February 27, 2025
Project No. 1003.010.11

GEOTECHNIQUES
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Ventura, California 93003
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Moorpark College
Department of Maintenance and Operations
7075 Campus Drive
Moorpark, California 93021
Attention: Mr. John Sinutko

Subject: Specifications for Pavement Improvements for Applied Arts East and LMC North Handicap Parking Lots, 7075 Campus Road, Moorpark College, Moorpark, California

Dear Mr. Sinutko;

This letter provides geotechnical recommendations for new asphalt concrete pavement at the handicap parking lots for the Applied Arts (Lot 10) and LMC (Lot 12, west half) classroom buildings.

APPLIED ARTS HANDICAP PARKING

The existing Applied Arts asphalt concrete pavement section in the improvement area should be removed deep enough to provide for a minimum of 3 inches of replacement asphalt concrete, or entirely through the existing asphalt concrete course, whichever is deeper. After observation of the removal bottom by the geotechnical representative and any necessary recompaction of the exposed aggregate base course to a minimum of 95 percent of the maximum dry density, the area should be repaved with ¾-inch asphalt concrete in accordance with project specifications. The new pavement should be temporarily marked and should be sealed at least 3 months after placement and then permanently marked with traffic-rated paint.

LMC HANDICAP PARKING LOT

The existing LMC Handicap Parking Lot asphalt concrete pavement section in the improvement area should be removed deep enough to provide for a minimum of 3 inches of replacement asphalt concrete, or entirely through the existing asphalt concrete course, whichever is deeper. After observation of the removal bottom by the geotechnical representative and any necessary recompaction of the exposed aggregate base course to a minimum of 95 percent of the maximum dry density, the area should be repaved with ¾-inch asphalt concrete in accordance with project specifications. The new pavement should be temporarily marked and should be sealed at least 3 months after placement and then permanently marked with traffic-rated paint.

CLOSURE

The recommendations in this letter are intended to be used in conjunction with the accompanying Geotechnical specifications. We appreciate the opportunity to be of service to Moorpark College. Please call if you have any questions concerning this letter.

Sincerely,
Geotechniques

Carole Wockner, P.E.
Principal Engineer
R.C. E. No. 74407, exp 09/30/25

SECTION 02220
DEMOLITION AND EXCAVATION

CONTENTS

SECTION 02220
DEMOLITION AND EXCAVATION

Drawings and General Conditions of the contract apply to this Section, but this section shall have precedence when regarding conflicts. Demolition and excavation work shall conform with latest edition of “State of California Department of Transportation Standard Specifications” (Caltrans) and Standard Specifications for Public Works (“Greenbook”), latest edition, except as modified herein, and Standard Specifications shall be considered included as part of contract documents.

PART 1 - GENERAL

1.01 WORK SPECIFIED HEREIN

A. Labor, materials, equipment, transportation, and services to complete the demolition and excavation work shown explicitly on the construction drawings, or additional demolition as necessary to complete the work.

B. The demolition work shall include, but not be limited to, the following items:

1. Prior to performing work, Contractor shall, at his sole expense, locate, mark, and memorialize all components of the improvements for restorative purposes, including, but not limited to, all pavement markings.

2. Remove asphalt concrete and concrete pavement within areas to receive new pavement or concrete. Dispose of removed materials to offsite location at Contractor’s expense. Provide weigh tickets to campus M&O Director for offsite material/soil disposal.

3. Locate and protect in place all underground and overhead utilities

4. Strip grass mat from trenching alignment prior to excavation and save to replace upon completion of trenching.

5. Loading, hauling, and dump fees for asphalt concrete, concrete, reinforcement steel, soil, and other removal items.

C. Protect in place surrounding greenscape and hardscape improvements, and underground utilities, as directed by District’s representative. Restore damaged landscape to approval of Director of Facilities Maintenance and Operations.

D. Contractor shall strictly adhere to the following regulations during demolition, excavation and grading:

Title 8 CCR 1532.1	Lead in Construction
Title 8 CCR 1529	Asbestos
Title 8 CCR 5194	Hazard Communication
Title 8 CCR 5155	Airborne Contaminants
Title 8 CCR 5192	Hazardous Waste Operations and Emergency Response

1.02 SUBMITTALS

A. Demolition procedures, items to salvage and operational sequence and schedule shall be submitted at least 14 days in advance of mobilization for review and acceptance by campus Director of Facilities Maintenance and Operations.

1.03 SCHEDULE AND NOTIFICATION

A. Work shall be performed so as not to disrupt campus operations. The Contractor shall submit a work schedule and traffic signage/barricading/control compatible with campus operations to the campus Director of Facilities Maintenance and Operations for approval at least 14 days prior to mobilization, and confirm field coordination of scheduled activities with campus Director in writing at least 3 business days in advance of site preparation/equipment mobilization and in accordance with the approved Work Segment Plan. Work shall be performed and completed, without exception, on pre-approved, scheduled work days.

B. A preconstruction meeting shall be convened with the campus Director of Facilities Maintenance and Operations, Contractor's field supervisor, and District's engineer at least 10 business days prior to construction to review Contractor's work schedule, and construction sequence and approach.

1.04 PROJECT CONDITIONS

A. Provide traffic control for all work in traffic areas. Work area shall be well-cordoned off and marked, as agreed upon in advance by the M&O Director at time of work plan/schedule submittal. The Contractor is responsible in maintaining safe work areas at all times.

B. Existing conditions: Verify existing conditions before starting work.

1. Prior to performing work: Mark and memorialize all components of the improvements for restorative purposes, including, but not limited to, all pavement markings to be removed as a result of demolition and repair/reconstruction or maintenance.

C. Protection

1. Do not interfere with use of adjacent buildings. Maintain free and safe passage to and from adjacent classrooms and pedestrian/vehicle areas.

2. Prevent movement or settlement of structures, ongrade improvements, and utilities. Provide bracing or shoring. Be responsible for safety and support of same. Assume liability for movement, settlement, damage, or injury.

3. Cease operations and notify District immediately if safety of structures and improvements appears to be endangered. Take precautions to properly support existing structures and improvements. Resume operations only after safety is restored.

4. Provide, and maintain barricades, lighting, and guardrails required by applicable regulatory advisory to protect passersby and workers.

D. Existing Services

1. Follow the procedures outlined in the general conditions for utility disconnects and interruptions.

2. Immediately notify campus Director of Facilities Maintenance and Operations and District's engineer of damage to existing improvements, including underground utilities.

3. Place markers to indicate location of disconnected services. Identify service lines and capping locations on project record documents.

4. Verify with campus M&O Director that exposed, repaired, and/or rerouted underground utilities are fully functioning prior to paving or concrete placement. Unverified utilities will be restored as necessary at Contractor's expense.

PART 2 - PRODUCTS

2.01 MATERIALS

Excess or unsuitable material, used geotextiles, broken asphalt concrete, broken Portland cement concrete, pipes, etc., shall be removed and disposed of by the Contractor. All materials shall be disposed of at an approved disposal site. Contractor shall, prior to commencement of the work, submit a letter to the District stating the location of disposal site(s) for all excess material and certifying that he has obtained the property owner's permission for the disposal of all surplus materials.

PART 3 - EXECUTION

3.01 PREPARATION

A. Provide protection from falling objects over entrances, which are to be kept open during normal working hours.

B. Perform demolition work to cause the least inconvenience to surrounding areas.

3.02 METHODS

A. Contractor shall be responsible for determining the method or methods used to accomplish the removals and excavations indicated on the plans, except that blasting will not be allowed.

B. Contractor shall assume all responsibility to protect existing structures and facilities during all phases of the work, and shall repair or replace any structures or facilities damaged by him or his subcontractors at his expense.

C. Contractor shall demolish in an orderly and careful manner items required to accommodate new work, including work required for connection to existing structures.

D. Remove existing earth materials and asphalt concrete paving as indicated. Saw cut concrete and/or asphalt pavement to provide a straight line at edges of existing pavement that will remain.

E. Remove concrete panels at joints so that entire panel is replaced.

F. Grind existing pavement, as needed, in overlay areas to effect positive surface drainage to existing and new drainage improvements.

G. Protect tree roots during demolition.

H. Debris:

1. Remove excess debris as it accumulates, except as otherwise specified. Do not store or permit debris to accumulate on site. If Contractor fails to remove excess debris promptly, District reserves right to cause same to be removed at Contractor's expense.

2. Materials requiring removal and demolition, including but not limited to, Petromat, asphalt concrete and concrete, shall be removed completely from site by Contractor, unless approved otherwise.

3. Contractor shall submit weigh tickets for material disposal to campus M&O Director.

4. If Contractor encounters unforeseen items during clearing and demolition work, he is to notify the owner prior to removal or demolition.

I. Perform demolition hauling and disposal in accordance with applicable authorities having jurisdiction.

J. Repair demolition performed in excess of that required, at no cost to District.

K. Burning of materials onsite is not permitted.

L. Remove demolished materials. Provide weigh tickets to campus M&O Director for offsite material/soil disposal. Remove tools and equipment from site upon completion of work.

M. District may identify specific items for the Contractor to salvage and deliver to District for future use.

N. Contractor shall provide sufficient watering to abate dust. Contractor to secure water from County of Ventura.

3.03 SECURE DEMOLITION AREA

A. Contractor shall implement safety measures and use barricades and signage to prevent pedestrian/handicap access and redirect traffic near areas where demolition and construction is underway.

B. Contractor shall maintain safe and secure work areas until construction is complete.

END OF SECTION 02200

SECTION 02720
AGGREGATE BASE COURSE

CONTENTS

SECTION 02720
AGGREGATE BASE COURSE

Drawings and General Conditions of the contract apply to this Section, but this section shall have precedence when regarding conflicts.

PART 1 - GENERAL

1.01 SUMMARY

A. Furnish labor, materials, equipment, facilities, transportation and services to complete all base course preparation, installation and related work as shown in contract documents and/or specified herein.

B. Scope of work:

General extent of base course work is shown on the drawings and may include, but is not necessarily limited to, the following:

1. Grading and compaction of subgrade soil under asphalt concrete paving.

2. Furnishing, placing, and compaction of aggregate base material under asphalt concrete and concrete paving.

C. Related sections can include, but may not be limited to:

1. Section 0220 - Demolition and Excavation

2. Section 02310 – Subgrade Preparation

3. Section 02740 - Asphalt Concrete Paving

4. Section 03000 – Concrete Pavement and Sitework

1.02 REFERENCES AND REGULATORY REQUIREMENTS

The State of California Department of Transportation Standard Specifications, latest edition, and Standard Specifications for Public Works Construction ("Greenbook"), latest edition, except as modified herein, shall be considered included as part of contract documents by reference.

1.03 QUALITY ASSURANCE

A. Control of Work: Conform to Section 5 of the Standard (Caltrans) Specifications.

B. Control of Materials: Conform to Section 6 of the Standard Specifications (Caltrans).

1.04 SUBMITTALS

A. Submit material certificates of compliance and/or sieve analysis for all products and materials proposed to be used in work covered by this Section at least 14 days prior to onsite delivery.

1.05 PRODUCT/SITE CONDITIONS

A. Wet Conditions: No subgrade preparation or base material placement shall occur when excessively wet conditions exist in the opinion of the District's Representative. Subgrade shall be firm and unyielding when proof-rolled with a loaded water truck immediately prior to base placement.

B. Dry Conditions: Contractor shall provide dust control in conformance with Section 10 of Standard Specifications (Caltrans) and shall provide water to soil subgrade and base courses as necessary to achieve compaction goals.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Materials shall be stockpiled onsite in locations that, in the opinion of the Contractor, cause least interference with construction and as acceptable to the District's representative.

B. Materials shall not be stockpiled in landscape areas.

C. Protect materials from segregation, contamination, and wind and water erosion.

1.07 SEQUENCING AND SCHEDULING

A. Work of this section shall not proceed until underground utilities and irrigation sleeves have been installed and accepted.

B. Contractor shall schedule work so that installation of paving/surfacing occurs no later than five (5) business days after placement and proper compaction of base materials. Base materials left unpaved longer than this time period shall be subject to testing and recompaction at Contractor's expense.

PART 2 - PRODUCTS

2.01 MATERIALS

Aggregate Base: Aggregate base shall be Class 2, 3/4" maximum material conforming to Section 26-1.02A of the Standard Specifications (Caltrans) or Crushed Miscellaneous Base (CMB) in accordance with the 'Greenbook" (latest edition).

PART 3 - EXECUTION

3.01 SUBGRADE PREPARATION

A. Preparation of subgrade shall conform to Section 02310 of these specifications and Section 6 of the Standard Specifications (Caltrans).

B. Remove unsuitable subgrade material as necessary and replace with suitable material or aggregate base per the discretion of the District's representative.

C. Subgrade shall be firm and unyielding when proof-rolled with a loaded water truck. Areas of deflecting subgrade shall be repaired at Contractor's expense in terms of cost and schedule.

3.02 BASE MATERIAL PLACEMENT AND COMPACTION

A. Conform to Section 26 of the Standard Specifications (Caltrans).

B. Obtain acceptance of subgrade preparation work prior to placing base material thereon. Place Mirafi 600X on pavement subgrade in accordance with manufacturer's recommendations prior to placement of aggregate base. Do not traffic geotextile without a minimum of 6 inches of base over geotextile.

C. Place and compact base material in 6 inch maximum loose lifts unless otherwise noted. Base materials shall be moisture conditioned to within 2% of optimum moisture content prior to placement. Compact base materials to at least 95% relative compaction.

D. Equipment trafficking and staging operations shall be performed in a manner that prevents pumping of underlying subgrade and/or finished base materials. Mitigation of adverse subgrade and/or base conditions aggravated by actions of Contractor shall be the responsibility of the Contractor in terms of cost and schedule.

E. Aggregate base course shall have a compacted thickness consistent with drawings and to satisfy positive drainage requirements and/or District-approved drainage plan prepared by Contractor.

F. Base shall be firm and unyielding when proof-rolled with a loaded water truck. Areas of deflecting base course shall be repaired at Contractor's expense in terms of cost and schedule.

3.03 TOLERANCES

Conform to Section 26 of the Standard Specifications (Caltrans).

3.04 CLEAN-UP OF WORK AREA

Contractor shall remove and legally dispose of excess materials/spoils and debris from the job site on a daily basis.

3.05 PROTECTION OF FINISHED PRODUCT

Contractor shall provide barricades, signs and other devices and prevent over-trafficking, as necessary, to prevent damage to finished base courses.

END OF SECTION 02720

SECTION 02740
ASPHALT CONCRETE PAVING

CONTENTS

SECTION 02740
ASPHALT CONCRETE PAVING

PART 1 - GENERAL

1.01 DOCUMENTS

A. Drawings and General Conditions of the contract apply to this Section.

B. "Standard Specifications" refers to latest edition of "State of California Department of Transportation Standard Specifications" (Caltrans, 2010) and Standard Specifications for Public Works Construction refers to "Greenbook," latest edition.

1.02 SCOPE OF WORK

A. Furnish labor, materials, equipment, facilities, transportation and services to complete asphalt concrete paving and related work as contained in contract documents and/or as specified herein.

B. Work Included: The general extent of the asphalt concrete paving is shown on the Drawings and includes, but is not necessarily limited to, the following:

1. Replacement of asphalt concrete materials removed during demolition.

2. Restoration of pavement markings with traffic-grade paint.

C. Related Work:

1. Demolition covered by Section 02220 of these specifications.

2. Subgrade Preparation covered by Section 02310 of these Specifications.

3. Aggregate Base Course covered by Section 02720 of these Specifications.

4. Concrete Pavement and Sitework covered by Section 03000 of these specifications.

D. Workmanship and material within this section shall conform to the Standard Specifications, except as modified herein.

1.03 SUBMITTALS

A. Submit to the Engineer at least 14 days in advance of construction:

1. Test reports for asphalt concrete and base materials, gradation and quality. Submit for each material to be incorporated into the work.

2. Manufacturer's product specifications and installation recommendations.

3. Provide copies of material certificates signed by material producer and contractor, certifying that each material item complies with, or exceeds specified requirements.

1.04 NOTIFICATION

A. Work shall be performed so as not to disrupt campus operations. The Contractor shall submit a detailed work schedule compatible with campus operations to the campus Director of Facilities Maintenance and Operations for approval at least 10 business days prior to mobilization, and confirm field coordination of specific scheduled activities with campus Director in writing at least 3 business days prior to start of site preparation/equipment mobilization and in accordance with the approved Work Segment Plan. Work shall be performed and completed, without exception, on District-pre-approved, scheduled work days.

B. A preconstruction meeting shall be convened with the campus operations director, Contractor's field supervisor, and District's engineer at least 10 business days prior to construction to review Contractor's survey and drainage plan, work schedule, and construction sequence and approach.

1.05 TRAFFIC CONTROL

A. The Contractor shall provide temporary traffic controls required to perform the work of this Section as required by the District and campus Director of Facilities Maintenance and Operations.

B. Contractor to prepare and submit traffic control plans to the District and campus Director of Facilities Maintenance and Operations for approval. No work shall be performed until approval granted from the District and campus Director of Facilities Maintenance and Operations.

1.06 PRODUCT HANDLING

A. Protection

1. Use all means necessary to protect bituminous concrete pavement materials before, during and after installation and to protect existing improvements.

2. Paving materials delivered to the work site prior to placement shall be stockpiled in such a manner as to minimize surface water impact on the stockpile and minimize intrusion of soils adjacent to and beneath the stockpile.

B. Replacements

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

1.07 PROTECTION OF WORK

Pavement markings shall be memorialized by Contractor prior to demolition or construction for post-construction restoration of all markings. Curbs, walls and other adjacent improvements are to be covered with suitable material and protected from injury or damage by equipment and contact with oil, emulsion or asphalt. All manholes, catch basins and other gratings are to be covered with suitable material so that no asphalt or emulsion will come in contact with the inside walls or floors of the structures. Any damage to such work shall be repaired and/or replaced at the contractor's expense. Manhole rims and catch basin grates shall be adjusted, where necessary, to new finish pavement elevations. Headers shall be constructed in areas not abutting asphalt concrete or concrete.

1.08 TESTING AND INSPECTION

A. At the District's discretion, testing and inspection of asphalt concrete pavement mixes and testing of placed aggregate base course and asphalt concrete pavement will be performed by independent testing laboratory appointed and paid for by District.

B. If compaction tests indicate that aggregate base course or asphalt concrete paving do not meet specified requirements, contractor shall remove defective work, replace and retest at contractor's expense.

1.09 GENERAL REQUIREMENTS

A. Paving surfaces shall have positive drainage as indicated in the contract documents. Upon completion of the work, paved areas included in this section shall be subject to a water drainage test. Areas that fail to drain properly as determined by the District or District's representative shall be corrected and repaired at no additional cost to the District.

B. Asphalt concrete paving shall be free from cracking, pot holes, raveling, slippage, depressions, birdbaths, corrugations, aggregate ("rock") pockets, or other defects at the date of completion and acceptance of the project.

C. Finished asphalt concrete surfaces shall be smooth, dense and of uniform texture and appearance, and shall not deviate more than ½ inch in 10 feet and ⅜ inch in 2 feet, as verified with a straightedge.

D. Repairs shall be made within ten (10) days of notification at no cost to the District.

1.10 QUALITY ASSURANCE

A. Codes and Standards: Comply with Standard Specifications, 2010 edition, and "Standard Plans for Public Works Construction" ("Greenbook"), latest edition.

B. Manufacturer's Qualifications: Company with experience in manufacturing Asphalt Concrete pavement for a period of five years minimum.

1.11 SITE CONDITIONS

A. Construct asphalt concrete surface course when temperatures exceed 40 degrees F and when the aggregate base is dry and unyielding.

B. Establish and maintain required lines and elevations.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Aggregate Base material shall be State of California Department of Transportation Standard Specification Section 26.1.02A Class 2 aggregate base, 3/4-inch gradation. Crushed miscellaneous base material conforming to Standard Specifications for Public Works Construction Section 200-2.4, fine gradation, shall be an acceptable alternative aggregate base material.

B. Unless otherwise shown on the Drawings, the minimum thickness of aggregate base shall be 6 inches.

C. Headers shall be foundation grade 2" x 4" redwood. A minimum thickness of ½ inch shall be used for bends.

D. Asphalt Concrete. Material for new asphalt concrete pavements shall consist of plant-mixed, hot-laid asphalt mixture with 1/2-inch aggregate (C2 per Greenbook, latest ed.). Recycled content shall not exceed 20 percent. Asphalt shall be PG-64-10 performance grade binder, per Caltrans Standard Specifications Section 92. Unless otherwise shown on the Drawings, the as-compacted thickness of asphalt concrete for new or replacement pavements shall be a minimum of 3 inches.

E. Liquid Asphalt shall conform to requirements for SC-70 liquid asphalt as per Section 93 of the Standard Specifications. Rate of application shall be fifteen-hundredths to one-quarter (15/100 - ¼) gallon per square yard.

F. Asphaltic emulsion shall be penetration type conforming to the RS-1 requirements of Section 94 of the Standard Specifications. Asphaltic emulsions shall be composed of a bituminous material uniformly emulsified with water and an emulsifying or stabilizing agent and conform to the provisions in Caltrans Standard Specifications

Section 94, "Asphaltic Emulsions." Polymer modified asphaltic emulsion shall also contain a polymer.

G. Primer for application on asphalt surfaces (tack coat) shall be RC-1 or approved equal.

H. Soil sterilant shall be “Treflan” pre-emergence herbicide or approved equal.

I. Paving fabric used below overlays shall be a thermoplastic non-woven fiber, resistant to mildew, rot and chemical attack. Paving fabric shall be Petromat Style No. 4599 as manufactured by Propex Fabrics, Inc., placed in accordance with manufacturer’s recommendations.

J. Crack Sealant shall be a mixture of paving asphalt and ground rubber or polymer with the following properties, such as Crafco Superflex HT, or equivalent:

Rubberized/Polymer Sealant

Test	ASTM Designation	Requirements
Softening Point	D 36	210°F min.
Cone Penetration @ 25°C	D 5329	45 mm, min.
Elongation @ 25°C	D 3407	1000% min.
Flow @ 25°C	D 5329	0 mm max.

1. Gradation of the ground rubber shall be such that 100 percent will pass a 2.36-mm sieve.

2. Modified asphalt crack sealant material shall be capable of being melted and applied to cracks at temperatures below 204°C. When heated, it shall readily penetrate cracks ¼-inch wide or wider.

K. Fog Seal shall be SS-1 consistent with Caltrans Standard Specifications Sections 37 and 94, and shall be applied at least 3 months after asphalt concrete ladown.

L. Traffic-rated marking paint. Reflective blue in crosswalks.

PART 3 - EXECUTION

3.01 ACCEPTABLE APPLICATORS

A. Company with experience in applying asphalt concrete pavement for a period of five (5) years minimum.

B. Soil sterilant shall be applied in one (1) application: after base and before asphalt concrete is laid. The material shall be uniformly applied according to the manufacturer's recommendations and at the minimum rate of 7.5 lbs. per 1000 square feet.

3.02 EQUIPMENT

A. Paving Equipment:

1. Approved power brooms, aggregate spreaders, bituminous material distributor and hauling vehicles.

2. Furnish equipment in such number and capacities as required to provide coordinated and uniform paving progress.

3. Aggregate spreaders shall be mechanical and either self propelled or attachable to the rear of a dump truck and be capable of spreading aggregate within the specified limits.

4. Bituminous material distributor shall provide controls for regulating and monitoring the spread of material at even heat on variable widths up to 15 feet with uniform pressure.

B. Compacting Equipment:

1. Self-propelled rollers shall be vibratory steel drum rollers and pneumatic tired rollers capable of exerting a ground pressure of not less than 80 pounds per square inch of contact area.

2. Initial rolling shall be performed when the sum of the air and asphalt concrete temperature is between 300 and 375°F. Finish rolling shall commence after pavement has cooled sufficiently to permit removal of roller marks and shall be continued in whatever direction is necessary to produce a pavement surface free of indentations.

3. Manually pushed rollers shall not be allowed.

4. Vibrating plate compactors shall be manually guided vibrating plate type compactors.

3.03 SURFACE PREPARATION

A. New Pavement and Replacement Pavement Areas

1. Proof roll prepared aggregate base surface to check for unstable areas and areas requiring additional compaction with the District or District's representative present.

2. Notify District or District's representative in writing of unsatisfactory conditions. Do not begin paving work until deficient subbase, base and asphalt concrete areas have been corrected, including sealing cracks and repairing potholes and depressions

3. Install foundation grade 2” x 4” redwood headers except where adjacent to existing pavement, concrete curbs, walks or building. Use ½ inch thick boards where required for bending.

4. Apply tack coat to horizontal and vertical contact surfaces of previously constructed asphalt or Portland cement concrete. Exercise care in applying materials to avoid smearing of adjoining concrete surfaces. Remove and clean damaged areas. A tack coat shall also be applied to the base course asphalt just prior to placing the top course asphalt.

B. Cleaning Surfaces

1. Clean flat surfaces with rotary power brooms, or high velocity compressed air methods.

a. Clean paved areas showing signs of surface erosion or raveling that do not require removal in this manner.

3.04 INSTALLATION

A. Cutting or Breaking Paved Surfaces

1. In cutting or breaking up street and roadway surfacing including asphalt and concrete pavement, the Contractor shall not use equipment which will injure or endanger nearby improvements of any type.

2. All Portland cement and asphalt concrete pavements, gutters, driveways, curbs and sidewalks excavated or damaged shall be removed between neat vertical cuts made with a saw of approved type. In the case of curbs, gutters and sidewalks, cuts shall be made at the nearest score marks beyond the damaged portion, as may be required in each case by the governing agency. In the event a joint or scoring line does not exist or that such joint is 3 feet or more from the removed or damaged portion, the existing concrete shall be removed and reconstructed to neat, plane faces.

3. All pavement sawcuts shall be neat and straight to provide an unfractured and level pavement joint for bonding existing surfacing with pavement replacement. All cut edges shall provide clean, solid vertical faces free from all loose material. Where large irregular surfaces are removed or result from subsequent disturbance, such trimming or cutting as hereinafter provided, shall be parallel or at right angles to the road centerline.

4. Sawcut limits of replacement or repair (patch) shall be cutback (“keyed”) at least 12 inches into existing asphalt concrete, at the base of the existing section.

5. Asphalt concrete pavement edge areas shall be built up or ground down, as needed, to provide level transition to abutting concrete flatwork, gutters, manholes, vault lids, or pavement surface.

6. All existing crushed aggregate and asphaltic concrete removed shall be hauled away from the work site and legally disposed of by the contractor. Weigh tickets for disposed materials shall be submittted to District within 3 days of disposal.

B. Subgrade Preparation

1. Subgrade for pavement shall not vary more than 0.02 foot from the specified grade and cross-section.

2. Upper 12 inches of subgrade shall be moisture conditioned to within 2 percent of optimum moisture content and compacted to a minimum of 95 percent of the maximum dry density, as determined by ASTM D1557.

3. Subgrade shall be firm and unyielding prior to placement of aggregate base.

C. Aggregate Base

1. Aggregate base courseshall be compacted to a minimum pf 95 percent of the maximum dry density and shall not vary more than 0.02 foot from the specified grade and cross-section.

2. Aggregate base shall be firm and unyielding prior to placement of asphalt concrete.

D. Crack Filling and Sealing

1. Preparation

a. Cracks with an average clear opening between ¼ and ½ inch shall be routed with a power cutter to provide minimum sealant reservoir of ½ inch wide by 1 inch in depth

b. Cracks shall be treated with an herbicide at least 48 hours prior to sealing.

c. Clean all cracks with high velocity compressed air of at least 90 psi to depth of two times width.

2. Application of crack filler or sealant shall be according to manufacturer's recommendations except where exceeded by thses specifications.

a. Do not place crack filler or sealant during dewey, wet or inclement weather.

b. Apply filler/sealant with melter applicator with a pressure feed wand followed with a squeegee. Temperature of filler/sealant shall be maintained between 380 and 400˚ F during application.

c. Sealant shall be applied in a slightly overfilled condition and shall be struck off using a squeegee, resulting in a band width between 2 and 4 inches. Overfill shall not exceed 1/16-inch over pavement surface. Overflow or excess sealant material shall be cleaned from pavement surface.

d. In areas where filler or sealant has sagged or contracted into crack, repeat application at two additional 2 week intervals or until filler or sealant remains intact at surface or 1/16-inch higher than surface.

e. Fill cracks at no less than 1 week intervals at least two times prior to completion or application of slurry seal.

3. Crack Sealing: Application methods shall control sealant material within crack to depth of ¼ inch below existing pavement surface.

E. Patching: Repair areas of severe cracking, root damage, depressions, potholing, or subgrade failure to full depth of asphalt and at least 48 hours prior to overlay, where applicable.

1. Extend asphalt concrete removal minimum 12 inches into satisfactory pavement surrounding area to be patched. Edge distress from construction equipment shall result in enlarged asphalt concrete removal widths at Contractor's expense.

2. Repairs shall be square-edged and cuts rectangular in shape.

3. Apply tack coat to vertical faces and exposed surfaces of pavement.

4. Backfill patches with hot asphalt pavement mix in lifts not exceeding 4 inches in thickness prior to compaction.

5. Compact asphalt concrete to a minimum of 95 percent of maximum density with several passes of vibratory roller within 60 minutes of laydown. Use wacker for compaction in areas not accessible to roller.

6. Comply with compaction and surface tolerance requirements specified for asphalt concrete pavement.

7. Keep the premises free from accumulations of waste materials, rubbish, grindings, and other debris resulting from the Work.

F. Pavement Patching or Restoration

1. In all existing pavement areas where the surface is removed, broken or damaged or in which the ground has caved in or settled the surface shall be restored to the original grade by the Contractor. Prior to resurfacing, the existing surfacing shall be removed as specified herein. All broken and jagged edges of the pavement edge shall be sawed straight. Areas to be cut shall be indicated by the District and no permanent pavement shall be placed until these edges have been sawed. If during the initial removal of the existing pavement a method of removal was used which disturbed the adjoining pavement, or if during general construction operations the adjacent pavement or base material was disturbed, then this adjoining pavement shall also be removed and replaced. Where irregular surfaces are to be surfaced, existing pavement shall be cut parallel to the centerline of the roadway, at the discretion of the District. Asphalt concrete pavement shall be saw cut to a minimum depth of 4 inches at a point not less than 12 inches outside the limits of excavation or the previous pavement cut (made by pneumatic tools), whichever limits are the greater. Where a repair edge is less than 4 feet from the existing edge of pavement, gutter or curb, the remaining existing pavement shall be removed and replaced asphalt concrete pavement.

2. Wherever asphalt cement pavement does not terminate against a curb, gutter, or another pavement, the Contractor shall provide and install a redwood header and stakes. Such headers and stakes shall remain in place upon completion of the improvements. Existing headers shall be removed where new pavement abuts old.

3. Headers shall be 2-inch (nominal size) boards, the vertical dimension of which shall at least be equal to the thickness of the pavement at the header line. Side stakes 2 inches by 3 inches (nominal size), 18 inches long or longer, and spaced not over 4 feet apart shall be driven on the outside of headers to a depth of 1 inch below the top and then nailed to the header. The joints between the individual boards being used as headers shall be spliced with a 1-inch-thick (nominal size) board of the same height as the header and not less than 24 inches long. Headers and stakes shall be redwood.

4. In order to obtain a satisfactory junction with adjacent surfaces, the contractor shall cut back and trim the edges so as to provide a clean sound, vertical joint, before permanent replacement of an excavated or damaged portion of pavement, gutter, driveway, curb or sidewalk with the same kinds of materials as used in the original construction and to the same thickness and other applicable dimensions, as nearly as may be, in such manner as to restore the affected portions of all said pavement facilities to a sound and serviceable conditions satisfactory to the District and the agency having jurisdiction.

5. An herbicide effective against native grasses and weeds of the area shall be applied on top of the subgrade in areas to receive new or replacement pavement in the quantity and according to the methods recommended by the manufacturer.

6. Apply tack coat of Grade SS1h on existing horizontal and vertical surfaces to come in contact with new asphalt pavement at a rate of 0.2 gallons per square yard or greater. Apply tack coat between successive lifts of asphalt concrete.

7. Place and compact asphalt concrete to match original finished surface. Lift thickness of compacted asphalt shall not exceed 3 inches. Placement of asphalt concrete shall be done by use of an automated asphalt paving machine specifically designed for placement of asphalt paving. Placement of permanent asphalt concrete with hand tools or walk behind devices will not be allowed. .

8. Correct areas of segregated aggregate immediately after laydown and before compaction.

9. Grind existing asphalt concrete to effect positive drainage and level transitions to abutting concrete flatwork or pavements. Transitions between pavement edges elevated greater than ¼-inch above adjacent concrete gutter shall be planed level, within ⅛-inch tolerance, with adjacent gutter. Edge milling shall be performed to remove accumulation of asphalt adjacent to gutters 1-inch or greater in thickness

10. All manholes, valve boxes and other surface structures shall be brought level to existing or new paved grades, as applicable.

G. Asphalt Overlay

1. Perform asphalt overlay where indicated on the Drawings.

2. The minimum width of asphalt overlay shall be the entire width of the paved road.

3. Width of asphalt overlay at street or driveway intersections shall be calculated as a straight line along the edge of pavement across the intersection of other side of the intersection.

4. Asphalt overlay shall be performed after all heavy equipment has been demobilized off the project area and pavement restoration is complete. The Contractor shall arrange his work such that none of the Contractor's equipment heavier than H-20 loading is allowed to travel over the new asphalt overlay. Placement of asphalt concrete shall be done by use of an automated asphalt paving machine specifically designed for the placement

of asphalt paving. Placement of permanent asphalt concrete with hand tools or walk behind devices will not be allowed.

5. Apply tack coat of Grade SS1h on existing horizontal and vertical surfaces to come in contact with new asphalt pavement at the rate of 0.1 gallon per square yard.

6. Install paving fabric beneath the overlay in accordance with manufacturer's recommendations.

7. Place asphalt overlay to achieve a 2½-inch as-compacted thickness with smooth and even surfaces. Compaction shall be consistent with Sections **3.05 Placing Mix** and **3.06 Rolling**, below.

8. Grind existing asphalt concrete, where elevated ≥¼-inch above abutting flatwork or manhole/vault cover, to effect positive drainage and level transitions to abutting concrete flatwork, pavements, and improvements.

9. All manholes, valve boxes and other surface structures shall be brought level with new paved grades.

10. Seal edges of overlay that abut existing asphalt concrete.

H. Installation of New Pavement

1. Place the minimum asphalt concrete specified herein unless otherwise shown on Drawings. Placement of asphalt concrete shall be done by use of an automated asphalt paving machine specifically designed for the placement of asphalt paving. Placement of permanent asphalt concrete with hand tools or walk behind devices shall not be allowed.

2. Asphalt concrete showing segregated aggregate shall be corrected upon laydown and prior to compaction.

3. Pavement adjacent to structures and in other areas inaccessible to heavy rollers shall be compacted by means of heated hand tools and wackers.

4. Asphalt concrete shall be compacted to a minimum of 95 percent of the maximum density, including along longitudinal joints of successive adjacent lanes.

5. All manholes, valve boxes and other surface structures shall be brought to new paved grades, as required.

6. Apply tack coat between successive lifts of asphalt concrete.

I. Clean-Up

1. During the Work, all roads, public and private, shall be kept clean and neat. Any debris, rubbish, grindings, unused materials or equipment shall be expeditiously removed.

2. All manholes, valve covers, survey monuments and concrete improvements shall be thoroughly cleaned of construction debris and markings resulting from Contractor's operations.

J. Acceptance

1. All pavement restoration and repair shall be completed to the satisfaction of such public agency having jurisdiction. District will not issue the Statement of Acceptance for the Work until the District has received approval from the public agency having jurisdiction that the work has been satisfactorily completed.

3.05 PLACING MIX

A. Place asphalt concrete mixture on prepared surface, spread and strike off. Spread mixture at a minimum temperature of 275˚ F for the base course layer and 266˚ F for the finish course layer. Place inaccessible and small areas by hand. Correct areas showing segregated aggregate immediately after laydown and before compaction. Place each course to required grade, cross-section, and compacted thickness. Asphalt concrete placement shall be constructed to the thickness shown on the plans, and individual lift thickness shall be compatible with the size/weight of rolling equipment used for compaction, and shall in no case exceed 4 inches. Successive lifts of asphalt concrete shall not be placed until the preceding lift has achieved a minimum compaction of 95 percent of the maximum density.

B. Equipment trafficking and staging operations shall be performed in a manner that prevents pumping of underlying aggregate base and subgrade materials. Areas where pumping develops shall be repaired at Contactor's expense.

C. Make joints between old and new pavements, between successive (adjoining mats), or between successive days' work, to ensure continuous bond and uniform compaction between adjoining work. Construct joints to have same texture, density and smoothness as other sections of asphalt concrete course.

D. Spreading and rolling equipment shall be in accordance with the Standard Specifications. Areas inaccessible to roller contact shall be compacted to a minimum of 95 percent of the maximum density using wackers or heated hand tools.

E. Compaction shall be in accordance with the Standard Specifications.

3.06 ROLLING

A. Begin rolling when mixture will bear roller weight without excessive displacement.

B. Asphalt concrete lifts shall receive 7 passes with 8- to 10-ton vibratory roller and 10- to 12-ton static roller within 90 minutes of laydown and above a temperature of 185°F.

C. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers. Asphalt concrete shall be compacted to at least 95 percent of maximum density. Compaction shall be attained within 90 minutes of laydown and before asphalt concrete cools to 185°F.

D. As soon as the first strip or lane is placed, the breakdown roller shall make the first pass on the low side of the mat with the steel drum overhanging about six inches. The second pass shall be made on the opposite side of the mat, again overhanging the steel drum about six inches.

E. Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling, and repair displaced areas by loosening and filling, if required, with hot material.

F. Follow breakdown rolling as soon as possible, while mixture is hot. Continue second rolling until mixture has been thoroughly compacted.

G. As loose mix from lane 2 is placed over top of the compacted mix of lane 1, the mix shall be high by the amount of compaction that will occur. Overlap of the second lane placed onto the first lane shall be of sufficient thickness to prevent a depression or invert along the joint once the minimum (95%) compaction is achieved along the joint. Excess mix shall be raked away and properly disposed off of pavement, not cast onto adjacent surface.

H. Compaction along the longitudinal joint shall be performed by rolling with the steel drum almost entirely on the hot mat, overlapping onto the cold mat by about 6 inches, and as the entire width of the steel drum is being utilized in vibratory mode while the mix is still hot.

I. Perform finish rolling while mixture is still warm enough for removal of roller marks. Continue rolling until roller marks/plate edges/seams are eliminated and course has attained maximum density.

J. After final rolling/compaction, do not permit vehicular traffic on pavement until pavement has cooled and hardened.

3.07 PAVEMENT MARKINGS

A. Restore all pavement markings, including but not limited to, stalls, arrows, stop bars, and ADA markings, in repaved, overlay and slurry seal areas, and provide new markings, where applicable, using traffic-rated paint, and in accordance with contract documents.

B. Remove loose paint prior to applying new paint on curbs.

C. Prior to performing work, Contractor shall, at his sole expense, locate, mark, and memorialize all components of the improvements for restorative purposes.

3.08 MAINTENANCE OF SURFACE

A. Following the certification of completion by the District, the Contractor shall maintain the surface of overlay and new pavement areas for at least the period of the guarantee of the Work.

B. All materials and labor required for the maintenance of paving shall be supplied by the Contractor, and the Work shall be done in a manner satisfactory to the District.

3.09 FIELD QUALITY ASSURANCE

A. Test in-place asphalt concrete courses for compliance with requirements for thickness, planarity and surface smoothness. Repair or remove and replace unacceptable paving as directed by District or District's representative.

B. Tolerances for thickness shall be one eighth (⅛) inch, plus or minus.

C. Asphalt substrate shall not vary from planned cross slope by more than +/- 0.2%. Finished asphalt shall be smooth and planar and shall not vary greater than 1/2", plus or minus, under a 10 foot straight edge in any direction, and ⅜-inch under a 2-foot straight edge in any direction. Contractor shall be responsible for providing a survey of new asphalt surfaces that are acceptable to District or District's representative, and to water flood the surface with a water truck in the presence of District or District's representative. If after 20 minutes, "birdbaths" are evident in a depth more than ¼", the contractor and the District or District's representative will determine the best method of correction at no cost to District.

D. Contractor shall be responsible for determining if the planarity, cross slopes, and general specifications have been met.

E. In no case shall polyurethane filler used to correct birdbaths be greater than ¼" thick.

F. Rough, high spots or over-asphalted areas shall be brought to grade by burning, blading, grinding, or edge-milling.

G. Fog seal shall be applied at the rate of 0.1 gallon/sq.yd. to mitigate visible transitions between new and existing surfaces and between two different surfaces such as between existing and new pavement and between overlay and new pavement. Fog seal shall be applied over new asphalt concrete pavement where rock pockets are visible. Fog seal shall be applied no sooner than 90 days after pavement laydown

consistent with Section 37 of Caltrans Standard Specifications. Finished asphalt concrete surface shall be of uniform color and consistency.

3.10 REJECTION OF WORK

A. Failure to meet any test requirement including compaction, surface irregularities, separation of fines from aggregates, or specification herein shall be cause for rejection. At the discretion of the Engineer, the Contractor may be allowed to:

(1) Attempt to correct surface irregularities by fog or slurry sealing in conformance with these specifications.

(2) Attempt other corrective measures as approved by the Engineer that will not affect the quality or integrity of the asphalt concrete in place.

(3) Place an additional minimum 1-inch asphalt concrete layer over the defective area and such that positive drainage and planarity are achieved or maintained.

(4) Agree to a reduction in the Contract Unit Price for the material involved.

Such measures, if allowed by the Engineer, shall be solely at the Contractor's risk and expense. In permitting the Contractor to proceed with such measures the Contractor agrees it does not obligate the Engineer to accept such work. Work not corrected to the satisfaction of the Engineer and District shall be removed and replaced by the Contractor at no expense to the District.

END OF SECTION 02740

SECTION 03000
CONCRETE PAVEMENT AND SITEWORK

CONTENTS

SECTION 03000
CONCRETE PAVEMENT AND SITEWORK

PART 1 - GENERAL

1.01 CONTRACT DOCUMENTS

A. The General Conditions and all other Contract Documents for this project are complementary and applicable to this section of the Specifications.

B. "Standard Specifications" refers to the State of California Department of Transportation Standard Specifications, latest edition.

C. ACI 318, Building Code Requirements for Structural Concrete and Commentary, latest edition.

1.02 SCOPE OF WORK

Furnish labor, materials, equipment, facilities, transportation and services to complete concrete work and related work as shown on the Drawings and includes, but is not necessarily limited to, the following:

1. Concrete curb restoration at Moorpark College Lot 12, at sidewalk near stairs and mechanical enclosure (east end)

1.03 RELATED SECTIONS

A. Section 02220 - Demolition.

B. Section 02720 - Aggregate Base Course

1.04 STANDARDS

Materials and procedures for forming and reinforcing concrete shall conform to Sections 51, 52 and 90 of the Standard Specifications, unless otherwise noted on the Drawings or in these Specifications.

1.05 SUBMITTALS AND OBSERVATIONS

A. Materials List: Submit for all products at least 14 days in advance of work.

B. Forming and reinforcing shall be observed and approved by the District or District's Representative before the concrete is poured.

C. Observation of concrete work by the District or District's Representative shall be requested by contractor at least two (2) working days prior to the anticipated observation.

1.06 QUALITY ASSURANCE

A. Industry Standard: Perform concrete paving Work in accordance with ACI 301.

B. Regulatory Requirements: Conform to Standard Specifications for Public Works Construction, for Work in rights-of-way.

C. Materials Quality: Obtain like materials from same source throughout.

D. Lines and Levels: Established by licensed Surveyor.

1.07 TESTS

A. An approved independent testing laboratory shall test structural concrete for conformance with the plans and specifications. Tests shall be submitted to District's Representative for approval. District will pay for tests of structural concrete.

B. Concrete not conforming to requirements of plans and specifications shall be removed from the site and replaced at Contractor's expense.

C. In the event concrete does not conform to the requirements of the Plans and Specifications as determined by testing, Contractor shall reimburse the District for testing costs relating to non-structural concrete. District retains right to test replaced concrete, and require Contractor reimburse District for additional testing expenses.

1.08 PROJECT CONDITIONS

A. Water and Dust Control: Maintain control of concrete dust and water at all times. Do not allow adjacent planting areas to be contaminated.

1.09 ENVIRONMENTAL REQUIREMENTS

Do not place concrete when base surface temperature is less that 40 degrees F.

PART 2 - MATERIALS

2.01 BASE MATERIAL

A. According to Section 02720 - Aggregate Base Course

2.02 FORM MATERIALS

A. Forms: Steel or wood, profiled to suit conditions, to the lines and grades shown on Drawings. Earth forms shall not be used for Portland cement concrete paving.

2.03 REINFORCEMENT

A. Reinforcement, General: Except as modified herein, comply with all applicable requirements for reinforcement in the Standard Specifications for Public Works Construction.

B. Steel Reinforcing Bars: ASTM A615, Grade 40 or 60, unless otherwise indicated, deformed billet steel bars, clean and free from rust, scale and coatings that would reduce bond.

C. Dowels: ASTM A615, 1/2-inch diameter, smooth billet steel slip bars at expansion joints and between old and new concrete.

D. Tie Wires: 18 gage minimum, black annealed steel.

2.04 CONCRETE MATERIALS

A. Concrete shall be Portland cement concrete conforming to Standard Specifications, Section 90. Unless specified otherwise in the Drawings, concrete pavement shall have a minimum 28-day compression strength of 3,500 psi.

B. Cement shall be Type II cement conforming to ASTM Designation C150 as modified by the Standard Specifications.

C. Fine and Coarse Aggregates: ASTM C33.

D. Water: Clean and not detrimental to concrete.

E. Chemical Admixtures: ASTM C494, types as follows.

1.	Water Reducing:	Type A.
2.	Set Retarding:	Type B.
3.	Set Accelerating:	Type C.
4.	Water Reducing and Set Retarding:	Type D.
5.	Water Reducing and Set Accelerating:	Type E.
6.	High Range Water Reducing:	Type F and G.

Use no admixtures not included in mix design.

F. Water shall be clean and free from oil, acid, alkali, and organic matter.

G. Mix concrete in accordance with ACI 304.

H. Deliver concrete in accordance with ASTM C94.

I. Select proportions for normal weight concrete in accordance with ACI 301.

J. Use accelerating admixtures in cold weather only when approved by Architect/Engineer.

K. Use calcium chloride only when approved by Architect/Engineer.

L. Use set retarding admixtures during hot weather only when approved by Architect/Engineer.

2.05 OTHER MATERIALS

A. Formwork materials shall conform to Standard Specifications, Section 51-1.05, and as specifically outlined, unless otherwise noted on the Drawings.

1. Form panels shall be placed in a neat, symmetrical pattern subject to approval of District's Representative.

2. Form clamps or bolts shall be used to fasten forms. Use of ties consisting of twisted wire loops to hold forms in position during placing of concrete will not be permitted unless noted otherwise.

3. Exposed sharp edges shall be chamfered with triangular fillets not less than 3/4" x 3/4" to prevent mortar runs and to preserve smooth, straight lines, unless otherwise directed by District's Representative or the Drawings.

4. Before concrete is placed in forms, inside surface of forms that will later be removed shall be thoroughly coated with commercial quality form-oil as specified, unless otherwise noted, which will permit the ready release of forms and will not discolor concrete.

5. Where form panels are attached directly to studding or joists, panels shall be not less than 5/8-inch thick, and studding or joints shall be spaced not more than twelve inches (12") center to center. Form-panels less than 5/8-inch thick, otherwise conforming to requirements specified, may be used with a continuous backing of surfaced material ¾-inch thick. Form-panels more than 5/8-inch thick attached to studding or joists spaced at more than 12 inches center to center may be used, provided deflection of panel between studding or joists does not exceed that of a 5/8-inch panel attached to studding or joists spaced at 18-inches (18") center to center.

6. Curved surfaces shall be formed with sheet metal, Masonite, plywood, or timber. Sheet metal shall have Masonite or plywood backing. Plywood for forming shall be ACX or better grade.

   a. Sheet metal for curves less than 24-inches radius.
   b. Bender board between 25-inch and 48-inch radius.

c. 1x timber between 49-inch and sixteen feet (16') radius.
d. 2x timber for curves with radii over sixteen feet (16').

B. Aggregate base shall be Class 2, 3/4" maximum material conforming to Section 26-1.02A of the Standard Specifications or Crushed Miscellaneous Base (CMB) in accordance with the 'Greenbook" (latest edition).

C. Expansion joint material shall be pre-molded joint filler conforming to Standard Specifications, Section 51-1.12C.

D. Expansion joint caulk shall be an approved polyurethane sealant, conforming to Standard Specifications, Section 51-1.12F.

E. Reinforcing bars (re-bars) shall be intermediate grade deformed bars conforming to Standard Specifications, Section 52-1.02A. Bars shall be clean new stock, free of rust, scale or other coatings that could affect the bond between bars and concrete.

F. Water-stops shall conform to Standard Specifications, Section 51-1.14, unless noted otherwise on Drawings.

G. Street side curbs, gutters, driveways, streets, and sidewalks shall conform to Standard Specifications, Section 73 (Class B concrete). Reinforcement shall conform to Standard Specifications, Section 52.

2.06 MINIMUM STRENGTH REQUIREMENTS

Minimum mix requirements: It shall be the contractor's responsibility to design the concrete mixes to provide the minimum requirements listed below. Increase cement content over that listed if necessary to obtain the specified compressive strength. Minimum ultimate compression strength of concrete for listed items at 28 days is as follows:

Item	Strength	Max. Slump	Size of Aggregate	Cement (# of 94 lb. Sacks per yard)	W/C Ratio
Gutter/Swales, Curbs/ Headers/Sidewalk	3,500	4"	3/8"-1", as specified on drawings	6.0	0.55
Apron, Streets, Driveways	3,500	4"	1"	6.8	0.57

PART 3 - EXECUTION

3.01 EXCAVATION

In addition to general excavation required under the Site Preparation and Grading Section 02310, Contractor shall excavate to the required depths to construct pavement section thickness shown on drawings. Excess excavation shall be replaced with concrete poured monolithically with the pavement, at no additional cost to District.

3.02 SECTION THICKNESS

Concrete aprons shall consist of 7 inches Portland cement concrete over a minimum of 6 inches of Class 2 aggregate base. Concrete sidewalks shall consist of 4-inch thick concrete with 6-inch thickened edges, and Concrete ribbon gutters shall have a minimum thickness of 8 inches along flow line.

3.03 PREPARATION

A. Subgrade: Fine grading, checking, shaping, and preparation and compacting of subgrade shall be complete before start of Portland cement concrete Work.

B. Base Material: Base material shall be as specified in Section 02720.

C. Curbs and Gutters: Concrete curbs and gutters/swales to be in place and cured prior to start of adjoining Portland cement concrete and asphalt concrete paving Work.

D. Moisture Conditioning: Moisten base to minimize absorption of water from fresh concrete. Do not place concrete on standing water.

3.04 FORMING

A. Forming shall conform to Standard Specifications, Section 51-1.05 and shall result in surface finished as follows:

1. Surfaces which will be below finished grade or totally hidden from view shall conform to “Ordinary Surface Finish,” Section 51-1.18A.

2. Surfaces exposed to view shall conform to “Class I Surface Finish”, Section 51-1.18B. Contractor shall build forms with degree of care, and shall select from materials of adequate strength and smoothness to produce smooth, even surfaces of uniform texture and appearances, free of unsightly bulges, depressions, or other imperfections. District’s Representative shall be sole judge in this respect.

3. Transition of curves to straight lines and from curves to curves shall be formed as smooth, continuous and uninterrupted, with typical ninety (90) degree radius alignment at points of tangency.

3.05 COORDINATION WITH EXISTING CONSTRUCTION

A. Connection to Existing Construction: Where new concrete is doweled to existing construction, drill holes in existing concrete, insert steel dowels and pack with non-shrinking grout.

B. Preparation of Existing Concrete: Prepare previously placed concrete by cleaning with steel brush and apply bonding agent in accordance with manufacturer's instructions.

3.06 CONCRETE JOINTS

A. Joints are to be constructed at locations specified below. Where expansion material is specified, cut expansion material back and caulk exposed surfaces with an approved polyurethane joint sealant, color to match concrete color, or as approved by District or District's Representative. Dowel expansion joints with plain bars wrapped on one side with building paper.

B. Construct Concrete Joints as Follows:

1. Cold Joints

   a. Concrete slabs shall be poured in alternate sections of maximum three hundred (300) square feet each section.
   b. Joints between each section shall have No. 4 reinforcing dowels at minimum three (3) feet on center. Wrap one side of dowel with building paper, or other approved “break bond” method.
   c. Edge of joints between sections of concrete slabs shall have one-quarter inch radius toweled edge.

2. Expansion Joints

   a. Expansion joints shall be provided on concrete work at thirty (30) feet on center maximum; and between new flatwork and existing flatwork; and between new flatwork and existing or new concrete walls.
   b. Filler material shall be placed plumb and level in correct position before concrete is poured.
   c. Filler shall be held back one-quarter (1/4) inch from exposed surfaces.

3. Contraction and Score Joints

   a. Construct score marks at least one-half (1/2) inch deep on concrete work at five (5) feet on center
   b. Install "screed-key" contraction joints at ten (10) feet on center. "Screed key" joints shall be manufactured by Form A Key, Dayton Superior, or approved equal.

3.07 EDGING

A. Joints shall be tooled with one-quarter (1/4) inch radius edging tool.

B. Edge of slabs, curbs and other structures shall be tooled with one-half (1/2) inch radius edging tool, unless otherwise specified on the Drawings.

C. Flange marks resulting from tooling of edges shall be carefully troweled out, unless specifically detailed otherwise on the Drawings.

3.08 REINFORCEMENT

A. Reinforcement installation shall conform to Standard Specifications as follows:

1. Cleaning – Section 52-1.05.

2. Bending - Section 52-1.06.

3. Placing – Section 52-1.07.

4. Splicing – Section 52-1.08.

5. Lapped Splices – Section 52-1.08A

B. Reinforcement placement, General: Locate reinforcement as indicated on Drawings. Place, support and secure reinforcement against displacement. Locate reinforcement to provide required cover by concrete. If not otherwise indicated on Drawings, provide concrete cover in compliance with ACI 318.

C. Reinforcement spacing: Space reinforcement as indicated on Drawings. If not indicated, rebar for on-grade concrete should be 24 inches each way. Maintain clear spacing of two times bar diameter but not less than 1-1/2 inches nor less than 1-1/3 times maximum size aggregate.

D. Coordination: Locate reinforcement to accommodate embedded products and formed openings and recesses.

E. Slab on grade Reinforcement: Provide load bearing pads under supports or provide precast concrete block bar supports.

F. Dowels: Secure tie dowels in place before depositing concrete. Provide No. 4 bars for securing dowels where no other reinforcement is provided.

3.09 OBSERVATION

District or District's Representative shall observe and approve forming and reinforcing prior to pouring concrete. Contractor shall notify District or District's Representative five (5) working days in advance for observation of concrete forms.

3.10 CONCRETE PLACEMENT

Concrete placement shall conform to Standard Specifications, Section 51-1.09.

3.11 BONDING

Construction joints shall conform to Standard Specifications, Section 51-1.13.

3.12 FLATWORK

Concrete flatwork shall be constructed in accordance with Standard Specifications, Section 73-1.06. Pavements shall be marked or jointed as shown on Drawings. Provide weakened plane joints for crack control at spacing equal to sidewalk width or at 12 foot spacing in each direction for aprons to create “square” joint/edge configuration.

3.13 SURFACE DRAINAGE

A. Flatwork shall have a minimum pitch of one percent (1%) and nominally one and one-half percent (1-1/2%). Verify with the District or District's Representative on site where pitch exceeds two percent (2%). Finish surface shall drain properly with no areas of standing water. Tops of curbs shall be level unless otherwise specified.

B. Concrete gutter shall maintain positive drainage of at least 0.5 percent to outlet.

3.14 CURING

Contractor shall cure new concrete in accordance with Standard Specifications, Section 90-7.02 (“Curing Concrete”) by “Pigmented Curing Compound Method” or “Waterproof Membrane Method”. Method used must be compatible with sealers, concrete colors, exposed aggregate (if applies), other finishes and materials specified in this and other sections of the Contract Documents.

3.15 PROTECTION

New concrete shall be protected in accordance with Standard Specifications, Section 90-8, and “Protecting Concrete”. Contractor shall provide necessary security to protect concrete from vandalism before it sets and hardens. Contractor shall replace concrete that is defaced or damaged during course of this contract at no additional cost to District.

3.16 CONCRETE FINISHES

A. Concrete work shall have even surfaces of uniform texture and appearance, free of unsightly bulges, depressions, and other imperfections. The District's Representative shall be the sole judge in this respect.

B. Patching of concrete to disguise flaws, imperfections or other damage shall commence only with the approval of the District's Representative. Patching color and finish shall conform to the original adjacent concrete color and finish, and the District's Representative shall be the sole judge in this respect.

C. Provide concrete finishes as follows: (conform to min. static coefficients of friction per CBC 1133.B.7.1.)

1. Trowel Finish - Finish surface shall be smooth and clean with no obvious trowel marks.

2. Broom Finish:

a. Concrete shall be poured to line and grade as shown on plans.

b. Trowel and work the concrete to smooth even finish in accordance with the provisions of the Standard Specifications, Section 73-107.

c. Brush with bristled broom across width of path to a uniformly roughened surface. Finished surface shall be clean with uniform and reasonably straight lines.

d. Flatwork to be Medium Broom Finish and all slopes greater than 5% to be Heavy Broom Finish. Broom in a uniform direction as shown on the Drawings and details. Provide smooth flanged bands at concrete joints as shown on details.

e. Exterior Concrete Tolerance: AC1 301, Class B, 1/4-inch in 10 feet.

f. Edges: Rounded, 1/2-inch radius, unless indicated otherwise on drawings!

g. Sawcut Joints: 1-inch deep sawcut joints at spacing indicated on drawings. Joints shall be sawcut within 48 hours of finishing.

3.17 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Division I of these Specifications.

B. Four concrete test cylinders will be taken for every 50 or less cubic yards of concrete placed each day. Compressive strength of cylinders will be determined at 7 and 28 days,

C. One slump test will be taken for each set of test cylinders taken.

D. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, test samples taken, and compressive strength.

END OF SECTION 03000