DOCUMENT 00 91 01 –

ADDENDUM NO. 1

1. GENERAL

This document includes requirements that clarify or supersede portions of the bid and/or contract requirements for the project. This Addendum is a Contract Document.

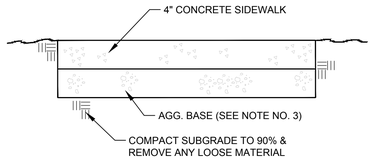
2. SUMMARY

The following changes, additions and deletions shall be made to the following document(s); all other conditions shall remain the same.

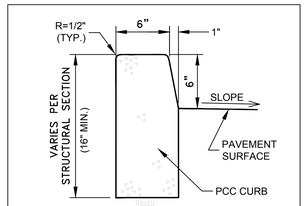
1. Replace Sheet C6 of the plan set with attached Sheet C6 Addendum No. 1.
2. Replace Technical Specifications in the Bid Documents with attached Technical Specifications Addendum No. 1
3. CONTRACTOR SHALL RELOCATE OFF-HAUL NATIVE MATERIAL TO ON-SITE LOCATIONS ON CAPITOL AVENUE AS DIRECTED BY THE DISTRICT REPRESENTATIVE. MATERIAL SHALL BE FREE OF ANY TREES, STUMPS AND DEBRIS AND SHALL BE UNIFORMLY SPREAD THROUGHOUT THE DESIGNATED AREAS. NATIVE MATERIAL SHALL BE GRADED IN SUCH A MANNER TO TAPPER TO THE EXISTING GRADE ELEVATION A MINIMUM OF 5 FEET FROM THE BASE OF ALL TREES. NO EXCESSIVE MOUNDING WILL BE ALLOWED. EXCESS OFF-HAUL MATERIAL WILL NEED TO BE LEGALLY DISPOSED OF AT THE CONTRACTOR EXPENSE. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL TESTING THAT MAY BE REQUIRED TO LEGALLY DISPOSE OF EXCESS MATERIAL.

END OF DOCUMENT

NOTES
1. CONTROL JOINTS @ 10' O.C. MAX.
2. MATCH EXISTING COLOR/FINISH (AS CLOSELY AS POSSIBLE).
3. PLACE 4" AGG. BASE UNDER NEW SIDEWALK; RECOMPACT EX. AGG. BASE UNDER SIDEWALKS TO BE REMOVED/REPLACED.

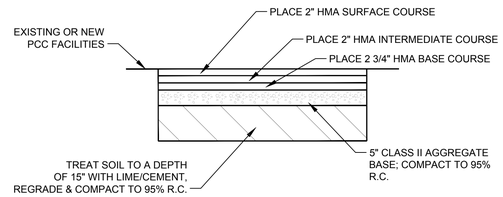


PCC SIDEWALK DETAIL
NTS

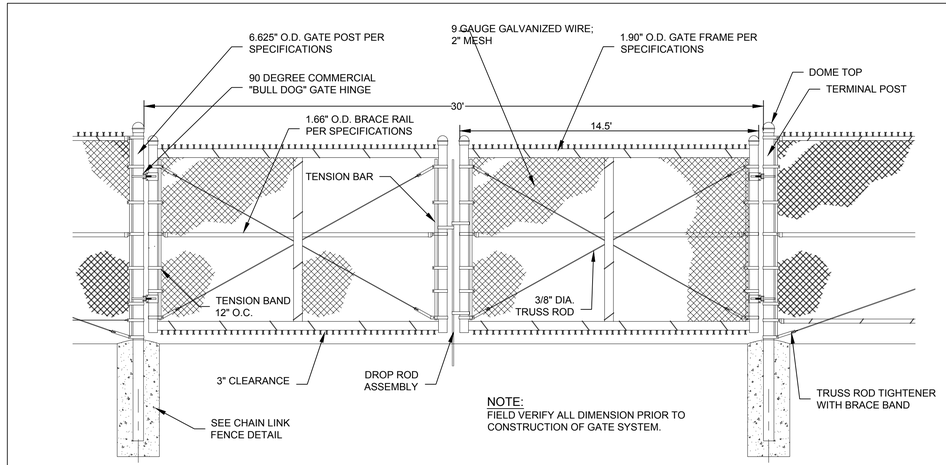


NOTE
CONTROL JOINTS @ 10' O.C. MAXIMUM
SEE SPECIFICATIONS FOR REQUIREMENTS

PCC CURB DETAIL
NTS

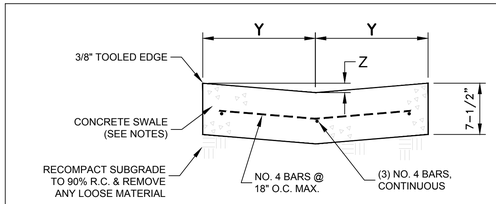


TREAT SOIL TO A DEPTH OF 15" WITH LIME/CEMENT; PLACE 5" AGGREGATE BASE & 6 3/4" NEW HMA
NTS



NOTE:
FIELD VERIFY ALL DIMENSION PRIOR TO CONSTRUCTION OF GATE SYSTEM.

CHAIN LINK GATE DETAIL
NTS

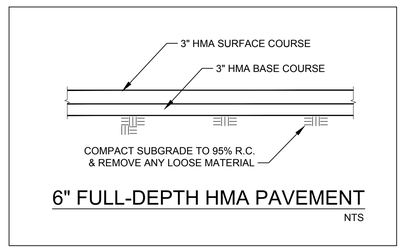


DIMENSION CHART

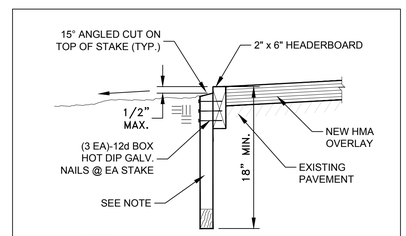
SWALE TYPE	HALF WIDTH (Y)	DEPTH (Z)
S24	12"	1"
S36	18"	1-1/2"
S48	24"	2"

NOTES:
1. DEPTH OF SWALE VARIES. WHERE SWALE INTERSECTS W/ADA PATH OF TRAVEL, ADJUST FLOWLINE DEPTH SUCH THAT SLOPE ON SIDES OF SWALE DO NOT EXCEED 5%.
2. INSTALL CONTRACTION JOINTS @ 10' O.C. MAX.
3. SWALE SURFACE SHALL BE BROOM-FINISHED.

PCC SWALE W/REINFORCEMENT
NTS

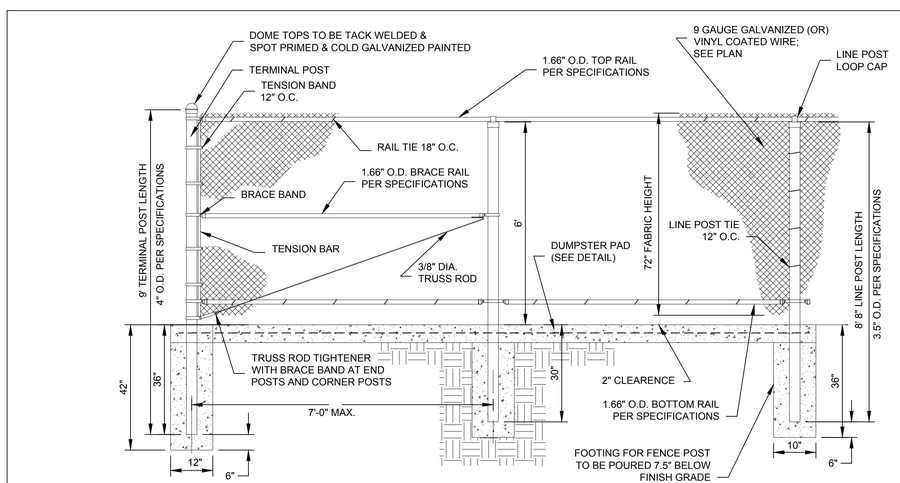


6" FULL-DEPTH HMA PAVEMENT
NTS



NOTE
2" x 4" x 18" MIN. STAKES @ 32" O.C. &
2" x 6" x 18" MIN. STAKES @ HEADERBOARD JOINTS

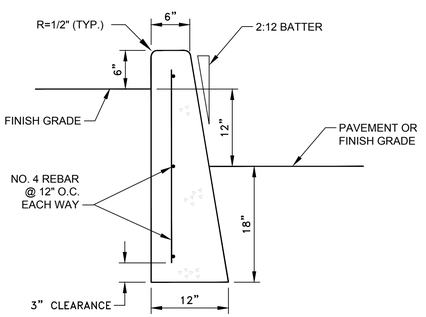
2x6 HEADERBOARD DETAIL
NTS



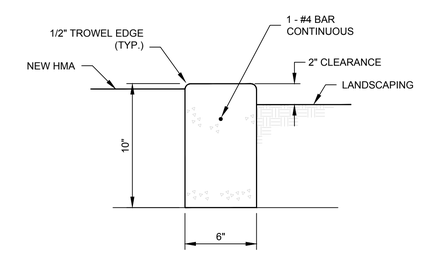
POST LENGTH CALCULATIONS FOR STANDARD DESIGN/NORMAL CONDITIONS:
LINE POSTS = FABRIC HEIGHT + 2'-6"
TERMINAL POSTS = FABRIC HEIGHT + 3'-0"

NOTE:
FIELD VERIFY ALL DIMENSION PRIOR TO CONSTRUCTION OF FENCE.

CHAIN LINK FENCE DETAIL
NTS



PCC RETAINING CURB DETAIL
NTS



PCC FLUSH CURB DETAIL
NTS

ADDENDUM NO. 1

PROJECT ENGINEER: WILLIAM J. LONG
LICENSE: CA 047552 EXP.: 12-31-17
PLAN STATUS: FINAL PLANS FOR CONSTRUCTION

Pavement Engineering Inc.
Civil Engineers • Materials Testing
Specializing in Pavement Rehabilitation
Petaluma Office (707) 769-5330
Redding Office (530) 224-4535
San Luis Obispo Office (805) 781-2265

EAST SIDE UNION HIGH SCHOOL DISTRICT
830 NORTH CAPITOL AVENUE SAN JOSE, CA

SCALE: NTS	APPROVED BY:	DRAWN BY: BTR
DATE: JAN. 2017		REVISED:

2017 TRANSPORTATION YARD RELOCATION PROJECT
DETAIL PLAN

EAST SIDE UNION HIGH SCHOOL DISTRICT | DRAWING NUMBER 150227-01 C6

EAST SIDE UNION HIGH SCHOOL DISTRICT

TRANSPORTATION YARD RELOCATION PROJECT
SAN JOSE, CALIFORNIA

ADDENDUM NO. 1
TECHNICAL SPECIFICATIONS

Table of Contents

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../02051.wpd
   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 us**e** 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..../01300.wpd
   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

SITEWORK 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 QUALTIY 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 22 14 00

STORM DRAINAGE

PART 1 GENERAL

1.1 SUMMARY

A. Includes But Not Limited To
   1. Perform excavating and backfilling required for work of this Section.
   2. Furnish and install storm drainage system as described in Contract Documents.
   3. Connecting to existing facilities
   4. Clean out existing pipes and structures, including through curb drains.

B. Related Sections
   1. Section 32 00 01 - General Exterior Site Construction Requirements

1.2 REFERENCES

A. American Association Of State Highway And Transportation Officials
   1. AASHTO M-252, 4 to 10 inch pipe, 'Specifications for Corrugated Polyethylene Pipe'
   2. AASHTO M-294, 12 to 36 inch pipe, 'Specifications for Corrugated Polyethylene Pipe'

B. American Society For Testing And Materials (most recent revisions)
   1. ASTM A 74, 'Standard Specification for Cast Iron Soil Pipe and Fittings'
   2. ASTM A 929, 'Standard Specification for Steel Sheet, Metallic-Coated by the Hot-Dip Process for Corrugated Steel Pipe.
   3. ASTM C 14, 'Standard Specification for Concrete Sewer, Storm Drain, and Culvert Pipe'
   4. ASTM C 76, 'Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe'
   5. ASTM C 564, 'Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings'
   6. ASTM D 2321, 'Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications'
   7. ASTM D 3034, 'Standard Specification for Type PSM Poly (Vinyl Chloride)(PVC) Sewer Pipe and Fittings'

PART 2 PRODUCTS

2.1 MATERIAL

A. Bedding Material - Clean fill sand

B. Backfill
   1. CLSM
   2. Slurry Cement Backfill per Section 19-3.062, Caltrans Standard Specifications.
   3. 3/4" Class 2 Aggregate Base per Section 26, Caltrans Standard Specifications.

2.2 COMPONENTS

A. Catch Basins & Area Drains - Paving and Landscape Areas
   1. Precast Structures as shown on Drawings.
   2. Include cover inlet with cast iron frame and grate as shown on Drawings.

3. Cast-in-place Bases
    a. 4000 psi concrete
    b. 6 inch minimum thickness
    c. Extend base 6 inches beyond wall of structure.
4. Frame and Grate as shown on Drawings
    a. Traffic Areas shall be heavy duty and traffic rated.
    b. Frames in concrete aprons or swales shall be cast into concrete with paving notch type frame.
    c. All grates shall have bicycle bars and be bolted to frames.
5. 5. Approved Manufacturers
    a. Associated Concrete Products (925) 426-1100
    b. Christy Concrete Products (800) 287-4788
    c. Central Precast Products (800) 500-5016
    d. Approved Equal by Owner

B. Area Drains - Sidewalk and Other Concrete Pedestrian Areas
1. Cast Iron Drain Inlets with Bronze Grates and elastomeric seals.
2. Approved Manufactures
    a. Zurn Industries (877) 875-1404.
    b. Approved Equal by Owner.

C. Concrete Pipe
1. Non-Reinforced - Meet requirements of ASTM C 14.
2. Reinforced -
    a. a. Meet requirements of ASTM C 76, plain end.
    b. b. Determine class of pipe by depth of cover over pipe at rough-graded elevations as follows -

Depth Of Cover	Class Of Pipe
Under 2 feet	V
2 feet to 3 feet	IV
3 feet to 6 feet	III
Over 6 feet	II

D. PVC Pipe and Fittings
1. Meet requirements of ASTM D 3034, SDR 35
2. Fittings - Slip Joint type with elastomeric seals.

E. Corrugated Polyethylene Pipe and Fittings
1. Meet requirements of AASHTO M-252 or M-294, Type S.
    a. Corrugated, helical or annular exterior with smooth interior and gasketed connectors.
    b. Hancor Hi-Q, ADS N-12, or equal approved by Owner

F. Cast Iron Soil Pipe and Fittings
1. Meet requirements of ASTM A 74.
2. Joint Material -
    a. Rubber gaskets meeting requirements of ASTM C 564 and compatible with pipe used.

G. Fittings - All Pipe Types where applicable
1. Use only Wyes. Tees not allowed
2. Use 1/8 bends or less or combination thereof for direction changes. Do not use 90 degree ells. Long sweep cast iron fittings allowed.

H. Cleanouts
1. Christy Concrete Products (800) 287-4788

2. Approved Equal by Owner.

I. Cleanouts in Sidewalk or Other Pedestrian Areas
1. Zurn Industries (877) 875-1404.
2. Approved Equal by Owner.

J. Manholes
1. Precast Manholes with concrete risers as necessary.
   a. 48 inch eccentric manholes with either cone or flat top transition to 24 inch round riser rings.
   b. Steps required.
   c. Approved Manufacturers
      1) Associated Concrete Products (925) 426-1100
      2) Central Cast Products (800) 500-5016
      3) Approved Equal by Owner.
   d. Cast-in-place Bases
      1) 4000 psi concrete
      2) Use forming ring to create match for precast barrel sections.
      3) 6 inch minimum thickness.
      4) Extend base 6 inches beyond outside of precast barrel.
2. Frames and Covers
   a. South Bay Foundry SBF 1900-Reg
   b. D&L Foundry A-1024
   c. Stamped “Storm Drain” on Cover.
   d. Approved Equal by Owner.

PART 3 EXECUTION

3.1 PREPARATION

A. Storage
1. Store pipe and fittings where protected from damage. Store pipe on flat surface to prevent bending of pipe.
2. Protect elastomeric seals from sunlight damage.
3. Do not drop, throw or drag pipe, fittings or structures.
4. Damage pipe, fittings or structures shall be replaced.
5. Do not block emergency access or facilities

3.2 INSTALLATION

A. Pipe Installation
1. Excavate trench a minimum of 6 inches wider than the outside diameter of the pipe.
2. Runs shall be as close as possible to those shown on Drawings.
3. Excavate to required depth and grade from downstream end up slope.
4. Provide shoring as required by
   a. Cal OSHA
   b. CalTrans Specifications, Sections 5-1.02A and 7.1.01E
   c. Local agency requirements
5. Remove debris from trench prior to laying of bedding and pipe.
6. Backfill over excavated trench bottoms in excess of 2 inches with native soils compacted to 90 percent relative compaction.
7. Do not cut trenches near footings without consulting Owner.
8. Lay pipes with bells on the upstream end of pipe. Excavate bell hole as required. Make joints in accordance with manufacturer’s recommendations.
9. Secure pipe from floating during backfill and maintain 2 inches minimum clearance

from trench wall to pipe.

10. Pipes shall be within **0.03** foot of design grades when backfilled and shall be free of dips or humps.
11. Backfill only after pipe lines have been tested, inspected, and approved by Owner.
12. Backfill with either CLSM or Cement Slurry as soon as practical after placement of pipe.
    a. In landscape areas, place backfill to within 12 inches of surface. Backfill remaining trench with topsoil compacted to 85 percent relative compaction.
    b. Under concrete, extend backfill to top of native material.
    c. In existing pavement areas, extend backfill to top of aggregate base.
    d. In new pavement areas, extend backfill to top of native soils.
13. Special Pipe Installation Requirements
    a. Concrete Pipe
        1) Provide 3 inches of compacted sand bedding material below pipe.
        2) After installation of pipe, provide additional sand bedding material up to springline of pipe.
    b. PVC / Polyethylene Pipe
        1) Install in accordance with ASTM D 2321.
        2) Minimum cover for corrugated polyethylene pipe and fittings shall be 12 inches for H-20 load.

B. Structure Installation
1. Excavate hole a minimum of 12 inches wider than outside of structure.
2. Structures shall be set to within +/- **0.03** feet of design grade.
3. For structures with precast bottoms, level bottom of excavation. Sand or aggregate base may be used. If greater than 1-1/2 inches thick, must be moisture conditioned and compacted with vibraplate.
4. Grout structure to cast-in-place base. Structures set on wet concrete do not need to be grouted.
5. Provide sediment basin of 1 to 2 inches depth in bottom of structure below invert of outfall pipe. Fill with concrete and finish smooth if necessary.
6. Creating holes in existing structures shall be performed by coring where possible. If coring is not possible, the hole shall be created by using a rotohammer to make 1/2" to 1" inch holes approximately 2 inches apart at the outer circumference of the hole. After the holes have been rotohammered completely through the existing structure, the inside of the hole can be chipped out. Do not use jackhammer to create hole without predrilling as specified above first. Hole shall be 1 to 3 inches larger than outside diameter of pipe. Damaged structures shall be repaired as directed by the Owner.
7. CLSM or Cement Slurry backfill material may be used to fill the annular space around the pipe to within 2 inches of the inside of the structure. The last two inches of annular space shall be filled with a commercial non-shrink grout and finished smooth with the interior of the structure.
8. Pipes shall be trimmed to be flush (+/- 2 inch) with the inside of the structure.
9. Backfill structure with CLSM or Cement Slurry.
    a. In landscape areas, place backfill to within 12 inches of surface. Backfill remaining trench with topsoil compacted to 85 percent relative compaction.
    b. Under concrete, extend backfill to top of native material.
    c. In existing pavement areas, extend backfill to top of aggregate base.
    d. In new pavement areas, extend backfill to top of native soils.
    e.

3.3 FIELD QUALITY CONTROL

A. Failure to install joints properly shall be cause for rejection and replacement of piping system.

B. Notify Owner 24 hours in advance of backfilling system for inspection.

C. Remove covers and grates for interim and final inspections.

3.4 CLEANING

A. Clean storm drain system immediately prior to acceptance of project.

B. Clean all structures, new and existing, and pipe from all debris and/or sediment.

C. Remove asphalt, concrete or any other foreign substances from frame and covers or grates.

D. Clean through curb drain pipes up to a distance of 20 feet from curb face.

PART 4 PAYMENT

A. Payment for work associated with storm drain improvements shall be made on a lump sum basis. Said payments shall be considered full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for all related efforts to complete the work in place.

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:

Screen Size	Percentage passing
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.

END OF SECTION

SECTION 31 32 13.19

LIME SOIL STABILIZATION

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 subgrade as described in Contract Documents.
   3. Stabilize and compact 2 feet of soil under building and transition areas as described in Contract Documents.
   4. Stabilize and compact 12-inch layer of subgrade under remainder of site 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. Cal Test 216 “Method of Test for Relative Compaction of Untreated and Treated Soils and Aggregates.”

B. California Department of Transportation, Standard Specifications
   1. Section 24, Lime Stabilization

1.3 SUBMITTALS

A. Product Data: Hi Calcium Quicklime by Chemical Lime Company, 4303 South McKinley Ave., Stockton, CA 95206 (800) 284-6048.
   1. Quicklime - Submit Certificate of Compliance.

B. Samples
   1. Quicklime - Submit 10 lb. sample in sealed and labeled container.

1.4 SEQUENCING

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

B. Pavement Areas
   1. After rough grading is completed, perform lime soil stabilization in the designated building area to the specified depth.
   2. Lime soil stabilization shall be performed after completing all site utility work, including storm drainage; water and fire lines; irrigation piping and wiring; site lighting conduit; communication wiring; electrical services and site branch services; and all other underground facilities to be installed, tested, and backfilled.
   3. Lime soil stabilization shall be performed prior to the construction of the site work concrete where these facilities are constructed on the lime-stabilized subgrade.

PART 2 PRODUCTS

2.1 MATERIALS

A. On-site materials to be stabilized and Quicklime shall conform to Section 24-1.02 of the latest edition of Caltrans Standard Specifications.

B. Lime Content: 4.0 ± 0.5 percent by dry weight.

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 24-1.03 through 24-1.06 of the latest edition of Caltrans Standard Specifications, except as noted.
   2. Maximum treatment and lift thickness shall be 12 inches.
   3. Spread rate shall be confirmed on each lift for each row of lime application until uniformity is confirmed to the Soils Engineer's satisfaction. Thereafter periodically, as needed to confirm uniformity.

C. Compaction
   1. Compact in 12-inch maximum lifts to 95 percent relative compaction at or above optimum moisture as determined by Cal Test 216.
   2. The maximum compacted thickness of a single layer may be increased provided the Contractor can demonstrate to the Soils Engineer that the equipment and method of operation will provide uniform distribution of the lime and the required compaction density throughout the layer.

D. Tolerances
   1. At a minimum, the completed lime-treated section, after compaction and trimming, shall be equal to the design thickness. The maximum completed lime-treated section thickness shall not exceed the design thickness plus 1 inch.
   2. Thickness/Uniformity Verification - Immediately after trimming and compaction are completed, excavate test pits. At locations selected by Soils Engineer, excavate a test pit for each 3,000 square feet of treated area. Test pits shall be 1 ft. by 1 ft. minimum, through lime-treated section. Backfill with lime treated material and compact immediately after verification of thickness and uniformity by District.

E. Curing
   1. If not covered by asphalt concrete or aggregate base within 48 hours, the exposed lime stabilized soil subgrade shall be covered with the appropriate emulsion seal as described in the referenced Caltrans Standard Specification sections within 24 hours of completing lime stabilization.

3.3 PROTECTION

A. Maintain subgrade in a smooth, compacted condition until placement of aggregate. Repair any damage to the lime-stabilized subgrade by immediately replacing with similar lime-treated material within 24 hours after damage.

B. Permit only rubber-tired vehicles or paving equipment on surface after compaction.

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 Resistence "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 Footof 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.

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

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 lump sum basis, 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 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) 654-2616Set-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 17 39.19

PARKING BUMPERS

PART 1 GENERAL

1.1 SUMMARY

A. Includes But Not Limited To
   1. Furnish and install parking bumpers as described in Contract Documents.

B. Related Sections
   1. Section 32 00 01 - General Exterior Site Construction Requirements

PART 2 PRODUCTS

2.1 PARKING BUMPERS

A. Size
   1. Accessible Parking Stalls - 4 foot minimum.
   2. All other stalls - 3 foot minimum.

B. Construction
   1. Cast in two reinforcing bars, No. 3 minimum, full length of bumper less end coverage requirements.
   2. 3000 psi concrete.

C. Pins -
   1. Material
      a. 1/2 inch galvanized steel pipe.
      b. 3/4 or 5/8 inch reinforcing bar.
      c. 3/4 inch concrete stake.
   2. Length
      a. In HMA - 24 inches
      b. In Concrete - 12 inches

D. Epoxy - 2 part epoxy compatible with manufacturers recommendations.

PART 3 EXECUTION

3.1 INSTALLATION

A. Alignment
   1. Install level with paving and aligned with sidewalks.
   2. Place bumpers as close to curb and/or sidewalk while providing a minimum of 84 inches between the back of the sidewalk and front of the bumper.
   3. Where the bumper is placed to protect a facility such as a pole, sign, utility, etc., place bumper 36 inches from the facility to be protected and the front of the bumper.

B. Hot-Mix Asphalt Pavements
   1. Premark location on pavement with keel, not paint.
   2. Place epoxy adhesive to provide a minimum band of adhesive at least 4 inches wide and the length of the bumper minus 6 inches.

3. Place bumper at final location in such a manner that no further moving of bumper for alignment is necessary after initial placement.
4. Drive pins using method which does not damage or chip bumper.
5. Recess anchoring pins 1/4 to 1/ 2 inch below top of bumper using follower.

C. PCC Concrete Pavements
1. Premark location on pavement with keel, not paint. Mark pin holes.
2. Rotohammer pin holes using 1 inch bit. Holes shall be 8 inches deep minimum.
3. Place epoxy adhesive to provide a minimum band of adhesive at least 4 inches wide and the length of the bumper minus 6 inches.
4. Place bumper at final location in such a manner that no further moving of bumper for alignment is necessary after initial placement.
5. Epoxy pins into concrete pavement or slab. Do not drive pins into concrete pavement.
6. Recess anchoring pins 1/4 to 1/2 inch below top of bumper using follower.

PART 4 PAYMENT

A. Parking bumpers shall be paid for on a lump sum basis and shall be considered full compensation for all labor, equipment, and materials required to perform the work as described herein.

END OF SECTION

SECTION 32 31 13

CHAIN LINK FENCING

PART 1 GENERAL

1.1 SUMMARY

A. Includes But Not Limited To
   1. Furnish and install complete fence and gates as described in Contract Documents.

1.2 REFERENCES

A. American Society For Testing And Materials
   1. ASTM A 123-00, 'Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products'
   2. ASTM A 153-98, 'Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware'
   3. ASTM A 392-96, 'Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric'
   4. ASTM F 567, 'Standard Practice for Installation of Chain-Link Fence'
   5. ASTM A 570-98, 'Standard Specification for Steel, Sheet and Strip, Carbon, Hot-Rolled, Structural Quality'
   6. ASTM F 626, 'Standard Specification for Fence Fittings'
   7. ASTM A 641, 'Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire'
   8. ASTM F 668, 'Standard Specification for Polyvinyl Chloride (PVC), Polyolefin and Other Polymer-Coated Steel Chain Link Fence Fabric'
   9. ASTM F 669-92 'Standard Specification for Strength Requirements of Metal Posts and Rails for Industrial Chain Link Fence'
   10. ASTM A 780, 'Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings'
   11. ASTM A 824, 'Standard Specification for Metallic-Coated Steel Marcelled Tension Wire for Use With Chain Link fence'
   12. ASTM F 900 'Standard Specification for Industrial and Commercial Swing Gates'
   13. ASTM F 934, 'Standard Specification for Standard Colors for Polymer-Coated Chain Link Fence Materials'
   14. ASTM F 1043-00, 'Standard Specification for Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework'
   15. ASTM F 1083-97, 'Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures'
   16. ASTM A 1011-01, 'Standard Specification Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability'
   17. ASTM C 1107-99, 'Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)'

1.3 SUBMITTALS

1. General: Submit all fence components per the Conditions of the Contract Documents.

2. Product data in the form of manufacturer's technical data, specifications, and installation

instructions for fence and gate posts, fabric, gates and accessories.

3. Shop drawing showing location of fence, gates, each post, and details of post installation, extension arms, gate swing, hardware, and accessories.

1.4 QUALITY ASSURANCE

1. Installer Qualifications: Engage an experienced Installer who has at least three years' experience and has completed at least five chain link fence projects with same material and of similar scope to that indicated for this Project with a successful construction record of in-service performance.

2. Single- Source Responsibility: Obtain chain link fences and gates, including accessories, fittings, and fastenings, from a single source.

1.5 PROJECT CONDITIONS

1. Field Measurements: Verify layout information for fences and gates shown on the Drawings in relation to the property survey and existing structures. Verify dimensions by field measurements.

1.6 MISCELLANEOUS REQUIREMENTS

1. Deliver, store, uncrate, handle and install in manner to prevent damage to equipment.

2. Remove promptly from site all debris resulting from installation of materials and equipment specified herein.

3. Finish of all materials and equipment shall be appropriate for exterior locations.

PART 2 PRODUCTS

2.1 MATERIALS

1. Fabric - Fencing

   a. Selvage: Knuckled at both selvages.
   b. Steel Chain-Link Fence Fabric: Fabricated in one-piece widths for fencing 12 feet and less in height to comply with Chain Link Fence Manufacturers Institute (CLFMI) "Product Manual" and with requirements indicated below:

      1. Mesh and Wire Size:
         a. Standard Fence – 2-inch mesh, 0.148- diameter (9 gauge) wire galvanized after weaving with 1.2 ounce zinc coating conforming to requirements of ASTM A 392, Class I, 2 inch mesh.
         b. Vinyl Coated Fence – 1-inch mesh, 0.148-diameter (9 gauge). Coating exruded onto zinc-coated wire. PVC coating shall be between 15-25 mils at any point conforming to requirements of ASTM F 668, Class I, 1 inch mesh.

B. Framework

   1. Posts and rails shall be roll-formed, self-draining shapes meeting strength requirements of ASTM F 669-92, Table 3, and with 2 ounce zinc coating per sq ft

of surface area conforming to ASTM A 123.

Polymer Coated Color: Pipe: Polymer coated pipe shall have a PVC coating fused and adhered to the exterior zinc coating of the specified galvanized pipe. The coating shall have a minimum thickness 10-mils (0.254 mm) in accordance with the provisions listed in ASTM F 1043. Color shall be as selected by Architect from manufacturers' standard colors complying with ASTM F934.

2. Line Posts - 2.875 inch outside diameter Schedule 40 tubular section weighing 4.64 lbs/lin ft meeting requirements of ASTM F 1083.

3. Terminal And Man Gate Posts -3 inch outside diameter Schedule 40 pipe weighing 5.79 pounds per lineal foot meeting requirements of ASTM F 1083. Drive Gate Posts – 6.625 inch outside diameter Schedule 40 pipe weighing 18.99 pounds per lineal foot meeting requirements of ASTM F 1083.

4. Top And Brace Rail - 1.660 inch outside diameter Schedule 40 pipe weighing 2.27 lbs/lin ft meeting requirements of ASTM F 1083.

2.2 FITTINGS AND ACCESSORIES

A. Material: Comply with ASTM F 626. Mill-finished aluminum or galvanized iron or steel to suit manufacturer's standard.

1. Fittings –

a. Steel and Iron: Unless specified otherwise, Pressed steel or malleable iron, hot-dip galvanized conforming to ASTM A 153. Tie wires shall be 12 gauge minimum galvanized steel or 9 gauge minimum aluminum wire.
b. Supplemental Color Coating: In addition to above metallic coatings, provide a 10-mil minimum polyvinyl chloride (PVC) plastic resin finish applied to exterior surfaces and , except inside cap shapes, to exposed interior surfaces. Color to match chain link fabric.

2. Post and Line Caps: Provide weathertight closure cap for each post. Provide line post caps with loop to receive tension wire or top rail.

3. Tension and Brace Bands: 3/4-inch-wide minimum hot-dip galvanized steel with a minimum of 1.2 oz. of zinc coating per sq. ft.

1. Tension Bands: 0.074 inch thick (14 gage) minimum.
2. Brace Bands: 0.105 inch thick (12 gage) minimum.

4. Tension Wire - 7 gauge minimum galvanized spring steel. 0.177-inch-diameter metallic-coated steel marcelled tension wire conforming to ASTM A 824 with finish to match fabric. Provide at all fencing except baseball backstop.

5. Tie Wires: 0.106-inch-diameter (12-gage) galvanized steel with a minimum of 0.80 oz. per sq. ft. of zinc coating according to ASTM A 641, Class 3 or 0.148-inch-diameter (9-gage) aluminum wire alloy 1350-H19 or equal, to match fabric wire.

2.2 SWING GATES

A. Swing Gates: Galvanized steel pipe welded fabrication in compliance with ASTM F 900. Gate frame members 1.900 in. OD ASTM F 1083 schedule 40 galvanized steel pipe. Frame members spaced no greater than 8 ft. apart vertically and horizontally. Welded joints protected by applying zinc-rich paint in accordance with ASTM Practice A 780. Positive locking gate latch, pressed steel galvanized after fabrication. Galvanized malleable iron or heavy gauge pressed steel post and frame hinges. Provide lockable drop bar and gate holdbacks with double gates. Match gate fabric to that of the fence system. Gateposts per ASTM F1083 schedule 40 galvanized steel pipe. Polymer coated gate frames and gateposts, match the coating type and color to that specified for the fence framework. Moveable parts such as hinges, latches and drop rods may be field coated using a liquid polymer field touch.

Gateposts: Regular Grade ASTM F1083 Schedule 40 pipe

Gate fabric height up to and including 6 ft.		
Gate leaf width	**Post Outside Diameter**	**Weight**
up to 4 ft	2.375 in.	3.65 lb/ft
over 4 ft. to 10 ft	2.875 in.	5.79 lb/ft
over 10 ft. to 18 ft.	4.000 in.	9.11 lb/ft
Gate fabric height over 6 ft. to 12 ft.		
Gate leaf width		
up to 6 ft.	2.875 in.	5.79 lb/ft
over 6 ft. to 12 ft.	4.000 in.	9.11 lb/ft
over 12 ft. to 18 ft.	6.625 in.	18.97 lb/ft
over 18 ft. to 24 ft.	8.625 in.	28.58 lb/ft

B. Hinges shall be structurally capable of supporting gate leaf and allow opening and closing without binding. Non-lift-off type hinge design shall permit gate to swing.

2.3 MIXES

A. Post Foundation Concrete
   1. One cu ft cement, 2 cu ft sand, 4 cu ft gravel, and 5 gallons minimum to 6 gallons maximum water.
   2. Mix thoroughly before placing.

PART 3 EXECUTION

3.1 INSTALLATION

A. Fence shall be installed by mechanics skilled and experienced in erecting fences of this type and in accordance with Contract Documents.

1. When general ground contour is to be followed, make changes of grade in gradual, rolling manner.
2. Evenly space posts in line of fence a maximum of 10 feet center to center.

B. Post Foundations
1. Except atop retaining walls, set posts with concrete post foundations as specified below -

Line Posts -,Diameter 8 inches, Depth 36 inches
Line Posts Trash Enclosure Diameter 10 inch, Depth 36 inches
Gate, End And Corner Posts - Diameter 12 inches, Depth 42 inches
End And Corner Posts Trash Enclosure – Diameter 14 inches, Depth 42 inches.
Gate Posts Trash Enclosure – Diameter 20 inches, Depth 42 inches.

a. At mow strips, set top of post foundation below grade sufficient to allow for placing of mow strip. Measure post foundation depth from top of mow strip.
b. Where fences are incorporated into slabs, measure post foundation depth from top of slab. Extend bottom of slab footing sufficient to allow specified amount of concrete around post. At existing slabs, install fence outside perimeter of slab.
c. For fences on retaining walls, provide 12 inch long sleeves to be cast into retaining wall. Set pipe in sleeve and grout space between sleeve and post full.

C. Fence
1. After posts have been permanently positioned and concrete cured for one week minimum, install framework, braces, and top rail. Join top rail with 6 inch minimum couplings at not more than 21 foot centers.
2. Stretch fabric by attaching one end to terminal post and supplying sufficient tension to other end of stretch so slack is removed.
a. Fasten fabric to line posts with tie wires. Pass ties over one strand of fabric and hook under line post flange.
b. Place one tie as close to bottom of fabric as is possible with additional ties equally spaced between top and bottom band on approximately equal spacing not to exceed 14 inches on center.
c. Attach fabric to roll formed terminals by weaving fabric into integral lock loops formed in post. Attach fabric to tubular terminals with tension bars and bands.
d. Hold fabric approximately 2 inches above finish grade line.
e. On top rail, space tie wires at no more than 24 inches on center.
f. Securely attach fittings and firmly tighten nuts.

D. Swing Gates

Installation of swing gates and gateposts in compliance with ASTM F 567. Direction of swing shall be **[outward.]** Gates shall be plumb in the closed position having a bottom clearance of 3 in., grade permitting. Hinge and latch offset opening space shall be no greater than 3 in. in the closed position. Double gate drop bar receivers shall be set in a concrete footing minimum 6 in. diameter 24 in. deep. Gate leaf holdbacks shall be installed for all double gates.

3.2 CLEANING

A. Spread dirt from foundation excavations evenly around surrounding area unless otherwise directed. Leave area free of excess dribbles of concrete, pieces of wire, and

other scrap materials.

PART 4PAYMENT

A. Payment for chain-link fence installation shall be paid for on a lump sum basis. Said payment shall be considered full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work described herein.

END OF SECTION

SECTION 32 84 21

UTILITY SLEEVES

PART 1 GENERAL

1.1 SUMMARY

A. Includes But Not Limited To
   1. Furnish and install utility sleeves as described in Contract Documents.

B. Related Sections
   1. Section 32 00 01 - General Exterior Site Construction Requirements

PART 2 PRODUCTS

2.1 PIPE SLEEVES

A. Size - As shown on plans.

B. Pipe - SDR 35 with elastomeric or welded couplings and caps.

C. Marker Post - 4"x4"x 3' pressure treated post.

2.2 BACKFILL

A. Under Pavement - CLSM or Sand Slurry per Section 02051.

B. Landscape - Native soil.

PART 3 EXECUTION

3.1 INSTALLATION

A. Depth - Top of pipe shall be either:
   1. Minimum 21 inches below finished hot-mix asphalt pavement surface or 12 inches below base rock, which ever is greater..
   2. Minimum 18 inches below sidewalks.

B. Location
   1. Alignment as shown on drawings.
   2. Extend sleeves a minimum of 6 inches into planter areas or under sidewalks.

C. Construction
   1. Trench shall be a minimum of 6 inches wide.
   2. Remove all debris from trench.
   3. Weld all couplings or use elastomeric couplings. Place caps at each end of sleeve without welds.
   4. Place marker post abutting cap, plumb and level at each end of pipe sleeve. Top of marker post shall be flush with adjacent sidewalk or ground surface and painted white.
   5. Secure pipe to prevent floating while backfilling.
   6. Backfill to top of baserock, bottom of existing paving, or bottom of existing sidewalk.

7. Do not allow CLSM or Sand Slurry to flow into planter area. Use cut off form as necessary. Remove any backfill material protruding into landscape area before placing marker post or backfilling with native.

PART 4 PAYMENT

A. Utility Sleeves shall be paid for on a lump sum basis and shall be considered full compensation for all labor, equipment, and materials required to perform the work as described herein.

END OF SECTION

SECTION 32 84 23

UNDERGROUND IRRIGATION SYSTEM

PART 1 GENERAL

1.1 SUMMARY

A. Includes But Not Limited To
   1. **Ensure existing system has been tested for function by owner and shut down prior to beginning planned work. Obtain emergency contact information for maintenance personnel.**
   2. Furnish and install underground sprinkler system as described in Contract Documents complete with accessories necessary for proper function.

B. Related Sections
   1. Section 32 00 01 - General Exterior Site Construction Requirements

1.2 SYSTEM DESCRIPTION

A. Design Requirements
   1. Layout of Irrigation Heads and Dripline -
      a. Location of heads and/or dripline shown on Drawings is approximate. Actual placement may vary slightly as is required to achieve full, even coverage without spraying onto buildings, sidewalks, fences, etc.
      b. During layout, consult with Owner's Representative to verify proper placement and make recommendations, where revisions are advisable.
      c. Minor adjustments in system layout will be permitted to avoid existing fixed obstructions.
   2. Arrange valve stations to operate in an easy-to-view progressive sequence around site. Record sequence on controller lid.

B. Existing irrigation controller is to be replaced with a new controller with additional stations for adding new valves. See plans for new location, make and model of new controller.

C. The improvements are designed to work by connecting to salvaged portions of the existing system. If existing system does not appear to be in a condition which allows connection, Contractor shall notify Owner immediately.

1.3 SUBMITTALS

A. Product Data
   1. Manufacturer's cut sheets for each element of system.
   2. Parts lists for operating elements of system.
   3. Manufacturer's printed literature on operation and maintenance of operating elements of system.

B. Quality Assurance / Control - Results of pressure test before beginning work on system.

C. Closeout
   1. Record Drawings

a. As installation occurs, prepare accurate record drawing to be submitted before final inspection, including -
   1) Detail and dimension changes made during construction.
   2) Significant details and dimensions not shown in original Contract Documents.
   3) Field dimensioned locations of valve boxes, quick-coupler valves, control wire runs not in mainline ditch, sleeve locations, and any other system facilities.
   4) Take dimensions from permanent constructed surfaces or edges located at or above finish grade.
   5) Take and record dimensions at time of installation.

b. Two (2) copies of reduced record drawing to half-size, color key circuits, and laminate both sides with 5 mil thick or heavier plastic. Record Drawing to be delivered to Owner or Owner's Agent at completion of installation.

2. Instruction Manuals -
   a. Instruction manual which lists complete instructions for system operation and maintenance to be delivered to maintenance personnel of the facility at completion of installation.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements - Work and materials shall be in accordance with latest rules and regulations, and other applicable state or local laws. Nothing in Contract Documents is to be construed to permit work not conforming to these codes.

1.5 DELIVERY, STORAGE, AND HANDLING

A. During delivery, installation, and storage, protect materials from damage and prolonged exposure to sunlight.

1.6 WARRANTY

A. Standard one year guarantee shall include -
   1. Filling and repairing depressions and replacing plantings due to settlement of irrigation trenches.
   2. Adjusting system to supply proper coverage of areas to receive water.

1.7 OWNER'S INSTRUCTIONS

A. After system is installed and approved, instruct maintenance personnel in complete operation and maintenance.

PART 2 PRODUCTS

2.1 MATERIALS

A. Rock-Free Soil
   1. Backfill soil around PVC pipe.
   2. Soil having rocks no larger than 1/4 inch in any dimension.

B. Pea Gravel
   1. For use around valves, quick couplers, and where shown on plans.
   2. 1/2 inch maximum round, water worn, washed rock.

C. Sand - Fine granular material naturally produced by rock disintegration and free from organic material, mica, loam, clay, and other deleterious substances.

D. Native Material - Soil native to project site free of wood and other deleterious materials and rocks over 1-1/2 inches.

E. Topsoil - Existing in-place topsoil material or imported topsoil. Remove rocks, roots, sticks, clods, debris, and other foreign matter over 1-1/2 inches longest dimension encountered during trenching.

2.2 COMPONENTS

A. Pipe, Pipe Fittings, And Connections
1. Pipe shall be continuously and permanently marked with Manufacturer's name, size, schedule, type, and working pressure.
2. Pipe sizes shown on Drawings are minimum. Larger sizes may be substituted without additional cost to Owner.
3. Pipe -
   a. Pressure Lines - Schedule 40 PVC.
   b. Lateral Lines - Schedule 40 PVC.
   c. Quick Coupler Piping - Galvanized steel
4. Fittings - Same material as pipe.

B. Sprinkler Heads
1. Each type of head shall be product of single manufacturer.
2. Conform to requirements shown on Drawings as to type, size, radius of throw, pressure, and discharge. Equal as approved by Owner's Representative before bidding.

C. Sprinkler Risers
1. Pop-up sprinkler heads, shrub spray heads, bubbler heads, and stationary spray sprinkler heads shall have risers made up one of the following ways -
   a. Three schedule 40 street ells connected to lateral tee to form an adjustable riser or pop-up riser as detailed.
   b. Risers for sprinkler heads 14 inches long minimum and 24 inches maximum.
      1) Acceptable Manufacturers -
         a) Rainbird swing pipe with spiral barb fittings and street ell as detailed.
         b) Funny Pipe by Toro
         c) Equal as approved by Owner's Representative before installation.

D. Automatic Sprinkler Control Wiring & Controller
1. Control wire shall be UF-UL listed, color coded copper conductor direct burial size 14. Do not use green color coded wire.
2. Waterproof Wire Connectors -
   a. Acceptable Products And Manufacturers -
      1) DBY or DBR by 3M
      2) One Step' by King
      3) Equal as approved by Owner's Representative before installation.
      4) Controller as specified on drawings.

E. Valves
1. Electric Valves - Make and model shown on Drawings.
2. Quick Coupling Valve - Brass two piece valve with locking top.
3. Backflow Preventer - Make and model shown on Drawings or as required by local code.

4. Pressure Regulator - Make and model shown on Drawings.
5. Pressure Reducer - Make and model shown on Drawings.
6. Valve Accessories
7. Valve Boxes -
    a. Rectangular heavy duty
    b. Lock top or snap top lids.
    c. Large enough for easy removal or maintenance of valves.
    d. Use extensions as required.
    e. Acceptable Manufacturers -
        1) Ametek
        2) Brooks
        3) Equal as approved by Owner's Representative before installation.
8. Valve Box Support - Standard size fired clay paving bricks without holes.

F. Dripline –
1. TLDL6-12 Techline by Netafim, with emitters at 12" spacing.

G. Other Components
1. Recommended by Manufacturer and subject to Owner's Representative's review and acceptance before installation.
2. Provide components necessary to complete system and make operational.

PART 3 EXECUTION

3.1 EXAMINATION

A. Site Verification Of Conditions - Perform pressure test at stub-out where irrigation system is to connect on site. Notify Owner's Representative if pressures over 80 psi or under 40 psi are found to determine if some re-design of system is necessary before beginning work on system.

B. Coordinate with Owner's Agent for shutting off water prior to any connections to the existing water supply.

3.2 PREPARATION

A. Protection
1. Repair or replace work of this Section damaged during course of the Work at no additional cost to Owner. If damaged work is new, repair or replacement shall be performed by installer of original work.
2. Do not cut existing tree roots measuring over 2 inches in diameter in order to install sprinkler lines.

B. Drawings show arrangement of piping. Should local conditions necessitate rearrangement, obtain written approval of Owner's Representative before proceeding with work.

3.3 INSTALLATION

A. Trenching And Backfilling
1. Pulling of pipe is not permitted.
2. Over-excavate trenches 2 inches and bring back to indicated depth by filling with rock-free soil or sand as specified under PRODUCTS. Separate out rocks larger than 1-1/2 inch in any direction uncovered in trenching operation from excavated material and remove from areas to receive landscaping.

3. Cover pipe both top and sides with 2 inches of rock-free soil as specified under PRODUCTS.
4. Do not cover pressure main, sprinkler pipe, or fittings until Owner's Representative has inspected and approved system.

B. Installation of Pipe
1. Install pipe in manner to provide for expansion and contraction as recommended by Manufacturer.
2. Unless otherwise indicated on Drawings, install main lines with minimum cover of 18 inches based on finished grade. Install remaining lateral lines with minimum of 12 inches of cover based on finish grade.
3. Install pipe and wires under driveways or parking areas in specified sleeves 18 inches minimum below finish grade or as shown on Drawings. All pipes under paved areas shall be sleeved as noted on the Drawings.
4. Sprinkler heads immediately adjacent to mowstrips, walks, or curbs shall be one inch below top of mowstrip, walk, or curb and have one to 3 inches clearance between head and mowstrip, walk, or curb.
5. Cut plastic pipe square. Remove burrs at cut ends before installation so unobstructed flow will result.
6. Make solvent weld joints as follows -
   a. Do not make solvent weld joints if ambient temperature is below 40 deg F.
   b. Clean mating pipe and fitting with clean, dry cloth and apply one coat of P-70 primer to each.
   c. Apply uniform coat of 711 solvent to outside of pipe.
   d. Apply solvent to fitting in a similar manner.
   e. Re-apply light coat of solvent to pipe and quickly insert into fitting.
   f. Give pipe or fitting a quarter turn to insure even distribution of solvent and make sure pipe is inserted to full depth of fitting socket.
   g. Hold in position for 15 seconds minimum or long enough to secure joint.
   h. Wipe off solvent appearing at outer shoulder of fitting.
   i. Do not use excessive amount of solvent thereby causing obstruction to form on inside of pipe.
   j. Allow joints to set at least 24 hours before applying pressure to PVC pipe.
7. Tape threaded connections with teflon tape.

C. Control Valves and Controller
1. Install controller, control wires, and valves in accordance with Manufacturer's recommendations and according to electrical code.
2. Install valves in plastic boxes with reinforced heavy duty plastic covers. Locate valve box tops at finish grade. Do not install more than two valves in single box.
3. Place 6 inches minimum of pea gravel below bricks supporting valve boxes to drain box. Extend pea gravel 3 inches minimum beyond limits of valve box and maintain 4 inches minimum between bottom of valve and top of pea gravel. Set valve boxes over valve so all parts of valve can be reached for service. Set cover of valve box even with finish grade.
4. Wiring -
   a. Install all new control wiring in Schedule 40 PVC pipe.
   b. Use waterproof wire connectors at splices and locate all splices within valve boxes.
   c. Use white or gray color for common wire and other colors for all other wire. Each common wire may serve only one controller.
   d. **Run one extra control wire from panel continuously from valve to valve throughout system similar to common wire for use if a wire fails. Wire shall be different color than all other wires, except use of green wire is not acceptable. Mark extra control wire in control box as an extra wire. Extend extra control wires 24 inches and leave coiled in each valve box.**

1) provide a minimum of one (1) extra control wire per every four (4) valves or fraction thereof.

D. Sprinkler Heads
   1. Before installation of sprinkler heads, open control valves and use full head of water to flush out system.
   2. Set sprinkler heads and quick-coupling valves perpendicular to finish grade.
   3. Do not install sprinklers using side inlets. Install using base inlets only, unless approved otherwise in writing by Owner's Representative.
   4. Set sprinkler heads at a consistent distance from existing walks, curbs, and other paved areas and to grade.

E. Sleeving
   1. Install sleeving as shown on the project plans and as described herein.
   2. Use one water pipe maximum per sleeve. Sleeve control wiring in separate sleeve.
   3. Position sleeves with respect to buildings and other obstructions so pipe can easily be removed.

F. Dripline – Install lines per Plans.

3.4 FIELD QUALITY CONTROL

A. Site Tests - Before backfilling system, test pressure lines at 100 psi minimum for 6 hours minimum and make certain there are no leaks. **Notify Owner's Representative 48 hours minimum before conducting test.**

3.5 ADJUSTING

A. Adjust heads to proper grade to allow walking on it without appreciable harm. Such lowering or raising of heads shall be part of original contract with no additional cost to Owner.

B. Adjust sprinkler heads (and dripline) for proper distribution and trim to prevent extreme overspray on adjacent walks, pavement, building, etc.

C. Adjust watering time of valves to provide proper amounts of water to all plants.

PART 4 PAYMENT

A. Installation of new systems - Paid for on a lump sum basis and shall be considered full compensation for all labor, equipment, and materials required to perform the work as described herein.

B. Modification of existing systems - Paid for on a lump sum basis for and no separate payment will be made.

END OF SECTION

SECTION 32 91 13

SOIL PREPARATION

PART 1 GENERAL

1.1 SUMMARY

A. Includes But Not Limited To
   1. Furnish and apply soil additives as described in Contract Documents.

B. Related Sections
   1. Section 32 00 01 - General Exterior Site Construction Requirements
   2. Section 32 93 00 - General Planting Requirements

1.2 SUBMITTALS

A. Product Data - Product literature and chemical / nutrient analysis of soil amendments and fertilizers.

B. Samples - Submit sample of soil conditioner and soil amendment for approval before delivery to site. Include product analysis list.

C. Quality Assurance / Control - Submit delivery slips indicating amount of soil conditioner delivered to Project site.

PART 2 PRODUCTS

2.1 MATERIAL

A. Organic Soil Amendments And Application Rates
   1. Organic soil amendment
      a. 5 cy per 1,000 square feet of Nitrolized soil amendment (Min. 1%) over new planter areas.
      b. Equal as approved by Owner’s representative before installation.

B. Acceptable Organic Soil Conditioners And Application Rates
   1. Provide one of following at 5 cu yds per 1000 sq ft -
      a. EPA Class 'A' co-compost or compost with SAR less than 3.0, EC less than 4.0, and CN ratio of 15 to 25:1 passing through 1/2 inch mesh screen as approved by Owner’s representative prior to installation.

C. Acceptable Fertilizers and Application Rates
   1. 6-20-20 pelletized fertilizer at 25 pounds per 1,000 sq ft.

PART 3 EXECUTION

3.1 PREPARATION

A. Surface Preparation
   1. Seven days maximum prior before beginning seeding and planting -

a. Loosen area 4 inches deep, dampen thoroughly, and cultivate to properly break up clods and lumps.
b. Rake area to remove clods, rocks, weeds, roots, and debris.
c. Grade and shape landscape area to bring surface to true uniform planes free from irregularities and to provide drainage and proper slope to catch basins.

3.2 APPLICATION

A. Site Tolerances
1. Finish grade of planting areas prior to planting and after addition of soil additives shall be specified distances below top of adjacent pavement of any kind -
a. Sodded Areas - 2 inches below
b. Seeded Areas - One inch below
c. Shrub And Ground Cover Areas - 1 to 2 inches below
2. Fill any spots that settle and smoothly regrade finished surface to conform to depths listed above.

B. Add specified soil amendments at specified rates.
1. Roto-till or otherwise mix amendments evenly into top 6 inches of topsoil.
2. Incorporate and leach chemical soil amendments which require leaching, such as gypsum, within such time limits that soil is sufficiently dry to allow proper application of fertilizer and soil conditioners.

C. Apply fertilizers and soil conditioners over planting areas. Roto-till soil conditioner into top 6 inches of top soil until homogeneous mixture results.

3.3 FIELD QUALITY CONTROL

A. Inspections - **Notify Owner's representative 48 hours minimum prior to roto-tilling in any soil additives.**

PART 4 PAYMENT

A. Soil Preparation shall be paid for on a lump sum basis and shall be considered full compensation for all labor, equipment, and materials required to perform the work as described herein.

END OF SECTION

SECTION 32 93 00

GENERAL PLANTING REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Includes But Not Limited To
   1. General procedures and requirements for landscaping work.

B. Related Sections
   1. Section 32 00 01 - General Exterior Site Construction Requirements

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.1 PREPARATION

A. Protection
   1. Take care in performing landscaping work to avoid conditions which will create hazards. Post signs or barriers as required.
   2. Provide adequate means for protection from damage through excessive erosion, flooding, heavy rains, etc. Repair or replace damaged areas.
   3. Keep site well drained and landscape excavations dry.
   4. **Protect storm drain inlets using approved BMP products.**

3.2 FIELD QUALITY CONTROL

A. Inspection - Owner's Representative will review landscaping installation approximately 1 week prior to end of maintenance period. Replace landscaping that is dead or appears dead as directed by Owner's Representative prior to end of maintenance period. ***Landscaping repairs that are not made before the end of maintenance period may be cause to extend the maintenance period at the discretion of the Owner's representative.***

3.3 ADJUSTING

A. Replace damaged plantings at no additional cost to Owner.

3.4 CLEANING

A. Immediately clean up any soil or debris spilled onto pavement and dispose of all deleterious materials.

3.5 PROTECTION

A. Protect planted areas against traffic or other use immediately after planting is completed by placing adequate warning signs and barricades.

B. Provide adequate protection of planted areas against trespassing, erosion, and damage of any kind. Remove this protection after planted areas have been accepted by Owner's Representative.

PART 4 PAYMENT

A. New work described in “General Planting Requirements” shall be paid for under a lump sum basis.

END OF SECTION

SECTION 32 93 05

EXTERIOR PLANTS

PART 1 PART

1.1 SUMMARY

A. Includes But Not Limited To
   1. Furnish and install landscaping plants as described in Contract Documents.

B. Related Sections
   1. Section 32 93 00 - General Planting Requirements

1.2 REFERENCES

A. American National Standards Institute
   1. ANSI Z60.1-1990, 'American Standard for Nursery Stock'

1.3 WARRANTY

A. Guarantee shrubs, trees, ground covers, and vines to live and remain in healthy condition for one year minimum from project completion.

PART 2 PRODUCTS

2.1 MATERIALS

A. Plants
   1. Conform to requirements of Plant List and Key on Drawings and to ANSI Z60.1.
   2. Nomenclature - Plant names used in Plant List conform to 'Standardized Plant Names' by American Joint Committee on Horticultural Nomenclature except in cases not covered. In these instances, follow custom of nursery trade. Plants shall bear a tag showing the genus, species, and variety of at least 10 percent of each species delivered to site.
   3. Quality -
      a. Plants shall be sound, healthy, vigorous, free from plant disease, insect pests or their eggs, noxious weeds, and have healthy, normal root systems. Container stock shall be well established and free of excessive root-bound conditions.
      b. Do not prune plants or top trees prior to delivery.
      c. Plant materials shall be subject to approval by Owner's representative as to size, health, quality, and character.
      d. Bare root trees are not acceptable.
      e. **Provide plant materials from licensed nursery or grower produced within 50 miles from planting location unless approved by owner.**
   4. Measurements -
      a. Measure height and spread of specimen plant materials with branches in their normal position as indicated on Drawings or Plant List.
      b. Measurement should be average of plant, not greatest diameter. For example, plant measuring 15 inches in widest direction and 9 inches in narrowest would be classified as 12-inch stock.
      c. Plants properly trimmed and transplanted should measure same in every direction.
      d. Measure caliper of trees 6 inches above surface of ground. Where caliper or

other dimensions of plant materials are omitted from Plant List, plant materials shall be normal stock for type listed.

e. Plant materials larger than those specified may be supplied, with prior written approval of Owner's representative, and -
   1) If complying with Contract Document requirements in all other respects.
   2) If at no additional cost to Owner.
   3) If sizes of roots or balls are increased proportionately.

5. Shape and Form _
   a. Plant materials shall be symmetrical or typical for variety and species and conform to measurements specified in Plant List.
   b. Acceptable plant material will generally have height equal to or greater than spread. However, spread shall not be less than 2/3 height.

B. Planting Mix - Mixture of three parts topsoil and one part rotted composted manure..

C. Planting Tablets - 21 gram Agriform 20-10-5.

D. Tree Stakes - 10' minimum height
   1. 2 inch diameter lodgepole pine
   2. Steel T-posts

E. Tree Staking Ties
   1. Acceptable Manufacturers -
      a. 32-inch Cynch-Tie tree ties
      b. Equal as approved by Owner's representative before installation.

F. Pre-Emergent Herbicide
   1. Approved Manufacturers -
      a. Elanco XL
      b. Ronstar
      c. Surflan

G. Bark Or Wood Top Dressing Mulch
   1. Approved Products -
      a. Medium or large size shredded redwood bark
      b. Shredded pine bark
      c. Shredded cedar

PART 3 EXECUTION

3.1 EXAMINATION

A. Before proceeding with work, check and verify dimensions and quantities. Report variations between Drawings and site to Owner's representative before proceeding with work of this Section. **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**

B. Plant totals are for convenience only and are not guaranteed. Verify amounts shown on Drawings. All planting indicated on Drawings is required unless indicated otherwise.

3.2 PREPARATION

A. Layout individual tree and shrub locations and areas for multiple plantings. Stake locations and outline areas. Secure Owner's representative's acceptance before planting. Make minor adjustments as may be requested.

3.3 INSTALLATION

A. Interface With Other Work - Do not plant trees and shrubs until major construction operations are completed.

B. **Ensure irrigation system is functional prior to planting.**

C. Excavation
1. If underground construction work or obstructions are encountered in excavation of planting holes, Owner's representative will select alternate locations.
2. Plant Excavation Size -
   a. Diameter - At least two times greater in diameter than root ball or container.
   b. Depth -
      1) Shrubs - Deep enough to allow 4 inches minimum of tamped planting mix beneath root ball.
      2) Trees - 4 inches minimum deeper than bottom of root ball.
3. Excavated material may be reused for topsoil purposes provided that it is clean and free of debris, roots, stones measuring more than 1-1/2 inches, or other deleterious material.
4. Roughen sides and bottoms of excavations.
5. After tree planting holes are excavated to proper depth, auger 8 inch diameter hole 6 feet deep in center of each excavation and fill with tamped planting mix.
6. Fill holes to receive shrubs with tamped planting mix sufficient to bring plant to proper elevation after watering and settling. In holes to receive trees, provide mound of tamped planting mix of height sufficient to bring tree to proper elevation.

D. Planting
1. Prior to planting, fill hole with water and verify that water drains away within two hours. Inform Owner's representative in writing if water does not drain properly. Do not plant trees or shrubs in holes that do not properly drain.
2. Removing Binders And Containers -
   a. Remove top 1/3 of wire basket and burlap binders.
   b. Remove entirely plastic and twine binders from around root ball.
   c. Remove entirely wood boxes from around root ball. Remove box bottoms before positioning plant in hole. After plant is partially planted, remove remainder of box without injuring root ball.
3. Plant immediately after removing binding material and containers. Place trees and shrubs in holes so that, after watering and settling, top of root ball shall be approximately one inch higher than finished grade.
4. Properly cut off broken or frayed roots.
5. Center plant in hole and backfill with specified planting mix. Except in heavy clay soils, make ring of mounded soil around hole's perimeter to form watering basin.
6. Add planting tablets in plant pit as follows. Place tablets in relation to root ball as recommended by Manufacturer.
   a. One Gallon Shrub - 1 tablet
   b. 5 Gallon Shrub / Tree - 3 tablets
   c. 15 Gallon Tree - 4 tablets
   d. 24 inch Box Tree - 6 Tablets
7. Settle by firming and watering to bring top of ball down to one inch higher than surrounding soil.

8. Do not use muddy soil for backfilling.
9. Make adjustments in positions of plants as directed by Owner's representative.
10. Thoroughly water trees and shrubs immediately after planting.

E. Supports for New Trees
   1. Provide new supports for trees noted on Drawings to be staked.
      a. Remove nursery stakes delivered with and attached to trees.
      b. Support shall consist of at least two tree stakes driven into hole base before backfill so roots are not damaged. Place stakes vertically and run parallel to tree trunk. Install stakes so 3 feet of stake length is below finish grade.
      c. Place tree ties 6 to 12 inches below crotch of main tree canopy. A second set of tree ties may be required 18 to 24 inches above finish grade, if directed by Owner's representative.
      d. Remove tops of tree stakes so top of stake is 6 inches below main tree canopy to prevent damage to tree branches and canopy growth.

F. Ground Covers - Container-grown unless otherwise specified on Drawings. Space evenly to produce a uniform effect, staggered in rows and intervals shown.

G. Post Planting Weed Control
   1. Apply specified pre-emergent herbicide to shrub and ground cover planting areas.
   2. Areas shall be free of existing weed growth prior to application of herbicide.

H. Mulching
   1. After application of herbicide, mulch shrub and ground cover planting areas with 3 inch deep layer of specified top dressing mulch.
   2. Place top dressing mulch to uniform depth and rake to neat finished appearance.

PART 4 PAYMENT

A. New landscape planter areas - Exterior planting shall be paid for on a lump sum basis and shall be considered full compensation for all labor, equipment, and materials required to perform the work as described herein.

B. Restored landscape planter areas - Exterior planting shall be included in the lump sum price and no separate payment will be made.

END OF SECTION

SECTION 32 93 10

PLANT MAINTENANCE

PART 1 GENERAL

1.1 SUMMARY

A. Includes But Not Limited To
   1. Provide maintenance for new landscaping as described in Contract Documents.

B. Related Sections
   1. Section 32 93 00 - General Planting Requirements
   2. Section 32 93 05 - Exterior Plants

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

A. General
   1. Maintain landscaping from completion of landscape installation for 30 days. Maintenance period of 30 days begins when Owner's representative is satisfied that all punch list items have been addressed and corrected, as identified during the final walkthrough.
   2. Provide at least one gardener on site for one hour per day at least twice a week during maintenance period.
   3. Replace landscaping that is dead or appears unhealthy or non-vigorous as directed by Owner's representative at end of maintenance period. Make replacements within 10 days of notification.
   4. Provide supplemental water to plant material to help plant establishment.

B. Trees, Shrubs, And Plants
   1. Maintain by pruning, cultivating, and weeding as required for healthy growth.
   2. Restore planting basins.
   3. Tighten and repair stake and guy supports and reset trees and shrubs to proper grades or vertical positions as required.
   4. Spray as required to keep trees and shrubs free of insects and disease.

END OF SECTION

SECTION 32 93 15

LANDSCAPE RESTORATION

PART 1 GENERAL

1.1 SUMMARY

A. Includes But Not Limited To
   1. Restoring landscape features impacted by other items of work.

B. Related Sections
   1. Section 32 84 23 - Underground Irrigation System
   2. Section 32 93 00 - General Planting Requirements
   3. Section 32 93 05 - Exterior Plants
   4. Section 32 93 23 - Lawn Sodding

PART 2 PRODUCTS

A. Components for Irrigation System Restoration - Per Section 32 84 23 “Underground Irrigation System”

B. Plant Material Restoration - Per Section 32 93 05 “Exterior Plants”

C. Top Dressing Mulch & Pre-emergent herbicide - Per Section 32 93 05 “Exterior Plants”

PART 3 EXECUTION

3.1 RESTORATION TO IRRIGATION SYSTEMS

A. Restoration -
   1. Relocate sprinkler heads, irrigation valves, quick coupler valves, and other features which interfere with items of new work.
   2. Cut and cap irrigation lateral lines where landscape area is converted to hardscape (sidewalk or paving).
   3. Reroute irrigation lateral lines and/or pressurized mainlines when conflicting with items of new work.

B. Perform all irrigation restoration work in accordance with Section 32 84 23 “Underground Irrigation System”.

3.2 RESTORATION OF LANDSCAPE PLANT MATERIAL

A. Restoration -
   1. Plants which are shown for temporary relocation shall be replaced at the completion of all other major work items of project.
   2. Plants which are specified to be protected or to remain which are damaged shall be replaced at no cost to the Owner. Minimum size for plant material restoration shall be

a. Trees (up to 10 feet existing height) - 15 gallon container
b. Trees (greater than 10 feet existing height) - 36 inch box
c. Shrubs - 5 gallon container

3. **In lawn areas adjacent to work, replace turf up to edges of landscape areas. Turf to be rolled sod to match existing turf grass as closely as possible. Repair of lawn areas by seeding will be allowed only if approved in advance by Owners Representative.**

B. Perform all planting installation in accordance with Section 32 93 05 “Exterior Plants”.

3.3 MISCELLANEOUS LANDSCAPE FEATURES

A. In landscape areas behind new sidewalk, curb, headerboards, and other site facilities, replace soil behind work to within 1 to 2 inches from finish surface.
1. Use existing site soil for backfill first, then imported topsoil per Section 31 23 00 “Excavation, Grading & Backfill” to supplement.

B. After finish grading in affected planter areas, apply pre-emergent herbicide and place top dressing mulch over all bare soil.
1. Perform installation per Section 32 93 05 “Exterior Plants”.

C. Replace existing landscaping boulders, stepping stones, and decorative features as specified on plans.

PART 4 PAYMENT

A. All work related to landscape restoration shall be paid on a lump sum basis and shall be considered full compensation for all labor, equipment, and materials required to perform the work as described herein

END OF SECTION