PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
A. Asphalt paving which meets the certification goals as established by the Victor Valley Community College District (VVCCD) Program for the individual Project requirements, of the following types.
B. Section Includes:
   1. Cold milling of existing asphalt pavement.
   2. Hot-mix asphalt patching.
   3. Hot-mix asphalt paving.
   4. Asphalt surface treatments.
C. Related Requirements:
   1. Section 024119 "Selective Demolition" for demolition and removal of existing asphalt pavement.
   2. Section 310000 "Earth Moving" for subgrade preparation, fill material, unbound-aggregate subbase and base courses, and aggregate pavement shoulders.
   3. Section 321373 "Concrete Paving Joint Sealants" for joint sealants and fillers at pavement terminations.
   4. Section 321723: “Pavement Marking” for painting of asphalt paving.
   5. Section 321236: “Seal Coats” for sealing of new or existing asphalt paving.

1.3 ACTION SUBMITTALS
A. Product Data: For each type of product.
   1. Include technical data and tested physical and performance properties.
   2. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.
   3. The CONTRACTOR shall formulate a job-mix formula using the Hveem method in accordance with SSPWC Section 203-6.2 and submit it to the ENGINEER for approval. The resultant mixture shall have Hveem properties conforming to Standard Specifications Section 203-6.4.3.
B. LEED Submittals:
1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content. Include statement indicating cost for each product having recycled content.

C. Samples for Verification: For the following product, in manufacturer's standard sizes unless otherwise indicated:

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer.

B. Material Certificates: For each paving material. Include statement that mixes containing recycled materials will perform equal to mixes produced from all new materials.

C. Material Test Reports: For each paving material, by a qualified testing agency.

D. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by authorities having jurisdiction or the DOT of state in which Project is located.


C. The Owners’s inspector shall test the temperature of each batch of asphaltic concrete prior to placement. At the time of delivery to the work site, the temperature of mixture shall not be lower than 260 degrees F or higher than 320 degrees F, the lower limit to be approached in warm weather and the higher in cold weather. If asphaltic concrete temperature is not with these tolerances the affected batch shall be rejected.

D. Comply with the requirements of Specification Section 01 71 23 – “Construction Surveying”.

E. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated.

1.6 ENVIRONMENTAL LIMITATIONS

A. Do not apply asphalt material if substrate is wet or excessively damp or if the following conditions are not met:

PART 2 - PRODUCTS

2.1 AGGREGATES

A. Base Course Material: Crushed base material shall consist of materials that meet the provisions of the SSPWC.
1. Crushed Aggregate Base (CAB) per Section 200-2.2, ¾” maximum of the SSPWC (Green Book).
2. Crushed Miscellaneous Base (CMB) per Section 200-2.4, fine Sieve, of the SSPWC (Green Book).
3. Prior to import, Contractor shall submit written certification to the Owner’s Construction Manager that Crushed Miscellaneous Base (CMB) does not contain Poly Chlorinated biphenyls (PCB) above laboratory detection limits when testing in accordance with EPA Method 8082.
4. Crushed aggregate base (CAB) shall consist of native rock without naturally occurring asbestos or recycled materials.

B. General: Use materials and gradations that have performed satisfactorily in previous installations.


D. Fine Aggregate: ASTM D 1073 or AASHTO M 29, sharp-edged natural sand or sand prepared from stone, gravel, or combinations thereof.

2.2 ASPHALT SURFACING MATERIALS

A. Asphalt Surfacing Materials: Furnish asphalt surfacing meeting the following requirement, furnished from a commercial asphalt central mixing plant.


D. Emulsified Asphalt Prime Coat: ASTM D 977 or AASHTO M 140 emulsified asphalt, or ASTM D 2397 or AASHTO M 208 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

E. Tack Coat: ASTM D 977 or AASHTO M 140 emulsified asphalt, or ASTM D 2397 or AASHTO M 208 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

F. Fog Seal: ASTM D 977 or AASHTO M 140 emulsified asphalt, or ASTM D 2397 or AASHTO M 208 cationic emulsified asphalt, slow setting, factory diluted in water, of suitable grade and consistency for application.

G. Water: Potable.


2.3 AUXILIARY MATERIALS

A. Recycled Materials for Hot-Mix Asphalt Mixes: Reclaimed asphalt pavement; reclaimed, unbound-aggregate base material; and recycled tires, asphalt shingles or glass from sources and
gradations that have performed satisfactorily in previous installations, equal to performance of required hot-mix asphalt paving produced from all new materials.

B. Herbicide: Commercial chemical for weed control, registered by the EPA, and not classified as "restricted use" for locations and conditions of application. Provide in granular, liquid, or wettable powder form.

C. Sand: ASTM D 1073 or AASHTO M 29, Grade No. 2 or No. 3.

D. Joint Sealant: ASTM D 6690 or AASHTO M 324, Type I Type II or III Type IV, hot-applied, single-component, polymer-modified bituminous sealant.

2.4 MIXES

A. Recycled Content of Hot-Mix Asphalt: Postconsumer recycled content plus one-half of pre-consumer recycled content not less than 10 or 20 or 40 percent or more than 15 or 25 or 50 percent by weight.

PART 3 - EXECUTION

CONSTRUCTION WASTE MANAGEMENT

A. Manage construction waste in accordance with provisions of Section 01 74 19 Construction Waste Management and Disposal. Submit documentation to satisfy the requirements of that Section.
   1. Set aside scrap material to be returned to manufacturer for recycling into new product.

END OF SECTION 321216
SECTION 321217 – SEAL COAT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Seal coat which meets the certification goals as established by the Victor Valley Community College District (VVCCD) Program for the individual Project requirements, of the following types.

B. Section Includes:
   1. Surface sealer over asphalt paved surfaces.

C. Related Requirements:
   1. Section 321723 “Pavement Marking” for painting of striping on top of sealer.
   2. Section 321216 “Asphalt Paving” asphalt surface installation.

1.3 REFERENCES

A. The work provided herein shall conform to and be in accordance with the Contract Plans, General Conditions/Specifications for Public Works Construction (“GREENBOOK”), 2009 Edition, adopted by the Southern California Chapter, American Public Works Association: herein referred to as the “Standard Specifications”. In case of conflict between the “Standard Specification”, the General Conditions/Specifications and these Special Provisions, the General Conditions/Specification and these Special provisions shall have precedence. Copies of the Standard Specifications may be obtained at the BNI Building News, 1612 S. Clementine Street, Anaheim, CA. 92802, phone 1-888-264-7483 or available on the internet at: http://www.bnibooks.com/

1.4 ACTION SUBMITTALS

A. Product Data: Submit manufacturer’s project information and application procedures for bituminous surfacing.
   1. Job Mix Designs: For each job mix proposed for the Work.

B. LEED Submittals:
   1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content. Include statement indicating cost for each product having recycled content.
1.5 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each paving material.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by authorities having jurisdiction or the DOT of state in which Project is located. Comply with the following as a minimum requirement: Standard Specifications Section 203-9, “SEALCOAT-ASPHALT BASED”

B. Obtain materials from same source throughout.

C. Review and resolve conflicts involving requirements of specifications. Record discussions and furnish copies to all attendees.

D. Beginning of Work means Contractor accepts all conditions.

E. Agitate bulk materials during transport

1.7 REGULATORY REQUIREMENTS

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: Comply with local air quality management district regulations for emissions maximums.

B. Maintain control of vehicular and pedestrian traffic during seal coating operation as required for other construction activities and in accordance with local traffic authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Seal Coat: The materials for sealcoat shall conform to Section 203-9-“Sealcoat-Asphalt Based” of the Standard Specifications. Before incorporation in the Work, the Contractor shall submit a 2L (2 quart) sample of undiluted seal coat at no cost to the Owner.

1. Seal Coat: Provide one of the following surface seals:
   a. Vulcan Materials Company: GuardTop
   b. Diversified Asphalt Product: Over Kote
   c. Western Colloid Products: Park Top
   d. Asphalt Coating Engineering: Sure Seal
   e. SealMaster Pavement Products: MasterSeal
PART 3 - EXECUTION

3.1 CONSTRUCTION WASTE MANAGEMENT

A. Manage construction waste in accordance with provisions of Section 01 74 19 Construction Waste Management and Disposal. Submit documentation to satisfy the requirements of that Section.
   1. Set aside scrap material to be returned to manufacturer for recycling into new product.

END OF SECTION 321216
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Concrete paving which meets the certification goals as established by the Victor Valley Community College District (VVCCD) Program for the individual Project requirements, of the following types.

B. Section Includes:
   1. Driveways.
   2. Parking lots.
   3. Curbs and gutters.
   4. Walks.

C. Related Sections:
   1. Section 033000 "Cast-in-Place Concrete" for general building applications of concrete.
   2. Section 321373 "Concrete Paving Joint Sealants" for joint sealants in expansion and contraction joints within concrete paving and in joints between concrete paving and asphalt paving or adjacent construction.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other Pozzolans, and ground granulated blast-furnace slag.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. LEED Submittals:
   1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content. Include statement indicating cost for each product having recycled content.
   2. Design Mixtures for Credit ID 1: For each concrete mixture containing fly ash as a replacement for portland cement or other portland cement replacements. For each design
mixture submitted, include an equivalent concrete mixture that does not contain portland cement replacements, to determine amount of portland cement replaced.

C. Shop Drawings: Indicate pavement markings, lane separations, and defined parking spaces. Indicate, with international symbol of accessibility, spaces allocated for people with disabilities.

D. Samples for Verification: For each type of product or exposed finish, prepared as Samples of size indicated below:

1. Exposed Aggregate: 1-lb Sample of each mix.
2. Wheel Stops: 6 inches long showing cross section; with fasteners.

E. Other Action Submittals:

1. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified ready-mix concrete manufacturer and testing agency.

B. Material Certificates: For the following, from manufacturer:

1. Cementitious materials.
2. Steel reinforcement and reinforcement accessories.
3. Fiber reinforcement.
4. Admixtures.
5. Curing compounds.
7. Bonding agent or epoxy adhesive.
8. Joint fillers.

C. Material Test Reports: For each of the following:

1. Aggregates. Include service-record data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.

D. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Detectable Warning Installer Qualifications: An employer of workers trained and approved by manufacturer of stamped concrete paving systems.

B. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" (Quality Control Manual - Section 3, "Plant Certification Checklist").

C. Testing Agency Qualifications: Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

D. Concrete Testing Service: Engage a qualified testing agency to perform material evaluation tests and to design concrete mixtures.

E. ACI Publications: Comply with ACI 301 unless otherwise indicated.

PART 2 - PRODUCTS

2.1 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.2 STEEL REINFORCEMENT

A. Recycled Content: Postconsumer recycled content plus one-half of pre-consumer recycled content not less than 25 percent.

B. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, fabricated from as-drawn or galvanized steel wire into flat sheets.


E. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.

F. Galvanized Reinforcing Bars: ASTM A 767/A 767M, Class II zinc coated, hot-dip galvanized after fabrication and bending; with ASTM A 615/A 615M, Grade 60 deformed bars.

G. Epoxy-Coated Reinforcing Bars: ASTM A 775/A 775M or ASTM A 934/A 934M; with ASTM A 615/A 615M, Grade 60 deformed bars.

H. Steel Bar Mats: ASTM A 184/A 184M; with ASTM A 615/A 615M, Grade 60, deformed bars; assembled with clips.
I. Plain-Steel Wire: ASTM A 82/A 82M, as drawn galvanized.

J. Deformed-Steel Wire: ASTM A 496/A 496M.

K. Epoxy-Coated-Steel Wire: ASTM A 884/A 884M, Class A coated, plain deformed.

L. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 plain-steel bars; zinc coated (galvanized) after fabrication according to ASTM A 767/A 767M, Class I coating. Cut bars true to length with ends square and free of burrs.

M. Epoxy-Coated, Joint Dowel Bars: ASTM A 775/A 775M; with ASTM A 615/A 615M, Grade 60, plain-steel bars.

N. Tie Bars: ASTM A 615/A 615M, Grade 60, deformed.

O. Hook Bolts: ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6), internally and externally threaded. Design hook-bolt joint assembly to hold coupling against paving form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.

P. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

Q. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating, compatible with epoxy coating on reinforcement.


2.3 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of same type, brand, and source throughout Project:

B. Normal-Weight Aggregates: ASTM C 33, Class 4S, Class 4M, Class 1N, uniformly graded. Provide aggregates from a single source with documented service-record data of at least 10 years' satisfactory service in similar paving applications and service conditions using similar aggregates and cementitious materials.

C. Exposed Aggregate: Selected, hard, and durable; washed; free of materials with deleterious reactivity to cement or that cause staining; from a single source, with gap-graded coarse aggregate as follows:

D. Water: Potable and complying with ASTM C 94/C 94M.

F. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

G. Color Pigment: ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.

2.4 FIBER REINFORCEMENT

A. Synthetic Fiber: Monofilament or fibrillated polypropylene fibers engineered and designed for use in concrete paving, complying with ASTM C 1116/C 1116M, Type III, 1/2 to 1-1/2 inches (13 to 38 mm) long.

2.5 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) dry or cotton mats.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

F. White, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 2, Class B, dissipating.

2.6 RELATED MATERIALS

A. Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork in preformed strips.

B. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery aggregate containing not less
than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.

C. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

D. Epoxy Bonding Adhesive: ASTM C 881/C 881M, two-component epoxy resin capable of humid curing and bonding to damp surfaces; of class suitable for application temperature, of grade complying with requirements, and of the following types:

E. Chemical Surface Retarder: Water-soluble, liquid, set retarder with color dye, for horizontal concrete surface application, capable of temporarily delaying final hardening of concrete to a depth of 1/8 to 1/4 inch (3 to 6 mm).

F. Pigmented Mineral Dry-Shake Hardener: Factory-packaged, dry combination of portland cement, graded quartz aggregate, color pigments, and plasticizing admixture. Use color pigments that are finely ground, nonfading mineral oxides interground with cement.

G. Rock Salt: Sodium chloride crystals, kiln dried, coarse gradation with 100 percent passing 3/8-inch (9.5-mm) sieve and 85 percent retained on a No. 8 (2.36-mm) sieve.

2.7 DETECTABLE WARNING MATERIALS

A. Detectable Warning Stamp: Semirigid polyurethane mats with formed underside capable of imprinting detectable warning pattern on plastic concrete; perforated with a vent hole at each dome. Polyurethane mat shall conform to current T24 requirements.

1. Retain subparagraph below if required; revise to suit Project.

2. Size of Stamp: One piece 24 by 36 inches or 24 by 48 inches.

B. Liquid Release Agent: Manufacturer's standard, clear, evaporating formulation designed to facilitate release of stamp mats.

2.8 PAVEMENT MARKINGS

A. Pavement-Marking Paint: Alkyd-resin type, lead and chromate free, ready mixed, complying with AASHTO M 248, Type N or Type F or Type S; colors complying with FS TT-P-1952.

B. Pavement-Marking Paint: MPI #32 Alkyd Traffic Marking Paint.

C. Pavement-Marking Paint: Latex, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952, Type II, with drying time of less than three hours 45 minutes.


E. Glass Beads: AASHTO M 247, Type 1 or FS TT-B-1325, Type 1A.
2.9 WHEEL STOPS

A. Wheel Stops: Precast, air-entrained concrete, 2500-psi minimum compressive strength, 4-1/2 inches high by 9 inches wide by 48 inches long. Provide chamfered corners and drainage slots on underside and holes for anchoring to substrate.

2.10 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301 (ACI 301M), for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.

B. Proportion mixtures to provide normal-weight concrete with the following properties:

C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:

D. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 or 0.30 percent by weight of cement.

E. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

F. Cementitious Materials: Use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent. Limit percentage, by weight, of cementitious materials other than portland cement.

G. Synthetic Fiber: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than 1.0 lb/cu. yd. (0.60 kg/cu. m) or 1.5 lb/cu. yd. (0.90 kg/cu. m).

2.11 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M and ASTM C 1116. Furnish batch certificates for each batch discharged and used in the Work.

PART 3 - EXECUTION

3.1 CONSTRUCTION WASTE MANAGEMENT

A. Manage construction waste in accordance with provisions of Section 01 74 19 Construction Waste Management and Disposal. Submit documentation to satisfy the requirements of that Section.

END OF SECTION 321313
SECTION 321373 - CONCRETE PAVING JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Concrete paving joint sealants which meets the certification goals as established by the Victor Valley Community College District (VVCCD) Program for the individual Project requirements, of the following types.

B. Section Includes:
   1. Cold-applied joint sealants.
   2. Hot-applied joint sealants.
   3. Cold-applied, fuel-resistant joint sealants.
   5. Joint-sealant backer materials.
   6. Primers.

C. Related Requirements:
   1. Section 079200 "Joint Sealants" for sealing non-traffic and traffic joints in locations not specified in this Section.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

C. Paving-Joint-Sealant Schedule: Include the following information:
   1. Joint-sealant application, joint location, and designation.
   2. Joint-sealant manufacturer and product name.
1.4 INFORMATIONAL SUBMITTALS
   A. Qualification Data: For Installer
   B. Product Certificates: For each type of joint sealant and accessory.

1.5 QUALITY ASSURANCE
   A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
   B. Product Testing: Test joint sealants using a qualified testing agency.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL
   A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

2.2 COLD-APPLIED JOINT SEALANTS
   A. Single-Component, Nonsag, Silicone Joint Sealant: ASTM D 5893/D 5893M, Type NS.
   B. Single-Component, Self-Leveling, Silicone Joint Sealant: ASTM D 5893/D 5893M, Type SL.
   C. Multicomponent, Nonsag, Urethane, Elastomeric Joint Sealant: ASTM C 920, Type M, Grade NS, Class 25, for Use T.
   D. Single Component, Pourable, Urethane, Elastomeric Joint Sealant: ASTM C 920, Type S, Grade P, Class 25, for Use T.
   E. Multicomponent, Pourable, Urethane, Elastomeric Joint Sealant: ASTM C 920, Type M, Grade P, Class 25, for Use T.

2.3 HOT-APPLIED JOINT SEALANTS
   B. Hot-Applied, Single-Component Joint Sealant: ASTM D 6690, Type I or Type II.
   C. Hot-Applied, Single-Component Joint Sealant: ASTM D 6690, Type I, II, or III.
   D. Hot-Applied, Single-Component Joint Sealant: ASTM D 6690, Type IV.
2.4 COLD-APPLIED, FUEL-RESISTANT JOINT SEALANTS
A. Fuel-Resistant, Single-Component, Pourable, Modified-Urethane, Elastomeric Joint Sealant: ASTM C 920, Type S, Grade P, Class 25, for Use T.
B. Fuel-Resistant, Multicomponent, Pourable, Modified-Urethane, Elastomeric Joint Sealant: ASTM C 920, Type M, Grade P, Class 12-1/2 or 25, for Use T.

2.5 HOT-APPLIED, FUEL-RESISTANT JOINT SEALANTS
A. Hot-Applied, Fuel-Resistant, Single-Component Joint Sealants: ASTM D 7116, Type I or Type II.

2.6 JOINT-SEALANT BACKER MATERIALS
A. Joint-Sealant Backer Materials: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by joint-sealant manufacturer, based on field experience and laboratory testing.
B. Round Backer Rods for Cold- and Hot-Applied Joint Sealants: ASTM D 5249, Type 1, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.
C. Round Backer Rods for Cold-Applied Joint Sealants: ASTM D 5249, Type 3, of diameter and density required to control joint-sealant depth and prevent bottom-side adhesion of sealant.
D. Backer Strips for Cold- and Hot-Applied Joint Sealants: ASTM D 5249; Type 2; of thickness and width required to control joint-sealant depth, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.

2.7 PRIMERS
A. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated.

PART 3 - EXECUTION

3.1 CONSTRUCTION WASTE MANAGEMENT
A. Manage construction waste in accordance with provisions of Section 01 74 19 Construction Waste Management and Disposal. Submit documentation to satisfy the requirements of that Section.
1. Set aside scrap material to be returned to manufacturer for recycling into new product.
END OF SECTION 321373
SECTION 321713 - PARKING BUMPERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Parking bumpers which meet the certification goals as established by the Victor Valley Community College District (VVCCD) Program for the individual Project requirements, of the following types.

B. Section includes wheel stops.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. LEED Submittals:

1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content. Include statement indicating cost for each product having recycled content.

PART 2 - PRODUCTS

2.1 PARKING BUMPERS

A. Concrete Wheel Stops: Precast, steel-reinforced, air-entrained concrete, 4000-psi (27.6-MPa) minimum compressive strength, 4-1/2 inches (115 mm) high by 9 inches (225 mm) wide by 48 inches (1800 mm) long. Provide chamfered corners, transverse drainage slots on underside, and a minimum of two factory-formed or -drilled vertical holes through wheel stop for anchoring to substrate.
PART 3 - EXECUTION

3.1 CONSTRUCTION WASTE MANAGEMENT

A. Manage construction waste in accordance with provisions of Section 01 74 19 Construction Waste Management and Disposal. Submit documentation to satisfy the requirements of that Section.
   1. Set aside scrap material to be returned to manufacturer for recycling into new product.

END OF SECTION 321713
SECTION 321723 - PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. Pavement Marking which meets the certification goals as established by the Victor Valley Community College District (VVCCD) Program for the individual Project requirements, of the following types.
   B. Section includes painted markings applied to asphalt and concrete pavement.

1.3 ACTION SUBMITTALS
   A. Product Data: For each type of product.
      1. Include technical data and tested physical and performance properties.
   B. LEED Submittals:
      1. Product Data for Credit IEQ 4.2: For interior, field-applied, pavement-marking paints, documentation including printed statement of VOC content.
   C. Shop Drawings: For pavement markings.
      1. Indicate pavement markings, colors, lane separations, defined parking spaces, and dimensions to adjacent work.
      2. Indicate, with international symbol of accessibility, spaces allocated for people with disabilities.
   D. Samples: For each exposed product and for each color and texture specified; on rigid backing, 8 inches (200 mm) square.

PART 2 - PRODUCTS

2.1 PAVEMENT-MARKING PAINT
   A. Pavement-Marking Paint: MPI #32, alkyd traffic-marking paint.
   B. Glass Beads: AASHTO M 247, Type 1 made of 100 percent recycled glass.
C. VOC Content: Pavement markings used on building interior shall have a VOC content of 150 g/L or less.

D. Handicapped Symbol Background Paint: Blue Color. Glidden Co.”Glid-Guard Lifemaster Finish No. 5200.series, Color 1/M 79”, or approved equivalent.

E. Thermoplastic Stripes and Markings:

F. Tactile warning lines shall be in conformance to CBC Section 1133B.8.3 and 1133B.8.4.

2.2 APPLICATION

A. Preparation:
   1. Clean and prepare surfaces to receive traffic paint in accordance with Caltrans Standard Specification Section 84-3.05 and these special provisions. Where required, remove existing striping and markings by wet blasting or equivalent method. Do not use dry sandblasting or other dust producing methods.

B. Traffic Paint:
   1. Traffic paint shall be machine applied in accordance with Caltrans Standard Specification Section 84-3.04.

C. Striping Layout:
   1. Traffic stripe shall be single and double, solid and broker, and of the color to match existing conditions.
   2. Traffic striping shall be placed in patterns to match existing conditions, contractor shall document.

D. Apply marking paint in accordance with approved manufacturer’s recommendations.

E. Density of paint coverage shall hide color and texture of substrate.

F. Parking Stripes: Paint four inches wide unless otherwise noted.

G. Symbol Marking: Paint to match existing conditions.

PART 3 - EXECUTION

3.1 CONSTRUCTION WASTE MANAGEMENT

A. Manage construction waste in accordance with provisions of Section 01 74 19 Construction Waste Management and Disposal. Submit documentation to satisfy the requirements of that Section.
   1. Set aside scrap material to be returned to manufacturer for recycling into new product.
SECTION 328400 - PLANTING IRRIGATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Planting irrigation which meets the certification goals as established by the Victor Valley Community College District (VVCCD) Program for the individual Project requirements, of the following types.

B. Section Includes:

1. Piping.
2. Encasement for piping.
4. Pressure-reducing valves.
5. Automatic control valves.
6. Automatic drain valves.
7. Transition fittings.
8. Dielectric fittings.
9. Miscellaneous piping specialties.
10. Sprinklers.
11. Quick couplers.
12. Drip irrigation specialties.
13. Controllers.

1.3 DEFINITIONS

A. Circuit Piping: Downstream from control valves to sprinklers, specialties, and drain valves. Piping is under pressure during flow.

B. Drain Piping: Downstream from circuit-piping drain valves. Piping is not under pressure.

C. Main Piping: Downstream from point of connection to water distribution piping to, and including, control valves. Piping is under water-distribution-system pressure.

D. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling power-limited circuits.
1.4 PERFORMANCE REQUIREMENTS

A. Irrigation zone control shall be automatic operation with controller and automatic control valves.

B. Location of Sprinklers and Specialties: Design location is approximate. Make minor adjustments necessary to avoid plantings and obstructions such as signs and light standards. Maintain 100 percent irrigation coverage of areas indicated.

C. Delegated Design: Design 100 percent coverage irrigation system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

D. Minimum Working Pressures: The following are minimum pressure requirements for piping, valves, and specialties unless otherwise indicated:

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

B. Wiring Diagrams: For power, signal, and control wiring.

C. Delegated-Design Submittal: For irrigation systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.6 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Irrigation systems, drawn to scale, on which components are shown and coordinated with each other, using input from Installers of the items involved. Also include adjustments necessary to avoid plantings and obstructions such as signs and light standards.

B. Qualification Data: For qualified Installer.

C. Zoning Chart: Show each irrigation zone and its control valve.

D. Controller Timing Schedule: Indicate timing settings for each automatic controller zone.

E. Field quality-control reports.

1.7 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For sprinklers controllers and automatic control valves to include in operation and maintenance manuals.
1.8 QUALITY ASSURANCE

A. Electrical Components, Devices Installer Qualifications: An employer of workers that include a certified irrigation designer qualified by The Irrigation Association, Professional Class member of the American Society of Irrigation Consultants, Professional Technical Class member of the American Society of Irrigation Consultants.

B. , and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

PART 2 - PRODUCTS

2.1 PIPES, TUBES, AND FITTINGS

A. Comply with requirements in the piping schedule for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.

B. Galvanized-Steel Pipe: ASTM A 53/A 53M, Standard Weight, Type E, Grade B.

C. Ductile-Iron Pipe with Mechanical Joints: AWWA C151, with mechanical-joint bell and spigot ends.

D. Ductile-Iron Pipe with Push-on Joint: AWWA C151, with push-on-joint bell and spigot ends.

E. Soft Copper Tube: ASTM B 88, Type L (ASTM B 88M, Type B), water tube, annealed temper.

F. Hard Copper Tube: ASTM B 88, Type L (ASTM B 88M, Type B), and ASTM B 88, Type M (ASTM B 88M, Type C), water tube, drawn temper.

G. PE Pipe with Controlled ID: ASTM F 771, PE 3408 compound; SIDR 11.5 and SIDR 15.

H. PE Pipe with Controlled OD: ASTM F 771, PE 3408 compound, SDR 11.

I. PE Pressure Pipe: AWWA C906, with DR of 7.3, 9, or 9.3 and PE compound number required to give pressure rating not less than 160 psig (1100 kPa) or 200 psig (1380 kPa).

J. PVC Pipe: ASTM D 1785, PVC 1120 compound, Schedule 40 or Schedule 80 or Schedules 40 and 80.


2.2 PIPING JOINING MATERIALS

A. Pipe-Flange Gasket Materials: AWWA C110, rubber, flat face, 1/8 inch (3.2 mm) thick unless otherwise indicated; full-face or ring type unless otherwise indicated.

B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.
C. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.

D. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

E. Solvent Cements for Joining PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

F. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.

2.3 ENCASEMENT FOR PIPING

A. Standard: ASTM A 674 or AWWA C105.

2.4 MANUAL VALVES

A. Curb Valves:
   1. Description: Standard: AWWA C800.

B. Curb-Valve Casing:
   1. Standard: Similar to AWWA M44 for cast-iron valve casings.

C. Shutoff Rods for Curb-Valve Casings: Furnish steel, tee-handle shutoff rod(s) with one pointed end, stem of length to operate deepest buried valve, and slotted end matching curb valve for Project.

D. Brass Ball Valves:
   1. Description: Standard: MSS SP-110.

E. Bronze Ball Valves:
   1. Description: Standard: MSS SP-110.

F. Iron Ball Valves:
   1. Description: Standard: MSS SP-72

G. Plastic Ball Valves:
   1. Description: Standard: MSS SP-122.

H. Bronze Gate Valves:
   1. Description: Standard: MSS SP-80, Type 2.
I. Iron Gate Valves, Resilient Seated:
   1. Description: Standard: AWWA C509.

J. Iron Gate Valve Casings:

K. Operating Wrenches for Iron Gate Valve Casings: Furnish steel, tee-handle operating wrench(es) with one pointed end, stem of length to operate deepest buried valve, and socket matching valve operating nut for Project.

L. Iron Gate Valves, NRS:
   1. Description: Standard: MSS SP-70, Type I.

M. Iron Gate Valves, OS&Y:
   1. Description: Standard: MSS SP-70, Type I.

2.5 PRESSURE-REDUCING VALVES

A. Water Regulators:
   1. Description: Standard: ASSE 1003.

B. Water Control Valves:
   1. Description: Pilot-operation, diaphragm-type, single-seated main water control valve. Include small pilot control valve, restrictor device, specialty fittings, and sensor piping.

2.6 AUTOMATIC CONTROL VALVES

A. Bronze, Automatic Control Valves:
   1. Description: Cast-bronze body, normally closed, diaphragm type with manual-flow adjustment, and operated by 24-V ac solenoid.

B. Plastic, Automatic Control Valves:
   1. Description: Molded-plastic body, normally closed, diaphragm type with manual-flow adjustment, and operated by 24-V ac solenoid.

2.7 AUTOMATIC DRAIN VALVES

A. Description: Spring-loaded-ball type of corrosion-resistant construction and designed to open for drainage if line pressure drops below 2-1/2 to 3 psig (17 to 20 kPa).
2.8 TRANSITION FITTINGS

A. General Requirements: Same size as, and with pressure rating at least equal to and with ends compatible with, piping to be joined.

B. Transition Couplings:
   1. Description: AWWA C219, metal sleeve-type coupling for underground pressure piping.

C. Plastic-to-Metal Transition Fittings:
   1. Description: PVC one-piece fitting with manufacturer's Schedule 80 equivalent dimensions; one end with threaded brass insert, and one solvent-cement-socket or threaded end.

D. Plastic-to-Metal Transition Unions:
   1. Description: MSS SP-107, PVC four-part union. Include one brass or stainless-steel threaded end, one solvent-cement-joint or threaded plastic end, rubber O-ring, and union nut.

2.9 DIELECTRIC FITTINGS

A. General Requirements: Assembly of copper alloy and ferrous materials or ferrous material body with separating nonconductive insulating material suitable for system fluid, pressure, and temperature.

B. Dielectric Unions:
   1. Description: Factory-fabricated union, NPS 2 (DN 50) and smaller.

C. Dielectric Flanges:
   1. Description: Factory-fabricated, bolted, companion-flange assembly, NPS 2-1/2 to NPS 4 (DN 65 to DN 100) and larger.

D. Dielectric-Flange Kits:
   1. Description: Nonconducting materials for field assembly of companion flanges, NPS 2-1/2 (DN 65) and larger.

E. Dielectric Couplings:
   1. Description: Galvanized-steel coupling.

F. Dielectric Nipples:
   1. Description: Electroplated steel nipple complying with ASTM F 1545.
2.10 MISCELLANEOUS PIPING SPECIALTIES
   A. Water Hammer Arresters: ASSE 1010 or PDI WH 201.
   B. Pressure Gages: ASME B40.1.

2.11 SPRINKLERS
   A. General Requirements: Designed for uniform coverage over entire spray area indicated at available water pressure.

2.12 QUICK COUPLERS
   A. Description: Factory-fabricated, bronze or brass, two-piece assembly. Include coupler water-seal valve; removable upper body with spring-loaded or weighted, rubber-covered cap; hose swivel with ASME B1.20.7, 3/4-11.5NH threads for garden hose on outlet; and operating key.

2.13 DRIP IRRIGATION SPECIALTIES
   A. Freestanding Emitters: Device to deliver water at approximately 20 psig (138 kPa).
      1. Body Material: PE or vinyl, with flow control.
   B. Manifold Emitter Systems: Manifold with tubing and emitters.
      1. Manifold: With multiple outlets to deliver water to emitters.
   C. Multiple-Outlet Emitter Systems: Emitter with tubing and button-type outlets.
      1. Emitter: With multiple outlets to deliver water to remote outlets.
   D. Drip Tubes with Direct-Attached Emitters:
      1. Tubing: Flexible PE or PVC with plugged end.
   E. Drip Tubes with Remote Discharge:
      1. Tubing: Flexible PE or PVC with plugged end.
   F. Off-Ground Supports: Plastic stakes.
   G. Application Pressure Regulators: Brass or plastic housing, NPS 3/4 (DN 20), with corrosion-resistant internal parts; capable of controlling outlet pressure to approximately 20 psig (138 kPa).
   H. Filter Units: Brass or plastic housing, with corrosion-resistant internal parts; of size and capacity required for devices downstream from unit.
   I. Air Relief Valves: Brass or plastic housing, with corrosion-resistant internal parts.
J. Vacuum Relief Valves: Brass or plastic housing, with corrosion-resistant internal parts.

2.14 CONTROLLERS

A. Description:

1. Controller Stations for Automatic Control Valves: Each station is variable from approximately 5 to 60 minutes. Include switch for manual or automatic operation of each station.

2. Exterior Control Enclosures: NEMA 250, Type 4, weatherproof, with locking cover and two matching keys; include provision for grounding.

3. Interior Control Enclosures: NEMA 250, Type 12, drip proof, with locking cover and two matching keys.


5. Timing Device: Adjustable, 24-hour, 14-day clock, with automatic operations to skip operation any day in timer period, to operate every other day, or to operate two or more times daily.

6. Moisture Sensor: Adjustable from one to seven days, to shut off water flow during rain.

7. Wiring: UL 493, Type UF multiconductor, with solid-copper conductors; insulated cable; suitable for direct burial.

8. Concrete Base: Reinforced precast concrete not less than 36 by 24 by 4 inches (900 by 600 by 100 mm) thick, and 6 inches (150 mm) greater in each direction than overall dimensions of controller. Include opening for wiring.

2.15 BOXES FOR AUTOMATIC CONTROL VALVES

A. Plastic Boxes:

1. Description: Box and cover, with open bottom and openings for piping; designed for installing flush with grade.

B. Polymer-Concrete Boxes:

1. Description: Box and cover, with open bottom and openings for piping; designed for installing flush with grade.

C. Drainage Backfill: Cleaned gravel or crushed stone, graded from 3/4 inch (19 mm) minimum to 3 inches (75 mm) maximum.
PART 3 - EXECUTION

3.1 CONSTRUCTION WASTE MANAGEMENT

A. Manage construction waste in accordance with provisions of Section 01 74 19 Construction Waste Management and Disposal. Submit documentation to satisfy the requirements of that Section.
   1. Set aside scrap material to be returned to manufacturer for recycling into new product.

END OF SECTION 328400
SECTION 329113 - SOIL PREPARATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
A. Soil Preparation which meets the certification goals as established by the Victor Valley Community College District (VVCCD) Program for the individual Project requirements, of the following types.
B. Section includes planting soils and layered soil assemblies specified by composition of the mixes.
C. Related Requirements:
   1. Section 129300 "Site Furnishings" for placing planting soil in exterior unit planters.
   2. Section 311000 "Site Clearing" for topsoil stripping and stockpiling.
   3. Section 329300 "Plants" for placing planting soil for plantings.

1.3 DEFINITIONS
B. Backfill: The earth used to replace or the act of replacing earth in an excavation. This can be amended or unamended soil as indicated.
C. CEC: Cation exchange capacity.
D. Compost: The product resulting from the controlled biological decomposition of organic material that has been sanitized through the generation of heat and stabilized to the point that it is beneficial to plant growth.
E. Duff Layer: A surface layer of soil, typical of forested areas, that is composed of mostly decayed leaves, twigs, and detritus.
F. Imported Soil: Soil that is transported to Project site for use.
G. Layered Soil Assembly: A designed series of planting soils, layered on each other, that together produce an environment for plant growth.
H. Manufactured Soil: Soil produced by blending soils, sand, stabilized organic soil amendments, and other materials to produce planting soil.
I. NAPT: North American Proficiency Testing Program. An SSSA program to assist soil-, plant-, and water-testing laboratories through interlaboratory sample exchanges and statistical evaluation of analytical data.

J. Organic Matter: The total of organic materials in soil exclusive of undecayed plant and animal tissues, their partial decomposition products, and the soil biomass; also called "humus" or "soil organic matter."

K. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified as specified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.


M. SSSA: Soil Science Society of America.

N. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

O. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.

P. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil"; but in disturbed areas such as urban environments, the surface soil can be subsoil.


1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include recommendations for application and use.
2. Include test data substantiating that products comply with requirements.
3. Include sieve analyses for aggregate materials.
4. Material Certificates: For each type of imported soil and soil amendment and fertilizer before delivery to the site, according to the following:

   a. Manufacturer's qualified testing agency's certified analysis of standard products.
   b. Analysis of fertilizers, by a qualified testing agency, made according to AAPFCO methods for testing and labeling and according to AAPFCO's SUIP #25.
   c. Analysis of nonstandard materials, by a qualified testing agency, made according to SSSA methods, where applicable.

B. LEED Submittals:

1. Product Certificates for Credit MR 5: For products and materials required to comply with requirements for regional materials, certificates indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include
statement indicating distance to Project, cost for each regional material, and fraction by weight that is considered regional.

C. Samples: For each bulk-supplied material, 1-quart (1-L) or 1-gal. (4-L) volume of each in sealed containers labeled with content, source, and date obtained. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of composition, color, and texture.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For each testing agency.

B. Preconstruction Test Reports: For preconstruction soil analyses specified in "Preconstruction Testing" Article.

C. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent, state-operated, or university-operated laboratory; experienced in soil science, soil testing, and plant nutrition; with the experience and capability to conduct the testing indicated; and that specializes in types of tests to be performed.

1.7 SOIL-SAMPLING REQUIREMENTS

A. General: Extract soil samples according to requirements in this article.

B. Sample Collection and Labeling: Have samples taken and labeled by the direction of the testing agency.

1.8 TESTING REQUIREMENTS

A. General: Perform tests on soil samples according to requirements in this article.

B. Physical Testing:

1. Soil Texture: Soil-particle, size-distribution analysis by one of the following methods according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods":

   a. Sieving Method: Report sand-gradation percentages for very coarse, coarse, medium, fine, and very fine sand; and fragment-gradation (gravel) percentages for fine, medium, and coarse fragments; according to USDA sand and fragment sizes.


2. Total Porosity: Calculate using particle density and bulk density according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."

C. Chemical Testing:
   1. CEC: Analysis by sodium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 3- Chemical Methods."
   2. Clay Mineralogy: Analysis and estimated percentage of expandable clay minerals using CEC by ammonium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 1- Physical and Mineralogical Methods."
   3. Metals Hazardous to Human Health: Test for presence and quantities of RCRA metals including aluminum, arsenic, barium, copper, cadmium, chromium, cobalt, lead, lithium, and vanadium. If RCRA metals are present, include recommendations for corrective action.
   4. Phytotoxicity: Test for plant-available concentrations of phytotoxic minerals including aluminum, arsenic, barium, cadmium, chlorides, chromium, cobalt, copper, lead, lithium, mercury, nickel, selenium, silver, sodium, strontium, tin, titanium, vanadium, and zinc.

D. Fertility Testing: Soil-fertility analysis according to standard laboratory protocol of SSSA NAPT NCR-13 or SSSA NAPT NEC-67 or SSSA NAPT SERA-6] SSSA NAPT WERA-103.


F. Recommendations: Based on the test results, state recommendations for soil treatments and soil amendments to be incorporated to produce satisfactory planting soil suitable for healthy, viable plants indicated. Include, at a minimum, recommendations for nitrogen, phosphorous, and potassium fertilization, and for micronutrients.

PART 2 - PRODUCTS

2.1 MATERIALS
   A. Regional Materials: Imported soil or manufactured planting soil and soil amendments and fertilizers shall be manufactured within 500 miles (800 km) of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.

2.2 PLANTING SOILS SPECIFIED BY COMPOSITION
   A. General: Soil amendments, fertilizers, and rates of application specified in this article are guidelines that may need revision based on testing laboratory's recommendations after preconstruction soil analyses are performed.
B. Planting-Soil Type: Existing, on-site surface soil, with the duff layer, if any, retained; and stockpiled on-site; modified to produce viable planting soil. Blend existing, on-site surface soil with the following soil amendments and fertilizers in the following quantities to produce planting soil:

C. Planting-Soil Type: Imported, naturally formed soil from off-site sources and consisting of sandy loam, loam, silt loam, loamy sand or sand soil according to USDA textures; and modified to produce viable planting soil.

D. Planting-Soil Type: Manufactured soil consisting of manufacturer's basic topsoil, sandy loam according to USDA textures, blended in a manufacturing facility with sand, stabilized organic soil amendments, and other materials to produce viable planting soil.

2.3 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:

B. Sulfur: Granular, biodegradable, and containing a minimum of 90 percent elemental sulfur, with a minimum of 99 percent passing through a No. 6 (3.35-mm) sieve and a maximum of 10 percent passing through a No. 40 (0.425-mm) sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

D. Perlite: Horticultural perlite, soil amendment grade.

E. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through a No. 50 (0.30-mm) sieve.

F. Sand: Clean, washed, natural or manufactured, free of toxic materials, and according to ASTM C 33/C 33M.

2.4 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter produced by composting feedstock, and bearing USCC's "Seal of Testing Assurance," and as follows:

B. Sphagnum Peat: Partially decomposed sphagnum peat moss, finely divided or of granular texture with 100 percent passing through a 1/2-inch sieve, a pH of 3.4 to 4.8, and a soluble-salt content measured by electrical conductivity of maximum 5 dS/m.

C. Muck Peat: Partially decomposed moss peat, native peat, or reed-sedge peat, finely divided or of granular texture with 100 percent passing through a 1/2 inch sieve, a pH of 6 to 7.5, a soluble-salt content measured by electrical conductivity of maximum 5 dS/m, having a water-absorbing capacity of 1100 to 2000 percent, and containing no sand.

D. Wood Derivatives: Shredded and composted, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.
E. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, debris, and material harmful to plant growth.

2.5 FERTILIZERS

A. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 or 33 or 50 percent available phosphoric acid.

B. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

C. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

D. Chelated Iron: Commercial-grade FeEDDHA for dicots and woody plants, and commercial-grade FeDTPA for ornamental grasses and monocots.

PART 3 - EXECUTION

3.1 CONSTRUCTION WASTE MANAGEMENT

A. Manage construction waste in accordance with provisions of Section 01 74 19 Construction Waste Management and Disposal. Submit documentation to satisfy the requirements of that Section.

1. Set aside scrap material to be returned to manufacturer for recycling into new product.

END OF SECTION 329113
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Turf and grasses which meets the certification goals as established by the Victor Valley Community College District (VVCCD) Program for the individual Project requirements, of the following types.

B. Section Includes:

1. Seeding.
2. Hydroseeding.
4. Plugging.
5. Sprigging.
6. Meadow grasses and wildflowers.
7. Turf renovation.
8. Erosion-control material(s).

C. Related Requirements:

1. Section 329300 "Plants" for trees, shrubs, ground covers, and other plants as well as border edgings and mow strips.

1.3 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

C. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
D. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth. See Section 329113 "Soil Preparation and drawing designations for planting soils.

E. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For landscape Installer.

B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture, stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

1. Certification of each seed mixture for turfgrass sod or plugs. Include identification of source and name and telephone number of supplier.

C. Product Certificates: For fertilizers, from manufacturer.

D. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of turf and meadows during a calendar year. Submit before expiration of required maintenance periods.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful turf and meadow establishment.

1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.

2. Experience: Three years' experience in turf installation in addition to requirements in Section 014000 "Quality Requirements."

3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.

4. Personnel Certifications: Installer's personnel assigned to the Work shall have certification in one of the following categories from the Professional Landcare Network:

   a. Landscape Industry Certified Technician - Exterior.
   b. Landscape Industry Certified Lawncare Manager.
   c. Landscape Industry Certified Lawncare Technician.
5. Pesticide Applicator: State licensed, commercial.

PART 2 - PRODUCTS

2.1 SEED
   A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Rules for Testing Seeds" for purity and germination tolerances.

2.2 TURFGRASS SOD
   A. Turfgrass Sod: Number 1 Quality/Premium, including limitations on thatch, weeds, diseases, nematodes, and insects, complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture that is strongly rooted and capable of vigorous growth and development when planted.
   B. Turfgrass Species: Campus standard mix.
   C. Turfgrass Species: Sod of grass species as follows, with not less than 85 percent germination, not less than 95 percent pure seed, and not more than 0.5 percent weed seed:

2.3 PLUGS
   A. Plugs: Turfgrass sod, Certified, Approved, Number 1 Quality/Premium, including limitations on thatch, weeds, diseases, nematodes, and insects, complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture that is cut into square or round plugs, strongly rooted, and capable of vigorous growth and development when planted; of the following turfgrass species and plug size:

2.4 SPRIGS
   A. Sod Sprigs: Healthy living stems, rhizomes, or stolons with a minimum of two nodes and attached roots free of soil, of the following turfgrass species:

2.5 MEADOW GRASSES AND WILDFLOWERS
   A. Wildflower Seed: Fresh, clean, and dry new seed, of mixed species as follows:
   B. Native-Grass Seed: Fresh, clean, and dry new seed, of mixed species as follows:
   C. Wildflower and Native-Grass Seed: Fresh, clean, and dry new seed, of mixed species as follows:
   D. Seed Carrier: Inert material, sharp clean sand or perlite.

Victor Valley Community College District  TURF AND
New Science/Health Building  GRASSES
Outline Specifications  329200 - 3
2.6 FERTILIZERS

A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

B. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

2.7 MULCHES

A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.

B. Sphagnum Peat Mulch: Partially decomposed sphagnum peat moss, finely divided or of granular texture, and with a pH range of 3.4 to 4.8.

C. Muck Peat Mulch: Partially decomposed moss peat, native peat, or reed-sedge peat, finely divided or of granular texture, with a pH range of 6 to 7.5, and having a water-absorbing capacity of 1100 to 2000 percent, and containing no sand.

D. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch (25-mm) sieve; soluble salt content of 2 to 5 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

E. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic and free of plant-growth or germination inhibitors; with a maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.

F. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors.

G. Asphalt Emulsion: ASTM D 977, Grade SS-1; nontoxic and free of plant-growth or germination inhibitors.

2.8 PESTICIDES

A. General: Pesticide, registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Nonselective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.
2.9  EROSION-CONTROL MATERIALS

A. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh.

B. Erosion-Control Fiber Mesh: Biodegradable burlap or spun-coir mesh.

C. Erosion-Control Mats: Cellular, nonbiodegradable slope-stabilization mats designed to isolate and contain small areas of soil over steeply sloped surface.

2.10  GRASS-PAVING MATERIALS

A. Grass Paving: Cellular, nonbiodegradable plastic mats, designed to contain small areas of soil and enhance the ability of turf to support vehicular and pedestrian traffic.

B. Base Course: Sound crushed stone or gravel complying with ASTM D 448 for Size No. 8.

C. Sand: Sound, sharp, washed, natural sand or crushed stone complying with gradation requirements in ASTM C 33/C 33M for fine aggregate.

D. Proprietary Growing Mix: As submitted and acceptable to Architect.

E. Sandy Loam Soil Mix: Sound, sharp, washed, natural sand or crushed stone complying with gradation requirements in ASTM C 33/C 33M.

F. Soil for Paving Fill: Planting soil.

PART 3 - EXECUTION

3.1  CONSTRUCTION WASTE MANAGEMENT

A. Manage construction waste in accordance with provisions of Section 01 74 19 Construction Waste Management and Disposal. Submit documentation to satisfy the requirements of that Section.

1. Set aside scrap material to be returned to manufacturer for recycling into new product.

END OF SECTION 329200
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Planting which meets the certification goals as established by the Victor Valley Community College District (VVCCD) Program for the individual Project requirements, of the following types.

B. Section Includes:

1. Plants.
2. Tree stabilization.
3. Tree-watering devices.
4. Landscape edgings.
5. Tree grates.
6. Apply pre-emergent to planning areas as specified herein.
7. Fine grading
8. Soil preparation and fertilization.
9. Furnish trees, shrubs and ground covers
10. Stake and/or guy trees.
11. Attach vines as directed.
12. Plant new lawn (hydraulic seeding, sod or stolons).
13. Mulching
14. Furnish and install (metal landscape edging or redwood header).
15. Weed, inset and pest control
16. Protect, maintain and warranty as specified.
17. All work of every description mentioned in the specification and /or amendments thereof, and all other satisfactory completion of the work including clean-up of the site.

C. Related Requirements:
1. Section 329200 "Turf and Grasses" for turf (lawn) and meadow planting, hydroseeding, and erosion-control materials.

1.3 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with a ball size not less than sizes indicated; wrapped with burlap, tied, rigidly
supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.

C. Balled and Potted Stock: Plants dug with firm, natural balls of earth in which they are grown and placed, unbroken, in a container. Ball size is not less than sizes indicated.

D. Bare-Root Stock: Plants with a well-branched, fibrous-root system developed by transplanting or root pruning, with soil or growing medium removed, and with not less than the minimum root spread according to ANSI Z60.1 for type and size of plant required.

E. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.

F. Fabric Bag-Grown Stock: Healthy, vigorous, well-rooted plants established and grown in-ground in a porous fabric bag with well-established root system reaching sides of fabric bag. Fabric bag size is not less than diameter, depth, and volume required by ANSI Z60.1 for type and size of plant.

G. Finish Grade: Elevation of finished surface of planting soil.

H. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant. Some sources classify herbicides separately from pesticides.

I. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

J. Planting Area: Areas to be planted.

K. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

L. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.

M. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

N. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.

O. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.
1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.
   2. Plant Photographs: Include color photographs in digital and 3- by 5-inch (76- by 127-mm) print format of each required species and size of plant material as it will be furnished to Project. Take photographs from an angle depicting true size and condition of the typical plant to be furnished. Include a scale rod or other measuring device in each photograph. For species where more than 20 plants are required, include a minimum of three photographs showing the average plant, the best quality plant, and the worst quality plant to be furnished. Identify each photograph with the full scientific name of the plant, plant size, and name of the growing nursery.

B. Samples for Verification: For each of the following:
   1. Trees and Shrubs: Three Samples of each variety and size. Maintain approved Samples on-site as a standard for comparison.
   2. Organic Mulch: 1-pint (0.5-L) volume of each organic mulch required; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of color, texture, and organic makeup.
   3. Mineral Mulch: 2 lb (1.0 kg) of each mineral mulch required, in sealed plastic bags labeled with source of mulch. Sample shall be typical of the lot of material to be delivered and installed on-site; provide an accurate indication of color, texture, and makeup of the material.
   4. Weed Control Barrier: 12 by 12 inches (300 by 300 mm).
   5. Proprietary Root-Ball-Stabilization Device: One unit.
   6. Slow-Release, Tree-Watering Device: One unit of each size required.
   7. Edging Materials and Accessories: Manufacturer's standard size, to verify color selected.
   8. Tree Grates, Frames, and Accessories: Manufacturer's standard size, to verify design and color selected.
   9. Root Barrier: Width of panel by 12 inches (300 mm).

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of owners' contact persons.

B. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:
   1. Manufacturer's certified analysis of standard products.
   2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

C. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.
D. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before expiration of required maintenance periods.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful establishment of plants.

1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.

2. Experience: Three years' experience in landscape installation in addition to requirements in Section 014000 "Quality Requirements."

3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.

4. Personnel Certifications: Installer's personnel assigned to the Work shall have certification in all of the following categories from the Professional Landcare Network:

   a. Landscape Industry Certified Technician - Exterior.
   b. Landscape Industry Certified Interior.
   c. Landscape Industry Certified Horticultural Technician.

5. Pesticide Applicator: State licensed, commercial.

B. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.

1. Selection of plants purchased under allowances is made by Architect, who tags plants at their place of growth before they are prepared for transplanting.

C. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.

1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container-grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches (150 mm) above the root flare for trees up to 4-inch (100-mm) caliper size, and 12 inches (300 mm) above the root flare for larger sizes.

2. Other Plants: Measure with stems, petioles, and foliage in their normal position.

D. Plant Material Observation: Architect may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Architect may also observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and may reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.
1. Notify Architect of sources of planting materials seven days in advance of delivery to site.

E. Reference specifications and standards:
2. Standards established by the American Standard or Nursery Stock, ANSI Z60.1, latest edition as accepted by the American Association of Nurserymen.

F. Soils testing for planning areas shall be performed by an approved library. Tests shall be paid for by the Contractor.

G. The testing laboratory for soils analysis shall use the following criteria for soil testing:
1. USDA Agricultural Suitability test per Handbook-60.
2. University of California Soil Fertility test.
3. Interpretation, recommendations, and comments regarding these tests are required.

H. A soils analysis of existing on-site soils shall be required.
1. Take a minimum of six samples or one sample per 5,000 sf (whatever quantity is greater) of base soil after completion of rough grading in landscape areas as directed by the Owner.
2. Provide a chemical analysis report of each individual sample to cover the following:
   a. Percentage of organic matter.
   b. Salinity.
   c. pH.
   d. Lime content.
   e. Mineral nutrients, including concentrations of nitrogen, phosphorus, potassium, calcium, magnesium, iron, manganese, zinc, copper, sulfur, and molybdenum.
   f. Potential hazards of impediments to plant growth from salinity, sodium chloride, boron, impaired soil structure, or drainage.
3. Provide recommendations for organic materials, fertilizers, and other materials found necessary to amend base soil for optimum plant growth.
4. Prescribe a backfill mix, or mixes as appropriate to be applied in planting all plants for the project.

I. A soils analysis of import soil, raised planter mix, lightweight soil mix, and fir sawdust or organic amendment shall be required prior to backfill.
1. One quart of import soil, without specified amendments, shall be submitted for particle size, suitability and fertility analyses. Two quarts of the custom lightweight soil shall be submitted for organic analysis. Two quarts each of sphagnum peat moss, nitrogen stabilized fir sawdust, organic amendment, and fine sand for backfill mix and on-grade plantings shall be submitted for organic and particle size analyses. Do not mix.

J. The Contractor shall perform all soil testing of the backfill mix, acid loving plant mix and raised planter mix and submit the oil testing laboratory’s findings to the Landscape Architect within a minimum of 5 days prior to backfilling.
K. Samples of materials shall be submitted for observation. Delivery may begin upon approval of samples. Material samples shall include fertilizers and soil conditioners, plants and any other materials indicated herein.

L. No substitutions will be permitted without the approval of the Owner’s authorized Representative. Rejected materials shall be removed from the site b the Contractor.

M. The Contractor shall warranty shrubs and hydro seeded ground covers for a period of six months and trees for one tear from date of final acceptance.

1.8 WARRANTY

A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner.
   b. Structural failures including plantings falling or blowing over.
   c. Faulty performance of tree stabilization or edgings and tree grates.
   d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Periods: From date of planting completion or Substantial Completion.

3. Include the following remedial actions as a minimum:
   a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
   b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
   c. A limit of one replacement of each plant is required except for losses or replacements due to failure to comply with requirements.
   d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

1.9 TESTS AND INSPECTIONS

A. Plants shall be subject to inspections and acceptance of Owner at place of growth and/or upon delivery for conformity to Specifications. Such acceptance shall not impair the right of inspection and rejection during progress of work.

1. Inspection and tagging of plant material by Owners authorized Representative is for design intent only and does not constitute Owner acceptance of plant materials in regard to their health and vigor.

2. Health and vigor of plant material is the sole responsibility of the Contractor.

3. Plants that are found not to be healthy, or are damaged or excessively root bound, shall be rejected prior to planting and removed from the site.
B. Owner reserves the right, at any time, to take and analyze samples of materials to verify conformity with Specifications. Furnish samples upon request by Owner.
   1. Rejected materials shall be immediately removed from site at Contractor’s expense.
   2. Cost of testing of materials not meeting Specifications shall be paid by Contractor.

C. Percolation Tests: The Owner’s authorized representative will observe the percolation results with the Contractor prior to installations of plant materials.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant List, Plant Schedule, or Plant Legend indicated on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch (19 mm) in diameter; or with stem girdling roots are unacceptable.

2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.

B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Architect, with a proportionate increase in size of roots or balls.

C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which begins at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

D. Labeling: Label each at least one plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant.

E. If formal arrangements or consecutive order of plants is indicated on Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

F. Annuals and Biennials: Provide healthy, disease-free plants of species and variety shown or listed, with well-established root systems reaching to sides of the container to maintain a firm ball, but not with excessive root growth encircling the container. Provide only plants that are acclimated to outdoor conditions before delivery and that are in bud but not yet in bloom.
2.2 FERTILIZERS

A. Planting Tablets: Tightly compressed chip-type, long-lasting, slow-release, commercial-grade planting fertilizer in tablet form. Tablets shall break down with soil bacteria, converting nutrients into a form that can be absorbed by plant roots.

2.3 MULCHES

A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:

B. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through a 1-inch (25-mm) sieve; soluble-salt content of 2 to 5 dS/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

C. Mineral Mulch: Hard, durable stone, washed free of loam, sand, clay, and other foreign substances, of the following type, size range, and color:

2.4 WEED-CONTROL BARRIERS

A. Nonwoven Geotextile Filter Fabric: Polypropylene or polyester fabric, 3 oz./sq. yd. (101 g/sq. m) minimum, composed of fibers formed into a stable network so that fibers retain their relative position. Fabric shall be inert to biological degradation and resist naturally encountered chemicals, alkalis, and acids.

B. Composite Fabric: Woven, needle-punched polypropylene substrate bonded to a nonwoven polypropylene fabric, 4.8 oz./sq. yd. (162 g/sq. m).

2.5 PESTICIDES

A. General: Pesticide registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Nonselective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.
   1. Pre-emergent herbicide products include: Ronstar, Treflan, Eptam, Vegitex or equal.
   2. Fungicide/Insecticides include Subdue 2-E and Bayleton.

C. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.

2.6 TREE-STABILIZATION MATERIALS

A. Trunk-Stabilization Materials:
2. Wood Deadmen: Timbers measuring 8 inches (200 mm) in diameter and 48 inches (1200 mm) long, treated with specified wood pressure-preservative treatment.
3. Flexible Ties: Wide rubber or elastic bands or straps of length required to reach stakes or turnbuckles or compression springs.
4. Guys and Tie Wires: ASTM A 641/A 641M, Class 1, galvanized-steel wire, two-strand, twisted, 0.106 inch (2.7 mm) in diameter.
5. Tree-Tie Webbing: UV-resistant polypropylene or nylon webbing with brass grommets.
6. Guy Cables: Five-strand, 3/16-inch- (4.8-mm-) diameter, galvanized-steel cable, with zinc-coated turnbuckles or compression springs, a minimum of 3 inches (75 mm) long, with two 3/8-inch (10-mm) galvanized eyebolts.
7. Flags: Standard surveyor's plastic flagging tape, white, 6 inches (150 mm) long.
8. Proprietary Staking-and-Guying Devices: Proprietary stake or anchor and adjustable tie systems to secure each new planting by plant stem; sized as indicated and according to manufacturer's written recommendations.

B. Root-Ball Stabilization Materials:
   1. Upright Stakes and Horizontal Hold-Down: Rough-sawn, sound, new hardwood or softwood, free of knots, holes, cross grain, and other defects.
   3. Proprietary Root-Ball Stabilization Devices: Proprietary at- or below-grade stabilization systems to secure each new planting by root ball and that do not encircle the trunk.

C. Palm Bracing: Battens or blocks, struts, straps, and protective padding.

2.7 LANDSCAPE EDGINGS
A. Wood Edging: Of sizes indicated on Drawings, and wood stakes.
B. Steel Edging: Standard commercial-steel edging, fabricated in sections of standard lengths, with loops stamped from or welded to face of sections to receive stakes.
C. Aluminum Edging: Standard-profile extruded-aluminum edging, ASTM B 221 (ASTM B 221M)
D. Plastic Edging: Standard black polyethylene or vinyl edging.

2.8 TREE GRATES
A. Tree Grates: Manufacturer's standard tree grates and frames.
B. Finish: As fabricated.
2.9 TREE-WATERING DEVICES
   A. Watering Pipe: PVC pipe 4 inches (100 mm) in diameter, site-cut to length as required, and with snug-fitting removable cap.
   B. Slow-Release Watering Device: Standard product manufactured for drip irrigation of plants and emptying its water contents over an extended time period; manufactured from UV-light-stabilized nylon-reinforced polyethylene sheet, PVC, or HDPE plastic.

2.10 MISCELLANEOUS PRODUCTS
   A. Wood Pressure-Preservative Treatment: AWPA U1, Use Category UC4a; acceptable to authorities having jurisdiction, and containing no arsenic or chromium.
   B. Root Barrier: Black, molded, modular panels.
   C. Burlap: Non-synthetic, biodegradable.
   D. Planter Drainage Gravel: Washed, sound crushed stone or gravel complying with ASTM D 448 for Size No. 8.
   E. Planter Filter Fabric: Woven, Nonwoven geotextile manufactured for separation applications and made of polypropylene, polyolefin, or polyester fibers or combination of them.
   F. Mycorrhizal Fungi: Dry, granular inoculant containing at least 5300 spores per lb (0.45 kg) of vesicular-arbuscular mycorrhizal fungi and 95 million spores per lb (0.45 kg) of ectomycorrhizal fungi, 33 percent hydrogel, and a maximum of 5.5 percent inert material.

2.11 WEED AND FUNGUS CONTROL
   A. No material or method shall affect the landscape planting and must conform to Federal, State and Local regulations.
   B. Contact herbicide and pre-emergence herbicide such as recommended by a licensed Pest Control Advisor and applied by a licensed Pest Control applicator. Follow manufacturer’s directions strictly.
   C. Submittals: Prior to the installation of any chemical weed control materials, the Pest Control Advisor shall submit to the Landscape Architect a list of the weed control materials and quantities per acre intended for use in controlling the weed types prevalent and expected on the site. Pest Control Advisor shall furnish data to demonstrate the compatibility of the weed control materials and methods with the intended planning and seed varieties.
   D. The Contractor shall include the costs of all fungus control applications required to treat plants at the nursery and upon delivery to the site for installation.
2.12 INSECT CONTROL

A. Provide insecticides for control of all harmful insects as necessary to protect all plant materials and as approved by a licensed Pest Control Advisor. Submittal types for approval prior to application. The costs for all insect control shall be included in the bid.

PART 3 - EXECUTION

3.1 CONSTRUCTION WASTE MANAGEMENT

A. Manage construction waste in accordance with provisions of Section 01 74 19 Construction Waste Management and Disposal. Submit documentation to satisfy the requirements of that Section.
   1. Set aside scrap material to be returned to manufacturer for recycling into new product.

END OF SECTION 329300