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END OF SECTION 000010
SECTION 01 10 00 – SUMMARY

PART 1 - GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS


   1. Project Location: Cabrillo College’s Aptos Campus

   2. Owner: Cabrillo Community College District

   3. Civil Engineer: Bowman and Williams
                                1011 Cedar Street
                                Santa Cruz, CA 95060

1.02 DESCRIPTION

A. Project Scope: Maintenance and Repair of pavement in Parking Lots I,J,K & N, Including, asphalt reconstruction, new asphalt dikes, asphalt slurry sealing and restriping of the parking stalls. Concrete retaining curbs and guard railing in parking lot I, Plans prepared by Bowman & Williams Job Number 25042.

Add Alternates: Attention is directed to the Add Alternates 1 and 2 in parking lot I and ADD Alternate 3 in parking lot J. Work involved with the Add Alternates is shown on the plans.

B. Increase/Decrease

   Attention is directed to Caltrans Standard Specifications Section 4-1.03B with regards to increases or decreases in the quantity of a contract items of work: If the total pay quantity of any item of work required under the contract varies from the Engineers Estimate by 25% or less, payment will be made for the quantity of work of said item performed at the contract unit price therefor , unless eligible for adjustment pursuant to Section 4-1.03C, “Changes in Character of Work”.

1.03 USE OF PREMISES

A. General:

B. Restricted Areas:
C. Accessible Route:

1.03 SPECIFICATION FORMATS

A. Specification Format: The Specifications are organized into Divisions and Sections using the 2004 CSI/CSC’s “MasterFormat” numbering system.

END OF SECTION 01 10 00
SECTION 01 55 26 – TRAFFIC CONTROL

PART 1 - GENERAL

1.01 SUMMARY

A. Description: This work shall conform to the provisions in Section 12, "Construction Area Traffic Control Devices," of the Caltrans Standard Specifications and the provisions under “Maintaining Traffic” elsewhere in the special provisions, and shall consist of installing traffic and pedestrian signing, delineators, fencing, barricades, temporary base rock or plywood walkways, temporary driveways and flaggers as necessary to maintain safe passage, and these special provisions, and as directed by the College’s Representative.

1.02 REFERENCES


PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

A. Vehicular and pedestrian access to private property shall be maintained at all times unless the closing of such access is approved by the District’s Representative. The Contractor shall request in writing permission from the District’s Representative in advance of making such closing.

B. Detours and all lights, signs, barricades, flag persons or other devices necessary to provide for safety and convenience shall be furnished, installed and maintained by the Contractor. Lighted or flashing barricades shall be used during hours of darkness.

C. Existing traffic signs shall be protected in place by the Contractor during the construction period.

D. The Contractor shall place, remove, store, maintain, relocate, replace, and dispose construction area traffic control devices and traffic control and construction area signs.

E. Personal vehicles of the Contractor's employees shall not be parked on the traveled way or shoulders, including any section closed to the public traffic.

F. The Contractor shall notify local public safety authorities of this intent to begin work at least 5 working days before work is begun. The Contractor shall cooperate with local public safety authorities relative to handling traffic through the area and shall make his own arrangements relative to keeping the working area clear of parked vehicles.

G. The full width of the traveled way shall be open for use by public traffic on Saturdays, Sundays and designated legal holidays, after 3:00 p.m. on Fridays and the day preceding designated legal holidays, and when construction operations are not actively in progress.
H. Designated legal holidays are: January 1, the third Monday in February, the last Monday in May, July 4, the first Monday in September, November 11, Thanksgiving Day, and December 25. When a designated legal holiday falls on a Sunday, the following Monday shall be a designated legal holiday. When November 11 falls on a Saturday, the preceding Friday shall be a designated legal holiday.

I. Minor deviations from the requirements of this section concerning hours of work which do not significantly change the cost of the work may be permitted upon the written request of the Contractor if in the opinion of the District Representative public traffic will be better served and the work expedited. Such deviations shall not be implemented until the District Representative has indicated his written approval. All other modifications will be made by Contract Change Order.

3.02 CONSTRUCTION AREAS SIGN

A. Construction area signs shall be furnished, installed, maintained, and removed when no longer required in accordance with the provisions in Section 12, "Construction Area Traffic Control Devices," of the Caltrans Standard Specifications. Construction area signs shall be installed 7 calendar days prior to starting work.

END OF SECTION 01 55 26
SECTION 01 71 13 –MOBILIZATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Organization and mobilization of the Contractor’s forces.

B. Transporting construction plant and equipment to the jobsite and setting up of staging area.

C. Transporting various tools, materials, and equipments to the jobsite.

D. Erection of temporary buildings and facilities as required for field offices, staging, storage, and construction operations.

1.02 DESCRIPTION

A. This work shall conform to the requirements of Section 11, “Mobilization,” of the Caltrans Standard Specifications and shall consist of preparatory work and operations, including but not limited to, those necessary for the movement of personnel, equipment, supplies, and incidentals to the project site; for the establishment of all offices, buildings and other facilities necessary for work on the project; and for all other work and operations which must be performed or costs incurred prior to beginning work on the various contract items on the project site.

B. Mobilization shall also include assembly and delivery to the job site, equipment, tools, materials, and supplies necessary for the prosecution of work which are not intended to be incorporated in the Work.

1.03 SUBMITTALS

A. The Contractor shall submit a plan of the proposed layout of the construction site, including fences, roads, parking, buildings, staging, and storage areas, within 7 days after the effective date of Notice to Proceed.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 SCHEDULE

A. The Contractor shall submit a detailed construction schedule to the College Representative for review and approval prior to the pre-construction meeting for the project.

B. The contractor shall implement necessary traffic control during mobilization to maintain roadway vehicular access per Section 11 55 26.

END OF SECTION 01 71 13
SECTION 01 71 23 - FIELD ENGINEERING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Provide and pay for field engineering services required for the project.
   1. Civil or other professional engineering services specified, or required to execute Contractor's construction methods.
   2. Coordination with testing laboratory and soils engineer.
   3. Contractor furnished assistance.
   4. Verification of conditions.

B. Related Requirements in Other Parts of the Project Manual:
   1. Conditions of the contract.

1.02 SUBMITTALS

A. Submit name and address of professional engineer to District, including changes as they may occur.

B. On request of District, submit documentation to verify accuracy of field engineering work.

C. Record Drawings:
   1. At project completion, obtain and pay for reproducible transparencies of the project plans. Clearly indicate all differences between original drawings and completed work within specified tolerances.
   2. Completed record drawing transparencies shall be dated, signed and certified as correct by the Civil Engineer.

1.3 QUALITY ASSURANCE

A. Qualifications of Engineer: Engage a registered Civil Engineer acceptable to both Contractor and Owner and who is qualified to perform land surveying. Furnish to Owner prior to start of work, the name and license (or registration number) issued by the State of California, Board of Registration for Professional Engineers and Land Surveyors. Provide notice to Owner during course of construction should identification of individual responsible for this work change, and obtain approval of Owner for the replacement.

B. All field engineering services furnished during the course of this project shall be under the direct supervision and control of the named individual Civil Engineer.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 RECORDS

A. Maintain a complete, accurate surveyor's log of all control and survey work as it progresses. Make this log available for reference.
END OF SECTION 01 71 23
SECTION 03 10 00
CONCRETE FORMING AND ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Formwork for cast-in-place concrete.
   2. Shoring, bracing, and anchorage.
   3. Form accessories.
   4. Form stripping.

B. Related Sections:
   1. Section 03 20 00 - Concrete Reinforcing.
   2. Section 03 30 00 - Cast-In-Place Concrete.
   3. Section 04 20 00 - Unit Masonry: Product requirements for masonry accessories for placement by this Section.

1.2 REFERENCES

A. American Concrete Institute:
   2. ACI 301 - Specifications for Structural Concrete.
   3. ACI 318 - Building Code Requirements for Structural Concrete.
   4. ACI 347 - Guide to Formwork for Concrete.

B. American Forest and Paper Association:
   1. AF&PA - National Design Specifications for Wood Construction.

C. The Engineered Wood Association:

D. American Society of Mechanical Engineers:

E. ASTM International:

F. West Coast Lumber Inspection Bureau:
   1. WCLIB - Standard Grading Rules for West Coast Lumber.

1.3 DESIGN REQUIREMENTS

A. Design, engineer and construct formwork, shoring and bracing in accordance with [ACI 318] to conform to applicable code requirements to achieve concrete shape, line and dimension as indicated on Drawings.
1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Shop Drawings: Signed and sealed by professional engineer.
   1. Submit formwork, shoring, and re shoring shop drawings.
   2. Indicate the following:
      a. Pertinent dimensions, openings, methods of construction, types of connections, materials, joint arrangement and details, ties and shores, location of framing, studding and bracing, and temporary supports.
      b. Means of leakage prevention for concrete exposed to view in finished construction.
      c. Sequence and timing of erection and stripping assumed compressive strength at time of stripping, height of lift and height of drop during placement.
      d. Vertical, horizontal and special loads in accordance with ACI 347, Section 2.2 and camber diagrams, when applicable.
      e. Notes to formwork erector showing size and location of conduits and piping embedded in concrete in accordance with ACI 318, Section 6.3.

C. Product Data: Submit data on void form materials and installation requirements.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 347.

B. For wood products furnished for work of this Section, comply with AF&PA.


1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Products storage and handling requirements.

B. Deliver void forms and installation instructions in manufacturer's packaging.

C. Store off ground in ventilated and protected manner to prevent deterioration from moisture.

1.7 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Coordinate this Section with other sections of work, requiring attachment of components to formwork.

PART 2 PRODUCTS

2.1 WOOD FORM MATERIALS

A. Form Materials: At discretion of Contractor.

B. Lumber Forms:
1. Application: Use for edge forms and unexposed finish concrete.
2. Boards: 6 inches or 8 inches in width, shiplapped or tongue and groove, “Standard” Grade Douglas Fir, conforming to WCLIB Standard Grading Rules for West Coast Lumber. Surface boards on four sides.

C. Plywood Forms:
   2. Forms: Conform to PS 1; full size 4 x 8 feet panels; each panel labeled with grade trademark of APA/EWA.
   4. Plywood where “Smooth Finish” is required, as indicated on Drawings: APA/EWA “HD Overlay Plyform Structural I Exterior” grade, minimum of 3/4 inch thick.

D. Form Liners: Smooth, durable, grainless and non-staining hardboard, unless otherwise indicated on Drawings.

E. Framing, Studding and Bracing: Stud or No. 3 structural light framing grade.

2.2 FORMWORK ACCESSORIES

A. Form Ties: Removable or Snap-off type, galvanized metal, fixed or adjustable length, cone type, with waterproofing washer free of defects capable of leaving holes larger than 1 inch in concrete surface.

B. Spreaders: Standard, non-corrosive metal form clamp assembly, of type acting as spreaders and leaving no metal within 1 inch of concrete face. Wire ties, wood spreaders or through bolts are not permitted.

C. Form Anchors and Hangers:
   1. Do not use anchors and hangers exposed concrete leaving exposed metal at concrete surface.
   2. Symmetrically arrange hangers supporting forms from structural steel members to minimize twisting or rotation of member.
   3. Penetration of structural steel members is not permitted.

D. Form Release Agent: Colorless mineral oil that will not stain concrete, or absorb moisture, or impair natural bonding or color characteristics of coating intended for use on concrete.

E. Vapor Retarder: Where indicated on Drawings, 8 mil (0.2 mm) thick polyethylene sheet.


G. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Size, strength and character to maintain formwork in place while placing concrete.

H. Water stop: Flexible strip of bentonite waterproofing compound in coil form for joints in concrete construction.
PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements (01300 - Administrative Requirements):
   Coordination and project conditions.

B. Verify lines, levels, and centers before proceeding with formwork. Verify dimensions agree with
   Drawings.

C. When formwork is placed after reinforcement resulting in insufficient concrete cover over
   reinforcement before proceeding, request instructions from Architect/Engineer.

3.2 INSTALLATION

A. Formwork - General:
   1. Provide top form for sloped surfaces steeper than 1.5 horizontal to 1 vertical to hold shape of
      concrete during placement, unless it can be demonstrated that top forms can be omitted.
   2. Construct forms to correct shape and dimensions, mortar-tight, braced, and of sufficient
      strength to maintain shape and position under imposed loads from construction operations.
   3. Camber forms where necessary to produce level finished soffits unless otherwise shown on
      Drawings.
   4. Carefully verify horizontal and vertical positions of forms. Correct misaligned or misplaced
      forms before placing concrete.
   5. Complete wedging and bracing before placing concrete.

B. Forms for Smooth Finish Concrete:
   1. Use steel, plywood or lined board forms.
   2. Use clean and smooth plywood and form liners, uniform in size, and free from surface and
      edge damage capable of affecting resulting concrete finish.
   3. Install form lining with close-fitting square joints between separate sheets without springing
      into place.
   4. Use full size sheets of form lines and plywood wherever possible.
   5. Tape joints to prevent protrusions in concrete.
   6. Use care in forming and stripping wood forms to protect corners and edges.
   7. Level and continue horizontal joints.
   8. Keep wood forms wet until stripped.

C. Forms for Surfaces to Receive Membrane Waterproofing: Use plywood or steel forms. After
   erection of forms, tape form joints to prevent protrusions in concrete.

D. Framing, Studding and Bracing:
   1. Space studs at 16 inches on center maximum for boards and 12 inches on center maximum
      for plywood.
   2. Size framing, bracing, centering, and supporting members with sufficient strength to maintain
      shape and position under imposed loads from construction operations.
   3. Construct beam soffits of material minimum of 2 inches thick.
   4. Distribute bracing loads over base area on which bracing is erected.
   5. When placed on ground, protect against undermining, settlement or accidental impact.

E. Erect formwork, shoring, and bracing to achieve design requirements, in accordance with
   requirements of [ACI 301] [ACI 318].
F. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.

G. Obtain Architect/Engineer’s approval before framing openings in structural members not indicated on Drawings.

H. Install fillet and chamfer strips on external corners of walls where called for on the plans.

I. Install void forms in accordance with manufacturer's recommendations.

J. Do not reuse wood formwork more than 2 times for concrete surfaces to be exposed to view. Do not patch formwork.

3.3 APPLICATION - FORM RELEASE AGENT

A. Apply form release agent on formwork in accordance with manufacturer’s recommendations.

B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.

C. Do not apply form release agent where concrete surfaces are indicated to receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

D. Reuse and Coating of Forms: Thoroughly clean forms and reapply form coating before each reuse. For exposed work, do not reuse forms with damaged faces or edges. Apply form coating to forms in accordance with manufacturer’s specifications. Do not coat forms for concrete indicated to receive “scored finish”. Apply form coatings before placing reinforcing steel.

3.4 INSTALLATION - INSERTS, EMBEDDED PARTS, AND OPENINGS

A. Install formed openings for items to be embedded in or passing through concrete work.

B. Locate and set in place items required to be cast directly into concrete.

C. Coordinate with Work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other Work.

D. Install accessories straight, level, and plumb. Ensure items are not disturbed during concrete placement.

E. Install water stops continuous without displacing reinforcement. Heat seal joints watertight.

F. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.

G. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.

H. Form Ties:
   1. Use sufficient strength and sufficient quantity to prevent spreading of forms.
   2. Place ties at least 1 inch away from finished surface of concrete.
   3. Leave inner rods in concrete when forms are stripped.
4. Space form ties equidistant, symmetrical and aligned vertically and horizontally unless otherwise shown on Drawings.

I. Arrangement: Arrange formwork to allow proper erection sequence and to permit form removal without damage to concrete.

J. Construction Joints:
   1. Install surfaced pouring strip where construction joints intersect exposed surfaces to provide straight line at joints.
   2. Just prior to subsequent concrete placement, remove strip and tighten forms to conceal shrinkage.
   3. Show no overlapping of construction joints. Construct joints to present same appearance as butted plywood joints.
   4. Arrange joints in continuous line straight, true and sharp.

K. Embedded Items:
   1. Make provisions for pipes, sleeves, anchors, inserts, reglets, anchor slots, nailers, water stops, and other features.
   2. Do not embed wood or uncoated aluminum in concrete.
   3. Obtain installation and setting information for embedded items furnished under other Specification sections.
   4. Securely anchor embedded items in correct location and alignment prior to placing concrete.
   5. Verify conduits and pipes, including those made of coated aluminum, meet requirements of ACI 318 for size and location limitations.

L. Openings for Items Passing Through Concrete:
   1. Frame openings in concrete where indicated on Drawings. Establish exact locations, sizes, and other conditions required for openings and attachment of work specified under other sections.
   2. Coordinate work to avoid cutting and patching of concrete after placement.
   3. Perform cutting and repairing of concrete required as result of failure to provide required openings.

M. Screeds:
   1. Set screeds and establish levels for tops of concrete slabs and levels for finish on slabs.
   2. Slope slabs to drain where required or as shown on Drawings.
   3. Before depositing concrete, remove debris from space to be occupied by concrete and thoroughly wet forms. Remove freestanding water.

N. Screed Supports:
   1. For concrete over waterproof membranes and vapor retarder membranes, use cradle, pad or base type screed supports which will not puncture membrane.
   2. Staking through membrane is not be permitted.

O. Cleanouts and Access Panels:
   1. Provide removable cleanout sections or access panels at bottoms of forms to permit inspection and effective cleaning of loose dirt, debris and waste material.
   2. Clean forms and surfaces against which concrete is to be placed. Remove chips, saw dust and other debris. Thoroughly blow out forms with compressed air just before concrete is placed.
3.5 FORM CLEANING

A. Clean forms as erection proceeds, to remove foreign matter within forms.

B. Clean formed cavities of debris prior to placing concrete.

C. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.

3.6 FORM REMOVAL

A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads and removal has been approved by Architect/Engineer.

B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.

C. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.

D. Leave forms in place for minimum number of days as specified in ACI 347.

3.7 ERECTION TOLERANCES

A. Construct formwork to maintain tolerances required by ACI 301.

3.8 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties, and items are secure.

C. Notify Architect/Engineer after placement of reinforcing steel in forms, but prior to placing concrete.

D. Schedule concrete placement to permit formwork inspection before placing concrete.

END OF SECTION 03 10 00
SECTION 03 20 00 - CONCRETE REINFORCING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Reinforcing bars.
   3. Reinforcement accessories.

B. Related Sections:
   1. Section 03 30 00 - Cast-In-Place Concrete.

C. American Concrete Institute:
   1. ACI 301 - Specifications for Structural Concrete.
   2. ACI 318 - Building Code Requirements for Structural Concrete.
   3. ACI 530.1 - Specifications for Masonry Structures.

D. ASTM International:
   1. ASTM A82/A82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
   4. ASTM A496/A496M - Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement.
   6. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
   7. ASTM A704/A704M - Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement.
   8. ASTM A706/A706M - Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.
   9. ASTM A767/A767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.
  13. ASTM A996/A996M - Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement.
E. American Welding Society:
   1. AWS D1.4 - Structural Welding Code - Reinforcing Steel.

F. Concrete Reinforcing Steel Institute:
   2. CRSI - Placing Reinforcing Bars.

1.2 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures.

B. Shop Drawings: Indicate bar sizes, spacing, locations, and quantities of reinforcing steel, bending and cutting schedules and supporting and spacing devices.

1.3 QUALITY ASSURANCE


B. Prepare shop drawings in accordance with ACI SP-66.

C. Perform Work in accordance with Caltrans Standards.

1.4 QUALIFICATIONS

A. Welders: AWS qualified within previous 12 months.

1.5 COORDINATION

A. Section 01 30 00 - Administrative Requirements Coordination and project conditions.

B. Coordinate with placement of formwork, formed openings and other Work.

PART 2 PRODUCTS

2.1 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M, #4 bars 40 ksi yield grade, deformed billet bars, uncoated.

2.2 ACCESSORY MATERIALS

A. Tie Wire: Minimum 16 gage annealed type.

B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions

2.3 FABRICATION

A. Fabricate concrete reinforcement in accordance with CRSI Manual of Practice, ACI 318.
B. Form standard hooks for 180 degree bends, 90 degree bend, stirrup and tie hooks and seismic hooks as indicated on Drawings.

C. Form reinforcement bends with minimum diameters in accordance with ACI 318.

D. Fabricate column reinforcement with offset bends at reinforcement splices.

E. Locate reinforcement splices not indicated on Drawings, at point of minimum stress.

2.4 SOURCE QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements : Testing, inspection and analysis requirements.

B. Make completed reinforcement available for inspection at manufacturer’s factory prior to packaging for shipment. Notify Architect/Engineer at least seven days before inspection is allowed.

PART 3 EXECUTION

3.1 PLACEMENT

A. Place, support and secure reinforcement against displacement. Do not deviate from required position beyond specified tolerance.
   1. Do not weld crossing reinforcement bars for assembly except as permitted by Architect/Engineer.

B. Do not displace or damage vapor retarder.

C. Accommodate placement of formed openings.

D. Space reinforcement bars with minimum clear spacing in accordance with ACI 318.
   1. Where bars are indicated in multiple layers, place upper bars directly above lower bars.

<table>
<thead>
<tr>
<th>Reinforcement Location</th>
<th>Minimum Concrete Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Footings and Concrete Formed</td>
<td>3 inches</td>
</tr>
<tr>
<td>Against Earth</td>
<td></td>
</tr>
<tr>
<td>Concrete exposed to earth or</td>
<td>No. 6 bars and larger</td>
</tr>
<tr>
<td>weather</td>
<td>No. 5 bars and smaller</td>
</tr>
<tr>
<td>Supported Slabs, Walls, and</td>
<td>No. 14 bars and larger</td>
</tr>
<tr>
<td>Joists</td>
<td>No. 11 bars and smaller</td>
</tr>
<tr>
<td>Beams and Columns</td>
<td></td>
</tr>
<tr>
<td>Shell and Folded</td>
<td>No. 6 bars and larger</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3.2 ERECTION TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Install reinforcement within the following tolerances for flexural members, walls, and compression members:

<table>
<thead>
<tr>
<th>Reinf. Depth</th>
<th>Depth Tolerance</th>
<th>Concrete Cover Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater than 8 inches</td>
<td>plus or minus 3/8 inch</td>
<td>minus 3/8 inch</td>
</tr>
<tr>
<td>Less than 8 inches</td>
<td>plus or minus 1/2 inch</td>
<td>minus 1/2 inch</td>
</tr>
</tbody>
</table>

C. Install reinforcement within the tolerances specified in ACI 530.1 for foundation walls.

3.3 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements, 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Field inspection and testing will be performed by Owner’s testing laboratory in accordance with ACI 318.

END OF SECTION
SECTION 03 30 00
CAST IN PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Provisions for Constructing:
   a. Concrete footings for retaining curbs and concrete slabs.

B. Related Sections

1. Section 31 23 13 - Subgrade Preparation
2. Section 03 20 00 - Concrete Reinforcing

1.2 REFERENCES

A. Standards listed below, after their abbreviated designation, apply where the designation is cited in this Section. Refer to the latest edition unless otherwise noted.

B. Local Agency Specifications

1. When applying the cited standards, the following shall be understood.
   a. Terms such as Commission, Department or Agency shall mean the Cabrillo Community College District (District).
   b. Terms such as Director, Executive Officer, or Engineer shall mean the District’s Representative.
   c. In case of discrepancies between the cited standards and this Section, this Section governs.
   d. All references to statistical testing are deleted.
   e. All references to measurement and payment are deleted.

2. Standards cited:
1.3 SUBMITTALS

A. Product Data: Catalog cuts for each specified or indicated manufactured product.

B. Quality Control Submittals


1.4 SITE CONDITIONS

A. Do not place concrete when base surface temperature is less than 40 degrees Fahrenheit, or surface is frozen.

PART 2 - PRODUCTS

2.1 AGGREGATE BASE AND SUBBASE

A. See Section 31 23 13 – Subgrade Preparation and Section 32 11 23 – Aggregate Base Course.

2.2 CONCRETE MATERIALS

A. Concrete mixes by minimum 28-day strength unconfined compressive strength for concrete of at least 2500 psi to be used for the Matt Slab.

<table>
<thead>
<tr>
<th>28-day Strength (psi)</th>
<th>Max. size of Aggregate (&quot;')</th>
<th>Max. Slump (&quot;&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2500</td>
<td>1&quot;</td>
<td>4&quot;</td>
</tr>
</tbody>
</table>

B. Use only one brand type of cement for each type of concrete finish; uniform color is required.

2.4 REINFORCEMENT:

A. Deformed steel bars shall conform to CSS Section 52, ASTM A615, Grade 40 or better and shall be of U.S.A. domestic manufacturers.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify grading has brought subgrade to proper elevation.

B. Report any discrepancies in Drawings, conditions at the site, or prior work done by others which would prevent positive drainage or would produce unsatisfactory concrete work.

C. Ensure all underground work and embedded items are in place.

3.2 AGGREGATE BASE
A. Place, spread, moisture condition, and compact in accordance with Section 02300.

3.3 CONCRETE, GENERAL

A. Notify the District’s Representative at least 48 hours prior to placing concrete.

B. Place Concrete in accordance with this section.

C. All concrete work shall be true to line and grade as indicated on the drawings. Follow the intent of drainage patterns indicated; any surface which does not drain properly will be rejected.

D. Finished paving surfaces shall not vary more than 1/8" from a 10' metal straightedge, except at grade changes. No "birdbaths" or other surface irregularities will be permitted. Correct irregularities to the satisfaction of the University's Representative at no additional cost to the University.

E. Tooled weakened plane joints shall be set at 20 foot intervals with a depth of 1/3 the slab thickness.

F. Concrete walkways with gradients less than 5% (1:20) shall have a light broom finish.

G. Concrete ramps with gradients between 5% (1:20) and 8.33% (1:12) shall have a medium broom finish.

3.4 PROTECTION

A. Conform to applicable requirements of CSS Section 90-8.

B. Protect all concrete work against injury and defacement during subsequent construction operations until Final Acceptance.

3.5 CURING

A. All concrete shall be allowed to cure a minimum of 7 days prior to any loading.

3.6 FIELD QUALITY CONTROL

A. The District’s Geotechnical Engineer will inspect subgrade and any required bases prior to placement of concrete.

B. The District’s Testing Agency will take samples for testing during the course of the work in accordance with the Contract Documents or as considered necessary.

END OF SECTION 02751
SECTION 05 52 00
METAL RAILINGS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes steel pipe tube railings, balusters, and fittings; and handrails.

B. Related Sections:
   1. Section 03 30 00 - Cast-In-Place Concrete: Execution requirements for placement of anchors specified in this section in concrete.

1.2 REFERENCES

A. ASTM International:
   3. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

B. Green Seal:

C. National Ornamental & Miscellaneous Metals Association:
   1. NOMMA Guideline 1 - Joint Finishes.

D. SSPC: The Society for Protective Coatings:
   1. SSPC - Steel Structures Painting Manual.
   2. SSPC Paint 15 - Steel Joist Shop Primer/Metal Building Primer.
   3. SSPC Paint 20 - Zinc-Rich Coating, Type I - Inorganic and Type II - Organic.

1.3 DESIGN REQUIREMENTS

A. Design handrail, guardrail, and attachments to resist forces as required by 2012 California Building Code. Apply loads non-simultaneously to produce maximum stresses.
   1. Guard Top Rail and Handrail Concentrated Load: 200 pounds applied at any point in any direction.
   2. Intermediate Rails, Panels, and Baluster Concentrated Load: 50 pounds applied to 1 sf area.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal requirements.
B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.

C. Samples: Submit one 6 inch long samples of handrail. Submit one sample, of elbow, tee, wall bracket, escutcheon and end stop.

1.5 QUALITY ASSURANCE

A. Finish joints in accordance with NOMMA Guideline 1.


1.6 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

PART 2 PRODUCTS

2.1 HANDRAILS AND RAILINGS

A. Manufacturers:
   1. Substitutions: Section 01 60 00 - Product Requirements.


2.2 STEEL RAILING SYSTEM COMPONENTS

A. Tubing: ASTM A513, Type 5, minimum 50 ksi yield strength.

B. Hollow Structural Sections: ASTM A500/A500M, Grade B.

C. Pipe: ASTM A53/A53M, Grade B.

D. Fittings: Elbows, T-shapes, wall brackets, escutcheons; cast or machined steel.

E. Mounting: Adjustable brackets and flanges, with steel inserts for casting in concrete with steel brackets for embedding in masonry. Prepare backing plate for mounting in wall construction.

F. Exposed Fasteners: Flush countersunk screws or bolts; consistent with design of railing.

G. Splice Connectors: Steel concealed spigots, welding collars, threaded collars.

H. Galvanizing: ASTM A123/A123M; hot dip galvanize after fabrication.

I. Touch-Up Primer for Galvanized Surfaces: SSPC Paint 20 Type I Inorganic or Type II Organic, zinc rich.

J. Shop Primer: SSPC Paint 15, Type 1, red oxide.] [Zinc-rich inorganic primer.] [moisture-cured micaceous iron oxide-zinc (MIO-zinc) primer.

K. Touch-Up Primer: Match shop primer.
2.3 FABRICATION

A. Fit and shop assemble components in largest practical sizes for delivery to site.

B. Fabricate components with joints tightly fitted and secured. Furnish spigots and sleeves to accommodate site assembly and installation.

C. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

E. Exterior Components: Continuously seal joined pieces by continuous welds. Drill condensate drainage holes at bottom of members at locations not encouraging water intrusion.

F. Interior Components: Continuously seal joined pieces by continuous welds.

G. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.


I. Accurately form components to suit stairs and landings, to each other and to building structure.

J. Accommodate for expansion and contraction of members and building movement without damage to connections or members.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify field conditions are acceptable and are ready to receive work.

C. Verify concealed blocking and reinforcement is installed and correctly located to receive wall mounted handrails.

3.2 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply items required to be cast into concrete and or embedded in masonry placed in partitions with setting templates, to appropriate sections.

3.3 INSTALLATION

A. Install components plumb and level, accurately fitted, free from distortion or defects.

B. Anchor railings to structure with anchors, sleeves.
C. Field weld anchors as indicated on Drawings and shop drawings. Touch-up welds with primer. Grind welds smooth.

D. Conceal bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

E. Assemble with spigots and sleeves to accommodate tight joints and secure installation.

F. Install Work in accordance with Caltrans Standard Specifications.

3.4 ERECTION TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

C. Maximum Offset From Alignment: 1/4 inch.


END OF SECTION 05 52 00
SECTION 31 10 00
SITE CLEARING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Removing surface debris.
2. Removing designated paving, curbs, sidewalks and other site features as shown on the plans.
3. Removing designated trees, shrubs, and other plant life.
4. Removing abandoned utilities.

B. Related Sections:
1. Section 02120 - Existing Planting to Remain.
2. Section 02200 - Earthwork and Grading
3. Section 02374 - Erosion and Sediment Control.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Site Clearing:
1. Basis of Payment: Includes clearing site, loading and removing waste materials from site. Cost associated with site clearing is included in the various items of work requiring site clearing.

1.3 SUBMITTALS

A. Section 01330 - Submittal Procedures: Requirements for submittals.

1.4 QUALITY ASSURANCE


B. Conform to applicable code for environmental requirements. Disposal of debris shall be at a disposal site approved by the Owner.

PART 2 PRODUCTS

Not Used.
PART 3 EXECUTION

3.1 EXAMINATION

A. Verification of existing conditions before starting work.

B. Verify existing plant life designated to remain is tagged or identified.

3.2 PREPARATION

A. Call Underground Service Alert at (800) 642-2444 not less than three working days before performing Work.
   1. Request underground utilities to be located and marked within and surrounding construction areas.

3.3 PROTECTION

A. Locate, identify, and protect utilities indicated to remain, from damage.

B. Protect trees, plant growth, and features designated to remain, as final landscaping. Attention is directed to the existing vegetation in planter areas and along parking lot perimeter. Contractor will be responsible for replacing in kind any landscaping damaged during construction.

C. Protect existing tree roots encountered during excavation or grinding. Notify a qualified Arborist to evaluate all tree roots before cutting or removal.

D. Protect temporary bench marks, and survey control points from damage or displacement.

3.4 CLEARING

A. Conform to the requirements of Caltrans Section 16 “Clearing and Grubbing”.

3.5 REMOVAL

A. Remove debris, rock, and extracted plant life from site.

B. Remove paving, curbs, and sidewalks and other site features as indicated on Drawings. Neatly saw cut edges at right angle to surface.

C. Remove abandoned utilities. Indicated removal termination point for underground utilities on Record Documents.

D. Continuously clean-up and remove waste materials from site. Do not allow materials to accumulate on site.

E. Do not burn or bury materials on site. Leave site in clean condition.

END OF SECTION 31 10 00
SECTION 31 20 00
EARTH MOVING

PART 1 - GENERAL

1.1 SUMMARY

A. Related Documents:
   1. The following applies to this section:
      a. General provisions of the Contract, including General and Supplementary Conditions.
      b. The Drawings.
      c. Division 01 Specification Sections and Related requirements in other sections of the Project Manual.
      d. Related requirements in other Contract Documents listed in the Agreement.
   2. Review these documents for coordination with additional requirements and information that apply to work under this Section.

B. Section Includes
   1. Clearing, including removal of existing improvements and anything necessary to complete the work on or below grade.
   2. Scarifying and compact the sub-base below areas to receive new pavement sections according to the plans.
   3. Excavating, filling and grading for the preparation of sub grade for new concrete curbs, asphalt concrete paving, asphalt concrete dikes.
   4. Dewatering to protect excavated subgrades.
   5. Excavating and backfilling or filling for buildings and structures, including footings and wall foundations.
   6. Disposal of debris and surplus material. Debris and surplus material shall be disposed of off District property at a legal disposal facility.
   7. Implement a Storm Water Pollution Prevention Plan (SWPPP) developed by Owner engaged agency:
      a. Providing temporary erosion and sedimentation control measures to protect graded areas from erosion during construction and until permanent planting, and permanent drainage and erosion control measures are installed and effectively operational.
      b. Contractor shall make a thorough review of the site SWPPP and ensure that erosion control measures installed meet the requirements of that document

1.2 REFERENCES

A. General:
   1. The following documents form part of the Specifications to the extent stated. Bring conflicts between Specifications, Drawings, and the referenced documents to the attention of the Architect, in writing, for resolution before taking any related action. Where differences exist between codes and standards, the one affording the greatest protection shall apply.
   2. If the year of the adoption or latest revision is omitted from the designation, it shall mean the specification, manual or test designation in effect the date the Notice to Proceed with the Work is given.

B. American Society for Testing and Materials’:

C. State of California, Department of Transportation's "Standard Specifications", (CSS) Latest edition. When applying the cited standards, the following should be understood.
1. Terms such as Commission, Department or Agency shall mean the City.
2. Terms such as Director, Executive Officer, or Engineer shall mean the City's Representative.
3. In case of discrepancies between the cited standards and this Section, this Section governs.

1.3 DEFINITIONS

A. Fill: All soil and aggregate materials placed to raise grade of site and/or roadways to fill around buried vaults or to backfill excavations.

B. Relative Compaction: Ratio (expressed as a percentage) of the field dry density to the maximum dry density of a representative sample of the same material determined by ASTM D1557.

C. Field Density: In-place compacted dry density as determined in accordance with ASTM D2922 or ASTM D1556 at the discretion of the City’s Geotechnical Engineer.

D. Stockpile Area: Off-site area designated for temporary stockpiling of native and/or imported material; location and limits as approved by the City’s Representative.

E. Paved Area: Areas to be covered by concrete or asphalt.

F. Unstable or "Pumping" Surface: Compacted soil or aggregate which, in the opinion of the District’s Geotechnical Engineer, shows unacceptable deflection either vertically or laterally, under loading of construction equipment.

1.4 SUBMITTALS

A. Samples as requested by the City’s Geotechnical Engineer -- Refer to SOURCE QUALITY CONTROL Article of this Section.

1.5 PROJECT CONDITIONS

A. Job Conditions:
1. Be familiar with site and subsurface conditions.
2. Off-site Access: Verify all limitations imposed by public jurisdictions on off-site construction routes.
3. On-site Access: Use on-site access routes designated by the District’s Representative. Maintain and clean these routes during construction. At completion of construction restore routes to original condition at no additional cost to the District.
4. Unusual Site Conditions: If unusual site conditions not defined by the Contract Documents are encountered notify the District’s Representative immediately.
5. Maintain and restore routes as required and accepted by the District’s Representative to provide for pedestrian, bicycle, and vehicular traffic during construction.
B. Environmental Requirements:
   1. Water Control: Construct temporary ditches if required to keep site and adjacent areas free from excess water at all times. Keep excavated areas dry by pumping excess water in manner accepted by the District’s Representative.
   2. Stockpiling: Temporary stockpiling of approved excavated materials on or off site for later use as topsoil will be permitted only in location and manner accepted by the District’s Representative.
   3. Adverse Weather Conditions:
      a. Do not perform fill compaction during periods when site soil moisture content is substantially in excess of moisture content required for optimum compaction.
      b. Prevent erosion of freshly graded areas during construction and until such time structures are completed and back-filled. Keep sediments from entering sinkholes at all times.
      c. After interruption by adverse weather conditions, re-establish compaction specified in last layer before resuming work.

C. Sequencing:
   1. Provide schedule of the work before commencing and otherwise notify the District’s Geotechnical Engineer and the District’s Representative before beginning any earthwork operation.
   2. Sequence earthwork operations and related work including, but not necessarily limited to, demolition, shoring, etc. so as to maintain safe working conditions and preserve existing work which is to remain.
   3. Do not place fill or backfill until forms, rubbish and deleterious materials have been removed, waterproofing measures have been installed, and areas have been accepted by the District’s Representative.
   4. After grading is completed and the District’s Geotechnical Engineer has finished his/her observation of the work, conduct no further excavation or filling except with the District’s Representative’s acceptance and under his/her observation.

1.6 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies: State and local code requirements shall apply to all work in this section and to disposal of debris.

B. Earthwork, trenching, or back-filling shall be performed with no less than 48 hours notification and only in presence of, or with acceptance by, the District’s Geotechnical Engineer. Any materials placed or improvements constructed in absence of the District’s Geotechnical Engineer’s or the District’s Representative’s acceptance to proceed shall be presumed to be defective and, at discretion of the District’s Representative, shall be removed and replaced at no additional cost to the District.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Native Fill Material: Soil or soil-rock mixture selectively obtained from site excavation, subject to acceptance by the District’s Representative, to be used only for site grading and grade adjustments
to the existing roadway (not for trench backfill) as approved by the District’s Representative and
conforming to the following:
1. Predominantly granular, well graded, not showing excessive shrinkage or swelling when
subjected to changes in water content.
2. Free of debris or other deleterious substances; organic content of less than 3 percent by
volume.
3. Thoroughly compactable without presence of excessive voids.
4. Free of rocks in excess of 6 inches in size with not more than 15 percent larger than 2.5
   inches.

B. Imported Fill Material: Soil or soil-rock mixture hauled in from off-site sources, subject to
acceptance by the District’s Representative, and conforming to the following:
1. Predominantly granular, well graded, not showing excessive shrinkage or swelling when
subjected to changes in water content.
2. Free of debris or other deleterious substances; organic content of less than 3 percent by
volume.
3. Thoroughly compatible without presence of excess voids.
4. PlastiDistrict Index between 4 and 12 (ASTM D4318).
5. Have a minimum sand equivalent of 20.
6. Have a minimum Resistance ("R") Value of 30.
7. Free of rocks in excess of 2 inches in size.

2.2 SOURCE QUALITY CONTROL

A. Inspection and testing will be performed under provisions of Division 01.

B. Contractor shall deliver samples to the District’s Geotechnical Engineer of all proposed earthwork
materials in sufficient quantities for required tests. Samples shall be tagged with source location
and shall be delivered at least 15 days in advance of import.

C. The District’s Geotechnical Engineer will test materials for conformance with requirements
specified.

PART 3 - EXECUTION

3.1 PREPARATION

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

B. Identify and flag locations of known above and below grade utilities.

C. Maintain and protect existing utilities remaining which pass through work.

D. Maintain and protect existing improvements intended to remain.

E. Notify the District’s Representative and District’s Geotechnical Engineer prior to commencing
operations requiring inspection or testing in accordance with FIELD QUALITY CONTROL article
of this Section.
3.2 GENERAL REQUIREMENTS

A. Conduct earthwork operations so as to prevent windblown or vehicle tracked dust and dirt from interfering with the District’s normal operations. Assume liability for all claims related to dust and dirt.

B. Perform Work with equipment, methods and schedule which do not interfere with the District’s adjacent operations.

C. Modify earthwork equipment, methods, and/or schedule at no additional cost to the District as required to reduce noise and vibration to a level acceptable to the District’s Representative.

D. Control drainage during progress of work and after completion of project in accordance with The District of Santa Cruz Erosion Control Standards.

E. Discontinue affected work and notify the District’s Representative upon discovery of any unknown utility.

F. Notify the District’s Representative upon discovery of unknown wells, vaults or otherwise enclosed spaces wherever they occur below new grade within area of new structures, paved areas, or landscaping.

3.3 CLEARING

A. Clear areas required for access to site and execution of work.

B. Remove portions of existing on or below grade construction including, but not limited to, retaining walls, foundations, paving, curbs, walks, and steps. Remove base rock underneath paved areas. Saw cut construction where adjacent portions are to remain.

3.4 STRIPPING

A. Strip areas to be further excavated or to receive fill, paving, or other improvements. Strip down to clean mineral materials as determined by the District’s Geotechnical Engineer.

B. Stockpile all strippings in a stockpile area location under conditions as directed and approved by the District’s Representative. Stockpiled material shall have heavy tarp/fabric between stockpile and soil below to allow for complete removal of stockpiled material without disturbing or mixing material below.

3.5 EXCAVATION

A. After stripping, excavate areas to required elevations. Include over excavation as recommended in the Geotechnical Report.

B. Excavate all soft or weak zones exposed in the excavated surface not readily capable of compaction in place.
C. Obtain approval from the District’s Representative based on recommendations from the District’s Geotechnical Engineer that all unsuitable materials have been removed prior to terminating excavation.

D. Perform stockpiling as follows:
   1. Stockpile excavated materials accepted for later use as fill in stockpile areas as directed by the District’s Representative. Stockpiles on soil will require heavy fabric underneath to assure full removal of stockpiled material.
   2. Excavate, handle and remove stockpiled material for use in a manner such that loss of material and contamination with other soils are minimized.
   3. Place material in stockpile in a neat embankment without compaction.

E. Where excavation is carried below specified depth, backfill with structural concrete or engineered fill as directed by the District’s Representative.

3.6 FILLING AND BACKFILLING

A. Preparation for filling:
   1. Remove forms, rubbish, and deleterious materials in areas to be back-filled and obtain acceptance from the District's Representative based on recommendations from the District’s Geotechnical Engineer that unsuitable materials have been removed.
   2. Scarify and re-compact surface of areas to receive fill as recommended in the Geotechnical Report.
   3. Cut out soft areas not readily capable of compaction in place.
   4. Bring scarified material to proper moisture content. Thoroughly mix soil and water to achieve uniform moisture content.
   5. Compact scarified materials to minimum compaction requirements specified for fill.
   6. Stabilize surface that is unstable or "pumping", by additional excavation and placement of engineered backfill as directed by the District’s Representative.

B. Placing and Compacting Fill:
   1. Place fill materials as required to establish elevations and grades shown.
   2. Spread fill material in uniform lifts not exceeding eight inches in un-compact thickness.
   3. Before compaction begins, bring fill to moisture content which will permit proper compaction by either aerating material if it is too wet, or by spraying material with water if it is too dry.
   4. Mix each lift thoroughly before compaction to provide uniform distribution of moisture content.
   5. Compact each layer uniformly to specified relative compaction. Compaction by flooding, ponding or jetting will not be permitted.
   6. Scarify and re-compact any layer not attaining compaction until specified minimum compaction is obtained.
   7. Stabilize any layer not attaining compaction before placing the next lift.
   8. Remove all intrusive water and dry sub-grade and fill to proper moisture content where water enters areas to be filled. Re-establish compaction specified in last layer before proceeding with operations.

C. Preparation for Back-filling:
   1. Verify areas to be back-filled are free of debris, form-work, and water.

D. Placing and Compacting Backfill:
   1. Place and compact backfill in accordance with requirements for placing and compacting fill.
E. Schedule of Locations:
   1. The paragraphs below identify location, fill material to be used (identified from upper to lower fill type), compacted thickness of each fill, and minimum relative compaction.
      a. Fill Under Paved Areas: Native and Import Fill Material, to sub-grade at under side of respective surfacing or to underside of lowest base (where base occurs): compact upper 8 inches to 95 percent, and 90 percent below.
      b. Note that Native Fill Material for the new roadway may be used only by approval of the District’s Representative based on information provided by the District’s Geotechnical Engineer.

3.7 GRADING

A. Bring all areas to proper grade, with allowance for finish materials, to the following tolerances:
   1. Building and paved areas: Plus or minus 0.10 feet.
   2. Other areas: Plus or minus 0.20 feet.

B. Grade areas to smooth uniform surface in conformity to contour lines and spot elevations noted. Grade to a plane where not otherwise indicated. Round or smooth abrupt changes in slopes including the intersection of cut or fill slopes with existing natural grade. Refill any settled grades to required levels.

C. Scarify native sub-grade at paved areas to a depth of eight inches, moisture condition, and compact to 95 percent relative compaction in accordance with requirements for placing and compacting fill.

D. Perform no further excavation or filling operations after grading is completed except by the District’s Representative's approval and under observation of the District’s Geotechnical Engineer.

3.8 DISPOSAL

A. Surplus material and debris becomes property of the Contractor for off-site disposal in accordance with applicable state and local codes, ordinances, and regulations.

3.9 PROTECTION

A. Prevent erosion of graded areas during construction and until permanent drainage and erosion control measures are installed.

3.10 FIELD QUALITY CONTROL

A. Inspection and testing will be performed under provisions of Division 01.

B. The District’s Geotechnical Engineer will:
   1. Test any fill material from source designated by the Contractor and any site materials stockpiled for use as fill; observe excavation and check stability of sub-grade, compacted fill, and backfill.
   2. Be present at the site intermittently during conduct of work to observe performance of work and soil conditions encountered.
   3. Perform laboratory and field density tests to evaluate compaction achieved.
   4. Observe and provide engineering opinions as to adequacy of excavation, compaction of sub-grade, and placement and compaction of fill and backfill. Engineering opinions will be based on observations of work performed as well as tests and inspections deemed necessary by the District’s Geotechnical Engineer to ensure compliance with the Contract Documents.
   5. Observe methods of compaction and report findings to the District’s Representative.
   6. Issue final report to the District’s Representative on grading; include opinion regarding degree of compliance with specifications.

C. The Contractor will:
1. Cooperate with the District’s Geotechnical Engineer in all aspects of the work.
2. Notify the District's Representative and the District’s Geotechnical Engineer at least 48 hours prior to required observation or testing.
3. Be responsible for expense of all re-testing of sub-grade, fill, aggregate base, backfill, or other controlled material found to be inadequate at first testing, including fees for travel, personnel time, laboratory expenses, office work, supervision, and testing which may be incurred by reason of such re-testing. The District’s Representative will deduct such expenses from monies due the Contractor under the Contract.

D. No earthwork shall be performed without direct knowledge of the District’s Geotechnical Engineer unless otherwise directed by the District’s Representative.

END OF SECTION 31 20 00
SECTION 31 23 13 – SUBGRADE PREPARATION

PART 1 - GENERAL

1.01 SUMMARY

A. Description: Performing operations necessary to construct sub grade to the required grade and compaction as shown on plans or specified herein.

B. Related Sections
   1. Section 32 11 23 – Aggregate Base Course
   2. Section 32 12 16 – Asphalt Paving
   3. Section 32 01 16.71 – Cold Milling Asphalt Paving
   4. Section 32 01 17.64 – Full Depth AC Pavement Repair

1.02 REFERENCES


B. California Testing Method No. 216; or as directed by the District’s Soil Engineer.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

A. After initial 2” deep Cold Mill of existing AC pavement, Cold Mill an additional 2” deep where shown on the plans.

B. At sub grade level, keep sub grade free of water, debris, and foreign matter.

C. Compact sub grade to 95% relative compaction per California Testing Method No. 216.

D. As required, provide additional engineered fill material where needed to keep grade. Additional engineered fill material shall also be compacted to 95% relative compaction prior to asphalt paving.

E. At the direction of the College’s Soil Engineer, water may be added to sub grade soil to achieve compaction requirements.

3.02 RECORDS

A. Maintain a complete, accurate log of all soils compaction testing work as it progresses. Make this log available for reference.

END OF SECTION 31 23 13
SECTION 31 25 00
EROSION & SEDIMENTATION CONTROLS

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

Extent: This section includes procedures, requirements and guidelines for Contractor designed constructed, and maintained erosion and sediment control measures.

B. Related Work:

1. Section 31 10 00 - Site Clearing
2. Section 32 20 00 - Earth Moving
3. Section 33 12 16 - Asphalt Paving
4. Section 32 11 00 - Base Courses and Ballast

1.02 EROSION CONTROL

A. General:

1. The Contractor will be responsible for erosion and sediment control within the Project site or anywhere that project construction disturbs the surface vegetation or soil.

2. The Contractor's erosion and sediment control measures will protect graded areas from erosion during construction and until permanent planting, and permanent drainage and erosion control measures are installed and effectively operational.

3. Erosion and sediment control measures will prevent any sediment from leaving the Project site, either water-borne, air-borne, on the tires of vehicles, or by spillage from off-site hauling of soils.

4. The Contractor shall insure that no sediment or pollution is discharged into the lagoon adjacent to the site as a result of this project. The Contractor shall be liable for any damage that occurs to the adjacent lagoon as a result of the project.

B. Winter Erosion and Sediment Control Plan:

1. The Contractor shall be responsible for providing an Erosion and Sediment Control Plan to be submitted to the City for approval. The Erosion and Sediment Control Plan shall be prepared by a registered landscape architect, civil engineer or certified erosion control specialist. Proposed revisions to the Erosion and Sediment Control Plan shall be prepared by a registered landscape architect, civil engineer or certified erosion control specialist for any denuded soil area within the Project site or any other area where the soil surface will be disturbed by construction operations.

2. Install features shown on the Erosion and Sediment Control. A meeting will be conducted with the Contractor to discuss and agree upon the implementation of the plan.

3. Implement the plan by October 15 or by the date scheduled for commencing construction after October 15, with all required features in place.

4. Agreement to the plan by other parties does not relieve the Contractor from responsibility for its effectiveness.

PART 2 PRODUCTS
PART 3 MATERIALS

3.01 IMPLEMENTATION:

A. A standby crew for emergency work shall be available at all times during the rainy season, October 15 through April 15. Necessary materials shall be available on the Project site and stockpiled at convenient locations to facilitate rapid construction of temporary devices or to repair any damaged erosion control measures when rain is imminent.

B. Do not move or modify devices without the approval of the Owner.

C. All removable protective devices shown shall be in place at the end of each working day when the five-day rain probability forecast exceeds 40 percent.

D. After a rainstorm, remove all silt and debris from check berms and sediment basins. Immediately repair any graded slope surface protection measures damaged during a rainstorm.

E. Fill slopes at the project perimeter must drain away from the top of the slope at the conclusion of each working day.

F. Whenever the depth of water in any device exceeds two feet, barricade or guard the project site for public safety until the water has subsided.

G. Do not pump or otherwise drain unfiltered water from the basins until sediment has settles.

H. Do not fill sand bags with gravel; use only sand or granular soil.

I. Do not use perforated risers as pond outlets.

J. Do not use filtering devices as a means of control.

3.02 DUST CONTROL

A. Dust control shall conform to the requirements of Section 10: Dust Control, of the Caltrans Standard Specifications. Full compensations for dust control will be included in the lump sum price paid for Erosion Control and no further compensation will be allowed.

3.03 USE OF PERMANENT DRAINAGE FACILITIES

A. Any drainage structures or detention devices which appear in the contract documents may be utilized in the Erosion and Sediment Control Plan on the condition that they are temporarily modified to serve the Contractor's purposes, and cleaned before Project completion.

B. Such facilities have been designed for use in drainage control upon completion of the Project, and shall not be considered as adequate for control during construction except by the independent determination of the Contractor.

3.03 PLANTED AREAS

A. Slopes scheduled for seeding shall not be cleared and seeded during the period of October 15 through April 25. Seeding operations shall be scheduled to provide a minimum of four (4) months for seed germination and establishment prior to October 15.
B. For other disturbed areas, where seeding is recommended for temporary erosion control, the Contractor shall allow a minimum of two (2) months for germination prior to October 15.

C. Planted areas indicated on the plans are not considered to be installed until one year has elapsed since the time of planting, or until released by the Owner as being substantially established. Therefore:

1. Maintain planting, and erosion control measures around the planted area for at least one year.

2. Make repairs to any damaged areas during that time.

3. Where planting is lost due to erosion, replace it and begin the one-year period for that portion at the time of replacement.

END OF SECTION 31 25 00
SECTION 32 01 13.61 – SLURRY SEAL

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes
   1. Emulsified Asphalt Slurry Seal

B. Related Sections
   1. Section 32 12 16 – Asphalt Paving

1.02 REFERENCES

A. Standards listed below, with their designation in parenthesis, apply where designation is cited in this Section. Where the applicable year of adoption or revision is not listed below, the latest edition applies.

   1. Interpretation of Standard Specifications:
      a. Wherever the term Commission of Department occurs, it shall mean the College. Whenever the term Director or Executive Officer occurs, it shall mean the College's Representative.
      b. Whenever a discrepancy occurs between the Standard Specifications and this specification, this specification governs.

1.03 SUBMITTALS

A. Submit the following:
   1. Certificates of compliance with specified standards for natural materials and manufactured items.
   2. For manufactured items, the manufacturer's technical data of physical properties.
   3. Slurry mix design. Include recommended aggregate grading, asphalt content, and supporting test results.
   4. Samples as requested by the College's Testing Laboratory.

1.4 SITE CONDITIONS

A. Comply with all requirements of Cabrillo Community College District.

B. Do not place Slurry Seal unless atmospheric temperature is at least 50 degrees Fahrenheit and rising.

C. Slurry shall not be placed when rain is predicted or on a surface and shall not be applied during night conditions.

PART 2 - PRODUCTS

2.01 MATERIALS
A. Asphalt Emulsion: Asphalt Emulsion shall be a cationic quick-setting type conforming to the requirements of CQS1h grade under Caltrans Standard Specifications, Section 94, Table 4: Requirements for Quick-Setting Asphalt Emulsion.

B. Water: Water shall be potable, free of harmful salts and shall be of such quality that asphalt will not separate from emulsion before the slurry seal is in place.

C. Aggregate: Aggregate for slurry seal shall conform to the provisions in Section 37-2.02C, “Aggregate (Slurry Seal)” of the Caltrans Standard Specifications for Type II Aggregate with the following exceptions:

1. The percentage of aggregate passing the No. 4 sieve shall be 100%.

2. The aggregate shall have a minimum Sand Equivalent of seventy-two (72) when tested with California Test Method 217.

3. The aggregate shall have a minimum Durability Index result of seventy-five (75) when tested in accordance with the California Test Method 229.

4. Aggregate shall be 100% crushed into no ground particles, volcanic in origin and black in color. The used of gray or light colored aggregate shall not be allowed.

D. Storage of Materials: Storage location shall be approved by the College. Stockpiled materials shall be placed on flat, graded surfaces. The Contractor shall be responsible for the complete cleanup and removal of all material at stockpile and/or storage locations.

2.02 MIXES

A. Mix Design shall conform to Section 37.203 “Mix Design” of Caltrans Standard Specifications except as modified herein.

1. The “Wet Stripping” Test shown in the table following the 2nd paragraph of CALTRANS Standard Specifications Section 37-2.03, Mix Design shall be modified to include the requirement of “Pass (90% minimum)”.

2.03 PROPORTIONING

A. Proportioning shall conform to Section 37-2.04, “Proportioning of the Caltrans Standard Specifications except as modified herein.

1. The components of the slurry seal mix shall be proportioned in accordance with the requirements of these Standard Specifications and the approved mix design which is suitable for the current climate, curing, and traffic conditions. The mix design shall include the recommended application rate considering these factors.

2. Volume or weight controls for proportioning each individual material to be added to the slurry seal mix (i.e. aggregate, mineral filler, emulsified asphalt and additive) shall be provided, properly marked and calibrated.
3. The completed slurry seal mixture after addition of water and any control agent used, shall be such that the slurry seal mixture has proper workability and (a) break, set, and be ready for traffic no latter than 4:00 pm of the day of application unless otherwise allowed by the Inspector. There shall be no bleeding, raveling, separation or other distress within seven (7) days after placing the slurry seal.

2.04 EQUIPMENT

A. The slurry mixing machine continuous flow mixing unit, capable of delivering a predetermined proportion of aggregate, water, and asphalt emulsion to the mixing chamber and discharging the thoroughly mixed product on a continuous basis. The equipment shall be capable of prewetting the aggregate immediately prior to mixing with the emulsion. The mixing unit shall be capable of thoroughly blending all materials together.

B. Whenever mineral filler is required for the mixture, the mixing machine shall be equipped with an approved fines feeder that includes an accurate metering device or method to introduce a predetermined proportion of mineral filler into the mixer. The mineral filler shall be fed into the mixer at the same time and location as the aggregate.

C. The slurry mixing machine shall be equipped with a water pressure system and fog type spray bar, adequate for complete fogging of the surface receiving slurry treatment.

D. A mechanical type squeegee distributor with flexible material in contact with the surface of the pavement to prevent loss of slurry from the distributor shall be connected to the mixing machine. It shall be maintained so as to prevent loss of slurry on varying grades and crown. There shall be a steering device and flexible strike off. The spreader box shall have an adjustable width and shall be capable of placing the slurry mixture to the width specified in the contract documents.

E. Cleaning equipment in the form of power brooms, power blowers, air compressors, water flushing equipment, and hand tools shall be provided to clean the surface and cracks as required prior to slurry sealing operations.

PART 3 - EXECUTION

3.01 CLEANING AND PREPARATION OF THE SURFACE

A. Prior to applying the slurry, clean the surface of all loose material, mud spots, vegetation, and other objectionable material.

B. Standard cleaning methods used to clean pavement shall be power brooms, compressed air, high-pressure water, and hand tools. Water flushing shall not be permitted in areas where considerable cracks are present in pavement surface.

C. The surface preparation shall be inspected and approved by the College’s Representative prior to slurry treatment.

3.02 APPLICATION OF THE SLURRY MATERIAL

A. Pavement surface and asphalt berms to be slurry sealed shall be lightly pre-dampened with a fog spray of water.
B. Water fog shall be applied at such a rate that the entire surface is damp with no apparent flowing water in front of the slurry box.

C. A sufficient amount of slurry shall be carried in all parts of the spreader at all times to obtain complete coverage.

D. No lumping, balling, or unmixed aggregate shall be permitted. No segregation of the emulsion and aggregate fines from the coarse aggregate shall be permitted. If the coarse aggregate settles to the bottom of the mix, the slurry shall be removed from the pavement.

E. All lines of termination of slurry sealing shall be neat and straight.

F. Joint between the edge of pavement and concrete gutter shall be filled with slurry, but not overlapped.

G. Slurry applied to asphalt berms may be brush or roller applied. All cracks in the asphalt berms shall be thoroughly coated and filled with the slurry seal.

3.03 PROTECTION

A. Slurry treatment area shall be allowed to cure until it may be opened to traffic without pickup or raveling of the slurry mixture. Any damage caused to the slurry surface by premature opening to traffic shall be repaired or replaced at the Contractor’s expense.

END OF SECTION 32 01 13.61
SECTION 32 01 16.71 – COLDING MILLING ASPHALT PAVING

PART 1 - GENERAL

1.01 DESCRIPTION
A. Cold milling asphalt pavements is the process of removing existing pavement from the roadway to lines and dimensions shown on the plans or as directed by the College.

1.02 REFERENCES
A. Standards listed below, with their designation in parenthesis, apply where designation is cited in this Section. Where the applicable year of adoption or revision is not listed below, the latest edition applies.


1. Interpretation of Standard Specifications:
   a. Wherever the term Commission of Department occurs, it shall mean the College. Whenever the term Director or Executive Officer occurs, it shall mean the College's Representative.
   b. Whenever a discrepancy occurs between the Standard Specifications and this specification, this specification governs.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 EQUIPMENT
A. The Contractor shall use equipment with automatic grade and slope controls, capable of cold milling existing asphalt pavement to an accurate depth of cut, profile and cross slope and shall be capable of loading the milled material directly into trucks.

B. The cold planing machine shall be equipped with a cutting head not less than 72 inches in width and shall be operated so as not to produce fumes or smoke. The cold planing machine shall be capable of planing the pavement without requiring the use of a heating device to soften the pavement during or prior to the planing operation.

3.02 GENERAL
A. Planing asphalt concrete pavement shall be performed by the cold planing method. Use of the heater planing method will not be allowed.

B. The depth and width of the cut shall be as indicated on the plans or as directed by the Engineer. All conform locations on the plan are approximate and should be verified in the field with the Engineer. The outside lines of the planed area shall be neat and uniform. Planing asphalt concrete pavement operations shall be performed without damage to the surfacing to remain in place.
C. The Contractor shall be responsible for all damage to cold mill planing machine caused by hitting any hidden objects during the planing operation. In addition, the Contractor shall be responsible for the cost of repairing any facility that is damaged by the cold mill-planing machine.

D. Planed widths of pavement shall be continuous except for intersections at cross street where the planing shall be carried around the corners and through the conform lines. Following planing operations, a drop-off of more than 2 inches will not be allowed at any time between adjacent lanes open to public traffic.

E. The planed material from the roadway surface shall be removed from the project and disposed of.

A. The excess material planed from the roadway surface and remnants or slivers of old asphalt concrete lift, including material deposited in existing gutters, driveways, around structures, or on the adjacent traveled way, shall be removed and disposed of outside the right of way in accordance with the provisions in Section 7-1.13 of the Caltrans Standard Specifications. Removal of this material shall be considered as included under this item of work and no additional compensation will be allowed. Removal operations of cold-planed material shall be concurrent with planing operations and follow within 50 feet of the planer, unless otherwise directed by the College’s Representative.

B. The Contractor shall furnish and operate a self-loading motor sweeper with spray nozzles for final clean up work and shall keep the milled area cleaned and maintained at all times until the street has been resurfaced.

C. The Contractor is notified that existing pavement fabric may be encountered in the areas to be ground. If pavement fabric substantially hinders the progress of grinding as determined by the District Representative the Contractor will be given additional contract days to accomplish grinding operations. No additional compensation for cold mill planing will be made to the Contractor based on the presence of fabric in the sections to be ground. If the Contractor’s operation exposes existing pavement fabric, the Contractor shall continue grinding until the fabric is removed. This shall be considered as included in the bid item cost for cold mill planing and no further compensation will be allowed.

D. Temporary asphalt tapers must be provided where transverse joints are planed in the pavement at conform lines no drop-off shall remain between the existing pavement and the planed area when the pavement is opened to public traffic. Asphalt concrete for temporary tapers shall be placed to the level of the existing pavement and tapered on a slope of 1:60 (Vertical: Horizontal) or flatter to the level of the planed area.

E. Asphalt concrete for temporary tapers shall be of commercial quality and may be spread and compacted by any method that will produce a smooth riding surface. Temporary asphalt concrete tapers shall be completely removed, including the removal of all loose material from the underlying surface, before placing the permanent surfacing. The removed material shall be disposed of outside the highway right of way in accordance with the provisions in Section 7-1.13 of the Caltrans Standard Specifications. Operations shall be scheduled so that not more than 10 days shall elapse between the time when transverse joints are planed in the pavement at the conform lines and the permanent surfacing is placed at the conform lines.

END OF SECTION 32 01 16.71
SECTION 32 01 17.64 – FULL DEPTH AC PAVEMENT REPAIR

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes
   1. Cold mill and remove existing asphalt concrete pavement.
   2. Construct new asphalt concrete pavement.

B. Related Sections
   1. Section 32 11 23 – Aggregate Base Course
   2. Section 32 12 16 – Asphalt Paving

1.02 REFERENCES

A. Standards listed below, with their designation in parenthesis, apply where designation is cited in this Section. Where the applicable year of adoption or revision is not listed below, the latest edition applies.

   1. Interpretation of Standard Specifications:
      a. Wherever the term Commission of Department occurs, it shall mean the College.
      b. Wherever the term Director or Executive Officer occurs, it shall mean the College's Representative.
   b. Whenever a discrepancy occurs between the Standard Specifications and this specification, this specification governs.


1.03 SITE CONDITIONS

A. Comply with all requirements of Cabrillo Community College District.

B. Do not place Asphalt Concrete unless atmospheric temperature is at least 50 degrees Fahrenheit and rising.

PART 2 PRODUCTS

2.01 MATERIAL

A. Aggregates: See Section 32 11 23

B. Asphalt Paving: See Section 32 12 16

PART 3 - EXECUTION
3.01 EXAMINATION

A. Examine areas to receive full depth asphalt concrete paving repair and verify the following:
   1. Pavement conditions and sub-base conditions after initial 2” cold mill.
   2. Limits and locations as shown on plans.

3.02 PREPARATION

A. Damaged asphalt and areas shall be removed as shown on plan.

B. All weeds or other vegetation growing through the asphaltic concrete shall be removed.

3.03 FULL DEPTH ASPHALT REPAIR

A. After the initial overall 2 inch deep cold mill, areas designated by the Engineer shall be dug out to an additional depth of 2 inches (4 inches total) at locations shown on plan, (milling is recommended and preferred) removed and replaced with a full-depth section of 4 inches of asphaltic concrete placed in two 2 inch lifts, unless otherwise directed on the contract plans.

B. The material remaining in place, after removing surfacing and base to the required depth, shall be graded to a plane, watered, and compacted to 95 percent relative compaction for 6” of depth. After compaction and prior to the placing of asphalt concrete, the vertical edges of the existing pavement shall receive a tack coat. The finished surface of the remaining material shall not extend above the grade established by the District Representative.

C. The asphaltic concrete shall be placed in two lifts with the uppermost lift of not less than 0.15 feet or more than 0.20 feet and shall be Type B 1/2-inch Maximum, Medium grade. Removed materials shall be disposed of legally. The minimum width of any repair shall be 42 inches as field marked.

D. The Contractor shall make all arrangements for disposal of excavated materials. All edges shall be cold milled or saw-cut unless otherwise approved by the District Representative. Asphalt concrete in repair sections shall be placed in lifts in accordance with Caltrans Section 39-6.01 “Spreading and Compacting”, and shall be Type B, 1/2inch Maximum, Medium gradation per Section 39-2, “Materials” of the CSS. Removed materials shall be disposed of legally.

3.04 FIELD QUALITY CONTROL

A. The College's Testing Laboratory will:
   1. Inspect and test base and paving in accordance with CSS, including but not limited to:
      a. Compaction and thickness of base.
      b. Compaction and thickness of asphaltic concrete.
      c. Temperature of asphalt concrete just prior to paving.
   2. Check thickness of surfacing by coring when directed by the College's Representative.
B. Contractor will:

1. Repair areas cored for testing.

2. As directed by the College's Representative, remove and replace or repair all paving not meeting Contract Document requirements.

   END OF SECTION 32 01 17.64
SECTION 32 11 23 - AGGREGATE BASE COURSE

PART 1  GENERAL

1.01  SUMMARY

A. Section Includes
   1. Aggregate base course for new and reconstructed pavements.

B. Related Sections
   1. Section 32 01 17.64 – Full Depth AC Pavement Repair
   2. Section 32 12 16 – Asphalt Paving

1.02  REFERENCES

A. Standards listed below, with their designation in parenthesis, apply where designation is cited in this Section. Where the applicable year of adoption or revision is not listed below, the latest edition applies.

   1. Interpretation of Standard Specifications:
      a. Wherever the term Commission of Department occurs, it shall mean the College.
      b. Whenever the term Director or Executive Officer occurs, it shall mean the College's Representative.
      c. All references to statistical testing are deleted.
      d. Whenever a discrepancy occurs between the Standard Specifications and this specification, this specification governs.


1.03  SUBMITTALS

A. Submit the following:
   1. Certificates of compliance with specified standards for natural materials and manufactured items.
   2. For manufactured items, the manufacturer's technical data of physical properties.
   3. Samples as requested by the University's Testing Laboratory.

1.04  SITE CONDITIONS

A. Comply with all requirements of the Monterey Bay Unified Air Pollution Control District.

PART 2 - PRODUCTS

2.01  MATERIALS
A. Aggregate Base (AB): Class 2, R-value 78 minimum, 3/4 inch maximum size, meeting the requirements of CSS Section 26.

B. Aggregate Subbase: Class 2, R-value 50 minimum, CSS Section 25.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas to receive aggregate base and verify the following:

1. That abutting improvements have been set at proper elevations.
2. That gradients and elevations of pavement subgrade are correct.
3. That wet receiving surfaces or other conditions that adversely affect execution of this Work are absent.

B. Do not start Work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. If after initial preparation, the pavement subgrade is allowed to stand or is used by construction equipment, or is otherwise damaged, repair in accordance with CSS 26-1.03 at no additional cost to the College.

B. Proof-roll the pavement subgrade for pumping as defined in Section 02300. Where moisture appears on the pavement subgrade surface after rolling, repair as directed by the College, at no additional cost to the University.

C. Protect existing Work from damage. Protect concrete Work from staining with asphalt materials. Shield from overspray.

D. Sawcut 12" from the edge of existing pavement to obtain a clean vertical edge. Where an existing patch occurs within 24" of pavement edge, sawcut to the edge of pavement.

E. Damaged asphalt and areas completely saturated by oil and grease should be removed and replaced as required.

3.03 AGGREGATE BASE

A. Spread and compact in accordance with CSS Section 26, to thickness, lines and grades noted, with a maximum deviation of plus 0.0 and minus 0.05 feet from plan grade.

B. Do not incorporate into the completed section any base material used for construction traffic.

C. Moisture Treat the compacted base in accordance with CSS Section 17.

3.04 FIELD QUALITY CONTROL

A. Inspection and testing will be performed under the supervision of the College’s Soil Engineer.
B. The College's Testing Laboratory will:
   1. Inspect and test base and paving in accordance with CSS, including but not limited to
      a. Compaction and thickness of base.
      b. Compaction and thickness of asphaltic concrete.
      c. Temperature of asphalt concrete just prior to paving.
   2. Check thickness of surfacing by coring when directed by Strategic Construction
      Management.

C. Contractor will:
   1. Repair areas cored for testing.
   2. As directed by the College, remove and replace or repair all paving not meeting Contract Document
      requirements.

END OF SECTION 32 11 23
SECTION 32 12 16 – ASPHALT PAVING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes
   1. Sawcut and remove existing asphalt concrete pavement.
   2. Construct new asphalt concrete pavement.
   3. Pavement Reinforcing Fabric (Add Alternate 1)

B. Related Sections
   1. Section 32 11 23 – Aggregate Base Course
   2. Section 31 23 13 – Subgrade Preparation
   3. Section 32 01 16.71 – Cold Milling Asphalt Paving
   4. Section 32 01 17.64 – Full Depth Pavement Repair

1.02 REFERENCES

A. Standards listed below, with their designation in parenthesis, apply where designation is cited in this Section. Where the applicable year of adoption or revision is not listed below, the latest edition applies.

   1. Interpretation of Standard Specifications:
      a. Wherever the term Commission of Department occurs, it shall mean the College.
      b. Whenever the term Director or Executive Officer occurs, it shall mean the College's Representative.
      c. Whenever a discrepancy occurs between the Standard Specifications and this specification, this specification governs.


1.03 SUBMITTALS

A. Submit the following:
   1. Certificates of compliance with specified standards for natural materials and manufactured items.
   2. For manufactured items, the manufacturer's technical data of physical properties.
   3. Slurry mix design. Include recommended aggregate grading, asphalt content, and supporting stabilimeter test results conforming to California Test 304. Do not schedule seal coat work until submittal has been reviewed.
   4. Samples as requested by the College's Testing Laboratory.

1.4 DEFINITIONS

A. (Pavement) Subgrade: The material in excavation or embankments underlying the lowest layer of subbase, base, pavement surfacing or other specified layer which is to be placed. (The surface upon
which embankment is to be placed is sometimes called "subgrade" in other sections, not to be confused with pavement subgrade).

B. Structural Section: The planned traffic support layers of specified materials, normally consisting of subbase, base, and pavement placed over the pavement subgrade. The structural section is also commonly called the pavement structural section.

C. Subbase: A layer of aggregate of designed thickness and specified quality placed on the pavement subgrade as the foundation for a base.

D. Surface Course: The top layer of AC pavement. The top layer of AC pavement is sometimes called the "wearing course".

E. Pavement Reinforcing Fabric: Pavement reinforcing fabric as part of the AC overlay.

F. Leveling Course: A layer of A.C. pavement placed over uneven surfaces and extensive cracking prior to placing pavement fabric or reinforcing mesh.

1.05 SITE CONDITIONS

A. Comply with all requirements of Cabrillo Community College District.

B. Do not place Slurry Seal or Asphalt Concrete unless atmospheric temperature is at least 50 degrees Fahrenheit and rising.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Aggregates:
   1. Asphalt Concrete (AC): Type B, 1/2 inch maximum size, medium grading, CSS Section 39.

B. Asphalt Binder: Steam-refined paving asphalt, grade AR-8000, CSS Section 92.

C. Prime Coat: Liquid asphalt, Grade MC-70, CSS Section 93.

D. Paint Binder or Tack Coat: Type SS1h of SS1 asphaltic emulsion, CSS Section 94.

E. Sand: The sand shall be 30 mesh sand blast sand composed of clean hard durable particles, free from lumps of clay or organic material.
   I. Water: The water used in all mixtures shall be fresh and potable.

F. Pavement Reinforcing Fabric: Reinforcing fabric shall conform to requirements of “TruPave” by Owens Corning or approved Equal.

2.02 MIXES

A. Asphalt Concrete (AC):
   1. CSS Section 39, Type B asphalt concrete, 1/2”maximum gradation.
2. Determine the amount of asphalt binder in accordance with the mix design.

B. Bituminous Seals
1. CSS Slurry Seal or OverKote Asphalt Paving Coating or its Equivalent.

D. Do not change sources from those used in mix designs without prior written approval by the College's Representative.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas to receive asphalt concrete paving or slurry seal and verify the following:
   1. That abutting improvements have been set at proper elevations.
   2. That gradients and elevations of pavement subgrade are correct.
   3. That wet receiving surfaces or other conditions that adversely affect execution of this Work are absent.

B. Do not start Work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Damaged asphalt and areas completely saturated by oil and grease should be removed and replaced as required.

B. All weeds or other vegetation growing through the asphaltic concrete shall be removed and sprayed with a suitable sterilant.

C. All areas to receive slurry shall be power bromides to remove dirt debris and other materials prior to placing the seal coat.

3.03 BASE PRIME COAT

A. After Base has been accepted by the College's Representative, place asphalt concrete paving on new aggregate base while base is still tight and damp.

B. If base has been allowed to dry before placing asphalt concrete, apply prime coat in amount of 0.25 gallons per square yard of surface area to base in accordance with CSS Section 39, at no additional cost to College. Allow at least 24 hours for prime coat to set; remove any puddles; and spread sand over damp spots before placing asphalt concrete.

3.04 PAINT BINDER

A. Prior to placing asphalt concrete surfacing, apply a coat of asphaltic emulsion paint binder to all vertical contact surfaces in accordance with CSS Section 39 at an approximate rate of 0.10 gallons per square yard of surface covered.
3.05 PAVEMENT REINFORCING FABRIC/PAVING MAT (ADD ALTERNATE 1)

A. Installation of Paving Mat shall conform to the requirements of “TruPave” by Tencate Mirafi or approved equal.

B. The paving mat must be installed over a hot asphalt tack coat. Tack shall be AC-20, 64-22 or 80-100 penetration grade of asphalt applied at a rate of 0.21 to 0.25 gallons per square yard (g/sy). If atmospheric temperatures are above 100°F then AC-30, 64-22, or 80-100 should be used.

C. The temperature of the tack coat should not drop below 280°F with a maximum temperature of 400°F.

3.06 ASPHALT CONCRETE

A. After prime coats have been approved by the College’s Representative, spread and compact asphalt concrete paving to compacted thickness shown on Drawings in accordance with CSS Section 39, including all requirements for mix temperatures, and thickness of layers.

B. Provide surface which is dense, smooth, tight, free from pores, loose material of segregation, within tolerances specified, and free of bird baths.

C. Finished surface shall be no more than 0.01 feet below the bottom of a 12-foot straightedge laid on the surface in any direction.

D. Place asphalt concrete so that finished surface will be 0" to 1/8" above edge of adjacent concrete gutters designed to collect water runoff, or 0" to 1/8" below edge of adjacent concrete designed to deposit runoff onto paved surface.

E. Carefully roll with proper heat at edges alongside curbs, walks and driveways to match balance of rolled work. Hand tamping will be permitted only where inaccessible to heavy equipment.

3.07 FIELD QUALITY CONTROL

A. The College's Testing Laboratory will:

1. Inspect and test base and paving in accordance with CSS, including but not limited to:
   a. Compaction and thickness of base.
   b. Compaction and thickness of asphaltic concrete.
   c. Temperature of asphaltic concrete just prior to paving.

2. Check thickness of surfacing by coring when directed by the College's Representative.

B. Contractor will:

1. Repair areas cored for testing.

2. As directed by the College's Representative, remove and replace or repair all paving not meeting Contract Document requirements.

3.08 PROTECTION
A. Permit no surface traffic until surface has cooled sufficiently to resist damage.

END OF SECTION 32 12 16
PART 1 GENERAL

1.01 SUMMARY
A. Section Includes:
   1. Traffic lines, parking striping, and markings.
   2. Paint.
B. Related Sections:
   1. Section 32 12 16 – Asphalt Paving

1.02 REFERENCES
A. Standards listed below, with their designation in parenthesis, apply where designation is cited in this Section. Where the applicable year of adoption or revision is not listed below, the latest edition applies.
   1. Terms such as Commission, Department or Agency shall mean the College.
   2. Terms such as Director, Executive Office, or Engineer shall mean the College's Representative.
   3. In case of discrepancies between the cited standards and this Section, this Section governs.

1.03 PERFORMANCE REQUIREMENTS
A. Paint Adhesion: Adhere to road surface forming smooth continuous film one minute after application.
B. Paint Drying: Tack free by touch so as not to require coning or other traffic control devices to prevent transfer by vehicle tires within two minutes after application.

1.04 SUBMITTALS
A. Product Data: Submit paint formulation for each type of paint to be used.
B. Samples: As requested by the College’s Representative.
C. Manufacturer's Installation Instructions: Submit instructions for application temperatures, eradication requirements, application rate, line thickness, type of glass beads, bead embedment and bead application rate, and any other data on proper installation.

D. Manufacturer's Certificate: As requested by the College’s Representative.

1.05 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies: State and local code requirements shall apply to all work in this section.

B. Striping shall be performed with no less than four (4) working day's notification.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Material and Equipment: Requirements for transporting, handling, storing, and protecting products shall be done per manufacturer’s recommendations.

B. Invert containers several days prior to use when paint has been stored more than 2 months. Minimize exposure to air when transferring paint. Seal drums and tanks when not in use.

C. Glass Beads. Store glass beads in cool, dry place. Protect from contamination by foreign substances.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Protect material and equipment from environmental conditions affecting products on site per manufacturer’s recommendations.

B. Do not apply materials when surface and ambient temperatures are outside temperature ranges required by paint product manufacturer.

C. Do not apply exterior coatings during rain or snow when relative humidity is outside humidity ranges, or moisture content of surfaces exceed those required by paint product manufacturer.

D. Do not apply paint when temperatures are expected to fall below 50 degrees F for 24 hours after application.

E. Volatile Organic Content (VOC). Do not exceed State or Environmental Protection Agency maximum VOC on traffic paint.

PART 2 PRODUCTS

2.01 PAINTED PAVEMENT MARKINGS

A. Stripe and Pavement Marking Material. Paint and glass spheres for traffic stripes and pavement markings will be furnished by the contractor including paint for cat tracks and
dribble lines. White and yellow paint will be either the Fast Dry or Rapid Dry type at the option of the contractor. Black paint will be the Fast Dry type.

B. If more than 120 days have elapsed from the date of manufacture of the paint furnished, the paint shall be mixed in containers other than the spray equipment containers until a smooth, uniform product of proper consistency is obtained. All necessary mixing shall be at the contractor's expense.

C. Crosswalk markings shall be Thermoplastic with a non skid surface and shall match existing District’s Crosswalk markings along Soquel Drive.

D. Reflective Pavement Markers.

E. Glass Beads: AASHTO M247, Type 1, coated to enhance embedment and adherence with paint.

2.02 SOURCE QUALITY CONTROL

A. The paint and glass spheres to be furnished will conform to the Caltrans current specification for such materials. Copies of said specifications are available for inspection at Caltrans Transportation Laboratory, Sacramento, California.

B. Painting traffic stripes and markings and placing reflective pavement markings, at the existing locations or designated by the District's Representative shall be in conformance with Section 84, "Traffic Stripes and Pavement Markings" and Section 85, "Pavement Markers", of the Caltrans Standard Specifications.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify of existing conditions before starting work.

B. Do not apply paint to concrete surfaces until concrete has cured for 28 days.

3.02 PREPARATION

A. Maintenance and Protection of Traffic:

1. Provide short term traffic control in accordance with Section 11 55 26.

2. Prevent interference with marking operations and to prevent traffic on newly applied markings before markings dry.

3. Maintain access to existing buildings and other areas requiring access.

B. Surface Preparation.

1. Clean and dry paved surface prior to painting.
2. Blow or sweep surface free of dirt, debris, oil, grease or gasoline.

3. Spot location of final pavement markings as specified and as indicated on Drawings by applying pavement spots 25 feet on center.

3.03 EXISTING WORK

A. Remove existing markings by sandblasting methods. Do not remove existing pavement markings by painting over with blank paint or slurry. Remove by methods that will cause least damage to pavement structure or pavement surface. Satisfactorily repair any pavement or surface damage caused by removal methods. Cost of removing paint markings will be included in the cost of installing new striping and pavement markings.

B. Clean and repair existing remaining or reinstalled lines and legends.

3.04 APPLICATION

A. Mechanical means shall be used to paint traffic stripes and pavement markings and to apply the glass spheres for traffic stripes. Rapid Dry type paint shall be applied with only airless type equipment.

B. Cat tracking shall consist of stretching a rope on a straight line between control points on tangent alignment and on a true arc through control points on curved alignment and placing spots of paint on the rope. The spots shall be not more than three inches (3") in width and not more than five feet (5') apart on curves nor eight feet (8') apart on tangents.

C. Dribble lines shall consist of marking the pavement with a thin line of paint using a striping machine or other suitable device. Dribble lines shall be on a straight line between control points on tangent alignment and on a true arc through control points on curbed alignment.

D. Paint for cat tracks and dribble lines shall be the same color as the traffic stripe for which they are placed.

E. Laser guidance equipment, when used, shall be capable of maintaining the alignment of traffic stripes with an accuracy equivalent to or better than that obtained through use of cat tracking or dribble lines, as determined by the District's Representative.

F. Traffic stripes and pavement markings shall be applied only on dry surfaces and only during periods of favorable weather. Painting shall not be performed when the atmospheric temperature is below 40 degrees F.; when freshly painted surfaces may become damaged by rain, fog, or condensation; nor when it can be anticipated that the atmospheric temperature will drop below 40 degrees F. during the drying period.

G. All crosswalks, stop bars, and stenciled items will be thermoplastic.

H. Stencils shall be used to paint pavement markings words.

I. Paint shall not be heated to a temperature greater than 160 degrees F.

J. Traffic stripes shall be applied in two coats. The first coat of paint shall be dry and set for a minimum of 72 hours before application of the second coat.
K. Unless otherwise directed by the District’s Representative, glass spheres shall be uniformly incorporated in all coats of paint immediately after application of the paint, except that glass spheres shall not be applied to black paint. Spheres shall be embedded in the coat of traffic paint, being applied to a depth of at least one-half their diameter.

L. A double stripe shall consist of two 4-inch wide yellow stripes separated by a 3-inch wide black stripe.

M. Completed traffic stripes shall have clean and well-defined edges, shall be uniform, shall be straight on tangent alignment, and shall be on a true arc on curved alignment. The widths of completed traffic stripes shall not deviate more than 1/4-inch on tangent nor more than 1/2-inch on curves from the widths shown on the plans. Broken traffic stripes shall also conform to the following requirements:

N. The lengths of the gaps and individual stripes that form broken traffic stripes shall not deviate more than two inches from the lengths shown on the plans.

O. The lengths of the gaps and individual stripes shall be of such uniformity throughout the entire length of each broken traffic stripe that a normal striping machine will be able to repeat the pattern and superimpose additional coats of paint upon the traffic stripe being painted.

P. The completed pavement markings shall have clean and well-defined edges and shall conform to the dimensions shown on the plans.

Q. Drips, overspray, improper markings, and paint tracked by traffic shall be immediately removed from the pavement surface by last cleaning or other methods approved by the District’s Representative. All such removal work shall be at the contractor's expense.

R. Application Rates. Paint for traffic stripes and pavement markings shall be applied at a rate between one gallon per 60 square feet and one gallon per 250 square feet. The exact rate will be determined by the District’s Representative.

S. Glass spheres shall be applied to all coats at an approximate rate of 8 pounds per gallon of paint. The exact rate will be determined by the District’s Representative.

T. The volume of paint applied shall be measured by stabbing the paint tank with a calibrated rod. At the option of the District’s Representative, if the striping machine is provided with air atomized spray units (not airless) and is equipped with paint gauges, the volume of paint may be determined by using such gauges.

U. The amount of glass spheres applied shall be measured by stabbing the glass sphere tank with a calibrated rod.

V. Equipment and Operation. All equipment used in the application of traffic stripes and pavement markings shall produce stripes and pavement markings of uniform quality that conform to the specified requirements.

W. The striping machine shall be capable of accurately superimposing succeeding coats of traffic paint upon the first coat and upon existing stripes at a speed of at least five miles per hours.
X. Each coat of paint for any traffic stripe, including glass spheres where required, shall be applied in one pass of the striping machine, regardless of the number, widths, and types of individual stripes involved.

Y. The striping machine shall consist of a rubber-tired vehicle that is maneuverable to the extent that straight lines can be followed and normal curves can be made in true arcs. It shall be capable of applying traffic paints and glass spheres at the rates specified above. The striping machine shall be equipped with the following:

1. A pointer or sighting device not less than five feet (5’) long and extending from the front of the machine;

2. A pointer or sighting device extending from the side of the machine to gauge the distance from the centerline for painting shoulder stripes;

3. A positive acting cutoff device to prevent depositing paint in gaps of broken strips;

4. Shields or an adjustable air curtain for line control;

5. Pressure regulators and gauges (if pneumatically operated) that are in full view of the operator;

6. A paint strainer in the paint supply line;

7. A paint storage tank with a mechanical agitator that operates continuously during painting operations;

8. A glass sphere dispenser located behind the paint applicator nozzle and which is controlled simultaneously with the paint applicator nozzle; and

9. Calibrated rods for measuring the volume of paint and glass spheres in the paint and glass sphere tanks.

Z. All spray equipment shall be of a proper type and of adequate capacity for the work. Air atomized spray equipment shall be equipped with oil and water extractors and pressure regulators and shall have adequate air volume and compressors recovery capacity. Spray gun type needle assemblies and orifices shall be of the proper size.

3.05 FIELD QUALITY CONTROL

A. Inspect for incorrect location, insufficient thickness, line width, coverage, retention, uncured or discolored material, and insufficient bonding.

B. Repair lines and markings, which after application and curing do not meet following criteria:

   1. Incorrect Location: Remove and replace incorrectly placed patterns.

   2. Insufficient Thickness, Line Width, Paint Coverage, Glass Bead Coverage or Retention: Prepare defective material by acceptably grinding or blast cleaning to remove substantial amount of beads and to roughen marking surface. Remove loose particles and debris. Apply new markings on cleaned surface in accordance with this Section.
3. Uncured or Discolored Material, Insufficient Bonding: Remove defective markings in accordance with this Section and clean pavement surface one foot beyond affected area. Apply new markings on cleaned surface in accordance with this Section.

C. Prepare list of defective areas and areas requiring additional inspection and evaluation to decide where material may need replaced. Provide traffic control as necessary if markings require more detailed evaluation.

D. Replace failed or defective markings in entire section of defective markings within 30 days after notification when any of the following exists during warranty period:

1. Marking is discolored or exhibits pigment loss, and is determined to be unacceptable by three member team based on visual comparison with beaded color plates.

2. More than 15 percent of area of continuous line, or more than 15 percent of combined area of skip lines, within any 100 foot section of roadway is missing.

E. When eradication of existing paint lines is necessary, eradicate by shot blast or water blast method. Do not gouge or groove pavement more than 1/16 inch during removal. Limit area of removal to area of marking plus 1 inch on all sides. Prevent damage to transverse and longitudinal joint sealers, and repair any damage according to requirements in Section 02514 or Section 02740.

F. Maintain daily log showing work completed, results of above inspections or tests, pavement and air temperatures, relative humidity, presence of any moisture on pavement, and any material or equipment problems. Make legible entries in log in ink, sign and submit by end of each work day. Enter environmental data into log prior to starting work each day and at two additional times during day.

3.06 PROTECTION OF FINISHED WORK

A. Protect painted pavement markings from vehicular and pedestrian traffic until paint is dry and track free. Follow manufacturer's recommendations or use minimum of 30 minutes. Consider barrier cones as satisfactory protection for materials requiring more than 2 minutes dry time.

END OF SECTION 32 17 23