Project Specifications

NOCCCD ANAHEIM PARKING LOT 2 RENOVATION

NORTH ORANGE COUNTY COMMUNITY COLLEGE DISTRICT 1830 W Romneya Drive

Anaheim, CA 92801

DSA APP: 04-119326

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SECTION 02221

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. Provisions of Division 01 apply to this section.
- B. Section Includes: Furnishing labor, materials and equipment necessary for demolition, dismantling, cutting and alterations as indicated, specified, or required for completion of the Work. Includes items such as the following:
 - 1. Protection of existing improvements to remain.
 - 2. Cleaning existing improvements to remain.
 - 3. Disconnecting and capping utilities.
 - 4. Removing debris, waste materials, and equipment.
 - 5. Removal of items for performance of the Work.
 - 6. Salvageable items to be retained by the Campus.

1.2 QUALITY ASSURANCE

- A. Perform the Work of this section by workers skilled in the demolition of buildings and structures. Perform the Work of this section under direct superintendence at all times.
- B. Prior to commencement of Work, schedule a walkthrough with the Campus Representative, to confirm Campus property items have been removed from scheduled Work areas. Identify and mark remaining property items and schedule their removal.
- C. Coordinate demolition for the correct sequence, limits, and methods. Schedule demolition Work to create least possible inconvenience to the public and facility operations.
- D. Related Standard: American National Standard A10.6-1983.

1.3 **PROJECT CONDITIONS**

- A. Drawings may not indicate in detail all demolition Work to be performed. Examine existing conditions to determine the full extent of required demolition.
- B. Repair damage to existing improvements or damage due to excessive demolition.
- C. Provide all measures to avoid excessive damage from inadequate or improper means and methods, improper shoring, bracing or support.
- D. If conditions are encountered that varies from those indicated, promptly notify the Campus Representative for clarification before proceeding.

PART 2 - PRODUCTS

2.1 HANDLING OF MATERIALS

- A. Items Scheduled for salvage by the Campus shall be delivered to a location designated by the Campus Representative. Items shall be cleaned, packaged and labeled for storage.
- B. Items scheduled for reuse shall be stored on the Project site and protected from damage, theft and other deleterious conditions.

PART 3 - EXECUTION

3.1 GENERAL

- A. Protection:
 - 1. Do not commence demolition until safety partitions, barricades, warning signs and other forms of protection are installed. Refer to Section 01 5705: Construction Facilities and Temporary Controls.
 - 2. Provide all safeguards, including warning signs, lights and barricades, for protection of workers, occupants, and the public.
- B. If, at any time, safety of existing construction appears to be endangered, take immediate measures to correct such conditions; cease operations and immediately notify the Client Representative.
- C. Implement measures to control dust during demolition.

3.2 **DEMOLITION**

- A. Do not throw or drop materials.
- B. Remove existing construction only to extent necessary for proper installation of Work and interfacing with existing construction. Cut back finished surfaces to straight, plumb or level lines as required for a smooth transition.
- C. Where openings are cut oversize or in improper locations, replace or repair to required condition.

3.3 CUTTING EXISTING CONCRETE

A. Cutting of existing concrete shall be performed by skilled workers familiar with the requirements and space necessary for placing concrete. Perform concrete cutting with concrete cutting wheels and hand chisels. Do not damage concrete intended to remain.

- B. Prior to cutting or coring concrete, determine locations of hidden utilities or other existing improvements and provide necessary measures to protect them from damage.
- C. Replace concrete demolished in excess of amounts indicated.

3.4 REMOVAL OF OTHER MATERIALS

A. Remove existing improvements not specifically indicated or required but necessary to perform Work. Cut to clean lines, allowing for installation of Work.

3.5 PATCHING

A. Patch and/or repair materials to remain when damaged by the performance of the Work of this section. Finish material and appearance of patch and/or repair Work shall match existing.

3.6 CLEANING

- A. Clean existing materials to remain with appropriate tools and equipment.
- B. Protect existing improvements during cleaning operations.
- C. Debris shall be dampened by fog water spray prior to transporting by truck.
- D. Debris pick-up area shall be kept broom-clean and shall be washed daily with clean water.
- E. Remove waste and debris, other than items to be salvaged. Turn over salvaged items to District, or store and protect for reuse where required. Continuously clean up and remove items as demolition Work progresses.
- F. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION

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SECTION 02300

EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 **DEFINITIONS**

- A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
 - 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 - 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Base Course: Aggregate layer placed between the subbase course and concrete paving.
- C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.
- D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.
- F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
 - 1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Campus Representative. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
 - 2. Bulk Excavation: Excavation more than 10 feet (3 m) in width and more than 30 feet (9 m) in length.
 - 3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Campus Representative. Unauthorized excavation, as well as remedial work directed by Campus Representative, shall be without additional compensation.
- G. Fill: Soil materials used to raise existing grades.

- H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- I. Subbase Course: Aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete walk.
- J. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.
- K. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.3 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.

1.4 **PROJECT CONDITIONS**

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Campus Representative and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by Campus Representative or authorities having jurisdiction.
- B. Utility Locator Service: Notify utility locator service, Underground Service Alert (DigAlert) or other approved service, for area where Project is located before beginning earth moving operations.
- C. A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by geotechnical engineer. Owner will not be responsible for interpretations or conclusions drawn from this data.
- D. Existing Utilities: Locate existing underground utilities in areas of Work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.
 - Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.

2. Do not interrupt existing utilities serving facilities occupied and used by Owner or others, except when permitted in writing by Architect and then only after acceptable temporary utility services have been provided.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487, or a combination of these groups; free of rock or gravel larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
 - 1. Liquid Limit: As specified in the Soils Report.
 - 2. Plasticity Index: As specified in the Soils Report.
- C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.
 - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.
- E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.
- F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.
- G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.
- H. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch (37.5-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.

- I. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch (25-mm) sieve and 0 to 5 percent passing a No. 4 (4.75-mm) sieve.
- J. Sand: ASTM C 33; fine aggregate.
- K. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.2 ACCESSORIES

- A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored as follows:
 - 1. Red: Electric.
 - 2. Yellow: Gas, oil, steam, and dangerous materials.
 - 3. Orange: Telephone and other communications.
 - 4. Blue: Water systems.
 - 5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 **PREPARATION**

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.
- B. Protect and maintain required erosion and sedimentation controls during earth moving operations.
- C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
 - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

3.4 EXCAVATION FOR ASPHALT PAVEMENT, CONCRETE, AND SIDEWALK

A. Site Grading consists of removing the existing asphalt pavement (est 3.5"), cement treating the base and subgrade combined to the depth indicated on the plans, and earthwork for removal and recompaction as required for all sidewalk and concrete pavement.

3.5 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit unless otherwise indicated.
 - 1. Clearance: 12 inches (300 mm) each side of pipe or conduit
- C. Trench Bottoms: Excavate trenches 4 inches (100 mm) deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.
 - 1. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.
- D. Trenches in Tree- and Plant-Protection Zones:
 - 1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
 - 2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.

3.6 SUBGRADE INSPECTION

A. Notify Campus Representative and Soils Engineer when excavations have reached required subgrade.

- B. If Campus Representative and Soils Engineer determine that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Soils Engineer, without additional compensation.

3.7 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi (17.2 MPa), may be used when approved by Campus Representative.
 - 1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Campus Representative.

3.8 STORAGE OF SOIL MATERIALS

- A. Stockpile / borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.9 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 - 1. Construction below finish grade including, where applicable, sub-drainage, damp-proofing, waterproofing, and perimeter insulation.
 - 2. Surveying locations of underground utilities for Record Documents.
 - 3. Testing and inspecting underground utilities.
 - 4. Removing concrete formwork.
 - 5. Removing trash and debris.
 - 6. Removing temporary shoring and bracing, and sheeting.
 - 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.10 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

- B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- C. Trenches under Footings: Backfill trenches excavated under footings and within 18 inches of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings.
- D. Trenches under Roadways: Backfill in accordance with soils report recommendations.
- E. Backfill voids with satisfactory soil while removing shoring and bracing.
- F. Place and compact final backfill of satisfactory soil to final subgrade elevation.

3.11 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- B. Place and compact fill material in layers to required elevations as follows:
 - 1. Under grass and planted areas, use satisfactory soil material.
 - 2. Under walks and pavements, use satisfactory soil material.
 - 3. Under steps and ramps, use engineered fill.
 - 4. Under building slabs, use engineered fill.
 - 5. Under footings and foundations, use engineered fill.
- C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.12 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
 - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.13 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:
 - 1. Under structures, building slabs, steps, and pavements, scarify and recompact top 24 inches (300 mm) of existing subgrade and each layer of backfill or fill soil material at 90 percent.
 - 2. Under walkways, scarify and re-compact top 24 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 90 percent.
 - 3. Under turf or unpaved areas, scarify and re-compact top 24 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 90 percent.
 - 4. For utility trenches, compact each layer of initial and final backfill soil material at 90 percent.
 - 5. For flexible asphalt concrete pavement for parking, compact aggregate base and asphalt concrete at 95 percent.

3.14 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - 1. Provide a smooth transition between adjacent existing grades and new grades.
 - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
 - 1. Turf or Unpaved Areas: Plus or minus 1 inch (25 mm)
 - 2. Walks: Plus or minus 1 inch (25 mm)
 - 3. Pavements: Plus or minus 1/2 inch (13 mm)
- C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch (13 mm) when tested with a 10-foot (3-m) straightedge.

3.15 SUBBASE AND BASE COURSES UNDER WALKS

- A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:
 - 1. Place base course material over subbase course under concrete pavement.

- 2. Shape subbase course and base course to required crown elevations and cross-slope grades.
- 3. Place subbase course and base course 6 inches (150 mm) or less in compacted thickness in a single layer.
- 4. Place subbase course and base course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
- 5. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 90 percent- of maximum dry unit weight according to ASTM D 1557. For flexible asphalt concrete pavement for parking, compact aggregate base and asphalt concrete at 95 percent.
- C. Pavement Shoulders: Place shoulders along edges of subbase course and base course to prevent lateral movement. Construct shoulders, at least 12 inches (300 mm) wide, of satisfactory soil materials and compact simultaneously with each subbase and base layer to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.16 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
 - 1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
 - 2. Determine that fill material and maximum lift thickness comply with requirements.
 - 3. Determine, at the required frequency, that in-place density of compacted fill complies with requirements.
- B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.
- C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
- D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Goetechnical Engineer.
- E. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:

- 1. Paved Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. (186 sq. m) or less of paved area or building slab, but in no case fewer than three tests.
- 2. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet (46 m) or less of trench length, but no fewer than two tests.
- F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; re-compact and retest until specified compaction is obtained.

3.17 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace soil material to depth as directed by Geotechnical Engineer; reshape and re-compact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.18 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION

SECTION 02741

ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Hot-mix asphalt paving.
 - 2. Pavement-marking paint.
 - 3. Temporary asphalt concrete pavements over trenches and/or excavations in existing paved areas and the permanent replacement of pavement over these trenches and/or excavation
- B. Related Sections:
 - 1. Division 2 Section "Earthwork" for aggregate subbase and base courses and for aggregate pavement shoulders.

1.3 **DEFINITION**

A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.
 - 1. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.
- B. Material Certificates: For each paving material, from manufacturer.
- C. Material Test Reports: For each paving material.

1.5 **REFERENCES**

A. Standard Specifications: Standard Specifications for Public Works Construction ("Green Book"), by Joint Cooperative Committee of the Southern California Chapter of the American Public Works Association and the Southern California Districts of the Associated General Contractors of California. B. State Standard Specifications: State of California, Department of Transportation (CALTRANS) Standard Specifications.

1.6 QUALITY ASSURANCE

- A. Requirements: Comply with materials, workmanship, and other applicable requirements of Standard Specifications for Public Works Construction for asphalt paving work.
- B. Regulatory Requirements: Perform off-site Work in public rights-of-way in accordance with requirements of authorities having jurisdiction, including CALTRANS Specifications and Standard Specifications for Public Works Construction, as amended and adopted by those authorities. For conditions not indicated otherwise on Contract Drawings, conform to Standard Details adopted by authorities having jurisdiction, including Standard Details for Public Works Construction, as amended and adopted by those authorities.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.

1.8 **PROJECT CONDITIONS**

- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:
 - 1. Tack Coat: Minimum surface temperature of 60 deg F (15.6 deg C).
 - 2. Slurry Coat: Comply with weather limitations in ASTM D 3910.
 - 3. Asphalt Base Course: Minimum surface temperature of 40 deg F (4.4 deg C) and rising at time of placement.
 - 4. Asphalt Surface Course: Minimum surface temperature of 60 deg F (15.6 deg C) at time of placement.
 - 5. Full Depth Course: Minimum surface temperature of 60 deg F (15.6 deg C) at time of placement.
- B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 55 deg F (12.8 deg C) for water-based materials, and not exceeding 95 deg F (35 deg C).

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Materials, General: Unless otherwise indicated on the Drawings or specified herein, sub-base, aggregate base and asphaltic concrete paving materials shall comply with Section 200 – Rock Materials and Section 203 – Bituminous Materials, in the Standard Specifications.
- B. Soil Sterilant: Poly-Bor-Chlorate by United States Borax, Monobor-Chlorate by United States Borax, Monobor-Chlorate by Occidental Chemical or equal. Soil sterilant shall comply with all applicable environmental protection and toxic materials regulations.
- C. Headers and Stakes: 2 x 6 nominal preservative treated Douglas fir, except at curves provide laminated 1 x 6 nominal preservative treated Douglas fir. Use hot dipped galvanized nails only.
- D. Sub-base Material: Existing or imported materials, Select Sub-base in accordance with Standard Specifications, Subsection 200-2.6.
- E. Aggregate Base: Crushed Miscellaneous Base (CMB) in accordance with State of California, Department of Transportation (CALTRANS) Standard Specifications for Class 2 Base Material.
- F. Asphalt Concrete Materials: Standard Specifications, Subsection 203-6, PG-6410.
- G. Surface Sealer (Fog Seal): Emulsified asphalt sealer complying with ASTM D 977 or cationic emulsified asphalt complying with ASTM D 2397; slow setting, factory diluted in water, of suitable grade and consistency for application.
- H. Slurry Seal Coat: Emulsion-aggregate slurry, Standard Specifications, Subsection 203-5.

2.2 AGGREGATES

- A. General: Use materials and gradations that have performed satisfactorily in previous installations.
- B. Coarse Aggregate: ASTM D 692, sound; angular crushed stone, crushed gravel, or cured, crushed blast-furnace slag.
- C. Fine Aggregate: ASTM D 1073, sharp-edged natural sand or sand prepared from stone, gravel, cured blast-furnace slag, or combinations thereof.
 - 1. For hot-mix asphalt, limit natural sand to a maximum of 10 percent by weight of the total aggregate mass.
- D. Mineral Filler: ASTM D 422, rock or slag dust, hydraulic cement, or other inert material.

2.3 ASPHALT MATERIALS

A. Asphalt Cement: Standard Specifications, Subsection 203-6, PG-6410

- B. Tack Coat: ASTM D 977 emulsified asphalt, or ASTM D 2397 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.
- C. Water: Potable.

2.4 AUXILIARY MATERIALS

- A. Herbicide: Commercial chemical for weed control, registered by the EPA. Provide in granular, liquid, or wettable powder form as follows: Poly-Bor-Chlorate by United States Borax, Monobor-Chlorate by United States Borax, Monobor-Chlorate by Occidental Chemical or equal. Soil sterilant shall comply with all applicable environmental protection and toxic materials regulations.
- B. Sand: ASTM D 1073, Grade Nos. 2 or 3.
- C. Joint Sealant: ASTM D 6690, Type I hot-applied, single-component, polymermodified bituminous sealant.

2.5 MIXES

- A. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes approved by authorities having jurisdiction and designed according to procedures in AI MS-2, "Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types."
 - 1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
 - 2. Provide mixes complying with composition, grading, and tolerance requirements in Standard Specifications and ASTM D 3515.
- B. Asphalt Paving Mixes:
 - 1. Base or underlying courses: Standard Specifications, A-PG-6410 or B-PG-6410.
 - 2. Finish course, vehicle traffic areas: Standard Specifications, C2-PG-6410 (Dense Medium).
 - 3. Finish course, pedestrian walkways: Standard Specifications, #-PG-6410 (Extra Fine).

PART 3 - EXECUTION

3.1 GENERAL

A. The Contractor shall be responsible for laying out and installing all pavements in the correct locations and to the proper cross sections and in accordance with the lines and grades as specified herein and on the Drawings and/or in accordance with the directions of the Site/Civil Engineer. Pavements which are not constructed to the proper section, grade and/or alignment shall be corrected by repair or replacement

by the Contractor in accordance with the directions of the Site/Civil Engineer and at no additional cost to the Campus.

3.2 EXAMINATION

- A. Verify that subgrade is dry and in suitable condition to begin paving.
- B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades. See
 - Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph (5 km/h).
 - 2. Proof roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes).
 - 3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Campus Representative, and replace with compacted backfill or fill as directed.
- C. Proceed with paving only after unsatisfactory conditions have been corrected.

3.3 **PREPARATION OF SUBGRADE**

- A. General Requirements Prior to the start of paving operations, the subgrade surface shall be prepared by filling in wheel ruts, erosions and all other ground disturbances, regardless of cause, and the ground surface will be at the proper elevation (± .05') to accommodate the pavement structure.
- B. Remove roots to a depth of 12 inches. Compact soil to 95% maximum capacity in 6 inch lifts. Backfill all trenches, depressions, etc. to 95% of maximum capacity.
- C. Soil Sterilizing: Apply sterilizer according to manufacturer's directions using dry or aqueous spray process, minimum quantity of dry undiluted material per 100 SF of paving conforming to the manufacturer's directions for control of medium and heavier weed growth and to meet warranty requirements. If necessary, apply supplemental watering to fully dissolve all sterilizer and obtain two to three inches penetration into the subgrade. Reroll treated subgrade to specified compaction. Do not apply sterilizer during rain or windy weather and prevent contamination of landscaping areas
- D. Compaction Fine grading of the subgrade shall be accompanied by proper compaction to the extent that the upper twelve (12) inches of subgrade shall have a density not less than that as specified in the soils report. Compaction shall be done by means of a roller weighing not less than ten (10) tons or other compaction equipment.

3.4 REPAIRS TO EXISTING PAVING

- A. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt surface course to level sags and fill depressions deeper than 1 inch (25 mm) in existing pavements.
 - 1. Install leveling wedges in compacted lifts not exceeding 3 inches (75 mm) thick.
- B. Crack and Joint Filling: Remove existing joint filler material from cracks or joints to a depth of 1/4 inch (6 mm).
 - 1. Clean cracks and joints in existing hot-mix asphalt pavement.
 - 2. Use emulsified-asphalt slurry to seal cracks and joints less than 1/4 inch (6 mm) wide. Fill flush with surface of existing pavement and remove excess.
 - 3. Use hot-applied joint sealant to seal cracks and joints more than 1/4 inch (6 mm) wide. Fill flush with surface of existing pavement and remove excess.

3.5 PREPARATION FOR PAVEMENT INSTALLATION

- A. Meeting Existing Pavement Where new pavements are to meet existing pavements, the Contractor shall line cut the existing pavement with an approved saw cutting machine as directed so that there will be a vertical butting surface between the old and new pavements. Unless directed otherwise, there shall be a one (1) foot offset in each pavement course to permit each successive course to overlap the lower existing course. Line cutting of existing pavements shall be done along neat, straight and even lines and in such a manner so as not to damage the adjacent pavement which is to remain.
- B. Unless specified otherwise, the following procedures shall be used:
 - 1. Pavement Replacement in Existing Asphalt Concrete Pavements Line cut and cut back the existing pavement in accordance with the requirements specified herein for widening and extension of existing asphalt concrete pavements. Minimum width of cut back shall be six (6) inches unless otherwise specified or shown on the Drawings. Line cutting for pavement replacement over trenches shall be parallel to the centerline of the trench; line cutting for pavement replacement at manholes, drain inlets, catch basins or other underground structures, test holes, etc., shall be in a square or rectangular configuration as directed. For all types of pavement replacement the line cutting shall encompass the disturbed area and include the required undisturbed pavement shelf area as specified herein or as directed.
- C. Vertical Surfaces in Contact with Asphalt Mixtures All vertical surfaces of curbs, structures, gutters and existing pavement in contact with new asphalt concrete mixtures shall be painted with a uniform coating of an approved asphalt emulsion or priming material. Extreme care shall be exercised in the application of this material to prevent splattering or staining of surfaces that are to be exposed. Surfaces that are stained as a result of the Contractor's operation shall be repaired and/or replaced.

3.6 ASPHALT CONCRETE PAVEMENTS

- A. General Requirements The Contractor shall construct asphalt concrete pavements upon a properly prepared subgrade, in conformity with the lines, grades, compacted thicknesses and typical sections shown on the Drawings and as specified herein.
- B. Materials and Construction Details Materials and construction details shall conform to the applicable requirements of the jurisdiction, both local and state requirements.

3.7 SUB-BASE PREPARATION AND BASE PLACEMENT

- A. Sub-Base Preparation and Aggregate Base Placement, General: Comply with Standard Specifications Section 301.
 - 1. Fine grading, checking, shaping, and compacting of subgrade shall be complete before start of asphaltic concrete paving Work.
 - 2. All work shall comply to the satisfaction and approval of the Soils Engineer of record.
- B. Sub-Base Preparation: Prepare subgrade in compliance with Standard Specifications, Subsection 301-1. Prepare and place sub-base, if indicated on the Drawings, in compliance with Section 301 – Treated Soils, in the Standard Specifications.
- C. Aggregate Base Placement: Place and compact aggregate base material in accordance with Standard Specifications, Subsection 301-2. Place aggregate base also below curbs and gutters and Portland cement concrete paving, compacted to 95 percent at vehicular traffic and 90 percent at pedestrian-only traffic.

3.8 SURFACE PREPARATION

A. Herbicide Treatment: Apply herbicide according to manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted-aggregate base before applying paving materials.

3.9 ASPHALTIC CONCRETE PAVING PLACEMENT

- A. Asphaltic Concrete Placement: Deliver and place asphaltic concrete mix in accordance with Standard Specifications, Subsection 302-5. Do not pave against concrete curbs unless backfill is in place behind curb, to prevent movement of curb line.
- B. Produce dense, watertight finish surfaces free from roller marks or other marks and irregularities, conforming to levels and profiles indicated, with smooth transitions between elevations given. Bring surfaces flush with other materials and hold to a uniform dimension below curb tops.
 - 1. Asphalt Concrete Compaction: Compact (roll) asphaltic concrete in accordance with Standard Specifications, Subsection 302-5.6, using machine rollers.
 - a. Compaction by vehicular traffic is prohibited.

- b. Do not displace or extrude pavement form position.
- c. Compact areas inaccessible to rolling equipment with machine-powered tamper.
- d. Develop rolling with consecutive passes to achieve even and smooth finish, without roller marks.
- 2. Joining Pavement: Expose, cut and clean edges of existing pavement to straighten, vertical surfaces for full depth of existing pavement. Paint edge with asphalt emulsion before placing new asphaltic concrete. No laps or overlaps of existing paving will be acceptable. All edges of existing paving shall be saw cut to full depth of paving. Joints in new paving shall be in accordance with Standard Specifications.
- C. Surface Sealer (Fog Seal)
 - 1. Surface Sealer (Fog Seal) Application:
 - a. Clean and prepare asphaltic concrete surfaces according to sealer manufacturer's instructions and recommendations.
 - b. Apply asphalt emulsion surface sealer uniformly over asphaltic concrete surfaces according to sealer manufacturer's instructions and recommendations. Prevent sealer from contact with surfaces not indicated to receive surface sealer. Touch up sealer to present uniform color and texture of surface finish.
 - 2. Curing and Protection: Prevent all pedestrian and vehicular traffic from asphaltic concrete areas having received surface sealer. Allow surface sealer to cure according to sealer manufacturer's instructions and recommendations, with considerations for ambient temperature and humidity.
 - 3. Cleaning: Clean sealed surfaces in preparation for parking and traffic control markings to be applied as specified in Section 02765 Pavement Marking.
- D. Slurry Seal
 - 1. Slurry Seal: Clean and prepare asphaltic concrete surfaces. Apply emulsionaggregate coating in accordance with Standard Specifications, Subsection 302-4.
- E. Tolerances and Tests
 - 1. Tolerances:
 - a. Flatness: Maximum variation of ¼-inch measured with 10 foot straight edge.
 - b. Compacted Scheduled Thickness: Within ¹/₄-inch of design thickness.
 - c. Variation form True Elevation: Within ¹/₂-inch.
 - 2. Test: Flood test all paving to demonstrate positive drainage. No standing water shall remain 1-hour after test.

3.10 PAVEMENT MARKING

- A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Campus Representative.
- B. Allow paving to age for 30 days before starting pavement marking.
- C. Sweep and clean surface to eliminate loose material and dust.
- D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils (0.4 mm).

3.11 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.
- C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.
- D. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979.
 - 1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.
 - 2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.
 - a. One core sample will be taken for every 1000 sq. yd. (836 sq. m) or less of installed pavement, with no fewer than 3 cores taken.
 - b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.
- E. Replace and compact hot-mix asphalt where core tests were taken.
- F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.12 PERMANENT PAVEMENT REPLACEMENT

A. General Requirements - The Contractor shall replace disturbed pavement to the lines and grades shown on the Drawings or specified herein. The existing pavement shall be saw cut as shown on the Drawings, specified herein, and/or directed by the jurisdiction inspectors.

3.13 GUARANTEE AND MAINTENANCE

A. The Contractor shall guarantee all pavement installations, including materials and workmanship, for a period of one year from the date of overall project substantial completion. The Contractor shall make interim repairs as necessary to maintain all paved areas in good, usable condition. The Contractor shall receive no additional compensation for pavement maintenance and restoration during this guarantee period. Payment shall be considered as included in the Contract Sum.

3.14 DISPOSAL

- A. Remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.
 - 1. Do not allow milled materials to accumulate on-site.

END OF SECTION

SECTION 02760

PAVEMENT MARKING

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Parking-stall line and curb parking.
- B. Traffic symbols, direction arrows, lettering and safety zones, loading zone.
- C. Accessibility signage.
- D. Fire lane.

1.2 **REFERENCES**

- A. SSPWC Standard Specifications for Public Works Construction, Current Edition.
- B. AQMD Air Quality Management District.
- C. Fed. Std. 595C Colors Listed in Government Procurement.
- D. California Building Code, Title 24 of California Code of Regulations.

1.3 **REGULATORY REQUIREMENTS**

- A. Conform to Federal Regulations concerning lead content of paints.
- B. Conform to AQMD, Local Regulations.

1.4 QUALITY ASSURANCE

- A. Product Manufacturer: Company specializing in manufacturing quality traffic line paint products with ten years experience.
- B. Application: Company specializing in commercial pavement painting with five years experience.

1.5 SUBMITTALS

- A. Submit 6 copies product data.
- B. Submit shop drawing layout of complete parking lot, indicating stalls, lettering, safety zones, directional arrows, widths of lines and colors.

1.6 FIELD SAMPLES

- A. Provide field sample in the form of one parking lot stall, illustrating coating color, width of stroke, thickness of application and dimensioning.
- B. Locate where approved.
- C. Accepted sample may remain as part of Work.
- D. Do not proceed with pavement marking until sample panel has been approved.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to site in sealed and labeled containers.
- B. Container labeling to include manufacturer's name, type of paint, brand name, brand code, coverage, surface preparation, drying time, cleanup, color designation and instructions for mixing and reducing.
- C. Store paint materials at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, unless otherwise recommended by the manufacturer.

1.8 EXTRA STOCK

- A. Provide a one gallon unopened container of each color to Owner.
- B. Label each container with color in addition to the manufacturer's label.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products according to campus standards form the basis for design and quality intended.

2.2 MATERIALS

A. Traffic Line Paint: in accordance with campus standards.

2.3 COLORS

- A. Accessible Stalls and Signage: Blue, conforming to No. 15090 Fed. Std. 595C, 4 inches wide.
- B. Parking stalls, lettering, arrows, passenger loading zones and traffic signage: White. Stalls to be Single line, 4 inches wide.
- C. Fire Lanes: Red, paint curbs and pavement with 3-inch stenciled white letters indicating. "Fire Lane- No Parking" at 30 feet on center.

PART 3 - EXECUTION

3.1 INSPECTION

A. Verify that surfaces are ready to receive Work as instructed by the product manufacturer.

3.2 APPLICATION

- A. Re-apply pavement markings in all areas affected by work to restore to original configuration.
- B. Surface to be painted shall be clean and free of dust, dirt, grease, oil, water or other contaminates.
 - Existing lines to be removed shall be sandblasted clean.
- C. Traffic paint shall not be applied until seal coat has been in place a minimum of ten days.
- D. Apply material by machine spray, airless sprayer, roller or brush to provide a minimum thickness of 12 mils average. Precise edges required, no over spray allowed.
- E. Perform Work in accordance with approved shop drawings. Conform to Section 310-5.6.9, SSPWC and CAS/CAR.
- F. Accessible parking spaces and access aisles shall comply with **CBC Section 11B-502** and shall be dimensioned to the centerline of the marked lines as follows:
 - Parking spaces and access aisles shall be marked according to CBC Figures 11B-502.2, 11B-502.3, and 11B-502.3.3. Their surfaces shall comply with CBC Section 11B-302 and shall be at the same level with slopes not steeper than 1:48 in any direction. CBC Section 11B-502.4
 - Parking Spaces shall be 9'x18' minimum and van parking spaces shall be 12'x18' minimum with an adjacent access aisle of 5'x18' minimum. Access aisles shall be placed on either side of the parking spaces except be located on the passenger side for van parking spaces. Van parking spaces shall be permitted to be 9'x18' minimum where the access aisle is 8'x18' minimum.
 - Access aisles shall be marked by a blue painted borderline around their perimeter. The area within the blue borderlines shall be marked with hatched lines a maximum of 36" on center in a color contrasting with that of the aisle surface, preferably blue or white. Access aisle markings may extend beyond the minimum required length. **CBC Section 11B-502.3.3**
 - Access aisles (accessible parking spaces as well similar application) shall not overlap the vehicular way. CBC Section 11B-502.3.4

• A vertical clearance of 8'-2" minimum shall be provided for accessible parking spaces, access aisles, and vehicular routes serving them. **CBC Section 11B-502.5**

3.3 DEFECTIVE WORK

A. Remove any paint which demonstrates evidence of checking, cracking, peeling, discoloration, lack of bonding or poor coverage. Misplaced lines shall be completely removed by paint remover or sandblasting. Painting over misplaced lines will not be permitted. Conform to Section 310.5.6.3, SSPWC.

END OF SECTION