

PROJECT MANUAL

**PROJECT/CONTRACT NUMBER:
Z-045-705/CP3515**

Bid Number: B-03-19-20

DW Infrastructure-Play Court Improvements (PH)

Piedmont Hills High School

EAST SIDE UNION HIGH SCHOOL DISTRICT

VOLUME 2 of 2

August 6, 2019

BID SCHEDULE
 FOR
PIEDMONT HILLS HIGH SCHOOL
DW INFRASTRUCTURE - PLAY COURT IMPROVEMENTS
PROJECT NO. Z-045-705

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>QTY.</u>	<u>UNIT</u>	<u>UNIT COST</u>	<u>TOTAL</u>
1.	Pulverize Existing AC & AB to a Depth of 12"; Remove 4" of Pulverized Base; Cement Treat Base to 8" Depth & Place 4" HMA	43,000	SF	\$ _____	\$ _____
2.	Apply Acrylic Seal Coat	43,000	SF	_____	_____
3.	Remove Existing Lawn Sod, Backfill with Top Soil & Re-sod	6,000	SF	_____	_____
4.	Remove Existing PCC Sidewalk & Install New PCC Sidewalk	90	SF	_____	_____
5.	Install Flush PCC Strip	450	LF	_____	_____
6.	Install PCC Retaining Curb	450	LF	_____	_____
7.	Remove Existing Posts and Fencing; Install New 10 Foot High Black Powder Coated Chain Link Fencing with New Gates and Privacy Netting	890	LF	_____	_____
8.	Remove and Dispose of Existing Tennis Court Hardware; Install New Tennis Court Hardware	6	EA	_____	_____
9.	Remove & Dispose of Existing Interior Fencing	238	LF	_____	_____
10.	Install Weather Proof Electrical Outlets, Fasten to Fence Posts	6	EA	_____	_____
11.	Install 1" PVC Sch40 Electrical Conduit	665	LF	_____	_____
12.	Remove Existing Water Fountain & Install New ELKAY EZH20 Bottle Filling Station; Evergreen in Color	1	EA	_____	_____
13.	New Paint Markings	---	LS	---	_____
14.	Site Utility Repair (Allowance)	---	LS	---	5,000.00
				TOTAL:	\$ _____

Path: Z:\SHARED\DRIVE ACTIVE PROJECTS\EAST SIDE UHSD\190236-01_PIEDMONT HILLS TC\TASK 01\DRAWINGS\190236-01_SITED1.DWG Plot Date: 8/2/2019 12:46 PM

LEGEND

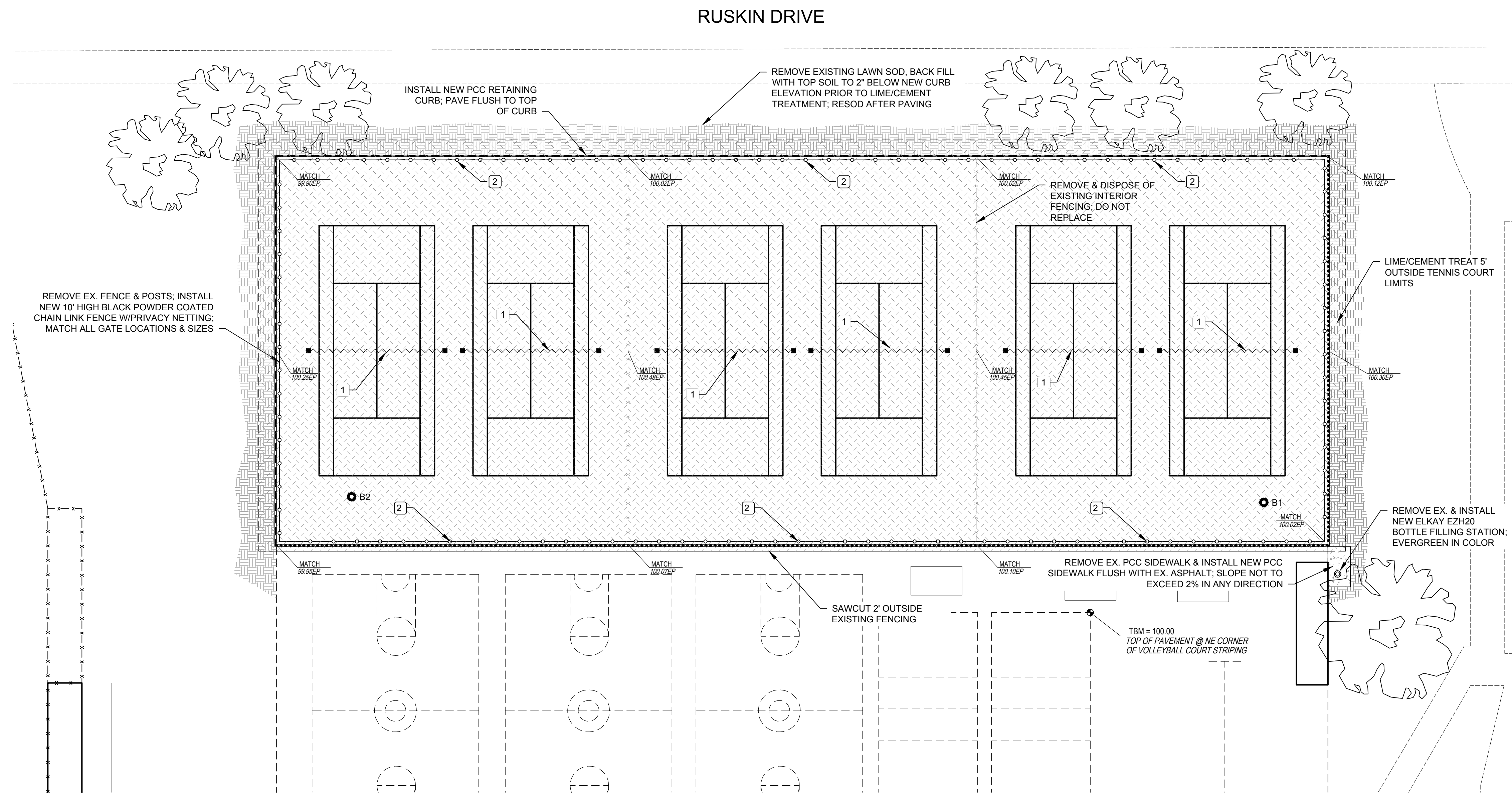
- PULVERIZE EXISTING AC & AB TO A DEPTH OF 12". REMOVE 4" OF PULVERIZED BASE; CEMENT TREAT BASE TO 8" DEPTH & PLACE 4" HMA
- REMOVE & REPLACE PCC FACILITIES (SEE PLAN)
- REMOVE EXISTING LAWN SOD, BACK FILL WITH TOPSOIL & RESOD AFTER PAVING
- INSTALL FLUSH PCC STRIP
- INSTALL PCC RETAINING CURB
- REMOVE EXISTING POSTS & FENCING; INSTALL NEW 10' BLACK POWDER COATED CHAIN LINK FENCING WITH NEW GATES & PRIVACY NETTING
- REMOVE & DISPOSE OF EXISTING FENCING
- BORE LOCATION (SEE BORING LOG)
- DESIGN ELEV.
- EXIST. ELEV.
- EDGE OF PAVEMENT
- TOP OF PAVEMENT
- TEMPORARY BENCHMARK

BORING LOG

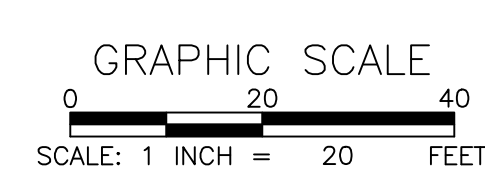
NO.	AC	AB	FABRIC	R-VALUE
B1	6-1/2"	5"	YES	9
B2	8"	4"	YES	---

NOTE:

- 1 CONTRACTOR SHALL REMOVE & DISPOSE OF EX. TENNIS COURT HARDWARE, POST & POST BASES. CONTRACTOR SHALL INSTALL NEW PW ATHLETIC TENNIS COURT HARDWARE MODEL NO. 2205-GR (POSTS), MODEL 8352 (PREMIUM TENNIS NET), MODEL NO. 8371-20 (GROUND ANCHOR), MODEL 8371-30 (NET TIE DOWN STRAP), AND ALL OTHER MFG. REQUIRED PARTS FOR INSTALLATION. INSTALL PER MFG. RECOMMENDATIONS.
- 2 INSTALL WEATHER PROOF ELECTRICAL OUTLETS, FASTEN TO FENCE POST.



ENLARGEMENT A
1" = 20'



	APP
	DESCRIPTION
	DATE
	REV
<p>Pavement Engineering Inc. You can ride on our reputation Corporate Office: 3485 Sacramento Drive, Suite A San Luis Obispo, CA 93401 805.781.2265</p>	
<p>PIEDMONT HILLS HIGH SCHOOL 1377 PIEDMONT RD, SAN JOSE, CA DW INFRASTRUCTURE - PLAY COURT IMPROVEMENTS ENLARGEMENT A</p>	
<p>PLANS FOR BIDDING</p>	
<p>DRAWN BY: TLS PROJECT NUMBER: 190236-01 SCALE: 1" = 20' DATE: AUG. 2019 SHEET NUMBER:</p>	
<p>2 OF 3</p>	

EAST SIDE UNION HIGH SCHOOL DISTRICT
PIEDMONT HILLS HIGH SCHOOL – TENNIS COURTS

PLAY COURT IMPROVEMENT
PROJECT NO. Z-045-705

TECHNICAL SPECIFICATIONS

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SECTION 02 41 13
SITE DEMOLITION

PART 1 GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To:
 - 1. Demolish and remove portions of existing site facilities as described in Contract Documents.
- B. Related Sections:
 - 1. Section 32 00 01 - General Exterior Site Construction Requirements
 - 2. New and replacement work specified in appropriate specification Section.

1.2 PRICE AND PAYMENT PROCEDURES

- A. If the project contains a Lump Sum price for demolition, all demolition activities shall be included under that bid price and not individual remove and replace items.
- B. If the project contains Unit Prices for various items such as "Remove Roots Under Repairs"; the cost of removal shall be included in the item of work.
- C. If the project is bid as a lump sum, no additional payment will be made for site demolition work.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination
 - 1. **Contractor shall contact an Underground Service Alert entity 48 hours in advance of work, and have all utilities marked prior to Preconstruction Meeting or ground disturbance.**
 - 2. Contractor shall request access to owner's water service controls.
 - 3. Contractor shall coordinate with affected utilities, transportation agencies, schools, waste disposal companies, and any other pavement users.
 - 4. Contractor shall coordinate with other contractors working on the site.
 - 5. Contractor shall use approved trucking routes from the municipalities on project haul routes.
- B. Preconstruction Meeting
 - 1. Contractor shall schedule a preconstruction meeting prior to initiating work.
 - 2. Attendees at the preconstruction meeting shall include but not be limited to:
 - a. Owner's Representative
 - b. Contractor's **Project Manager and General Superintendent**
 - c. **Subcontractor Representatives** (if applicable)
 - d. QA Representative
 - e. QC Representative
 - f. Other pavement users or affected parties as applicable.
- C. Sequencing
 - 1. Contractor shall sequence the work to minimize disruption to existing project users.
 - 2. Contractor shall sequence the work to prevent demolition operations from damaging new and existing sitework features.
 - 3. Contractor shall not commence demolition until all Storm Water protection BMPs have been installed.

- D. Scheduling
 - 1. Include on Construction Schedule detailed sequence of individual site demolition operations.
 - 2. Coordinate with Owner for equipment and materials to be removed by Owner, if necessary.

1.4 SUBMITTALS

- A. Upon Project Closeout - Identify abandoned utility and service lines and capping locations on record drawings.

1.5 CLOSEOUT SUBMITTALS

- A. Provide Owner documentation of disposal and recycling of site demolition material.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine site to determine extent of work necessary to separate work to be removed from work to remain. If separation procedure is unclear, request clarification from Owner's Agent at least 5 working days in advance of demolition.

3.2 PREPARATION

- A. Notify corporations, companies, individuals, and local authorities owning conduits running to property.
 - 1. Protect and maintain conduits, drains, sewers, pipes, and wires that are to remain on the property.
 - 2. Arrange for removal of wires running to and on property. Remove pipes and sewers in accordance with instructions of above owners.
 - 3. Mark locations of all underground utilities encountered including abandoned, damaged, repaired or unknown facilities on Record Drawings.
- B. Contractor shall be responsible for protecting soil stability underlying facilities during demolition.
- C. Contractor shall be responsible for protecting existing facilities.

3.3 PERFORMANCE

- A. Execute work in an orderly and careful manner, with due consideration for neighbors and the public. **Control dust.**
- B. Carefully remove, disassemble, or dismantle as required, and store in approved location on site, existing items to be reused in completed work.
- C. Concrete and Paving Removal
 - 1. Full depth saw cut joints between material to be removed and material to remain.
 - 2. Existing concrete site elements or pavement damaged during demolition or work shall be resawcut and replaced at Contractor's expense.

- D. Site Clearing
 - 1. Tree and Brush Removal
 - a. Cut off trees, shrubs, brush and vegetative growth 12 inches maximum above ground.
 - b. Remove stumps and roots 12 inches below original ground surface or until stump and all roots 1 inch or larger are removed.
 - c. Entirely remove roots of plants which normally sprout from roots as identified by Owner's Agent.
 - 2. Root Pruning and Removal
 - a. Hand excavate trench one foot wide and 20 inches deep along concrete or paving to be removed.
 - b. Cut roots encountered with saw, axe, or pruners. Do not cut roots with excavating equipment.
 - c. Remove roots under concrete and paving to 12 inches below top of base or native subgrade.
 - 3. Stripping
 - a. Strip existing vegetation layer 2 inches and remove from site prior to stripping topsoil for storage and reuse if necessary.
 - b. After stripping existing vegetation layer, strip existing topsoil 4 additional inches. Store onsite for reuse if necessary.
- E. Excavation
 - 1. Use excavation equipment and methods which do not cause or increase subgrade instability.
 - 2. Use methods which preclude tracking of soils or debris off site or onto streets, etc.
- F. Disposal
 - 1. Immediately remove from site all trees, shrubs, stumps, vegetative layer, asphalt concrete, removed concrete site elements and surface debris.
 - 2. Do not bury or burn waste.
 - 3. Comply with all local, state, and federal disposal and recycling regulations.
 - 4. If hazardous materials are encountered refer to the General Conditions.
- G. Site Maintenance
 - 1. Broom clean all remaining surfaces immediately after demolition and removal of debris. Maintain broom clean condition.
 - 2. Maintain all storm water protection measures.
 - 3. Provide continuous dust control measures until work is complete.

END OF SECTION

SECTION 02 41 15
SITE UTILITY REPAIR

PART 1 GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To
 - 1. The contractor shall identify the location of the existing utilities for the site using existing plans, obvious surface features, locations of facilities, locator services and other practical means **48 hours prior to ground disturbance.**
 - 2. At locations where identified site utilities may conflict with the planned construction, the contractor shall pothole the utility 5 days in advance of the work to ascertain if a conflict exists. If a conflict does exist, the contractor shall notify the Owner and Engineer immediately.
 - 3. Repair of existing utilities damaged during the course of construction.

1.2 PRICE AND PAYMENT PROCEDURES

- A. Payment for Repairs
 - 1. A Utility Repair Allowance is included in the project Bid Schedule. The contractor shall include this amount in his total bid.
 - 2. Payment for site utility repairs shall be made as follows:
 - a. Damaged due to Contractor's error or negligence - paid by Contractor
 - b. Damage due to unidentifiable or unknown conditions – paid through Site Utility Repair Allowance.
 - 1) Subcontractor markup limited to 5%
 - 2) Own forces markup 15%
 - 3) **“Greenbook” and Cal Trans Force Account rules do not apply to this project. Only equipment, material and personnel directly associated to repair shall be considered “extra work” by project owner.**
 - 4) No compensation for delays related to site utility repairs.
- B. Remaining monies in the Site Utility Repair Allowance at completion of job shall be credited back to owner by a change order.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination
 - 1. Contractor shall coordinate with affected utilities.
 - 2. Contractor shall coordinate with other contractors working on the site.
 - 3. Coordinate with site landscape maintenance company.
- B. Preconstruction Meeting
 - 1. Contractor shall schedule a preconstruction meeting prior to initiating work.
 - 2. Attendees at the preconstruction meeting shall include but not be limited to:
 - a. Owner's Representative
 - b. Contractor's **General Foreman**
 - c. Subcontractors (if applicable)
 - d. QA Representative
 - e. QC Representative
 - f. Other site users or affected parties as applicable.
- C. Scheduling
 - 1. The location of underground facilities shall be included as an initial schedule activity.
 - 2. Potholing of potential conflicting utilities shall be performed within 48 hours after the

conflict is identified.

1.4 SUBMITTALS

- A. The workman or subcontractors to perform the repairs shall be identified prior to the initiation of work and telephone number made available to the Owner's Representative.
 - 1. The contractor shall have the resources available to immediately and expeditiously repair damaged utilities, without impact to the schedule, including:
 - a. site lighting
 - b. irrigation lines and wires
 - c. water services
 - d. electrical lines

1.5 CLOSEOUT SUBMITTALS

- A. Provide Owner with record drawings indicating site utility repairs with related information including photographs.

PRODUCTS

1.6 MATERIALS

- A. The materials used for repairs shall be compatible and similar with the site utility to be repaired.
- B. Minimum thickness of plastic pipe for irrigation repairs shall be Schedule 40.
- C. Utility Boxes: Traffic-rated box and lid in pavement areas; Plastic or composite box in landscape areas.
- D. Wire Connectors: 3M AY type connectors shall be used for wire splices.

PART 2 EXECUTION

2.1 PROTECTION

- A. The contractor is responsible for protecting existing site utilities identified or which should have been identified by compliance with these specifications.

2.2 CONSTRUCTION

- A. Repair of damaged lines or wiring due to the contractor's failure to adequately identify or protect existing utility lines shall be the contractor's responsibility.
- B. Damaged utilities which were not able to be identified or protected shall be repaired by the contractor.
 - 1. The contractor shall make all repairs in accordance with the applicable codes. Care shall be exercised to avoid further damage to existing facilities during repairs.
 - 2. The repaired lines or wiring shall be tested prior to backfilling.
 - 3. The contractor shall be responsible for any damage to the completed work due to improper repairs of existing site utilities.
 - 4. Electrical splices:

- a. Damaged electrical lines shall be replaced from existing pull boxes or facilities. Splices shall only be made with the express permission of the Owner.
- b. Damaged irrigation wiring may be spliced with wire connectors. Splices in wiring run shall have a utility box placed over the splice.

END OF SECTION

SECTION 03 30 53
SITWORK CONCRETE

PART 1 GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To
 - 1. Removal of existing concrete and related materials.
 - 2. Compact subgrade for cast-in-place concrete site elements as described in Contract Documents.
 - 3. Furnish and install granular base for cast-in-place concrete site elements as described in Contract Documents.
 - 4. Furnish and install cast-in-place concrete site elements as described in Contract Documents.

- B. Related Sections
 - 1. Section 02 41 13 - Site Demolition
 - 2. Section 03 90 05 - Concrete Joint Sealant
 - 3. Section 31 23 00 - Excavation, Grading & Backfill
 - 4. Section 32 00 01 - General Exterior Site Construction Requirements

1.2 PRICE AND PAYMENT PROCEDURES

- A. Detectable Warning Surface – measured and paid for on a square foot basis as listed in the bid schedule.

- B. Stair Treads – included in the bid price for stair construction and no separate payment will be made.

- C. Joint Sealant - concrete joint sealant shall be included in the various items of work.

- D. All other items of sitework concrete to be measured and paid for as listed in the bid schedule and shall be considered full compensation for all labor, equipment, and materials required to perform the work as described herein.

- E. If sample panel(s) is required it shall be included in the unit cost of the work.

1.3 REFERENCES

- A. American Society For Testing And Materials (Most recent version)
 - 1. ASTM D 1751, 'Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)'
 - 2. ASTM A 615, 'Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement'
 - 3. ASTM C 33, 'Standard Specifications for Concrete Aggregates'
 - 4. ASTM C 94, 'Standard Specifications for Ready-Mixed Concrete'
 - 5. ASTM C 150, Standard Specifications for Portland Cement'

- B. 2010 Caltrans Standard Specifications immediately connected to concrete work

- C. California Building Code. (2013 or most recent version)

- D. American Disabilities Act including most recent rulings
- E. Applicable latest Caltrans Standard Details if applicable to the work (either because within Caltrans Right of Way or by municipal reference)

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Reinforcing steel shall be free of mud, heavy rust scales or flakes, or other coating at time of delivery and placing. Properly protect rebar on site after delivery.

1.5 SUBMITTALS

- A. Concrete Mix Designs
- B. Aggregate Base
- C. Safety Treads
- D. Detectable Warning Surface
- E. Concrete Joint Primer and Sealant
- F. Concrete Color
- G. Concrete Stamp Patterns

1.6 ACTION SUBMITTALS

- A. Delivery Tickets - Require mix plant to furnish delivery ticket for each batch of concrete. Keep delivery tickets at job-site for use of Owner or representatives. Tickets shall show following:
 - 1. Name of ready-mix plant
 - 2. Serial number of ticket
 - 3. Date and truck number
 - 4. Name of Contractor
 - 5. Name and location of Project
 - 6. Specific class or designation of concrete in conformance with the specifications. Class or designation shall match mix approved mix design.
 - 7. Amount of concrete
 - 8. Time loaded
 - 9. Type, name, and amount of admixtures used.
 - 10. Amount and type of cement
 - 11. Total water content
 - 12. Sizes and weights of sand and aggregate
 - 13. Fiber additive

1.7 QUALITY ASSURANCE

- A. Quality Assurance (QA) Inspection and/or Testing.
 - 1. Owner may, at their option, have independent quality assurance inspection and testing.
 - a. Inspections may be made during or after the work.
 - b. QA Inspection and testing is for the sole purpose of providing the Owner a greater degree of assurance that the requirements of the contract have been met. QA inspection and testing does not relieve the Contractor of any

- responsibility to comply with or perform in accordance with the Contract documents.
2. All QA concrete testing laboratories shall be CCRL, ACI or other wise qualified under ASTM C1077-14.
- B. Notification Required - **Allow Owner's Agent to verify grades and elevations or to schedule QA personnel, notify Owner's Agent 48 hours minimum prior to placing concrete.**

PART 2 PRODUCTS

2.1 MATERIALS

- A. Formwork
1. Material: Wood, metal or plastic
 2. Size
 - a. Straight Runs - 2 inch nominal thickness minimum.
 - b. Curves - laminated to 3/4 inch thickness minimum.
 - c. Depth - Within 2 inches of specified depth.
 3. Staking - 2 foot maximum spacing.
- B. Aggregate Base -
1. 3/4 inch Class 2 Aggregate per Section 26 of Caltrans Standard Specifications.
 2. Onsite Recycled Base per Section 32 12 16.
 3. Grindings from cold planing less than 2 inches in maximum dimension.
- C. Expansion Joints
1. Manufactured commercial fiber type meeting requirements of ASTM D 1751 and 1/2 inch thick.
- D. Concrete Reinforcing Steel
1. Grade 40 deformed bars.
- E. Concrete
1. Type I/II Cement
 2. All concrete except swales and PCC pads for dumpsters:
 - a. 1" maximum aggregate size.
 - b. 5 sack minimum.
 - c. 2,500 psi in 28 days.
 - d. 4 inch maximum slump.
 - e. Fibermesh Polypropylene Fibers, or equivalent, 3/4" minimum length @ 1.5 lbs/cy (0.01% by volume).
 3. Concrete swales and PCC pads for dumpsters:
 - a. 1" maximum aggregate size.
 - b. 6 sack minimum.
 - c. 2,000 psi in 7 days.
 - d. 3,500 psi in 28 days.
 - e. 4 inch maximum slump.
 - f. Fibermesh Polypropylene Fibers, or equivalent, 3/4" minimum length @ 3.0 lbs/cy (0.02% by volume).
 4. Omit Fibermesh on colored and/or textured concrete.
- F. Safety Treads - Wooster Products Inc. Type 231 complying with latest addition of UBC for placement and color.
1. Warning strip on top and bottom steps to differ in color from intermediate stair treads.

- G. Detectable Warning Surface -
 - 1. Tactile warning dots per Section 1133B.8.5 of the most recent edition of the California Building Code.
 - a. 36" Minimum width.
 - b. Durable, slip resistant material with a surface texture composed of raised, truncated domes in a staggered pattern with a diameter of nominal 0.9" at the base tapering to 0.45" at the top, a height of nominal 0.2", and a center spacing of nominal 2.35".
 - c. Color as specified on plans. If no color is specified, color shall be Safety Yellow.
 - d. "Set-in-concrete" system required (No glued & screwed mat systems installed after finished concrete)
 - 2. Acceptable Products (in safety yellow color):
 - a. "Wet-Anchor Box" by Disability Devices, Inc.
http://www.disabilitydevices.com/Offset_Dome_Tactile_Warning_Mat.html
 - b. "Cast-in-Place System" by Armor-Tile.
<http://www.armor-tile.com/truncateddomes/surface-applied-systems.htm>
 - c. Approved equal by Owner's Agent prior to bidding.

- H. Concrete Joint Sealant
 - 1. Pourthane SL Product 773-A by W. R. Meadows/SealTight
 - 2. Sikaflex Self-Leveling Sealant
 - 3. Or equal

PART 3 EXECUTION

3.1 PREPARATION

- A. Survey and stake sitework concrete to indicate location and elevations required by the Contract Documents. **Notification to Owners Representative of grades set by contractor Required - Allow Owner's Agent to verify grades and elevations 48 hours minimum prior to placing concrete.**

- B. Subgrade
 - 1. Fine grade to elevations required by Contract Documents with allowances for required concrete and aggregate base thickness.
 - 2. Compact native soils to 90 percent relative compaction at optimum moisture +/- 2 percent.

- C. Aggregate Base
 - 1. Where required, place required thickness.
 - 2. Fine grade to elevations required by Contract Documents with allowances for required concrete and aggregate base thickness.
 - 3. Compact to 90 percent relative compaction at optimum moisture +/- 2 percent.

- D. Sidewalk sample for specified finishes (not including broom-finished concrete)
 - 1. Prior to placing any concrete for sidewalks, Contractor shall prepare a 4 foot by 4 foot sample with the specified finish(s) for approval by the Owner's Representative.
 - a. Approved sample shall remain on site for the duration of the concrete work, and shall be disposed of at the completion of the final concrete pour.
 - b. Approved sample work shall not be a part of the finished work product.

- E. Protection of Existing Facilities

1. All vertical surfaces within 10 feet of the work shall be covered to a height of 3 feet with sheet plastic
2. Existing hardscape surfaces shall be protected with tape and plastic sheeting.
3. Any damage to adjacent finishes shall be repaired to the satisfaction of the owner. Repainting shall extend across the entire plane from corner to corner.
4. Horizontal surfaces shall be protected from graffiti or other damage.

3.2 INSTALLATION

A. Site Tolerances

1. Vertical
 - a. Subgrade - 0.00 feet high.
 - b. Aggregate Base - 0.00 feet high.
 - c. Finish Concrete +/- 0.02 feet.
2. Horizontal
 - a. General Finish Concrete - +/- 0.10 feet.
 - b. Required Widths - 0.00 to +0.10 feet.
3. Layout
 - a. Horizontal dimensions shall be within +/- 0.10 feet.
4. Exterior Accessible Travel Paths
 - a. Landings, Ramps, Crosswalks, Sidewalks, and other Pedestrian Travel Paths
Cross slopes - 2 percent or less.
 - b. Sidewalks - 5 percent or less longitudinal slope.
 - c. Ramps - 8.33 percent or less longitudinal slope.
 - d. Maximum vertical distance between landings - 30 inches.
5. Variations in stairs
 - a. Consecutive steps-
 - 1) Treads -1/4 inch, 11 inch minimum width.
 - 2) Risers - 1/4 inch, 4 inch minimum, 7 inch maximum.
 - b. Flight of stairs -
 - 1) Treads -3/8 inch.
 - 2) Risers - 3/8 inch.
6. Landings at Doorways -
 - a. 1/4 inch maximum differential between top of threshold and surface of landing.
7. Forms
 - a. Vertical surfaces shall be formed to within 2 inches of subgrade.
 - b. Gaps between forms shall not exceed 1/4".

B. Joints

1. Align joints of sidewalk and curb and gutter.
2. Expansion Joints with joint material -

- a. Spacing -
 - 1) Sidewalks, Curbs, and Curb & Gutter - 50 feet on center.
 - 2) Mow Strips - 10 feet on center.
 - 3) Flat Drainage Structures - 50 feet on center.
 - 4) Retaining Walls - 36 feet on center.
 - b. Full depth of sidewalk, curbs, gutters, pads, etc.
 - c. If reinforcement required, rebar to extend through expansion joint material.
 - d. Place at corner of curb and curb & gutter.
 - e. Install so top of expansion joint material is 1/4 inch below finished concrete surface.
 - f. No expansion joint required between curbs and walks parallel to curb.
 - g. Provide expansion joint at end of walks perpendicular to and terminating at curb.
 - h. Provide expansion joint between concrete work and buildings. Expansion joint shall be 1/2" below finished concrete surface. Caulk per Section 30 90 05.
3. Contraction Joint Spacing -
- 1) Sidewalks, Curbs, and Curb & Gutter - 10 feet on center.
 - 2) Mechanical Pads, Dumpster Enclosures, etc. - 12 feet on center.
 - 3) Flat Drainage Structures - 10 feet on center.
- b. Contraction Joint Depth
- 1) 1 inch minimum depth.
 - 2) 1/4 to 1/3 concrete thickness.
- c. Location
- 1) Align sidewalk and curb and/or gutter.
 - 2) If placing on existing concrete, align with underlying contraction joints and cracks if feasible.
 - 3) Place at all inside corners.
 - 4) At square utility boxes, place contraction joints at each corner.
 - 5) At round utility boxes, place joint through center to nearest edges of concrete.
 - 6) Spacing may be increased or decreased to 12 feet to accommodate utility boxes.
- d. Type
- 1) Tooled joint up to 6" concrete depth. Tooled joint required for all sidewalks. Sawcuts not allowed. Tooled joint may be deepened with sawcut within 24 hours of concrete placement if necessary.
 - 2) Sawcut or parting strip for concrete depths over 6 inches. All sawcuts shall be made within 24 hours of concrete placement.
4. Inserts, Stair Treads, etc. - Precut and place prior to concrete placement where practical.
5. Crack Repair - Cracks resulting from failure to comply with requirements will require removal and replacement of entire panel or section of concrete to adjacent contraction joints.

C. Finish

- 1. Curb, Gutter, Slabs, Mow Strips, Flat Drainage Structures, And Miscellaneous
 - a. Light Broom finish.
 - b. Round edges including edges formed by expansion joints.
 - c. Remove edger marks.
- 2. Sidewalk – Unless specified otherwise on plans, sidewalks shall have a light broom finish with the following requirements:
 - a. Washed, Fine Aggregate surface (3/8" max. size aggregate).
 - b. Round edges including edges formed by expansion joints.
 - c. Remove edger marks.
- 3. Curb Faces -

- a. Remove forms as soon as practical.
 - b. Fill voids with fresh concrete if necessary.
 - c. Finish face full depth with smooth steel trowel finish.
 - d. Remove any excess concrete beyond form line at bottom of curb face at time of finishing.
4. Walls -
- a. Immediately after removing forms, remove joints, marks, bellies, projections, loose materials, and cut back metal ties from surfaces to be exposed.
 - b. Point up voids with cement mortar, 1:2 mix, and rub exposed surface with carborundum to smooth, even surface.
5. Ramps -
- a. Medium broom finish transverse to direction of travel on ramp.
- D. Special Requirements
1. Form vertical surfaces full depth. Do not allow concrete to flow out from under forms in any degree. Remove any excess concrete beyond form face immediately after forms removed.
 2. Sidewalks, Exterior Stairs, And Landings -
 - a. Slope to drain.
 - 1) Slope sidewalks with cross slope of 1 percent minimum to 2 percent maximum in direction of intended drainage.
 - 2) Slope sidewalks away from building one percent minimum.
 - b. Dusting with cement not permitted.
 - c. Adding water during finish not permitted.
 3. At Channel Iron over Rainleaders -
 - a. Grout space between pipe and channel iron at curb face and sidewalk edge.
 - b. Grind 1/4 inch bevel on sawcut edge if applicable prior to concrete placement. Round over concrete edge of fresh concrete.
 4. Light Pole Bases
- E. Detectable Warning Surfaces -
1. Layout -
 - a. 36 inch minimum width, length per plan.
 - b. Surface flush with adjacent concrete.
 2. Install warning surface in accordance with manufacturer's recommendations.
- F. Concrete Joint Sealant
1. Cleaning
 - a. Remove all contaminants including dirt, paint, curing compounds, grease, oil or other non-compatible substances or compounds.
 - b. Do not use any oil based cleaning compounds.
 - c. After cleaning, vacuum thoroughly.
 2. Sealant
 - a. Cure new concrete a minimum of 28 days prior to sealing.
 - b. Application
 - 1) Surface of sealant shall be 1/16" to 3/16" below the concrete surface.
 - 2) Clean all sealant off adjacent concrete surfaces.
 - c. Protection
 - 1) Protect sealed joints until sealant is fully set.

3.3 FIELD QUALITY CONTROL

- A. Formwork Dimensions and Grades
1. Contractor shall verify that the formwork conforms to the required dimensions and elevations prior to placement of concrete.

- B. Contractor shall verify ADA travel path slopes and cross slopes
 - 1. Check formwork prior to concrete placement
 - 2. Check placed concrete during finishing
 - 3. Check completed work prior to placing curing compound

- C. Concrete Drainage Structures
 - 1. Contractor shall water test flowlines of drainage structures such as gutters, swales and v-ditches during the finishing process to eliminate high or low areas and any areas of ponding.

END OF SECTION

SECTION 31 23 00

EXCAVATION, GRADING & BACKFILL

PART 1 GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To
 - 1. Perform rough and finish grading work required to prepare site for construction as described in Contract Documents.
 - 2. Perform trench excavation and backfill for site utilities.
 - 2. Perform excavating and compacting included in Project not covered under other Sections.
- B. Related Sections
 - 1. Section 02 41 13 - Site Demolition
 - 2. Section 32 00 01 - General Exterior Site Construction Requirements

1.2 QUALITY ASSURANCE

- A. Investigation
 - 1. **Contractor shall schedule a pre-construction meeting with Owners Representative to discuss designed grades specific to this phase of project.**
 - 2. Identify benchmark to be used in establishing grades and review Contract Document requirements for grades, fill materials, and topsoil.
 - 3. Examine site to pre-plan procedures for making cuts, placing fills, and other necessary work.
- B. Proof Rolling
 - 1. Contractor shall proof roll keyways, fills and subgrades when requested to do so by Owner's representative.
- C. Compaction Testing
 - 1. Contractor shall schedule compaction testing with Owner's Agent at least 48 hours prior to required testing.
 - 2. Contractor shall provide construction equipment to prepare testing sites. Minimum equipment shall be a rubber tired backhoe or equivalently weighted rubber tired machine.
 - 3. Contractor shall recompact all test locations if necessary.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Site Material - Existing excavated material on site which has been identified as not being unsuitable as defined by Section 32 00 01 is suitable for use as fill material or backfill where allowed.
- B. Imported Fill/Backfill
 - 1. Equal to or greater than quality of onsite material in terms of "R" Value, but not less than R=25.

2. Plasticity Index less than 15 or no expansion pressure per CTM 301.

C. Imported Topsoil

1. Fertile, loose, friable soil meeting the following criteria:
 - a. pH between 5.5 and 7.7
 - b. Soluble Salts - less than 2.0 mmhos/cm
 - c. Sodium Absorption Ration (SAR) - less than 3.0
 - d. Organic Matter - greater than 1 percent
2. Physical Characteristics:
 - a. Gradation as defined by USDA triangle of physical characteristics as measured by hydrometer.
 - Sand - 15 to 60 percent
 - Silt - 10 to 60 percent
 - Clay - 5 to 30 percent
 - b. Clean and free from toxic minerals and chemicals, noxious weeds, rocks larger than 1-1/2 inches in any dimensions, and other objectionable materials.
 - c. Soil shall not contain more than 2 percent of particles measuring over 2.0 mm in largest size.

D. Trench Backfill – CLSM per Section 32 00 01

E. Drain Rock

1. Drain rock material shall meet the following gradation requirements:

<u>Screen Size</u>	<u>Percentage passing</u>
1-1/2"	100
3/4"	5 (max.)
No. 200	2 (max.)

PART 3 EXECUTION

3.1 PREPARATION

- A. Before making cuts, remove topsoil over areas to be cut and filled that was not previously removed by stripping. Stockpile this additional topsoil with previously stripped topsoil.
- B. Keyways for Fills
 1. Prepare keyway at toe of fills.
 2. Keyways shall extend a minimum of 1.5 feet below adjacent undisturbed ground.
 3. Keyways shall be a minimum of 6 feet in width.
 4. Keyways shall slope between 0 and 4 percent toward the fill.
 5. The bottom of the keyway shall be scarified, moisture conditioned and compacted to 90 percent relative compaction a minimum depth of 6 inches.
 6. Proof roll for unstable or unsuitable soils.

3.2 PROTECTION

- A. General: Open excavations, trenches, and the like shall be protected with fences, covers, or railings as required to maintain safe pedestrian and vehicular traffic passage.
- B. Erosion of newly backfilled areas shall be prevented during construction. Settlement or washing that occurs in backfilled areas shall be repaired and grades reestablished to the required elevations.

- C. Contractor shall comply with all local, state and federal storm water protection regulations.

3.3 PERFORMANCE

- A. Tolerances
1. Maximum variation from indicated grades for rough grading shall be **+/- 0.05 foot**.
 2. Grading shall not vary from the negative to positive tolerances within 50 feet.
 3. Make proper allowances for final finish grades of pavement, top soil, planting areas or other structures.
- B. When existing grade around existing plants to remain is higher than new finish grade, perform regrading by hand. Do not expose or damage existing shrub or tree roots.
- C. Excavation
1. Maximum cut slopes shall be 2H:1V or as shown on plans.
 2. Round off top 3 feet of cut slopes
 3. Do not overcut slopes by more than 0.5 feet measured perpendicularly from the cut slope.
 4. Protect existing trees and improvements from equipment damage.
 5. Finish slopes shall be graded smooth.
 6. Drainage: Ensure proper drainage in and around excavation area. Do not allow water to accumulate in excavated areas. Water in excavation areas shall be removed by pumps or other means.
 7. Excavated material becomes property of the contractor.
 - a. When fill is required elsewhere on site, Contractor shall use excavated material first prior to importing additional material, unless excavated material is deemed unusable by the Owner's Agent.
 - b. If not called for reuse elsewhere on the site, excavated material will be disposed of by the Contractor in a legal manner.
- D. Over-excavation
1. Excavations below indicated depths will not be permitted, except to remove unsuitable material as identified in Section 32 00 01 of these Specifications.
 2. Satisfactory material removed below the depths indicated without specific direction from the Owner's Agent shall be replaced at no additional cost to the Owner to the indicated excavation grade. Replacement material shall be approved by Owner's Agent prior to performing the work.
- E. Trenching
1. Excavate to depth and alignment as shown on plans.
 2. Bottom of trench shall be accurately graded to provide required slope and shall be stabilized if necessary, to provide a firm pipe bed.
 - a. Recesses shall be excavated to accommodate bells so that the pipe will be uniformly supported for the entire length.
 3. Rock, where encountered, shall be excavated to a depth of 6 inches below the bottom of the pipe and the void backfilled with clean fill sand.
 4. No joint trenching is allowed unless otherwise shown on drawings.
 5. Provide shoring as required by Cal OSHA.
 6. Trench width shall equal pipe width plus 6 inches unless otherwise shown on plans.

F. Subgrade Preparation

Site Tolerances

1. Maximum variation from indicated grades for rough grading shall be **+/- 0.05 foot**.
2. Grading shall not vary from the negative to positive tolerances within 50 feet.
3. Make proper allowances for final finish grades of pavement, top soil, planting areas or other structures.
4. If soft spots, water, or other unusual and unforeseen conditions affecting grading requirements are encountered, stop work and notify Owner's Agent.

G. Fill Construction

1. Uniformly moisture condition fill material to between optimum plus 3 percent optimum moisture prior to placing in fill.
2. Place fills in maximum loose lifts of 8 inches.
3. Compact fills to 90 percent relative compaction under concrete flat work areas; compact to 95 percent relative compaction under asphalt concrete paving. In landscape areas, compact to 85 percent relative compaction (do not over-compact).
4. Correct any unstable areas.
5. Compact fill slopes after trimming with 3 passes of a sheepsfoot roller or track roll.
6. No fill or backfill material shall be placed during adverse weather conditions that will alter the moisture content to above optimum level.
 - a. Approved compacted subgrades that are disturbed by adverse weather or by the Contractor's actions shall be scarified and re-compacted to the required density prior to further construction thereon.

H. Trench backfill

1. CLSM or Cement Slurry per Section 32 00 01 of these Specifications, and as shown on Plans.
2. Do not perform any trench backfill until lines have been inspected and/or tested by Owner's Agent and authorization has been given to proceed by said Agent.

I. Finish Grading

1. Do not start finish grading until rough grading tolerances are met.
2. Prior to finish grading or adding topsoil to planters, dig out weeds by roots and remove rocks, concrete, asphalt, wood, forming material, wire, rubble, sticks, etc.
3. Prior to placing topsoil, remove aggregate base down to native soil in planting areas.
4. Excavate planting areas to provide the following minimum topsoil depths below adjacent concrete or finish surfaces:
 - a. Lawn and Groundcover Planting Areas - 7 inches minimum
 - b. Shrub Planting Areas - 14 inches minimum.
5. Redistribute approved existing topsoil stored on site from stripping per Section 02 41 13.
6. Add imported topsoil as necessary to provide required topsoil depth.
7. Fine grade topsoil 1 inch minimum to 2 inches maximum below top of concrete or finish surfaces, unless shown otherwise on plans. Rake smooth and remove all lumps, rocks, etc.
8. Provide a minimum of 8 inches clearance from finish floor at buildings or wood structures.
9. Slope away from buildings at ½ inch per foot for a minimum of 5 feet.
10. Fill low spots and pockets with topsoil and grade to drain.

J. Clean up

1. Upon completion of the work under this section, Contractor shall remove from the

premises all surplus materials, tools, equipment, trash, rubbish, left-over material and debris resulting from the work at his own expense and leave the site in a clean and neat condition satisfactory to the Owner's Agent.

PART 4 PAYMENT

- A. Unless specified otherwise in the bid schedule, excavation, off haul, grading and backfill shall be paid for as a part of the various items of work and no separate payment shall be made.

END OF SECTION

SECTION 31 32 15
CEMENT TREATED BASES

PART 1 GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To
 - 1. **Contractor shall schedule a pre-construction meeting with Owners Representative to discuss designed grades specific to this phase of project.**
 - 2. Prepare grade as described in Contract Documents.
 - 3. Introduce Cement in one application, stabilize and compact to full depth the subgrade as described in Contract Documents.

- B. Related Sections
 - 1. Section 32 00 01 – General Exterior Site Construction Requirements
 - 2. Section 31 23 00 – Excavation, Grading, and Backfill
 - 3. Section 32 12 16 – HMA Paving

1.2 REFERENCES

- A. California Department of Transportation, Standard Test Methods
 - 1. Caltrans Test Method 216 “Method of Test for Relative Compaction of Untreated and Treated Soils and Aggregates.”
 - 2. Caltrans Test Method 231 “Method of Test for Relative Compaction of Untreated Soils and Aggregates using Nuclear Gauge.”

- B. California Department of Transportation, Standard Specifications
 - 1. Section 27, Cement Treated Bases

1.3 SUBMITTALS

- A. Product Data: Type II Portland Cement

- B. Samples
 - 1. Cement - Type II Portland Cement

1.4 SEQUENCING

- A. Rough Grading - Rough grading shall be performed to allow for placement of cement-stabilized soil/aggregate as described in the following paragraphs.

- B. Pavement Areas
 - 1. After rough grading is completed, perform cement soil/aggregate stabilization in the designated area to the specified depth.
 - 2. Cement soil/aggregate stabilization shall be performed after completing all site utility work.

PART 2 PRODUCTS

2.1 MATERIALS

- A. On-site materials to be stabilized using Type II Portland Cement shall conform to Section 27-1.02 of the latest edition of Caltrans Standard Specifications.

- B. Contractor shall perform mix design from materials sampled on-site to determine required cement content to meet unconfined compressive strength requirements of 300 psi minimum and 650 psi maximum.

PART 3 EXECUTION

3.1 PREPARATION

- A. Perform site preparation and rough grading in accordance with Section 31 23 00 to grade lines shown on Drawings.

3.2 CONSTRUCTION

- A. Site Verification of Conditions
 - 1. Complete all site work utility construction including testing.
- B. General Application
 - 1. Application and construction shall conform to Sections 27-1.03 of the latest edition of Caltrans Standard Specifications, except as noted.
 - 2. The depth of treatment shall be per the project plans.
 - 3. Spread rate shall be confirmed for each product application and thoroughly blended until uniformity is confirmed to the Soils Engineer's satisfaction.
- C. Compaction
 - 1. Compact full depth of treatment area to 95 percent relative compaction at or above optimum moisture as determined by Caltrans Test Methods 216 and 231.
- D. Tolerances
 - 1. At a minimum, the completed cement treated section, after compaction and trimming, shall be equal to the design thickness. The maximum completed cement treated section thickness shall not exceed the design thickness plus 1 inch.
- E. Curing
 - 1. Cover the completed CTB with asphaltic emulsion curing seal to conform to Section 27-1.03I of the latest edition of Caltrans Standard Specifications.
 - 2. Curing seal shall be applied the same day as completion of final compaction and as soon after final compaction is practicable. Keep surface moist until curing seal is applied.
 - 3. Do not allow traffic or equipment on the CTB for 72 hours after application of the curing seal. After 72 hours, limit traffic and equipment on the CTB to that used in paving operations.
- F. Testing
 - 1. One undefined compressive strength shall be determined for each lot in accordance with CTM 312. A lot shall consist of 1,000 sy or one days production, whichever is greater. The required strength during production should be between 250 psi and 700 psi for the unconfined compressive strength.

END OF SECTION

SECTION 32 00 01
GENERAL EXTERIOR SITE CONSTRUCTION REQUIREMENTS
PRIOR TO, DURING AND POST CONSTRUCTION

PART 1 GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To
 - 1. General procedures and requirements for Site Work.
 - 2. Accessibility Requirements

1.2 REFERENCES

- A. American Society For Testing And Materials (most recent revisions)
 - 1. ASTM D 1557, 'Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort'
 - 2. ASTM D 2216, 'Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock'
 - 3. ASTM D 2487, 'Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)'⁴
 - 4. ASTM D 6938, 'Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)'
 - 5. ASTM D 2950, 'Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods'
- B. Caltrans Test Methods (most recent revisions)
 - 1. CTM 216, 'Method of Test for Relative Compaction of Untreated and Treated Soils and Aggregates.'
 - 2. CTM 301, 'Method of Test for Determination of the Resistance "R" Value of Treated and Untreated Bases, Subbases and Basement Soils by the Stabilometer'
 - 3. CTM 304, 'Method of Preparation of Bituminous Mixtures for Testing'
 - 4. CTM 308, 'Methods of Test for Bulk Specific Gravity and Weight per Cubic Foot of Bituminous Mixtures'

1.3 DEFINITIONS

- A. Standard Specifications - Caltrans Standard Specifications **directly associated to the work.**
- B. Relative Compaction
 - 1. Ratio of field dry density as determined by ASTM D 2922 and ASTM D 3017 or 2216, and laboratory maximum dry density as determined by ASTM D 1557 or CTM 216F.
 - 2. Ratio of maximum field density as determined by ASTM D 2922 and the laboratory maximum density as determined by CTM 216G.
- C. Differing Subsurface or Physical Conditions
 - 1. Any subsurface or physical condition at or contiguous to the site that is uncovered or revealed either:
 - a. Is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided herein is materially inaccurate, or
 - b. Is of such a nature as to require a change in the Contract Documents, or
 - c. Differs materially from that shown or indicated in the Contract Documents, or

- d. Is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents.
 - 2. If Contractor believes that a differing subsurface or physical condition exists, Contractor shall promptly, after becoming aware thereof and before disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency), notify Owner's Agent in writing about such conditions. Contractor shall not further disturb such conditions or perform any Work in connection therewith until receipt of written order to do so.
- D. Unsuitable Material
 - 1. Soil or aggregate of such unstable nature as to be incapable of being compacted to specified density using ordinary methods at optimum moisture content; or
 - 2. Too wet to be properly compacted and circumstances not resulting from the Contractor's action or inaction prevent suitable in place drying prior to incorporation into the work; or
 - 3. Otherwise unsuitable for the planned use.
 - E. Unstable - visible deflection or movement either horizontally or vertically under loading of construction equipment or while being proof rolled.
 - F. Proof Rolling - Using a loaded 10-wheel dump truck, water truck, or equivalent to load soil by driving slowly over areas designated by the Owner's Agent to check for unstable areas.

1.4 QUALITY ASSURANCE

- A. Owner will pay for all testing required by the project specifications.
- B. Contractor shall pay for cost of all non-complying testing.

PART 2 PRODUCTS

- A. Controlled Low Strength Material (CLSM)
 - 1. Contains maximum of 94 lbs of cement per cubic yard.
 - 2. Compressive strength between 75 and 150 psi at 28 days.
 - 3. Fly ash is permitted.
 - 4. Air entrainment additives for workability.
- B. Cement Slurry - Conforms to Section 19-3.062 of Caltrans Standard Specifications.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Site Verification of Conditions
 - 1. 48 hours minimum prior to performing any work on site, contact Underground Service Alert (USA) to arrange for utility location services. If USA will not respond to the project site, the Contractor shall be required to provide a private locating service.
 - 2. Perform minor, investigative excavations to verify location of various existing underground facilities at sufficient locations to assure that no conflict with the proposed work exists and sufficient clearance is available to avoid damage to existing facilities.

3. Perform investigative excavating 10 days minimum in advance of performing any excavation or underground work.
4. Upon discovery of conflicts or problems with existing facilities, notify Owner's Agent by phone or fax within 24 hours. Follow telephone or fax notification with letter and diagrams indicating conflict or problem and sufficient measurements and details to evaluate problem.

3.2 PREPARATION

- A. Protection
 1. Spillage -
 - a. Avoid spillage by covering and securing loads when hauling on or adjacent to public streets or highways.
 - b. Remove spillage and sweep, wash, or otherwise clean project, streets, and highways.
 2. Dust Control -
 - a. Take precautions necessary to prevent dust nuisance, both on-site and adjacent to public and private properties.
 - b. Correct or repair damage caused by dust.
 3. Existing Plants and Features - Do not damage tops, trunks, and roots of existing trees and shrubs on site which are intended to remain. Do not use heavy equipment within branch spread. Interfering branches may be removed only with permission of Owner's Agent. Do not damage other plants and features which are to remain.
- B. If specified precautions are not taken or corrections and repairs made promptly, Owner may take such steps as may be deemed necessary and deduct costs of such from monies due to Contractor. Such action or lack of action on Owner's part does not relieve Contractor from responsibility for proper protection of the Work.
- C. Contractor shall comply with all local, state, and federal storm water protection regulations.

3.3 SURVEYING & LAYOUT

- A. Benchmark – Project Plans will provide either a permanent or temporary benchmark.
- B. Contractor shall provide all surveying and layout.
- C. Contractor shall provide 2 personnel as requested by the Owner's Agent to perform quality assurance testing including stringlining of subgrades and verification of grades. Stringline and engineers level (or laser level) shall be provided by the Contractor and be available at all times during site work.

3.4 REPAIR / RESTORATION

- A. Adjust existing covers, boxes, and vaults to grade.
- B. Replace broken or damaged covers, boxes, and vaults.
- C. Independently confirm size, location, and number of covers, boxes, and vaults which require adjustment.
- D. Advise Owner's Agent of damage to underground site utilities. Address utility repairs per Section 02 41 15 "Site Utility Repair".

- E. Site Cleaning Immediately Prior To Acceptance
 - 1. All surfaces shall be broom clean and free from any accumulation of debris.
 - 2. Clean tack coat on concrete surfaces. Tack coat within 1 inch of pavement on curbs or gutter is not required to be cleaned.
 - 3. Remove all traffic control devices, excess materials, debris and signage from site.
 - 4. Remove all debris and sediment from the existing storm drain structures.
 - 5. Clean existing through-curb drain pipes using ordinary methods such a garden hose with extension pipes.
 - 6. Bring clogged or damaged storm drain pipes or structures to attention of Owner's Agent.
 - 7. Replace any disturbed landscaping. Backfill planters with clean topsoil and replace surface dressing or mulch in kind.
 - 8. Remove all concrete debris and splatter.

3.5 ACCESSIBILITY REQUIREMENTS

- A. Work shall comply with the following code requirements:
 - 1. Title 24, CCR: California Building Code.
 - 2. Latest Edition of Uniform Building Code including California Amendments.
 - 3. American with Disabilities Act.
 - 4. Code requirements shall supercede plans or specifications.
- B. Coordination of Work
 - 1. Coordinate work elements to provide code compliance.
- C. Accessible Travel Paths
 - 1. Includes unloading zones, crosswalks, and sidewalks.
 - 2. Excludes ramps and landings.
 - 3. Maximum cross slope of 2 percent.
 - 4. Maximum longitudinal slope of 5 percent.
- D. Ramps and Landings
 - 1. Includes all travel paths between 5 and 8.33 percent.
 - 2. Provide handrails.
 - 3. Provide wheel curbs or wheel rails.
 - 4. Provide landings at beginning, end and every 30 inches of vertical rise. Landings shall be a minimum of 72 inches long, the width shall match the travel path, and the maximum cross slope shall be 2 percent.
- E. Curb Ramps
 - 1. Longitudinal slopes shall be between 6.7 and 8.33 percent.
 - 2. Cross slopes shall be less than 2 percent.
 - 3. Concrete score marks per code.
 - 4. Provide positive drainage.
 - 5. Detectable Warnings per ADA and codes.
- F. Door Landings
 - 1. Extend landing 42 inches beyond door swing, 24 inches beyond latch side of door.
 - 2. Maximum slope in any direction shall be 2 percent.
 - 3. Maximum drop at doorways of 1/4 inch from finish floor to landing.
- G. Accessible Parking Stalls and Unloading Zones
 - 1. Maximum slope in any direction of 2 percent.
 - 2. Unloading Zone shall be minimum 5 feet in width, 8 feet for Van Accessible Stalls.
 - 3. 6 foot Parking Bumpers shall be used to protect signs and overhang into accessible sidewalk as necessary to provide a 4 foot minimum sidewalk width.

- H. Signage
 - 1. Signage shall include required entrance signs and stall signage.
 - 2. Signage location preference shall be building first, landscape area second, and in pavement third.

3.6 FIELD QUALITY CONTROL

- A. If work has been interrupted by weather, scheduling, or other reason, notify Owner's Agent 24 hours minimum prior to intended resumption of work.
- B. Owner reserves the right to require additional testing to re-affirm suitability of completed work including compacted soils or aggregate bases which have been exposed to adverse weather conditions.

PART 4 PAYMENT

- A. Payment for all work described in this section shall be included in the various items of work and no separate payment shall be made.

END OF SECTION

SECTION 32 11 23

AGGREGATE BASE

PART 1 GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To:
 - 1. Prepare pavement sub-grade as described in Contract Documents to receive pavement base and paving.
 - 2. Furnish and install pavement base in playground, driveway and parking areas as described in Contract Documents.

- B. Related Sections
 - 1. Section 32 00 01 - General Exterior Site Construction Requirements
 - 2. Section 31 23 00 - Excavation, Grading & Backfill
 - 3. Section 32 01 26.72 - Cold Planing

1.2 REFERENCES

- A. Caltrans Standard Specifications, Section 26, 2010

1.3 SUBMITTALS

- A. Product Data - Manufacturer's published product data on soil sterilant.

- B. Quality Assurance / Control
 - 1. Copies of test results from tests conducted to assure compliance to Contract Document requirements.
 - 2. Certificate of Compliance for Aggregate Base

1.4 PROJECT CONDITIONS

- A. Project Environmental Requirements
 - 1. Do not perform work during following conditions:
 - a. Presence of free surface water or damp pavement.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Aggregate Base
 - 1. New Aggregate Base - 19mm (3/4") Class 2 aggregate base in conformance with Section 26 of the Caltrans Standard Specifications.
 - 2. Onsite Recycled Aggregate Base
 - a. By the contract documents or by approval from Owners Representative, pulverized existing asphalt concrete pavement mixed uniformly with existing aggregate base.

- b. Conform to following gradation

Sieve	Percent by Weight Passing Sieve
2-1/2 inch	100
1-1/2 inch	95 - 100
3/4 inch	60 - 100
No. 200	2 - 12
- c. Quality Requirements as established by testing
 - 1) R-value - 78 minimum

PART 3 EXECUTION

3.1 PREPARATION

- A. Survey and stake paving surfaces to indicate grading required by Contract Documents.
- B. Sub-Grade
 - 1. Finish grade surface area to grades required by Contract Documents.
 - 2. In pulverized areas where grading will match existing, regrade onsite recycled base to match approximate grade of previous surface.
 - 3. Compact as follows:
 - a. Under sitework concrete, concrete swales, concrete pads or concrete pavement - compact to 90 percent relative compaction at optimum moisture +/- 2 percent.
 - b. Under HMA pavements, compact to 95 percent relative compaction at optimum moisture +/- 2 percent.
 - 4. Proof roll completed subgrade prior to compaction testing and stringlining to verify subgrade stability. Proof roll with full water truck or equivalent vehicle. Repair unstable, soft or yielding areas.

3.2 APPLICATION

- A. Site Tolerances
 - 1. Sub-Grade - 0.00 inches high. Measure using stringline from curb to curb, gutter, flat drainage structure, or grade break.
 - 2. Base - The average base thickness shall be equal or greater than the design thickness after compaction. The minimum base thickness shall be equal to the design thickness minus **0.03 ft**. The surface shall be graded to a finished tolerance of plus or minus 1/4 inch in 10 feet. Measure using stringline from curb to curb, gutter, flat drainage structure, or grade break.
- B. Aggregate or Onsite Recycled Base
 - 1. Grade to specified tolerances.
 - 2. Compact as follows:
 - a. Under sitework concrete, concrete swales, concrete pads or concrete pavement - compact to 90 percent relative compaction at optimum moisture +/- 2 percent.
 - b. Under HMA pavements, compact to 95 percent relative compaction at optimum moisture +/- 2 percent.
 - 3. Remove and replace segregated areas.
 - 4. Remove or repair improperly prepared areas as directed by Engineer.
- C. 1.. Overlay Transitions -
 - a. Prepared per Section 32 01 26.72 "Cold Planing".
 - b. Place base course paving in full-depth transitions prior to overlay.

END OF SECTION

SECTION 32 12 16

HMA PAVING

PART 3 GENERAL

3.1 SUMMARY

- A. Includes But Not Limited To:
 - 1. Furnish and install Hot Mix Asphalt for areas as described in Contract Plans and Documents.

3.2 REFERENCES

- A. Caltrans Standard Specifications, Section 39, 2010 (Unrevised)

3.3 SUBMITTALS

- A. **HMA Submittals are due at Pre Construction Meeting**
- B. Product Data - Manufacturer's published product data on soil sterilant.
- C. Quality Assurance / Control
 - 1. Mix design of hot-mix asphalt mixture.
 - 2. Copies of test results from tests conducted to assure compliance to Contract Document requirements.
 - 3. Current verified **CEM 3513 including TSR value**

3.4 PROJECT CONDITIONS

- A. Project Environmental Requirements
 - 1. Do not perform work during following conditions:
 - a. Ambient, base, or pavement temperature below 50 degrees F.
 - b. Over-saturated base and sub-base materials.
 - 1) Base and sub-base to be wheel-rolled by loaded water truck to determine if any yielding occurs under the loading. If deflection is observed, do not perform paving until grade is stable and unyielding.

PART 4 PRODUCTS

4.1 MATERIALS

- A. Pavement
 - 1. Asphalt Binder - PG 64-10
 - 2. Aggregates

- a. 3/4" Type A used for HMA base courses of 2-1/2 inches or thicker.
- b. 1/2" Type A used for base courses less than 2-1/2 inches, but greater than or equal to 1-3/4 inches and surface course in vehicle traffic areas.
- c. 3/8" Type A used for leveling courses and surface courses in playgrounds and other pedestrian areas.

B. Tack Coat

- 1. Tack coat shall be utilized and will be emulsified asphalt Grade RS-1, RS-1h, SS-1, or SS-1h and shall conform to Section 94, 'Asphaltic Emulsions', of the Standard Specifications.

4.2 MIXES

A. Current verified and **PEI approved CEM 3513**

- 1. Mix voids targeted at 3.5%.
- 2. TSR to be minimum 70 in accordance with CTM 371.

PART 5 EXECUTION

5.1 PREPARATION

A. HMA Paving

- 1. **Use self-propelled laydown machine for all surface courses. Laydown machine for finish course shall be equipped with automated depth and grade control.** Base courses for digouts or stabilization areas may be placed by other mechanical means that will not destabilize subgrade.
- 2. Heat joints if laid more than 3 hours previously.
- 3. Compaction

a. Modify 39-2.03A Testing as follows:

"Quality Characteristic: Percent of maximum theoretical density (%) for HMA Type A to 92% to 96%. Retain footnotes e & f. Add the footnotes k through m to this requirement:

k. Perform testing in accordance with CT 375 for acceptance, except CT 309 shall replace TMD testing.

l. Maximum lot size shall be 500 tons

- 1) Minimum 3 test sites per location, 1 test for each 50 tons thereafter.
- 2) Each street segment or pavement area shall be an independent lot(s).
- 3) Compaction will be the average compaction for the street or pavement area.

m. **Failing tests shall be verified by coring.** If requested by the Contractor. Contractor obtains cores at locations randomly determined by Engineer. Engineer tests cores.

1) If requested by the Contractor and approved by the Engineer, non-nuclear gauges may be substituted for use in CT 375.

- b. If cores are passing, Engineer pays cost of core sampling and core testing. If cores are failing, Contractor pays for testing and core sampling. If the core density testing produces both passing and failing cores, the cost will be prorated

between the Owner and Contractor.

- c. The table for deductions indicated in the referenced Caltrans Section 39 shall apply to individual cores. The following table shall apply to deductions for average compaction of a lot:

Reduced Payment Factors for Percent of Maximum Theoretical Density			
HMA Type A Percent of Maximum Theoretical Density	Reduced Payment Factor	HMA Type A Percent of Maximum Theoretical Density	Reduced Payment Factor
92.0	0.0000	96.0	0.0000
91.9	0.0125	96.1	0.0125
91.8	0.0250	96.2	0.0250
91.7	0.0375	96.3	0.0375
91.6	0.0500	96.4	0.0500
91.5	0.0625	96.5	0.0625
91.4	0.0750	96.6	0.0750
91.3	0.0875	96.7	0.0875
91.2	0.1000	96.8	0.1000
91.1	0.1125	96.9	0.1125
91.0	0.1250	97.0	0.1250
90.9	0.1375	97.1	0.1375
90.8	0.1500	97.2	0.1500
90.7	0.1625	97.3	0.1625
90.6	0.1750	97.4	0.1750
90.5	0.1875	97.5	0.1875
90.4	0.2000	97.6	0.2000
90.3	0.2125	97.7	0.2125
90.2	0.2250	97.8	0.2250
90.1	0.2375	97.9	0.2375
90.0	0.2500	98.0	0.2500
< 90.0	Remove and Replace	> 98.0	Remove and Replace

- d. Field compaction testing performed in accordance with CTM 375 with a minimum of five tests per lot and one test per 50 tons.
- e. Roll with powered equipment capable of obtaining specified density and smoothness.
- f. **Execute initial compaction rolling prior to mix cooling below 250 degrees.** Complete finish rolling so visibility of joints is minimized as soon as possible after intermediate rolling and while asphalt paving is above 120 deg F surface temperature.
- g. **HMA that arrives at the job site at 260 degrees or below shall be rejected.**

Finish

- a. Surface shall be uniform with no 'birdbaths'. Leave finished surfaces clean and smooth. Variations from specified grades shall not exceed 1/2 inch. When tested with 10 foot straight edge, surface of complete work shall not contain irregularities in excess of 1/4 inch.
- b. Completed surface shall match the texture of the machine laid mat. Areas worked by raking shall have coarse aggregate removed rather than pushed back onto the mat. Any areas of coarse or segregated surface shall be remedied immediately and prior to finish rolling. **Failure to comply with this provision shall cause all paving to stop until mat surface corrections are performed.**

4. Thickness Tolerances

- a. Total HMA thickness less than or equal to 4 inches.
 - 1) **Minimum thickness shall be equal to or greater than design thickness**
- b. Total HMA thickness greater than 4 inches.
 - 1) **Minimum thickness shall be equal to or greater than design thickness**

PART 6 PAYMENT

Payment for HMA paving shall be included in the various items of work in the Bid Schedule, including but not limited to digouts, overlays, pavement removal and replacement, base course paving in full-depth transitions, and other items of work, and no separate payment will be made.

END OF SECTION

SECTION 32 12 40
ACRYLIC SURFACING SEALER

PART 1 GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To
 - 1. Furnish and install acrylic surfacing sealer on existing asphaltic concrete paving as described in Contract Documents.
- B. Related Sections
 - 1. Section 32 01 17.61 – Asphalt Joint and Crack Filling
 - 2. Section 32 12 16.05 – HMA Pavement Repair

1.2 REFERENCES

- A. United States Tennis Association

1.3 PROJECT CONDITIONS

- A. Project Environmental Requirements
 - 1. Apply sealer at ambient temperatures between 60 and 100 deg F.
 - 2. Do not apply sealer over wet pavement or when precipitation is imminent.

1.4 SEQUENCING

- A. Do not commence work of this Section until completion of pavement repair and crack filling as specified in Section 32 12 16.05 HMA Pavement Repair and 32 01 17.61 Asphalt Joint and Crack Filling.
- B. Do not place sealer until all other sitework concrete, paving, miscellaneous work and cleaning (with the exception of paint markings) are complete.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Asphalt Refinement Course Material
 - 1. APOC Filler Coat by Asphalt Products Oil Corp.
 - 2. Surfex TT650 by Cosmicoat, Inc.
 - 3. Over Kote by Reed & Graham
- B. Surface Sealer with Color and Filler
 - 1. Laykold Colercoat Series 200 by Chevron USA, Inc.
 - 2. 920-27 Deco-Color "MP" (multi-purpose) by Koch
- C. Surface Sealer with Color
 - 1. Laykold Colorcoat Series 100 by Chevron USA, Inc.
 - 2. 920-27 Deco-Color "MP" (multi-purpose) by Koch
- D. Line Paint
 - 1. Laykold White Line Paint
 - 2. 920-03 Deco-Color White Line Paint

- E. Water
 - 1. The water for all mixes shall be fresh and potable
- F. Plaster Sand
 - 1. Clean sand free of silt, clay, salts, and organic matter, and meeting following grading requirements -

<u>Sieve</u>	<u>Percent of Weight Passing</u>
No. 4	100
No. 8	95-100
No. 16	70-100
No. 30	40-75
No. 50	10-35
No. 100	2-15

- 2. The following mix shall be used for the refinement course:

2 gallons Plaster Sand
 2 gallons Asphalt Refinement Course Material
 Water to make a workable mix

PART 3 EXECUTION

3.1 PREPARATION

- A. Protection - Protect sign posts; street lamp posts; trees; shrubs; tops of curbs and gutters, sidewalks, buildings, enclosures, and other site improvements from being discolored by splashing material.
- B. Surface Preparation
 - 1. Grind or sand blast off existing painted lines that will not be replaced in their identical location after sealing.
 - 2. Remove spillage of any material which has adhered to pavement without damaging the pavement.
 - 3. Remove debris, sand, dirt, and dust from pavement using power brush, power vacuum sweeper, and blower as necessary.
 - 4. Remove all mud or left over sawcut residue by power washing. Allow a minimum of 8 hours of drying time prior to sealing.

3.2 APPLICATION

- A. Do not apply sealer until completion of pavement repair and crack filling as specified in Sections 32 12 16.05 HMA Pavement Repair and 32 01 17.61 Asphalt Joint and Crack Filling.
- B. Prior to the application of any materials, the entire area shall be water flooded and all depressions holding over 1/8 inch depth of water after drainage occurs and stops shall be filled with a refinement course mix and allowed to cure.
- C. Two squeegee coats of Refinement Course mix shall be applied by pouring from a can or wheeled container to continuous parallel lines and spreading immediately with rubber-faced squeegees.

- D. The squeegees shall be pulled on an angle from the lines of spread so as to continually roll the material toward the operator and not overflow or “spill” on its forward edge away from the operator.
- E. After each coat has dried, all ridges shall be removed with scrapers and then surface rolled.
- F. The minimum application shall be at the rate of not less than 20 gallons of undiluted refinement course material per 1000 square feet.

3.3 PROTECTION

- A. Keep traffic off freshly applied sealer for 24 hours minimum.
- B. Remove any misapplied sealer from sitework concrete, etc. Stained painted areas shall be repainted at the Contractor’s expense.

END OF SECTION

SECTION 32 17 23

PAVEMENT MARKING

PART 1 GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To
 - 1. Furnish material and apply pavement and curb markings as described in Contract Documents.
 - 2. Remove existing pavement markings in sealcoat areas which will conflict with new striping layout.
- B. Related Sections
 - 1. Section 32 00 01 - General Exterior Site Construction Requirements

1.2 QUALITY ASSURANCE

- A. Regulatory Requirements - Paint accessible parking spaces to conform to ADA Standards and local code requirements.
- B. **Notify Owners Representative 48 hours in advance of paint application to allow for review of layout.**

1.3 SUBMITTALS

- A. Manufacturers Product Datasheet

1.4 PROJECT CONDITIONS

- A. Project Environmental Requirements
 - 1. Apply only on dry surfaces, during favorable weather, and when damage by rain, fog, or condensation not anticipated.
 - 2. Latex Paint -
 - a. Atmospheric temperature above 50 degrees F.
 - b. When temperature is not anticipated to drop below 50 degrees F during drying period.
 - 3. Alkyd Paint -
 - a. Atmospheric temperature above 40 degrees F.
 - b. When temperature is not anticipated to drop below 40 degrees F during drying period.

PART 2 PRODUCTS

2.1 MATERIAL

- A. Paint
 - 1. Non-reflectorized.
 - 2. Types - Either Acrylic or Latex
 - 3. Colors -
 - a. Yellow - Parking stripes, crosswalk stripes, and safety markings.
 - b. Blue And White - Accessible Parking space markings.
 - c. Red - Fire lanes and no parking zones.
 - 4. Acceptable Products And Manufacturers -
 - a. 442XX Traffic Marking Paint by Devoe, Louisville, KY (800) 654-2616 Set-Fast Traffic Marking Paint by Sherwin-Williams, Cleveland, OH (800) 321-8194.
 - b. Equal as approved by Owner's Agent before installation.

PART 3 EXECUTION

3.1 PREPARATION

- A. Do not apply paint until hot-mix asphalt has cooled below 120 degrees F for at least one hour.
- B. Surfaces shall be dry and free of grease and loose dirt particles. Scrape and wire brush chipped or damaged paint on existing curbs. Power wash curbs after paving but prior to painting with 3500 psi minimum pressure.
- C. Perform layout with chalk or lumber crayon only. No blackout paint allowed.

3.2 APPLICATION

- A. Site Tolerances
 - 1. General - Make parking lot lines parallel, evenly spaced, and with sharply defined edges.
 - a. Line Widths - Parking Spaces 4 inch. Playground markings shall match existing layout and width prior to sealcoat or current plan if on new pavement.
 - b. Plus or minus 1/4 inch variance on straight segments.
 - c. Plus or minus 1/2 inch variance on curved alignments.
- B. Provide complete coverage in **one** application at 75 sq ft per gallon, or **two** coat application, each coat with maximum coverage of 150 sq ft per gal. Do not apply second coat within three hours minimum or until first coat is thoroughly dried, whichever is longer.
- C. The underlying surface shall not be visible through newly applied paint.
- D. **Failure to produce satisfactory paint markings may require contractor to provide a pavement coating to entire surface prior to the repainting of pavement markings.**

3.3 CLEANING

- A. Remove drips, overspray, improper markings, and paint material tracked by traffic by sand blasting, wire brushing, or other method approved by Owner's Agent prior to acceptance.

PART 4 PAYMENT

- A. Parking lot striping shall be paid for on a lump sum basis for "Pavement Markings" as listed in the bid schedule and shall be considered full compensation for all labor, equipment, and materials required to perform the work as described herein.
- B. All work associated with cleaning and painting curbs, including placement of legends on curb faces, shall be included in the lump sum price for "Pavement Markings" unless otherwise listed in the bid schedule.

END OF SECTION

SECTION 32 93 23

LAWN SODDING

PART 1 GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To
 - 1. Furnish and install sodded lawn as described in Contract Documents.
- B. Related Sections
 - 1. Section 32 93 00 - General Planting Requirements

1.2 DELIVERY, STORAGE, AND HANDLING

- A. Harvest, deliver, store, and handle sod in accordance with requirements of 'American Sod Producers Association (ASPA) Specifications for Turfgrass Sod Materials and Transplanting / Installing'.
- B. Cut and lift sod by method acceptable to Architect. Cut sod in pieces, approximately 3/4 to one inch thick. Roll or fold sod so it may be lifted and handled without breaking or tearing and without loss of soil.
- C. Schedule deliveries to coincide with topsoil operations and laying. Keep storage at job site to minimum without causing delays.
 - 1. Deliver, unload, and store sod on pallets within 24 hours of being lifted.
 - 2. Do not deliver small, irregular, or broken pieces of sod.
- D. During wet weather allow sod to dry sufficiently to prevent tearing during lifting and handling. During dry weather, protect sod from drying before installation. Water as necessary to insure vitality and to prevent excess loss of soil in handling. Sod which dries out before installation will be rejected.

1.3 SEQUENCING

- A. Do not commence work of this Section until work of Sections 32 84 23 and 32 91 13 has been completed and approved.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Certified Sod
 - 1. Superior sod grown from certified, high quality, seed of known origin or from plantings of certified grass seedlings or stolons.
 - a. Assure satisfactory genetic identity and purity.
 - b. Assure overall high quality and freedom from noxious weeds or an excessive amount of other crop and weedy plants at time of harvest.
 - 2. Sod shall be composed of two varieties minimum of Kentucky Bluegrass.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Site Tolerances - Final grade of soil after sodding of lawn areas shall be one inch below top of adjacent pavement of any kind.
- B. Laying of Sod
 - 1. Lay sod during growing season. Sodding during dry summer period, at freezing temperatures, or over frozen soil is not acceptable.
 - 2. Lay sod within 36 hours of being lifted.
 - 3. Lay sod in rows with joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with a sharp knife.
 - 4. Lay sod flush with adjoining existing sodded surfaces.
- C. After Sodding is Complete
 - 1. Roll horizontal surface areas in two directions perpendicular to each other.
 - 2. Repair and re-roll areas with depressions, lumps, or other irregularities. Heavy rolling to correct irregularities in grade will not be permitted.
 - 3. Water sodded areas immediately after laying sod to obtain moisture penetration through sod into top 4 inches of topsoil.

3.2 FIELD QUALITY CONTROL

- A. Inspection
 - 1. Sodded areas will be accepted at final inspection if –
 - a. Sodded areas are properly established.
 - b. Sod is free of bare and dead spots and without weeds.
 - c. No surface soil is visible when grass has been cut to height of 2 inches.
 - d. Sodded areas have been mowed at least twice.
 - 2. Areas sodded after November 1st will be accepted the following Spring (May 1st) approximately one month after start of growing season if specified conditions have been met.

END OF SECTION