3 references showing comparable products for projects completed within the last 5 years.
- C. Provide all signage systems from a single manufacturer.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Use all means necessary to protect signs before, during and after installation.
 - 1. In the event of damage, make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the District.
- B. Deliver materials to jobsite in manufacturer's original unopened factory packaging.
- C. Inspect materials at time of delivery to assure that specified products have been received.
- D. Store materials in original packaging in a climate controlled environment and away from direct sunlight.

2.0 PRODUCTS

2.1 MANUFACTURER

- A. Signage: Best Sign Systems, Inc., 1202 N. Park Ave., Montrose, CO 81401, 1-800-235-2378 or approved equal.

- B. Exterior Signage (Metal): Compliance Signs.com, Safeway Sign Co. (213) 321-4608, Zumar Industries (213) 233-8231, Western Highway (714) 761-4811, or approved equal.

2.2 METAL EXTERIOR SIGNS, POST-MOUNTED FREE-STANDING

- A. General: Sign(s) shall satisfy applicable codes and regulations (1129B.5):

- 1. Size of lettering on signage shall be no less than 1" in height.
- 2. Sign shall feature a reflectorized dark blue background with white symbol and lettering.

- B. Materials:

- 1. Aluminum: signs shall be minimum of 0.040" thick and shall be painted on both sides for corrosion resistance.
- 2. Steel: Sheet steel for painted work. One of the following zinc-coated sheet steel treated for paint adhesion:
 - a. Paintbond by U.S. Steel Corp.
 - b. Zincgrip Paintgrip by Armco Steel Corp.
 - c. Bethin Gripcote by Bethlehem Steel.
 - d. Paintite by Inland Steel Corp.
- 3. Fasteners: Galvanized steel for exterior signs.
- 4. Anchors and Inserts: Non-ferrous metal or hot-dipped galvanized steel anchors and inserts for exterior installations.
- 5. Sign Sizes:
 - a. Entrance to Parking Area sign shall be no less than 17" wide by 22" high.

2.4 ACCESSORIES

- A. Holes and screws.

2.5 BRAILLE SYMBOLS

- A. Contracted California Grade 2 Braille shall be used wherever Braille symbols are specifically required.
 - 1. Dots shall be 1/10 inch on centers in each cell with 2/10 inch space between cells.
 - 2. Dots shall be raised a minimum of 1/40 inch above the background.
- B. Mounting Location and Height: Where permanent identification is provided for rooms and spaces, raised letters shall be provided and shall be accompanied by Braille in conformance with Section 3105A.(e)7, The CalACS Accessibility Standards Interpretive Manual. Signs shall be installed on the wall adjacent to the latch outside of the door. Where there is no wall space on the latch side, including at double leaf doors, signs shall be placed on the nearest adjacent wall, preferably on the right. Mounting height shall be 60 inches above the finish floor to the center line of the sign. Mounting location shall be determined so that a person may approach within 3 inches of signage without encountering protruding objects or standing within the swing of a door.

3.0 EXECUTION

3.1 INSTALLATION

- B. Locate sign units and accessories as indicated on the Drawings. Use mounting methods of the type described and in compliance with the manufacturer's instructions. For complete specifications, see exterior sign schedules below.
- C. Install signs level, plumb, and at heights indicated.

* Towed vehicle reclamation location and telephone number to be permanent part of sign. Please indicate request for this information in signage submittal package.

3.2 SIGN SCHEDULES

- A. All Exterior signs shall be metal and are referenced in Table 2. Refer to part 2.3 of this Section.
- B. See plans for signage location

3.3 CLEAN UP

- A. Upon completion of installation, remove all debris resulting from work of this Section.
- B. Clean all signage surfaces in accordance with manufacturer's clean-up and maintenance instructions.

3.4 WARRANTY

A. Product delivered shall be free of defects.

END OF SECTION

**Division 31:
Earthwork**

SECTION 312213 – ROUGH & FINISH GRADING

1.0 GENERAL

1.1 SUMMARY

- A. Section includes ripping, grading, filling, rough contouring, and compacting as indicated on the drawings.
- B. In vegetable bed and planting areas, do not compact, only provide finish grading.
- C. Related Sections:
 - 1. None

1.2 REFERENCES

- A. The provisions of the project Soils Report and any supplements to the Soils Report shall be adhered to for rough grading of the site.

1.3 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements.
- B. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

2.0 PRODUCTS

2.1 MATERIALS

- A. Topsoil: none
- B. Other Fill Materials: Shall adhere to the provisions of the project Soils Report and any supplements to the Soils Report.

3.0 EXECUTION

3.1 EXAMINATION

- A. Section 013000 - Administrative Requirements.
- B. Verify site conditions.
- C. Verify that survey benchmark and intended elevations for the Work are as indicated.

3.2 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Stake and flag locations of known utilities.
- C. Locate, identify, and protect from damage utilities that are to remain.
- D. Notify affected utility companies to remove or relocate public utilities indicated on the plans to be removed or relocated by the utility company.
- E. Protect above and below grade utilities that are to remain.
- F. Protect plant life, lawns, and other features remaining as a portion of final landscaping.
- G. Protect bench marks, survey control point, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.3 SOIL EXCAVATION

- A. Excavate soil from areas to be further excavated, relandscaped, or regraded. as shown on the drawings.
- B. When excavating through roots, for trees to remain, perform work by hand and cut roots with sharp axe.
- C. Benching Slopes: Horizontally bench existing slopes greater than 1:4 to key placed fill material to slope to provide firm bearing as required by the Soils Report and any supplements to the Soils Report.
- D. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.

3.4 FILLING

- A. Install Work in accordance with the project Soils Report and any supplements to the Soils Report.
- B. Fill areas to contours and elevations with suitable materials.
- C. Place fill material on continuous layers and compact in accordance with the project Soils Report and any supplements to the Soils Report.
- D. Maintain optimum moisture content of fill materials to attain required compaction density.
- E. Slope grade away from buildings at a minimum slope of two (2%) percent unless noted otherwise.

F. Make grade changes gradual. Blend slope into level areas.

G. Remove surplus fill materials from site.

3.5 TOLERANCES

A. Section 014000 - Quality Requirements.

B. Top Surface of Subgrade: Plus or minus 0.05 feet from required elevation on paved or walkway areas and zero (0) feet to minus 0.10 foot in building pad areas.

3.6 FIELD QUALITY CONTROL

A. Testing and inspection shall be provided by the testing agency.

B. If tests indicate Work does not meet specified requirements, remove Work, replace and retest.

END OF SECTION

SECTION 312300 – EXCAVATION AND FILL

1.0 GENERAL

1.1 SUMMARY

- A. This Section includes all labor, materials, equipment, operations, or methods listed, mentioned or scheduled on the plans and/or herein specified, including all incidentals necessary and required for completion of work under this Section.
- B. Provide and install excavation services for building foundations, roads, parking areas, site grading, slabsongrade, landscaping areas, and for site structures.

1.2 RELATED SECTIONS

- A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Special Conditions and Division 1 of these Contract Documents.
- B. Section 312213, Rough Grading: Topsoil and subsoil removal from site surface.
- C. Section 312323, Backfill.
- D. Section 312316, Trenching: Excavating for utility trenches.

1.3 REFERENCES

- A. The project Soils Report: Geotechnical Investigation Report & Geologic and Seismic Hazards Assessment, Prepared by Geo-Logic Associate, bda Pacific Geotechnical engineering, December 1, 2015.
- B. Local utility standards when working within 24 inches of the respective utility lines.

2.0 PRODUCTS

Not applicable to this Section.

3.0 EXECUTION

3.1 PREPARATION

- A. Identify required lines, levels, contours, and datum locations.

3.2 EXCAVATING

- A. Underpin adjacent structures which may be damaged by excavating work.

- B. Excavate subsoil to accommodate building foundations, slabs on grade, paving and site structures.
- C. Compact disturbed load bearing soil in direct contact with foundations to original bearing capacity; perform compaction in accordance with Sections 312323, Backfill and 312316, Trenching.
- D. Slope banks with machine to angle of repose or less until shored.
- E. Do not interfere with 45 degree bearing splay of foundations.
- F. Grade top perimeter of excavating to prevent surface water from draining into excavation.
- G. Hand trim excavation. Remove loose matter.
- H. Remove lumped subsoil, boulders, and rock in accordance with the provisions of the Soils Report.
- I. Notify Architect/Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.
- J. Correct areas over excavated with backfill and compact replacement as specified for authorized excavation.
- K. Remove excess excavated material from site.

3.3 FIELD QUALITY CONTROL

- A. The project Soils Engineer shall provide testing and inspection services.

3.4 PROTECTION

- A. Prevent displacement or loose soil from falling into excavation; maintain soil stability.
- B. Protect structures, utilities and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth operations.

END OF SECTION

SECTION 312317 - TRENCHING

1.00 - GENERAL

1.01 SECTION INCLUDES

- A. Compacted fill from top of utility bedding to subgrade elevations.
- B. Backfilling and compaction.

1.02 RELATED SECTIONS

- A. Section 312213 - Rough Grading
- B. Section 312316 – Excavation and Fill
- C. Section 312333 - Backfill

1.03 UNIT PRICE - MEASUREMENT AND PAYMENT

Not Used.

1.04 REFERENCES

- A. City Standards.

1.05 DEFINITIONS

- A. Utility: Any buried pipe, conduit, or cable.

1.06 FIELD MEASUREMENTS

- Verify that survey bench mark and intended elevations for the Work are as shown on drawings.

1.07 COORDINATION

- Verify work associated with lower elevation utilities are complete before placing higher elevation utilities.

2.00 - PRODUCTS

2.01 FILL MATERIALS

- A. Per Geotechnical report.

2.02 ACCESSORIES

- A. Geotextile Fabric: Per Geotechnical report.
- B. Filter Fabric: Per Geotechnical report.

3.00 - EXECUTION

3.01 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Protect plant life, lawns, and other features remaining as a portion of final landscaping.
 - Protect bench marks, existing structures, fences, sidewalks, paving, and curbs from excavation equipment and vehicular traffic.
- D. Maintain and protect above and below grade utilities which are to remain.
- E. Cut out soft areas of subgrade not capable of in situ compaction. Backfill with fill per Geotechnical report and compact to density equal to or greater than requirements for subsequent backfill material.

3.02 EXCAVATION

- A. Excavate subsoil required for utilities to municipal utilities.
- B. Cut trenches sufficiently wide to enable installation and allow inspection.
- C. Do not interfere with 45 degree bearing splay of foundations.
 - Hand trim excavation. Hand trim for bell and spigot pipe joints. Remove loose matter.
 - Remove lumped subsoil, boulders, and rock up to 1/3 cu yd (0.25 cu m), measured by volume.
 - Correct areas over excavated in accordance with Section 312316.
 - Stockpile excavated material in area designated on site and remove excess material not being used, from site.

3.03 BACKFILLING

- A. Backfill trenches to contours and elevations with materials recommended in Soil Report and City Standards.

- B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen or spongy subgrade surfaces.
- C. Granular Fill: Place and compact materials in continuous layers not exceeding 6 inches (150 mm) compacted depth.
- D. Soil Fill: Place and compact material in continuous layers not exceeding 8 inches (200 mm) compacted depth.
- E. Employ a placement method that does not disturb or damage foundation perimeter drainage, conduit, duct in trench.
- F. Maintain optimum moisture content of fill materials to attain required compaction density.
- G. Remove surplus fill materials from site.
- H. Leave fill material stockpile areas completely free of excess fill materials.

3.04 TOLERANCES

- A. Top Surface of Backfilling Under Paved Areas: Plus or minus 1 inch (25 mm) from required elevations.
- B. Top Surface of General Backfilling: Plus or minus 1 inch (25 mm) from required elevations.

3.05 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed.
- B. Compaction testing will be performed in accordance with Geotechnical report.
- A. If tests indicate Work does not meet specified requirements, remove Work, replace, compact, and retest.
- D. Frequency of Tests: Per Soils Engineer.

3.06 PROTECTION OF FINISHED WORK

- A. Reshape and re-compact fills subjected to vehicular traffic during construction.

END OF SECTION

SECTION 312323 – BACKFILL

1.0 GENERAL

1.1 SUMMARY

- A. Section includes building perimeter and site structure, filling and backfilling to subgrade elevations; fill under slabs-on-grade, paving; fill for over-excavation; consolidation and compaction as specified in the Soils Report and any supplements to the Soils Report.
- B. Related Sections:
 - 1. Section 033000 – Cast-in-Place Concrete.
 - 2. Section 312300 – Excavation and Fill.
 - 3. Section 312316 – Trenching.

1.2 REFERENCES

- A. None

2.0 PRODUCTS

1.1 FILL MATERIALS

- A. Fill and Structural Fill as specified in the Soils Report and any supplements to the Soils Report.

1.2 ACCESSORIES

- A. None

3.0 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 – Administrative Requirements: Coordination and project conditions.
- B. Verify subdrainage, dampproofing, or waterproofing installation has been inspected.
- C. Verify structural ability of unsupported walls to support loads imposed by the fill.

3.2 PREPARATION

- A. Compact subgrade to density requirements for subsequent backfill materials.
- B. Cut out soft areas of subgrade not capable of compaction in place. Backfill and compact to density equal to or greater than requirements for subsequent fill material.
- C. Roll subgrade surface to identify soft spots; fill and compact to density equal to or greater than requirements for subsequent fill material.

3.3 BACKFILLING

- A. Backfill areas to contours and elevations shown on drawings.
- B. Employ a placement method that does not disturb or damage other work.
- C. Maintain optimum moisture content of backfill materials to attain required compaction density.
- D. Backfill against supported walls and structures. Do not backfill against unsupported walls or structures.
- E. Backfill simultaneously on each side of unsupported walls and structures until supports are in place.
- F. Slope grade away from building at a minimum slope of two (2%) percent, unless noted otherwise.
- G. Make gradual grade changes. Blend slope into level areas.
- H. Remove surplus backfill materials from site.

3.4 TOLERANCES

- A. Section 014000 – Quality Requirements.
- B. Top Surface of Backfilling Under Paved Areas: Plus or minus 0.05 feet from required elevations.
- C. Top Surface of General Backfilling: Plus or minus 1/10 feet from required elevations.

3.5 FIELD QUALITY CONTROL

- A. The project Soils Engineer shall provide testing and inspection services.

3.6 PROTECTION OF FINISHED WORK

- A. Section 017000 - Execution and Closeout Requirements.

- B. Reshape and re-compact fills subjected to vehicular traffic.

END OF SECTION

**Division 32:
Exterior
Improvements**

SECTION 321100 - SUBGRADE PREPARATION & BASE MATERIAL

1.0 - GENERAL

1.1 SUMMARY

- A. Provide subgrade preparation and the base material installation complete, including clearing, grading, excavation, and filling and watering.

1.2 QUALITY ASSURANCE

- A. Reference Standards

- 1. Perform all work in accordance with all applicable laws, codes and regulations required by the City of Morgan Hill.
- 2. Reference to "Standard Specifications" shall mean the Standard Specifications of the State of California, Business and Transportation Agency, Department of Transportation, CALTRANS.

- B. Related work specified elsewhere includes:

- 1. None

- C. Stipulations

- 1. The finished surface of the subgrade, at any point, shall not vary more than 0.05' above or below the elevation indicated on the drawings.

- D. ASTM Standards.

1.3 SOILS REPORT

- A. A soil investigation report has not been prepared for the project.

2.0 MATERIALS

2.1 AGGREGATED BASE - CLASS 2

- A. Aggregate base shall be Class 2, and free from vegetable matter or other deleterious substances. The percentage composition by weight of aggregate base shall conform to Section 26 of the Standard Specifications.

2.2 RECYCLED AGGREGATE BASE - CLASS 2

- A. Subject to the approval of the Geotechnical testing Engineer, recycled aggregate base shall be Class 2, and free from vegetable matter or other deleterious substances. The percentage composition by weight of aggregate base shall conform to Section 26 of the Standard Specifications. Existing material may be reused if it meets the specifications for Aggregate Base -Class 2 and the required compaction and the approval of the Geotechnical Engineer.

3.0 EXECUTION

3.1 TOPSOIL STRIPPING

- A. Limit to areas required by the need to prepare subgrade for improvements shown on material plans and grading plans and soil preparation plans including: paving, foundations, ramps, building pads and special soils required on the plans. Strip topsoil to required depths in a manner to prevent intermingling with underlying subsoil or other waste materials.
- B. Remove heavy growths of grass from areas before stripping. Remove trash, debris, weeds, roots, and other waste materials.
- C. Refer to Section 32 90 00 Planting and drawings for areas to receive Planting Soil Preparation.
- D. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust. Locate stockpiles where approved by Construction Manager.

3.2 SUBGRADE PREPARATION

- A. Refer to drawings for Fill Placement and Compaction.
- B. Subgrade is that area on which pavement, surfacing, base, sub-base or layer of any other material which may be specified is to be placed.
- C. Scarify subgrade to a depth of at least 12" below the final subgrade elevation, harrow, dry roll and break clods to achieve a finely divided condition. Remove all boulders, hardened

material or rock encountered. The earth shall be uniform for the full depth and width of the subgrade.

- D. Water the loose earth in a uniform manner and quantity so that the penetration will be at least 4".
- E. Harrow the earth to mix the wet earth with the dry beneath, until the whole mass of loose material is at the proper state of moisture for compaction.
- F. The finished subgrade, immediately prior to placing subsequent material thereon, shall be in accordance with the Standard Specifications for Class 2 Aggregate Base.
- G. Compact Engineered Fill to at least 95 percent relative compaction as determined by ASTM Test Designation D1557.
- H. Compact Subgrade below Class 2 Aggregate Base to at least 95 percent relative compaction as determined by ASTM Test Designation D1557.

3.3 AGGREGATE BASE

- A. Deliver to site as a uniform mixture and spread each layer in one operation without segregation.
- B. Class II Aggregate Base shall be readily compacted and spread with equipment that will provide a uniform layer conforming to the planned section, and as specified in Section 26 of the Standard Specifications.
- C. Compact the Class 2 Aggregate base to at least 95 percent relative compaction as determined by ASTM Test Designation D1557.

3.4 CLEANUP PER SECTION 01700.

END OF SECTION 321100

SECTION 321723 - PAVEMENT MARKINGS

1.0 GENERAL

1.1 SUMMARY

- A. This Section includes all labor, materials, equipment, operations, or methods listed, mentioned or scheduled on the plans and/or herein specified, including all incidentals necessary and required for completion of work under this Section.
- B. Provide pavement markings for parking lot as indicated on project Drawings.

1.2 RELATED SECTIONS

- A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Special Conditions and Division 1 of these Contract Documents.
- B. Section 321216 - Asphalt Paving

1.3 SUBMITTALS

- A. Comply with provisions of Section 013300, Submittal Procedures.
- B. Submit for approval manufacturer's product data and test reports.
- C. Submit manufacturer's full range of standard colors for selection.

1.4 QUALITY ASSURANCE

- A. Comply with governing codes and regulations in effect at time of project approval.
- B. Deliver, handle, and store materials in accordance with their manufacturer's instructions.

2.0 PRODUCTS

2.1 MANUFACTURERS & MATERIALS

- A. Acceptable manufacturers and materials are as follows; select one for project and verify with Architect:
 - 1. Zone-Lac by Morton International, Inc.

2. Traffic Marking Paint 1P-901 or Vinyl-Stripe vinyl epoxy paint W-801 by Dunn Edwards Corporation.
 3. 160 Vinyl Traffic Paint by ICI Deluxe Paints.
 4. Traffic Zone Paint B46 Series by Sherwin Williams.
- B. Color Selection: Blue where called out on accessible parking stall details. White elsewhere.

3.0 EXECUTION

3.1 PREPARATION

- A. Remove dust, debris, curing and sealing compounds, and other foreign substances detrimental to paint bond. Use a commercial degreasing solution to remove grease and oil.

3.2 INSTALLATION

- A. Mix and apply paint in compliance with the paint manufacturer's printed instructions.
- B. Paint pavement lines and legends in compliance with the layout shown on the Drawings. The work shall be straight or curved as indicated, of uniform color and texture with edges parallel, clean, sharply defined and accurate.
- C. Modify existing pavement markings by grinding or sandblasting to remove paint.
- D. Stripe for 8-foot wide stalls, as required, to provide accessible space as indicated. Number of stalls requiring striping to be determined after field measurements.
- E. Dry film thickness of cured paint film shall be 15 mils, or more where required for complete opacity.
- F. Restore damaged finishes. Clean and protect work from damage.

END OF SECTION

SECTION 321726 – TACTILE WARNING SURFACE

1.0 GENERAL

1.1 SUMMARY

- A. This Section includes all labor, materials, equipment, operations, or methods listed, mentioned or scheduled on the plans and/or herein specified, including all incidentals necessary and required for completion of work under this Section.
- B. Provide and install cast-in-place tactile warning surfacing as shown on project Drawings.

1.2 RELATED SECTIONS

- A. Documents affecting work of this section include, but are not necessarily limited to, General Conditions, Special Conditions and Division 1 of these Contract Documents.
- B. Section 321216 – Asphalt Paving
- C. Section 321313 – Portland Cement Concrete Pavement

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM D570-98 for water absorption.
 - 2. ASTM C1028-96 for slip resistance.
 - 3. ASTM D695-02a for compressive strength.
 - 4. ASTM D638-03 for tensile strength.
 - 5. ASTM D790-03 for flexural strength.
 - 6. ASTM D543-95 for chemical stain resistance.
 - 7. ASTM D2486-00 for abrasive wear.
 - 8. ASTM C501-84 for water resistance.
 - 9. ASTM E84-05 for fire resistance.
 - 10. ASTM D5420-04 for impact resistance.

11. ASTM G155-05a for accelerated weathering.

1.4 SUBMITTALS

- A. Comply with provisions of Section 013300, Submittal Procedures.
- B. Product Data: Submit manufacturer's literature describing products, instructions for installation, and maintenance procedures.
 1. Provide manufacturer's color chart for selection by the Architect.
- C. Samples: Provide samples as directed by Architect for verification purposes.
- D. Shop Drawings: provide Shop Drawings showing fabrication details, tile placement, installation materials and procedure.
- E. Materials Test Reports: Provide materials test reports from a qualified independent testing laboratory showing that materials for use are in compliance with all applicable requirements and meet the properties indicated.
- F. Warranty: Provide manufacturer's standard warranty.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Materials shall arrive in manufacturer's original product packaging and shall be stored unopened until installation.
- B. Materials shall be stored on a flat, level, and dry surface.

1.6 QUALITY ASSURANCE

- A. Provide materials from a single manufacturer.
- B. Tactile warning surfacing must comply with ADA requirements as well as the California Code of Regulations (CCR) Title 24, Part 2.
- C. Installer Qualifications: Contractor conducting installation shall conform to all local and state licensing and bonding requirements.

2.0 PRODUCTS

2.1 MANUFACTURER

- A. Engineered Plastics, Inc., 300 International Drive # 100, Williamsville, NY 14221, 1-800-682-2525, www.armor-tile.com.

2.2 MATERIALS

- A. Tactile Warning Pavers: Vitriified Polymer Composite (VPC) Surface Applied Detectable/Tactile Warning Surface Tiles shall be an epoxy polymer composition with an ultra violet stabilized coating employing aluminum oxide particles in the truncated domes
1. Paver shall meet the following requirements:
 - a. Compressive Strength: greater than 28,000 psi.
 - b. Tensile Strength: greater than 19,000 psi.
 - c. Slip Resistance: greater than .80.
 - d. Water Absorption: less than .05%.
 - e. Flexural Strength: greater than 25,000 psi.
 - f. Chemical Stain Resistance: shall not discolor or stain.
 - g. Abrasive Wear: less than .060 after 1,000 cycles.
 - h. Water Resistance: greater than 500.
 - i. Fire Resistance: flame spread less than 15.
 - j. Impact Resistance: greater than 550 in. lbf/in.
 2. Color:
 - a. Vehicular hazardous area: Yellow
 3. Size: 36" x 48" x 3/16"
- B. Fasteners: Color match, corrosion resistant, flat head drive anchor, 1/4" diameter x 1 1/2" long as supplied by Manufacturer.
- C. Adhesive: As supplied by Manufacturer
- D. Sealant: As supplied by Manufacturer

3.0 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. The surface to receive the Surface Applied Tactile Warning Surface Tile is to be mechanically cleaned with a diamond cup grinder or shot blaster to remove any dirt or foreign material. This cleaning and roughening of the concrete surface should include at least 4 inches around the perimeter of the area to receive the tile, and also along the cross pattern established by the corresponding areas on the backside of the tile. Those same areas should then be cleaned with a clean rag soaked in Acetone.
- C. Immediately prior to installing the Surface Applied Detectable/Tactile Warning Surface Tile, the concrete surfaces must be inspected to ensure that they are clean, dry, free of voids, curing compounds, projections, loose material, dust, oil, grease, sealers and determined to be structurally sound and cured for a minimum of 30 days.
- D. Using Acetone, wipe the backside of the tile around the perimeter and along the internal cross pattern, to remove any dirt or dust particles from the area to receive the adhesive.
- E. Apply Tactile Bond & Seal adhesive to the backside of the tile, following the perimeter and internal cross pattern established by the tile manufacturer. Sufficient adhesive must be placed on the prescribed areas to have full coverage across the 2" width of the adhesive locator and shall be applied to within 1/4" continuously around the perimeter edge of the tile. The entire tube of adhesive shall be applied to the back of each tile, sizes 24" x 36" and greater.
- F. Working from the center of the tile outwards, proceed to drill and install all fasteners in the tile's molded recesses.
- G. Standing with both feet applying pressure around the molded recess provided in the tile, drill a hole true and straight to a depth of 3½" using a 1/4" masonry drill bit. Drill through the tile without hammer option (on the drill) until the tile has been successfully penetrated, then with hammer option (on the drill) to drill into the concrete. Maintaining foot pressure on both sides of the hole while drilling prevents concrete dust from accumulating between the tile and concrete which can affect the tile being installed flush and may compromise installation integrity.
- H. Immediately after drilling each hole, before moving on to the next, and while still applying foot pressure, mechanically fasten tiles to the concrete substrate using a leather bound or hard plastic mallet to set the fasteners. Ensure the fastener has been placed to full depth in the dome, straight, and flush to the top of dome. Drive the pin of the fastener with the mallet, taking care to avoid any inadvertent blows to the truncated dome or tile surface.

- I. Following the installation of the fasteners, the concrete dust should be vacuumed, brushed or blown away from the tile's surface and adjacent concrete. Using Acetone on a rag, wipe the concrete around the tile's perimeter to ensure a clean, dry surface to receive perimeter sealant.
- J. Tactile Bond & Seal perimeter caulking sealant should be applied following the sealant manufacturer's recommendations. Tape all perimeter edges of the tile back 1/16" from the tile's perimeter edge and tape the adjacent concrete back 1/2" from the tile's perimeter edge to maintain a straight and even caulking line. Apply sealant around tile perimeter using care to work sealant into any void between the tile and concrete interface. Tool the perimeter caulking with a rounded plastic applicator or spatula to create a cove profile between the tile and adjacent concrete. Remove tape immediately after tooling perimeter caulking sealant.
- K. In order to maintain proper spacing between truncated domes on adjacent tiles, the tapered edge should be trimmed off using a continuous rim diamond blade in a circular saw or mini-grinder. The use of a straightedge to guide the cut is required. All cuts should be made prior to installation of the tiles. If installing adjacent tiles, care should be taken to leave a 1/8 inch gap between each tile to allow for expansion and contraction.

3.2 CLEAN UP AND PROTECTION

- A. Protect tiles against damage during project construction and tile installation period to comply with manufacturer's recommendations.
- B. In the event of rolling loads following installation, protect tiles by covering them with plywood or hardwood.
- C. Clean tiles by method as recommended by manufacturer not more than four days prior to final inspection.

3.3 WARRANTY

- A. Materials shall be free from all defects.
- B. Tactile warning tiles shall be guaranteed in writing for a period of five years from date of final completion.
- C. Warranty shall include defective work, breakage, deformation, and loosening of tiles.

END OF SECTION

SECTION 323113 - CHAIN LINK FENCES AND GATES

1.0 GENERAL

1.1 SUMMARY

- A. This Section includes all labor, materials, equipment, operations, or methods listed, mentioned or scheduled on the plans and/or herein specified, including all incidentals necessary and required for completion of work under this Section.
- B. Provide and install chain link swing gates, and all related accessories as shown on project Drawings and as specified herein.

1.2 RELATED SECTIONS

- A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Special Conditions and Division 1 of these Contract Documents.
- B. Section 033000 – Cast-in-place Concrete

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 1. ASTM F567 - Standard Practice for Installation of Chain-Link Fence
 2. ASTM F626 - Standard Specification for Fence Fittings
 3. ASTM F900 - Standard Specification for Industrial and Commercial Swing Gates
 4. ASTM F1043 - Standard Specification for Strength and Protective Coatings on Steel Industrial Chain Link Fence Framework
 5. ASTM F1083 - Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures
 6. ASTM A36 - Standard Specification for Carbon Structural Steel
 7. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 8. ASTM B221 Standard Specification for Aluminum and Aluminum Alloy Bars, Rods, Wire Profiles and Tubes.

8. ASTM A392 - Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric
9. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
10. ASTM A525 - Standard Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
11. ASTM F668 Standard Specification for Polyvinyl Chloride (PPVC) and Other Organic Polymer-Coated Steel Chain Link Fence Fabric
12. ASTM A780 Standard Practice for Repair of Damaged and Uncoated Areas of Hot-dip Galvanized Coatings
11. ASTM F1664 Standard Specification for Polyvinyl Chloride (PVC) and Other Conforming Organic Polymer-Coated Steel Tension Wire Used With Chain Link Fence

1.4 SUBMITTALS

- A. Comply with provisions of Section 013300, Submittal Procedures.
- B. Shop drawings: Layout of fences and gates with dimensions, details, and finishes of components, accessories, and post foundations.
- C. Product data: Manufacturer's catalog cuts indicating material compliance and specified options.
- D. Samples: Provide samples of materials, including wires and accessories.

1.5 QUALITY ASSURANCE

- A. Products from qualified manufacturers having a minimum of 5 years experience manufacturing galvanized chain link fencing and gates will be acceptable by the Architect as equal, if approved in writing, ten (10) days prior to bidding, and if they meet all of the following specifications for design, size gauge of metal parts and fabrication.
- B. Obtain chain link fences and gates, including accessories, fittings, and fastenings, from a single source.

2.0 PRODUCTS

2.1 MANUFACTURER

- A. Anchor Fence, 1015 East Market Street, Daly City, CA 94014, 1-650-757-2140, www.anchorfencecompany.com

OR

Master Halco, 3040 S. Cedar Ave., Fresno, CA 93725, www.fenceonline.com, or approved equal.

2.2 CHIN LINK FENCE FABRIC

- A. Steel chain link fabric per ASTM F668 Class 2b.
- B. Size and Height: Chain ink fabric 2 in. mesh, 9 gauge steel core wire having a break load of 1290 lbf, height per plans.
- C. Selvage of fabric knuckle at top and knuckle at bottom.

2.3 STEEL FENCE FRAMING

- A. Steel Pipe:
 - 1. Type I: ASTM F1083, standard weight schedule 40; minimum yield strength of 25,000 psi; sizes as indicated. Hot-dipped galvanized with minimum average 1.8 oz./ft.² of coated surface area on the inside and outside. Exterior of pipe to have F1043 PVC thermally fused color coating, minimum thickness 10 mils.
- B. Formed Steel ("C") Sections: Roll formed steel shapes complying with ASTM F1043, Group II, produced from 45,000 psi yield strength steel; sizes as indicated. External coating per ASTM F1043, Type A, minimum average 2.0 oz./ft.² of zinc per ASTM A123, or 4.0 oz./ft.² per ASTM A525 plus a minimum 10 mil thermally fused PVC color coating in accordance with F1043.
- C. Steel Square Sections: ASTM A500, Grade B Steel having minimum yield strength of 40,000 psi; sizes as indicated. Hot-dipped galvanized with minimum 1.8 oz./ft.² of coated surface area plus a minimum 10 mil thermally fused PVC color coating in accordance with F1043..
- D. Corner Post 2-1/2 sq" 3.65 lbs/ft.
- E. Line (intermediate) Post 1-5/8" od 3.65 lbs/ft.
- F. Rail and Braces 1-5/8" od

2.4 CHAIN LINK SWING GATES

- A. Gate frames: Fabricate chain link swing gates in accordance with ASTM F900 using galvanized steel tubular members, 2" round, weighing 2.60 lb/ft Fusion or stainless steel welded connections forming rigid one-piece unit. Welded areas to be protected with zinc-rich paint per ASTM A780 then over coated with liquid PVC to match frame. PVC coated pipe to be Grade 1 per section 2.03. Chain link fabric to match specifications of fence system.
- B. For gates over 8' high or 15' wide, provide minimum 1-1/2" round additional horizontal and vertical interior members to ensure proper strength.
- C. Hardware materials: Hot dipped galvanized steel or malleable iron shapes to suit gate size.
- D. Hinges: Structurally capable of supporting gate leaf and allow opening and closing without binding. Non-lift-off type hinge design shall permit gate to swing 180° inward or 180° outward per plan. May be field coated with liquid PVC.
- E. Latch: Forked type capable of retaining gate in closed position and have provision for padlock. Latch shall permit operation from either side of gate. May be field coated with liquid PVC.
- F. Keeper: Provide keeper for each gate leaf over 5' wide. Gate keeper shall consist of mechanical device for securing free end of gate when in full open position.
- G. Gate posts: PVC color coated steel pipe ASTM F1083 standard weight schedule 40; minimum yield strength of 25,000 psi size as indicated. Hot-dipped galvanized with minimum 1.8 oz/ft² of zinc or respective material finished in accordance with ASTM F1043.

Gate Leaf Single Width	Post Size (round)	Weight
6 feet or less	2.875 inches	5.79 lb/ft
6 feet to 12 feet	4.00 inches	9.11 lb/ft
12 feet to 19 feet	6.625 inches	18.97 lb/ft
19 feet	8.625 inches	28.55 lb/ft
OR		
Gate Leaf Single Width	Post Size (square)	Weight
6 feet	2.5 inches	5.1 lb/ft
6 feet	4.0 inches	9.59 lb/ft
12 feet	6.0 inches	14.65 lb/ft
19 feet	8.0 inches	25.44 lb/ft

2.5 SETTING MATERIALS

- A. Concrete: Minimum 28 day compressive strength of 2,500 psi.

2.6 ACCESSORIES

- A. Provide items required to complete fence system. Galvanize each ferrous metal item and finish to match framing in accordance with ASTM F626.
- B. All accessories and fittings to be PVC thermally fused color coated having a minimum thickness of 0.006" per ASTM F626. PVC color to match fabric and framework. Moveable parts, nuts and bolts to be field coated with PVC liquid touch up after installation.
- C. Post Caps: Formed steel, cast malleable iron, or aluminum alloy weathertight closure cap for tubular posts. Provide one cap for each post. Cap to have provision for barbed wire when necessary. "C" shaped line post without top rail or barbed wire supporting arms do not require post caps. (Where top rail is used, provide tops to permit passage of top rail.)
- D. Top Rail And Brace Rail Ends: Pressed steel per ASTM F626, for connection of rail and brace to terminal posts.
- E. Top Rail Sleeves: 7" expansion sleeve with spring, allowing for expansion and contraction of top rail.
- F. Wire Ties: Double wrap 13 gauge for rails and braces. Tie wire PVC coated and in compliance with ASTM F626. Color to match fabric color.
- G. Brace and Tension (stretcher bar) bands: Pressed steel. At square post provide tension bar clips.
- H. Tension Wire: Poly Vinyl Chloride (PVC) coated metallic coated steel tension wire per ASTM 1664, 7 gauge, diameter wire with tensile strength of 75,000 psi. PVC coating class and color to match chain link fabric.
- I. Truss Rods & Tightener: Steel rods with minimum diameter of 5/16". Capable of withstanding a tension of minimum 2,000 lbs.
- J. Nuts and bolts are galvanized. Standard PDS (self-locking using horizontal bottom channel system).

3.0 EXECUTION

3.1 EXAMINATION

- A. Verify areas to receive fencing are completed to final grades and elevations.
- B. Ensure property lines and legal boundaries of work are clearly established.

3.2 CHAINLINK FENCE FRAMING INSTALLATION

- A. Install chain link fence in accordance with ASTM F567 and manufacturer's instructions.
- B. Locate terminal post at each fence termination and change in horizontal or vertical direction of 30° or more.
- C. Touch up any nicks or scratches of the PVC color coating with liquid PVC paint.

3.3 CHAIN LINK FABRIC INSTALLATION

- A. Fabric: Install fabric on security side, pull fabric taut; thread the tension bar through fabric and attach to terminal posts with tension bands spaced maximum of 15" on center and attach so that the fabric remains in tension after pulling force is released. Install fabric so that it is 2" +/- 1" above finish grade.
- B. Secure fabric using wires ties to line posts at 15" on center and to rails and braces 24" on center, and to the tension wire using hog rings 24" on center. Tie wire shall be secured to the fabric by wrapping it two 360 degree turns around the chain link wire pickets. Cut off any excess wire and bend back so as not to protrude as to avoid injury if a pedestrian may come in contact with the fence.

3.4 CHAIN LINK SWING GATE POST INSTALLATION

- A. Install gate posts in accordance with manufacturer's instructions.
- B. Concrete set gate posts: Drill holes in firm, undisturbed or compacted soil. Holes shall have diameter **4 times** greater than outside dimension of post, and depths approximately **6"** deeper than post bottom. Excavate deeper as required for adequate support in soft and loose soils, and for posts with heavy lateral loads. Set post bottom **36"** below surface when in firm, undisturbed soil. Place concrete around posts in a continuous pour. Trowel finish around post and slope to direct water away from posts.
 - 1. Gate posts and hardware: Set keeper, stops, sleeves into concrete. Check each post for vertical and top alignment, and maintain in position during placement and finishing operations.
- C. Install gates plumb, level, and secure for full opening without interference.
- D. Attach hardware by means which will prevent unauthorized removal.
- E. Adjust hardware for smooth operation. Max operating pressure: 5#.
- F. Touch-up hardware as necessary and to the approval of the Architect.

3.5 ACCESSORIES INSTALLATION

- A. Tie Wires: Bend ends of wire to minimize hazard to persons and clothing.
- B. Fasteners: Install nuts on side of fence for added security.

3.6 CLEANING

- A. Clean up debris and unused material, and remove from the site.

END OF SECTION

SECTION 325110 - DECOMPOSED GRANITE PAVING

1.0 GENERAL

1.1 DESCRIPTION

- A. Provide decomposed granite paving as indicated on the Drawings and as specified herein.

1.2 RELATED SECTIONS

- A. None

1.4 QUALITY ASSURANCE

A. Reference Standards

1. Reference to "Standard Specifications" shall mean the Standard Specifications of the State of California, Business and Transportation Agency, Department of Transportation, CalTrans.

B. Stipulations:

1. At no point shall surface fail to drain.
2. DG surface shall be firm, stable and slip-resistant.

1.4 SUBMITTALS

- A. Submit sample for approval prior to delivery of material to the site.
- B. Provide mock up showing finishes, color and edges indicated on the Drawings. Accepted mock-ups shall be kept at the job site to serve as a prerequisite for all finishes.

2.0 MATERIALS

2.2 BASE

- A. Planting Soil as specified in Section 02900 and free of organic amendment.

2.2 Decomposed Granite

- A. High quality crushed rock, well graded between #4 and #200. Trade name "Desert Gold," gold track fines, uniform gold color available from Lyngso Garden Supply 650-364-1730, TMT Enterprises, Inc., San Jose, CA, 408-432-9040 or equal and shall conform to the following gradation.

Sieve Size % Passing

#4 85-100 #8 55-80

#30 30-45 #200 10-20

Maximum dry density: 130 p.c.f

Optimum moisture: 8.8%

- B. The performance characteristics of the decomposed granite should not be impacted by minor variations of the gradation (+/-10%)

2.3 ORGANIC BINDING AGENT

- A. Stabilizer™ binder additive. The organic binding agent shall be a premium non-toxic, colorless, odorless concentrated powder that binds decomposed granite together to provide a firm surface. It is manufactured by Stabilizer Solutions of Phoenix, AZ, 800-336-2468 as supplied by TMT Enterprises, Inc., San Jose, CA, Phone 408-432-9040. The binding agent shall be premixed at a standard rate of 12-16 pounds per ton of decomposed granite. It is critical that Stabilizer be thoroughly and uniformly mixed throughout the decomposed granite.
- B. Or equal.

2.4 WEED BARRIER

- A. Mirafi 140N.

3.0 EXECUTION

3.1 PREPARATION

- A. Clear the area to receive decomposed granite of all objectionable plant material, to include roots, snags, brush, grass, weeds and similar undesirable vegetation and any other debris found at the site not specified as improvements to be included as part of this project. All such materials shall be removed from the site and disposed of in an acceptable manner.
- B. In addition to the clearing of vegetation growth, the area to receive decomposed granite shall be grubbed to a depth of six inches (6") below finish grade, of debris and rocks over one inch (1") in size. Said material shall be removed from the site and disposed of in an acceptable manner.
- C. Dispose offsite, any site soil from area to receive decomposed granite on which are growing any noxious weeds such as Fennel, Morning Glory, Sorrel or Bermuda grass.
- D. Install steel edge per manufacturer's specifications.

- E. Earthwork, header and concrete mow band work shall be complete. Coordinate with tree planting, irrigation, site furnishings and concrete work as required.
- F. Complete finish grading and compaction to bring subgrades after final compaction to required grades and sections as indicated.

3.2 INSTALLATION

- A. Compact subgrade material to 90% relative compaction to achieve a smooth uniform surface.
- B. Upon thorough moisture penetration, compact decomposed granite to 90% relative compaction by compaction equipment such as: double drum roller (2-4 ton) or single drum roller (1,000 lbs.) vibratory plate tamp.
- C. Decomposed granite shall be installed in two lifts and compacted to a 1" depth. Each lift shall be wetted, rolled and compacted to 90% relative compaction in areas with tree planting to achieve a smooth uniform surface.
- D. Redress surface of decomposed granite areas with fines as necessary to correct any settlement, erosion or lack of crown, which develops after initial placement. Water and thoroughly compact surface until uniformly compacted.
- E. Remove and replace decomposed granite paving that is damaged, defective or does not meet requirements of this section.
- F. Maintain surface free of erosion and weeds through the extent of the Plant Establish Maintenance Period specified in Section 32 90 00.

3.3 CLEANUP:

- A. Provide complete daily clean up and final finishing. Remove all unused materials from the site.

END SECTION 325110



DATE: November 2, 2018

FROM: Brian Barry

RE: M54 pricing – Morgan Hill

Below please find the pricing you requested – Do not hesitate to call/email with any questions.

One (1) Clivus Multrum M54 Trailhead Compost System

System includes: M54 compost tank, single stall ADA accessible building kit with pine board and batten exterior and asphalt shingle roof, dry toilet fixture with connector chute, DC ventilation fan with solar system, grab rails, hand sanitizer with dispenser, toilet paper holder, starter bed material, maintenance floor hatch and freight.

Price Quotation: \$26,384 (FOB Morgan Hill, CA)

Terms: 50% deposit with order balance due upon delivery.

Note: Kit units ship by tractor and standard, enclosed trailer which will not go off-road. Off loading is the customer's responsibility.

Does not include installation.

Brian Barry
Clivus Multrum Inc.
15 Union Street
Lawrence, MA 01840
p 800.425.4887
f 978.557.9658
www.clivusmultrum.com