Ray Park Turf Replacement Project
Burlingame, CA

PROJECT SPECIFICATIONS
Bid Submittal

March 9, 2020

PREPARED BY:

VERDE DESIGN
Project No. 1801800
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PART 1  GENERAL

1.01  SUMMARY
   A. Abbreviated Written Summary / Scope of work: Briefly and without force and effect upon the Contract Documents, the work of the Contract can be summarized to include as follows:
      1. Perimeter paving, fencing, site furnishing improvements, and utility upgrades
      2. Natural turf and infield fines field renovations
   B. Related sections:
      1. All pertinent sections of the specifications

1.02  REFERENCES AND REGULATORY REQUIREMENTS
   A. Refer to Section 01 42 00 - References.

1.03  PROJECT LOCATION
   A. Ray Park, adjacent to Lincoln Elementary School. The project address is:
      1525 Balboa Ave
      Burlingame, CA
      94010

1.04  CONTRACT DOCUMENTS
   A. The general nature and extent of the work and the appurtenant facilities are shown on the Drawings under the title: Ray Park Turf Replacement Project
   B. Perform work within the Limit of Work line indicated on the Drawings and per the discretion of the Owner.

1.05  DRAWINGS
   A. Drawings such as irrigation plans, utility plans, etc., are essentially diagrammatic. Actual runs indicated on the Drawings shall be followed as closely as coordination with the work of other trades will permit. The exact routing of such improvements and locations of equipment shall be governed by site conditions, obstructions, and locations of other utilities as acceptable to the Owner.
   B. In the event that discrepancies arise over dimensions, product references, omissions, or written statements, these conflicts shall be immediately brought to the Owner’s attention by the contractor. If available, this may be accomplished with the use of a “Request for Information” (RFI) form. While awaiting direction or clarification from the Owner, the contractor shall re-direct work as necessary so as not to cause delay to the project.
   C. If discrepancies arise between plans, details, or specifications, the order of descending precedence shall be: 1.) Specifications 2.) Details 3.) Plans (ex. Details have precedence over Plans, yet Specifications have precedence over both).
   D. Products, materials, labor, etc., installed or performed without proper clarification, or prior to Owner acceptance shall be the Contractor’s sole responsibility and shall be removed, repaired,
replaced, and/or reinstalled per the Owner’s direction at no additional cost to the Owner or its agents.

1.06 CONTRACTOR’S DUTIES

A. Provide and pay for:
   1. Labor, materials, equipment, tools, construction equipment machinery, and other facilities and services necessary for proper execution and completion of the Contract.
   2. Water and temporary utilities required for construction excluding any metering and connection fees or charges.
      a. Subject to the discretion of the Owners Representative (contractor to verify), utilities which are in place and/or are in use by the Owner at the site (excluding telephone) may be utilized by the Contractor, to the extent available, at no cost.
   3. Other facilities and services necessary for proper execution and completion of work to provide a facility capable of operation.
   4. Legally required sales, consumer, and use taxes.

B. Permits:
   1. The Owner shall obtain and pay for the building permits, utility cut-offs and hook-ups including, but not limited to: water, gas, and electrical meters, sanitary and storm sewer connection fees.
   2. The contractor shall obtain and pay for other permits required by Owner, County and other agencies, including but not limited to business licenses and hauling & dumping permits as applicable.
   3. Provisions of required permits and licenses, whether obtained by the Owner’s Representative or the contractor, shall become a part of the Contract Documents and shall be adhered to by the contractor.

C. Comply with latest adopted edition of the governing building code and other codes, ordinances, rules, regulations, orders and other legal requirements of public authorities which bear on performance of the work. Nothing in the Drawings or Specifications shall be construed to permit work not conforming to these applicable laws, ordinances, rules, and regulations. In case of conflicts between code requirements, the most restrictive shall apply; except that where the requirements of these Specifications exceed code requirements, the Specifications shall govern.

D. Attend pre-scheduled on-site job conference meetings and/or any special meetings as may be required by the Owner’s Representative.

E. Promptly submit written notice to the Owner’s Representative of any observed variance in Contract Documents from legal requirements. Appropriate modifications to Contract Documents will be performed by the Owner’s Representative to incorporate such necessary modifications.
   1. Contractor shall assume responsibility for work performed and known to be contrary to such requirements.

F. Enforce strict discipline and good order among the contractor’s or sub-contractor’s employees per the discretion of the Owner’s Representative.

G. Prior to bidding, the contractor shall visit the site to become familiar with existing conditions and the requirements of the work.

H. The contractor shall be held to have examined the site and to have compared it with the Drawings and Specifications, to have carefully examined all of the Contract Documents and to have satisfied himself as to the conditions under which the work is to be performed before entering into this Contract. No allowance shall subsequently be made on behalf of the contractor on account of an error on his part or his negligence or failure to acquaint him with the conditions of the site.

All discrepancies found shall be brought to the attention of the Owner’s Representative by the
I. Examine site and verify that site conditions are acceptable to begin any work. Verify that work specified elsewhere has been completed to an appropriate stage to begin any applicable work. This includes, but is not limited to: lines, grades and surfaces prepared by others. Notify the Owner’s Representative in writing of any irregularities or unacceptable conditions. Start of work by contractor shall indicate contractor’s acceptance of site conditions.

J. Throughout the job the contractor shall be responsible for the general safety of the public and shall take appropriate means at no extra cost to Owner to provide a safe and secure job site to the satisfaction of the Owner’s Representative.

K. Verify all measurements, materials and systems taken from the Drawings and Specifications. Contractor shall be responsible for all investigations, field measurements layouts, and coordination necessary to properly fit, install and complete the work required, including integration of new work into, and with existing.

L. Contractor shall deliver, receive, store, protect, install and apply all materials in accordance with manufacturer’s and/or industry specifications and instructions unless specifically modified and shown otherwise in the Contract Documents. All installations shall be tight, smooth, level, straight, true to line, and secure.

1.07 PROTECTION OF PROPERTY, MATERIALS AND WORK

A. Contractor shall be held responsible insofar as his operations are concerned for the care, protection, and preservation of the adjoining premises, buildings, trees, landscaping, utilities, walks, streets, and adjacent properties from damage resulting from or incidental to this Contract.

B. Protect all existing structures, planted areas and improvements not designated for removal. Any damage to existing structures including asphalt paving, utilities, and fixtures shall be replaced to an "as was" or better condition, at contractor’s expense, per the direction and satisfaction of the Owner’s Representative.

C. All materials and equipment, both before and after installation, shall be properly protected by the contractor from the weather and other hazards and kept in a clean and orderly manner.

D. All utility piping and conduit stub-outs, and parts or equipment left unconnected shall be capped, plugged, or otherwise properly protected by the contractor to prevent damage or the intrusion of dirt or other foreign matter.

E. Materials and equipment damaged or containing defects developed before acceptance of the work shall be replaced with new at the contractor’s expense.

F. All new turf areas shall be fenced off during turf establishment and specified Landscape Maintenance Period subject to the discretion of the Owner’s Representative.

1.08 WORK SEQUENCE / SCHEDULE

A. The sequence and scheduling of the work to be performed by the contractor shall be subject to review and acceptance by the Owner’s Representative. The contractor shall submit a Submittal Progress Log and Schedule in accordance with Section 01 33 00 – Submittals prior to starting work. Project schedules shall conform to Specification Section 01 33 00.

1.09 CONTRACTOR’S USE OF PREMISES

A. Confine operations to areas immediately within the proposed project sites.

1. Develop and utilize construction access and haul routes as per the rules and regulations
pertaining to the locale in which the work is to be performed and per the discretion of the Owner’s Representative.

2. Do not encumber site with materials or equipment.

B. Limit use of premises for work and construction operations to allow for work by other contractors.
   1. Conduct operations so as not to cause unnecessary delay or hindrance to other contractors.
   2. Conduct, adjust, correct, and coordinate work with others to prevent project discrepancies and/or delays.

C. Assume full responsibility for protection and safekeeping of products stored on premises and work performed until Final Acceptance of the work.

D. Move stored products under contractor’s control which interfere with operations of the Owner.

E. Obtain and pay for use of additional storage or work areas needed for construction operations.

1.10 WORK HOURS AND WORK DURING ONGOING ACTIVITIES

A. Carry on the work as quietly as possible to prevent possible annoyance to adjacent properties. Avoid unnecessary noise at all times. Comply with all local noise regulations or requirements. Absolutely no work, delivery of equipment or materials shall take place between the hours of 5:00 PM and 8:00 AM, or during non-working hours/days without written authorization by the Owner’s Representative.

B. When connecting new utilities to existing, and similar operations, the contractor shall time and coordinate with Owner’s Representative, facility operators, and utility companies such operations to minimize interference with existing activities and operations.

1.11 MATERIALS

A. All materials and equipment used in the work herein specified shall be new, first class, condition (unless otherwise noted or scheduled), suited to the intended use.

B. Materials shall be delivered to the site and stored in original containers sheltered from the elements, but readily accessible for inspection by the Owner’s Representative until installed.

C. Materials of the same general type shall be of the same make and quality throughout the work to provide uniform appearance, operation, and maintenance ease.

D. Equipment specified by manufacturer’s number shall include all accessories, controls, etc., listed in catalog as standard equipment. Furnish optional or additional accessories as specified.

E. Where no specified make of material or equipment is specified, any product by a reputable manufacturer which conform to the requirements of the Construction Documents may be used with the Owner’s Representative’s acceptance.

F. Materials and equipment shall be current products by manufacturers regularly engaged in the production of such products.
   1. All equipment items shall be supported by service organizations, which are reasonably convenient to the equipment installation in order to render satisfactory service to the equipment on a regular and emergency basis during the Specified Warranty Period.

1.12 NUISANCE WATER

A. The contractor shall protect the work at all times from damage, and shall take measures to prevent delays in the progress of the work caused by nuisance water, such as rainfall, irrigation water and groundwater.
B. The contractor shall dispose of nuisance water using appropriate mechanical means at their sole expense and without adverse effects upon the Owner’s, or any other property.

C. The contractor shall comply with any and all applicable non-point source pollution regulations required by the Owner.

1.13 REFERENCE POINTS

A. The contractor shall leave all existing stakes and reference points in their existing locations unless directed or authorized otherwise by the Owner’s Representative. The contractor shall set additional stakes and reference points as necessary to properly establish horizontal and vertical controls required for the work.

1.14 COORDINATION:

A. The contractor shall coordinate all items of work to assure efficient and orderly sequence of installation of construction elements.
   1. The contractor shall make provisions for accommodating items installed by the Owner or under separate contracts.
   2. The contractor shall coordinate and cooperate fully with all other agencies, sub-contractors, or utility company personnel furnishing labor, materials, or services, so that the work, as a whole, shall be executed in the most efficient manner and without conflict or delay.

B. The contractor shall verify that characteristics of interrelated operating equipment are compatible and coordinate work having interdependent responsibilities for installing of mechanical, irrigation, or electrical work, which may be indicated diagrammatically on Drawings.

C. The contractor shall coordinate space requirements and installation of work, which is indicated diagrammatically on Drawings.
   1. Follow routing shown for pipes, and conduits as closely as possible, run lines parallel with lines of construction edges whenever possible.
   2. Utilize spaces efficiently for other installations, for maintenance, and for repairs.
   3. Work out all conditions involving work of all trades in advance of installation. If necessary, and before work proceeds in areas with constricted clearances, prepare supplementary drawings for Owner’s Representative review, showing all work in “tight” areas. Provide supplementary drawings and additional work necessary to overcome spatially constricted conditions.

D. Differences or disputes concerning coordination, interference or extent of work between divisions shall be decided by the Owner’s Representative.

E. Access Doors and Panels:
   1. Coordinate access door and panel requirements with each trade installing work to which access must be available to the Owner’s Representative from time to time.

1.15 CUTTING AND PATCHING

A. Contractor shall be responsible for all cutting, fitting, or patching of work which may be required to make its several parts come together properly and fix it to receive or be received by work of other trades.

B. Any cost caused by defective or poorly timed work shall be borne by the responsible party, as determined by the Owner’s Representative. Contractor shall not endanger any work, persons or construction by cutting, digging, or otherwise, and shall not alter the work of any other contractor.
except as acceptable to the Owner’s Representative.

C. Patching of all openings for new installations and all openings resulting from the removal or relocation of any installations shall be done with material of the same type adjoining openings and as acceptable to the Owner’s Representative.

1.16 CLEANING DURING CONSTRUCTION

A. Execute weekly cleaning operations to keep the work, site, streets, and adjacent properties free from accumulations of waste materials, rubbish, and windblown debris resulting from construction operations.
   1. The Owner’s Representative may, at any time during construction, order general clean up of the site at no additional cost to the Owner.

B. Provide on-site containers for the collection of waste materials, debris and rubbish.

C. Remove hazardous waste materials, debris, and rubbish from the site periodically and properly dispose of such materials at legal disposal areas.
   1. Location of legal disposal sites and all costs incurred from waste disposal and transportation shall be the responsibility of the contractor.
   2. Waste material or debris shall not be buried or burned on the site.

1.17 PROJECT COMPLETION

A. Conform to Section 01 77 00 - Contract Closeout.

B. The contractor shall, at completion of the project, leave all work installed properly operating and in a thoroughly clean condition.

C. Thoroughly instruct the Owner’s Representative and any applicable operation and maintenance personnel in the contents of the “operations and maintenance manual.” Refer to Section 01 33 00 - Submittals.

PART 2 PRODUCTS - Not Applicable

PART 3 EXECUTION - Not Applicable

END OF SECTION
SECTION 01 30 00

ALTERNATES

PART 1  GENERAL

1.01  SUMMARY

A.  Scope of work:
1.  Alternate Bids shall state the NET AMOUNT to be ADDED TO or DEDUCTED FROM the BASE BID PRICE or the CONTRACT SUM, as applicable.
2.  The changes described in each Alternate shall only become incorporated into the work if the Owner elects to proceed with one or more or any combination of the Alternative and amends the Owner-Contractor Agreement accordingly. Alternate selections may occur prior to the Contract Date, or may, by the Agreement, be deferred for possible selection at a subsequent date.
3.  Acceptance or Rejection: Acceptance or rejection of each Alternate Bid is at the discretion of the Owner. None, any, or all Alternate Bid item(s) may be accepted or rejected in any sequence by the Owner.
4.  Costs: Include under each Alternate Bid the net amount of all changes in costs, whether additive or deductive, resulting to the work affected by the Alternate Bid item(s).
5.  Modifications to the work shall require furnishing and installing the selected Alternate materials and labor to the satisfaction of the Owner’s Representative at no additional cost to the Owner other than described in the applicable Alternate Bid.
6.  Extent of Alternate Bid Items: Bidders shall determine the full extent of work affected by each Alternate and shall make full and proper allowance for such extent in the preparation of the Alternate Bid.
7.  Furnish all labor, materials, equipment, facilities, transportation, and services to complete all work relating to each Alternate listed below.
8.  No increase in Contract days or extension of Contract completion schedule shall be made for work required by Alternate Bid improvements.

B.  Related sections can include, but are not necessarily limited to:
1.  All applicable sections of the Specifications

PART 2  PRODUCTS

2.1  BID ALTERNATE “No. 1: Furnish all labor, materials, equipment, facilities, transportation, and services to complete all work relating to the installation of the concrete paving in lieu of decomposed granite, as shown on Drawing sheets L7.1, and further described by other applicable portions of the Contract Documents.

PART 3  EXECUTION

3.01  ADVANCE COORDINATION BY CONTRACTOR

A.  Upon Owner acceptance of any Alternate, all personnel and material suppliers affected shall be immediately notified by the contractor as to the nature and extent of additional or lesser work implied by such acceptance.

END OF SECTION
PART 1  GENERAL

1.01  SUMMARY

A.  Scope of work:
   1.  Submit all items specified herein and as noted elsewhere in the Contract Documents.

B.  Related sections:
   1.  All pertinent sections of the specifications

1.02  SCHEDULE OF SUBMITTALS

A.  Within ten (10) working days from date of Notice To Proceed, the contractor shall submit to the Owner a comprehensive list of all submittals and the Submittal Progress Log and Schedule (refer to Section 01 11 00- Summary Of Work) for review and acceptance. The submitted list shall be broken down by specification section, material / product and other applicable information. The log shall be reviewed and accepted prior to submission of actual submittals.

B.  Upon acceptance by the Owner Representative, the list and Progress Schedule shall become part of the Contract Documents.  All project submittals shall be submitted to the Owners Representative within ten (10) working days from the date of the Notice To Proceed unless noted otherwise.

C.  Coordinate the Progress Schedule with all sub-contractors, material suppliers, etc. to ensure adherence to the schedule.

D.  Revise and update the Progress Schedule on a monthly basis to reflect on-going construction conditions and sequences.

E.  Submit one copy of the Progress Schedule monthly to the Owner Representative showing all revisions for review and comment. Coordinate this submittal with Progress Payment requests or as acceptable to the Owners Representative.

1.03  IDENTIFICATION OF SUBMITTALS

A.  Identify each submittal with the following information:
   1.  Date and revision dates
   2.  Project title and number
   3.  The names of:
      a.  Sub-contractor
      b.  Supplier
      c.  Manufacturer
      d.  Separate detailer when pertinent
   4.  Identifications of product or material (the submitted product must be clearly identified).
   5.  Applicable standards
   6.  Identification of deviations from Contract Documents
   7.  Contractor’s stamp, initialed or signed, certifying review of submittal, verification of field measurements, and compliance with Contract Documents.

PART 2  PRODUCTS

2.01  PRODUCT LITERATURE
A. Contractor shall provide electronic submittals.
   1. Electronic Submittal: Include transmittal sheets and highlighted product data sheets, confirm receipt of submittals submitted via email. The City has limited capacity for size of attachments. It is advised that the contractor utilize file sharing applications if necessary.

B. Each submittal shall be by specification section and include all items pertinent to that specification section.

C. Contractor shall not submit multiple products or manufacture’s for the same item. If multiple products or manufacture’s are submitted for an item, the submittal will be rejected and sent back for resubmittal.

D. Clearly indicate, by colored highlight or colored stamp (USING A COLOR THAT WILL COPY), which portion of the literature is submitted to be reviewed for compliance with the Contract Documents. If items are not clearly indicated, the submittal will be rejected and sent back for resubmittal.

2.02 SHOP DRAWINGS

A. Shop drawings shall be drawn accurately to a scale sufficiently large to depict all aspect of the items and its methods of connection to the work. Submit shop drawings to the Owners Representative in the quantity specified in "PRODUCT LITERATURE" above.

B. Review of the shop drawings by the Owners Representative shall not relieve the contractor of the responsibility for errors and/or omissions in the design of adequate connections or satisfactory construction of the work or conformance to applicable codes, etc.

C. Clearly indicate, by colored highlight or colored stamp (USING A COLOR THAT WILL COPY), the desired deviations from the Drawings (as applicable). If items are not clearly indicated, the submittal will be rejected and sent back for resubmittal.

2.03 SAMPLES

A. Samples shall be of the actual article(s) to be furnished.

B. Submit four (4) samples to the Owners Representative for review. Two (2) samples shall be returned to the contractor and two (2) shall be retained by the Owners Representative.

C. When specifically acceptable to the Owners Representative the returned sample(s) may be used in the work as an installed item.

D. Construct the work, or re-submit in accordance with the Owners Representative's review.

2.04 COLORS AND PATTERNS

A. As required in related sections of these Specifications, submit actual color chips of specified colors and patterns as applicable to the actual material proposed for use in the work. Submit quantity as noted in "SAMPLES" above.

2.05 MANUALS

A. Submit four (4) copies of all required manuals.

B. Unless specified elsewhere, all manuals shall be bound in identical plastic binders approximately 8.5" x 11" in size and shall contain at least the following:
   1. Label on the front cover and binding edge stating general nature of the manual
   2. Neatly typed table of contents.
3. Complete instructions regarding operation and maintenance of all equipment to be furnished as part of the work.
4. Complete list of replaceable parts with part numbers and name and address of nearest supplier.
5. Copies of all guarantees and warranties issued.
6. Copies of reviewed shop drawings.
7. Photographs of exposed work before final covering, if required by the Owners Representative.

C. When the manual includes manufacturer's catalog "cut-sheets", clearly indicate the actual items installed in the project.

PART 3 EXECUTION

3.01 SUBMITTAL ORGANIZATION

A. Unless otherwise directed by the Owners Representative, organize all submittals in categories by specification section number from which the submittal was requested and submit all at one time in format as described in "MANUALS" above.

B. Owners Representative reserves the right to reject incomplete or partial submittals.

3.02 SUBMITTAL REVIEW

A. Contractor shall sign or stamp all submittals as verification that the submittal complies with the Contract Documents.

B. The Owners Representative shall review all submittals and respond with one of the following markings:
   1. No Exceptions Taken
   2. Furnish as Corrected
   3. Revise and Resubmit

C. The Owners Representative’s review of submittals shall not relieve the contractor from responsibility for deviations from the Constructions Documents unless the contractor has called the Owner Representative’s attention to such deviations and secured written acceptance, nor shall it relieve the contractor from the responsibility for errors and/or omissions in shop drawings or other data.

3.03 RESUBMITTAL REQUIREMENTS

A. General:
   1. The contractor shall make all submittals in advance of scheduled dates of installation to provide ample time for Owners Representative’s review, for possible revision and re-submittal, placing orders, necessary delivery lead times and for delivery to project site.
   2. In scheduling, the contractor shall allow at least ten full working days for the Owner Representative’s review following receipt of the submittal. If a submittal is time sensitive, the contractor shall clearly indicate this on the submittal and the Owners Representative shall make all reasonable effort to review the submittal and respond by the time it is needed.

B. Financial impact of delays due to contractor’s tardiness of submittals will be backcharged as necessary to the contractor and shall not be at the temporal or financial expense of the Owner.

END OF SECTION
REFERENCES

PART 1 GENERAL

1.01 SUMMARY

A. This section covers abbreviations, definitions, and the general requirements for regulatory requirements pertaining to the work. This section shall be supplementary to all other abbreviations, definitions, and regulatory requirements mentioned or references elsewhere in the Contract Documents.

B. Scope of work:
   1. Reference Standards
   2. Abbreviations
   3. Definitions

C. Related sections can include, but may not be limited to the following:
   1. All applicable sections of the Specifications.

1.02 REFERENCES AND REGULATORY REQUIREMENTS

A. Refer to latest editions of the references stated herein.

B. Work shall comply with the requirements of all applicable codes, laws, rules, regulations, and standards of applicable code enforcing authorities. Nothing in the drawings or specifications shall be constructed to permit work not conforming to the applicable laws, ordinances, rules, and regulations. In case of conflicts between code requirements, the most restrictive shall apply; except that where the requirements of these Specifications exceed code requirements, the Specifications shall govern. The following codes and specifications are hereby referenced and considered part of these Contract Documents.


F. California Mechanical Code (Uniform Mechanical Code, with California Amendments), current edition

G. California Plumbing Code (Uniform Plumbing Code, with California Amendments), current edition

H. California Electrical Code (National Electrical Code, with California Amendments), current edition

I. California Fire Code (International Fire Code, with California Amendments), current edition


L. American Association of State Highway and Traffic Officials.
N. Occupational Safety and Health (ACT) Standards.
O. Other statutes, ordinances, laws, regulations, rules, orders and codes specified in other sections of the Specifications or bearing on the work.
P. State and Local Public Health Codes.
R. Safety Orders of Division of Industrial Safety.
U. Americans with Disabilities Act (ADA).

1.03 ABBREVIATIONS

Abbreviations for numerous common references, terms and materials used throughout the specifications include:

- AA Aluminum Association
- AAMA Architectural Aluminum Manufacturers Association
- AAN American Association of Nurserymen
- AASHTO American Association of State Highway and Traffic Officials.
- ACI American Concrete Institute
- AEIC Association of Edison Illuminating Companies
- AFI Air Filter Institute
- AIA American Institute of Architects
- AIEEE American Institute of Electrical and Electronic Engineers
- AISC American Institute of Steel Construction
- AJCHN American Joint Committee on Horticultural Nomenclature
- AMCA Air Moving and Conditioning Association
- ANSI American National Standard Institute
- APA American Plywood Association
- APWA American Public Works Association
- ARI American Refrigeration Institute
- AHSRAE American Society of Heating, Refrigeration and Air Conditioning Engineers
- ASLA American Society of Landscape Architects
- ASME American Society of Mechanical Engineers
- ASSE American Society of Sanitary Engineering
- ASTM American Society for Testing and Materials
- AWI Architectural Woodwork Institute
- AWPI American Wood Preservers Institute
- AWS American Welding Society
- AWWA American Water Works Association
- BC Bottom of Curb
- BFP Backflow Preventer
- BOC Back of Curb
- CB Catch Basin
- CL Center Line
1.04 DEFINITIONS

Reference to Drawings: Where the words "shown", "indicated", "detailed", "noted", "scheduled". or words of similar import are used, it shall be understood that reference is made to the Drawings accompanying these Specifications, unless otherwise noted.
Addendum: The word "Addendum" shall mean written and/or graphic modifications to the contract documents provided to holders of the Contract Documents prior to the opening of bids. Addenda shall be issued by the Owners Representative.

Alternates: The word "Alternates" shall be understood to mean alternate products, materials, equipment, systems, methods, units of work or elements of the construction, which may, at the Owners option and under the terms established by the Contract Documents, be added to, or deleted from the work.

Approvals: The words "approved", "approval", "acceptable", "acceptance", shall mean acceptance by the Owners Representative is required.

Contract Change Order: The words "Contract Change Order" shall mean a change order authorization to the contractor, covering changes to the Contract found by the Owner Representative to be necessary for the proper completion or construction for the whole work required by the Contract, and establishing the basis of payment and/or time adjustments for the work affected by the changes, also sometimes referred to as a "Change Order".

Contract Documents: The words "Contract Documents" shall mean the documents contained within the General Conditions, Special Provisions of the Contract, the Drawings, the Specifications, all Addenda, Change Orders, clarifications and other modifications issued by the Owners Representative prior to and after execution of the Contract.

Directions: The words "directed", "designated", and "selected", shall mean the directions, designations, selection, of the Owners Representative, unless otherwise noted.

Drawings: The word "Drawings" shall mean the official project bid or construction plans, plan details, profiles, typical cross sections, working drawings, shop drawings, supplemental drawings, and/or reproductions thereof, accepted or issued by the Owners Representative, which show the locations, character, dimensions, and details of work to be performed. All such documents are to be considered as a part of the Drawings.

Equals: The words "or equal", "equal to", "approved equal", "or approved equal" and "equivalent", shall mean "equal to or acceptable in the opinion of the Owners Representative," unless stated otherwise.

Language: Words and phrases requiring an action or performance, such as "perform", "provide", "install", "furnish", "connect", "test", "coordinate", and words and phrases of similar import, shall be understood to be preceded by the phrase "The contractor shall" unless otherwise stated.

Modifications: The word "modifications" shall mean a written amendment to the Contract signed by both parties, a Change Order, a written interpretation issued by the Owners Representative or a written order for a minor change in the work issued by the Owners Representative.

Notice To Proceed: The words "Notice to Proceed" shall mean the written notice issued by the Owners Representative to the contractor fixing the date on which or within which dates the contractor shall start to perform the contractor’s obligations under the Contract Documents.

Perform: The word "perform" shall mean that the contractor, at his expense, shall perform all operations including necessary labor, tools, and equipment and further including the furnishing and installation of materials that are indicated, specified, and required to complete such the conditions of the Contract and Contract Documents.

Project: The word "project" shall mean the total construction of the work performed under the Contract Documents.

Provide: The word "provide" shall mean that the contractor, at his expense, shall furnish and install the work, complete in place and ready for use, including furnishing of necessary labor, materials, tools, equipment and transportation.
Required: The word "required" shall mean "as required to properly complete the work and as required and acceptable to the Owner’s Representative" unless otherwise noted.

Shop Drawings: The words "shop drawings" shall mean drawings, diagrams, schedules, and other data specifically prepared for the work by the contractor or his sub-contractor, manufacturer, supplier, or distributor to illustrate some portion of the work.

Site: The words "Site" or "Sites" shall be understood to mean the property or properties described within the Contract Documents and indicated on the Drawings where the work shall commence.

Substantial Completion: The words "substantial completion" shall mean the time and date when the work, or designated portion thereof, is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the work, or designated portion thereof, for the use for which it was intended, as evidenced by the Owner’s Certificate of Substantial Completion. The Certificate of Substantial Completion shall set forth the date on which Substantial Completion is deemed by the Owners Representative in its sole discretion to have occurred. This shall occur only when the site improvements are 100% complete and shall exclude correction of final punch list items(s) and the execution of the Landscape Maintenance Period. The issuance of a Certificate of Substantial Completion shall signify the date on which the accounting of Contract "Working Days" or "Calendar Days" is terminated insofar as they may relate to Liquidated Damages.

Work: The word "work" whether capitalized or in lower case, shall be understood to mean labor, materials, or both, and the entire construction encompassed by the Contract Documents.

PART 2 PRODUCTS - Not Applicable
PART 3 EXECUTION - Not Applicable

END OF SECTION
SECTION 0145 00
QUALITY CONTROL

PART 1    GENERAL

1.01 SUMMARY

A. Materials furnished and work performed under the Contract shall be subject to review by the Owner’s Representative. The contractor shall be held strictly to the requirements of the Contract Documents with regard to quality of materials, workmanship, and diligent execution of the Contract. Such review may include mill, plant, shop, or field review as deemed necessary.

B. Scope of work:
1. Work performed in the absence of any prescribed inspection or observation may be subject to removal and replacement. In such a case, the entire cost of removal and replacement shall be borne by the contractor, regardless of whether the work removed is found to be defective or not.
2. Testing, inspection, or other related services shall be performed by an independent consultant, testing laboratory or services selected by the Owner’s Representative.
3. Furnish labor necessary to obtain and handle testing samples at the project site or at other locations.

C. Related sections can include, but may not be limited to the following:
1. All applicable sections of these Specifications.

1.02 REFERENCES AND REGULATORY REQUIREMENTS

A. Control of Work: Conform to Section 5 of the State Standard Specifications.
B. Control of Materials: Conform to Section 6 of the State Standard Specifications.

PART 2    PRODUCTS

2.01 INSPECTION AND TESTS:

A. Inspections, observations and/or testing that may be required by the Contract Documents during progress of the work shall be made by a pre-qualified, independent testing agency selected and paid for by the Owner’s Representative. When tests indicate non-compliance, the contractor shall pay all direct and indirect costs of subsequent re-testing until compliance is established.

B. Costs associated with testing, inspections and observations due to the following shall be the responsibility of the contractor:
1. Re-testing due to failure of initial samples
2. Unacceptable changes in sources, lots, or suppliers of materials after original testing established compliance
3. Changes in methods or materials of construction by contractor that require testing, inspection or other related services in excess of that require by original design
4. Failure to properly notify the Owner’s Representative at critical stages of construction
5. Requesting testing, inspection, and/or observation of work not ready

2.02 TOLERANCES

A. Tolerances not specifically identified shall meet the written standards and/or recognized commercial tolerances established for the specific materials or product. Refer to Section 01 42 00 - References.
PART 3 EXECUTION

3.01 EXAMINATION OF CONDITIONS

A. Prior to installing any portion of the work, the contractor shall examine the site and verify that site conditions are acceptable to begin work of each section.

B. Verify that work specified elsewhere has been completed to an appropriate stage to begin work of each section.

C. Materials or products requiring installation under the supervision or inspection of a specific materials manufacturer or manufacturer’s representative shall be examined and/or tested, and accepted in writing, by such representative(s) prior to installation of work.

D. Notify the Owner’s Representative immediately in writing of any irregularities or unacceptable conditions and re-direct work to avoid delay.

E. Start of work by contractor shall indicate contractor’s acceptance of site conditions.

END OF SECTION
CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.01 SUMMARY

A. Scope of work: Provide construction facilities and temporary controls required for the performance of the work, which may include, but are not necessarily limited to, the following:
   1. Temporary utilities
   2. Enclosures, barricades, and fences
   3. Fire protection
   4. Protection of work
   5. Bottled water

B. Related sections can include, but may not be limited to the following:
   1. All pertinent sections of the specifications

1.02 SELECTED REFERENCE AND REGULATORY REQUIREMENTS

A. National Fire Protection Association (NFPA):
   1. 10 - Portable Fire Extinguishers.
   2. 241 - Safeguarding Building Construction and Demolition Operations.


1.03 UTILITY SERVICES

A. Power and Lighting: Furnish, install, and maintain temporary wiring, poles, meter board, service entrance switch, lamps, and equipment as necessary to provide temporary lighting and power for the construction site.
   1. Pay all costs for temporary electrical systems required for construction.
   2. Source of power shall be at location on site acceptable to the Owner’s representative. Required temporary transmission lines shall be arranged by contractor in conjunction with the appropriate utility company.

B. Water:
   1. Install temporary piping and valves downstream from permanent (new) meter locations as acceptable to the Owner’s representative. No temporary water services shall be installed prior to meter installation without prior Owner review and acceptance.
   2. Temporary water facilities shall be installed with an acceptable reduced pressure backflow prevention unit furnished and installed by the contractor.
   3. Locate temporary sources of water route, and construct pipelines so that they do not create a hazard or interfere with public access, traffic, or construction operations.
   4. Design and construct such pipelines.

C. Utility Costs for Contractors:
   Distribution of temporary utility services to sub-contractors shall be contractor’s responsibility and cost.

1.04 SANITARY FACILITIES

A. Provide, install and maintain, through duration of the work, temporary sanitary facilities for use of construction personnel.
   1. Sanitary facilities shall be provided, maintained with supplies as required for the number...
of construction personnel in compliance to local regulations.

2. Locate such facilities a reasonable distance from all working areas.

B. Provide weather tight and floored structures, maintained in clean and sanitary condition acceptable to the Owner’s representative.

C. New or existing restroom facilities shall not be used by construction personnel except with written permission from the Owner.

1.05 STORAGE ENCLOSURES

A. Provide sheds and enclosures necessary for storing applicable materials and equipment.

B. Enclosures shall be conveniently located, substantially and neatly constructed, and weather tight.

C. Store and protect products in accordance with manufacturer’s instructions, with seals and labels intact and legible.

D. For exterior storage of fabricated products, place on sloped supports, above ground.

E. Provide off-site storage and protection when site does not permit on-site storage or protection.

F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation or potential degradation of product.

G. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent contamination by foreign matter.

H. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.06 MAINTENANCE OF CONSTRUCTION FACILITIES

A. All facilities shall be provided and maintained by the contractor in accordance with Cal-OSHA and applicable laws and ordinances.

1.07 SECURITY

A. Employment of a watchman for non-construction hours shall be left to the discretion of the contractor, who shall be fully responsible for any theft or damage to any material, equipment or to portion of the work until Project Final Acceptance. Such security service shall be paid for by the contractor.

B. All site security shall be the responsibility of the contractor.

C. Contractor is strongly encouraged to provide site security during installation and curing of the track surfacing in order to prevent damage to surfacing.

1.08 FIRE PROTECTION

A. Take precautions to prevent and eliminate fire hazards. The contractor shall be responsible for providing, maintaining, and enforcing any necessary or required fire prevention safeguards until Project Final Acceptance.
B. Provide fire extinguishers on the premises during the course of construction of the type and sizes recommended by the NFPA 10 and NFPA 241 to control fires resulting from the particular work being performed. Instruct employees in their use. Place extinguishers in the immediate vicinity of the work being performed, ready for use.

C. Fire Inspection: The contractor’s superintendent shall inspect the entire project as necessary to make certain the required precautions are being adhered to.

D. Combustible and/or flammable Building Materials: Only an appropriate working supply of flammable fuel or building materials shall be located inside of any storage facility.

E. During the use of hazardous equipment, such as acetylene torches, welding equipment, bitumen kettles, and similar devices, no work shall start or equipment used unless fire extinguishers of specified type and capacity are placed in the working area and available for use by workmen using such hazardous equipment.
   1. Extinguishers shall meet standards established by Underwriter's Laboratory, and shall be inspected at regular intervals and recharged by the contractor as necessary.

F. Combustible and/or flammable Waste Materials. Oil-soaked rags, papers, and other highly combustible materials must be stored in closed metal containers with tightly-hinged lids at all times, and shall be removed from the site at the close of each day’s work and more often when necessary.

1.09 BARRICADES

A. Furnish or construct fences, barricades, railing, warning lights, lights and other barricades required by law, Contract Documents, common sense or to ensure public safety.

B. Give adequate warning to the public at all times whenever a dangerous condition exists as the result of construction work. Furnish Owner’s representative with name, address, pager number and local telephone number of the superintendent responsible and at least one other person for the maintenance of barriers, signs, lights and other accident prevention devices for evenings and weekends.

1.10 PROTECTION OF WORK AND FACILITIES

A. Protect adjacent property, roads, streets, curbs, planting areas, erosion control materials and other improvements during construction operations. All damaged materials shall be replaced and/or repaired at the expense of the contractor and to the satisfaction of the Owner’s representative.

B. Protect installed work and provide special protection where applicable.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. All new turf areas shall be fenced off during turf establishment and specified Landscape Maintenance Period subject to the discretion of the Owner’s Representative.

E. Contractor shall install temporary construction fencing per contract documents and place signage on the fence stating “Construction Area – Keep Out” and “No Trespassing”. Signs shall be located along fence every 75’.

1.11 VEHICULAR SAFETY

A. All motorized and/or self-propelled construction equipment shall be equipped with a reverse signal alarm (hub-cap type).
1.12 **FIRST AID**

A. Provide and maintain first aid supplies as required Cal-OSHA and applicable local ordinances. Make arrangements with local emergency center and nearest hospital to receive personnel requiring medical attention, including emergencies. Such information shall be conspicuously displayed at the construction office when an office is required on the project.

1.13 **ACCESS ROADS & PARKING AREAS**

A. Construct, designate and maintain specific vehicular access as required for the orderly progress of the work. Engineer construction access roads and parking areas as necessary to provide suitable support during all weather conditions for anticipated loads, including municipal fire apparatus. Provide adequate surface drainage without interrupting natural flow of existing drainage.

B. Provide designated parking areas for use by construction personnel and Owner’s representative(s) such parking areas are subject to the discretion of the Owner’s representative.

C. Restore temporary vehicular access and parking areas to original or specified conditions prior to Project Final Acceptance.

1.14 **HAUL ROUTES**

A. Comply with any and all local governing ordinances and guidelines.

1.15 **MAINTENANCE AND REMOVAL**

A. Maintain temporary facilities and controls as long as needed for safe and proper completion of the work. Coordinate removal of temporary facilities with the Owner’s representative.

B. After removal of temporary facilities, restore grounds or buildings which have been damaged or disturbed back to an “as was” or better condition subject to the discretion of the Owner’s representative.

1.16 **Storm Water Pollution Prevention Plan (SWPPP)**

A. Contractor shall be required to adhere to the project’s SWPPP that is provided within these contract documents.

**PART 2 PRODUCTS - Not Applicable**

**PART 3 EXECUTION - Not Applicable**

END OF SECTION
SECTION 01 57 23

STORMWATER POLLUTION PREVENTION

PART 1 GENERAL

1.01 SUMMARY

A. Construction shall adhere with the requirements of the California State Water Resource Control Board, General Permit for Storm Water Discharges Associated with Industrial Activities (General Permit). Project construction is covered under the General Permit WDID# to be determined.

B. The project Stormwater Pollution Prevention Plan (SWPPP) applies to operations within the limits of work and adjacent points of discharge that may be outside the limits of work. The SWPPP describes the proposed facilities, identifies potential sources of pollution and recommends appropriate Best Management Practices (BMPs) to reduce the discharge of pollutants. The contractor shall be strictly held to the requirements of the General Permit and shall provide the services of Qualified Stormwater Practitioner (QSP) as the agent to the District, who is the Legally Responsible Person (LRP).

C. Scope of work:
Provide such work to satisfy the requirements of the General Permit including but not limited to:
1. Qualified Stormwater Practitioner (QSP) services.
2. Install, adjust and maintain all necessary; BMPs, non-stormwater pollutants, safe storage, hazardous material controls and construction activities to protect discharge with best available technology.
3. Monitoring, testing and action plans as required by the project SWPPP Document.
4. Amend the SWPPP whenever there is a change in construction or operations that will affect the discharge of pollutants, or change in schedule delaying completion of grading activities beyond completion date identified in the project SWPPP.
5. All necessary data entry submit documentation to the Storm Water Multiple Application and Report Tracking System (SMARTS) during construction and closeout.

D. Related sections can include, but may not be limited to the following:
1. Section 01 50 00 - Construction Facilities and Temporary Controls
2. Section 02 41 00 - Site Clearing and Demolition
3. Section 31 20 00 - Earthwork
4. Section 33 40 00 - Storm Drainage

1.02 REFERENCES AND REGULATORY REQUIREMENTS

A. California State Board of Water Resources Construction General Permit Order 2009-0009-DWQ

B. SWPPP Document WDID# to be determined.


1.03 MONITORING AND TESTING:

A. Monitoring, testing, and action plans documentation required by the project SWPPP Document, and/or as required by the General Permit.

PART 2 PRODUCTS – not applicable

PART 3 EXECUTION
3.01 PREPARATION, MONITORING AND DOCUMENTATION

A. Prior to installing any portion of the work, the contractor shall examine the site and verify that site conditions are acceptable to begin work.

B. Prior to grading and demolition operations, the contractor shall install and manage all necessary BMPs with best available technology, making all necessary adjustments for the duration of construction.

C. Contractor shall be responsible for all necessary, modifications and additions to the BMPs and site conditions to meet the requirements of the General Permit at no additional cost to the District.

D. Regardless of construction schedule or weather conditions, it shall be the contractor’s responsibility to; provide all necessary measures, adjust BMPs, protect discharge from pollutants and take necessary actions should numeric action levels be triggered, at no additional cost to the District.

E. Contractor shall provide QSP to conduct all monitoring and testing and prepare action plans as required by the project SWPPP.

F. The contractor shall amend the SWPPP and prepare the COI whenever there is a change in construction or operations that will affect the discharge of pollutants or change in schedule that will delay completion of grading activities beyond completion date identified in the project SWPPP.

G. Contractor shall prepare, track and submit all necessary documentation to SMARTS during construction and closeout. This shall include filing all required Ad Hoc reports, Annual Reports, and the Notice of Termination on the SMARTS site.

END OF SECTION
PART 1 GENERAL

1.01 SUMMARY

A. Scope of work:
   1. Wherever in the Contract Documents a material, article, or process is indicated or specified by trade, patent, proprietary name, or name of manufacturer, such specification shall be deemed to be followed by the words, "or equal, as accepted in writing by the Owner’s representative".
   2. The naming of more than one manufacturer in a section does not imply that all products produced by such manufacturers are acceptable for use on the project. Where more than one proprietary name, process, product, etc. is specified, the contractor may provide materials or equipment of any one of the manufacturers specified, only if full compliance with other portions of the Contract Documents can be provided and the product is acceptable to the Owner’s representative.

B. Related sections can include, but may not be limited to the following:
   1. Section 01 33 00 - Submittals
   2. All other applicable sections of the Specifications

1.02 MATERIALS

A. Unless otherwise specifically provided in the Contract Documents, all equipment, material, and articles incorporated into the work shall be new and suitable for the purposes intended.

B. Reference to any equipment, material, article or patented process, by trade name or catalog number shall not be construed as limiting competition. Specifications designating a material, product, or service by specific brand or trade name, with only one name listed is:
   1. Required to be used since it is a unique product application
   2. Used as a standard of quality which must be satisfied without compromise
   3. The only brand or trade name known to the Owner’s representative

1.03 SUBSTITUTIONS

A. Materials and equipment for the work shall be the standard product of a manufacturer regularly engaged in the production of such materials and equipment. Product options or substitutions shall not be the basis for any price increase above the original bid price for the Contract.

B. Substitutions which are equal in quality, efficiency, durability and utility to those specified will be permitted, subject to the following provisions:
   1. All substitutions must be favorably reviewed and accepted by the Owner’s representative in writing prior to implementation.

C. Submit to the Owner’s representative, not later than twenty (20) working days from date of Notice To Proceed, a typewritten list containing a thorough side-by-side description of each proposed substitute item or material compared with the specified item as specified in Section 01 33 00.
   1. Provide sufficient data, drawings, samples, literature and other detailed information which demonstrates to the Owner’s representative that the proposed substitute is equal in quality, operating efficiency, and durability of the material specified.

D. The Owner’s representative shall review such proposed substitutions and determine if a substitution
is acceptable.

E. Favorable review shall not relieve the contractor from complying with the requirements of the Contract Documents, and the contractor shall be responsible for all expenses for any changes resulting from acceptable substitutions which affect other parts of the work.

F. Failure of the contractor to submit proposed substitutions for review in the manner specified shall be sufficient cause for rejection by the Owner’s representative of any substitutions otherwise proposed.

G. Failure to place orders for specified equipment or material sufficiently in advance of the scheduled date of installation shall not be considered a valid reason upon which the Contractor may base a request for any substitutions or for any deviations from the Contract Documents.

H. The first or only named manufacturer is the basis for the project design and the use of alternative-names, second-names, or unnamed manufacturer’s products may require modifications in the project design and construction.
   1. Costs incurred due to requests, changes or revisions resulting from substitutions requiring drawings or services of the Owner’s representative or project consultants to facilitate purchase, installation or erection of any portion of the work, shall be borne by the contractor. A flat hourly rate, as agreed upon, shall be paid by the contractor whether the change is accepted or not. This fee shall be deducted, and paid, from Contract moneys due to the contractor as determined by the Owner’s representative.

I. Contractor shall furnish full information concerning the material or articles being proposed for substitution.
   1. Testing of a proposed substitute material to assure compliance with the Specifications may be required by the Owner’s representative at the contractor’s expense.
   2. Samples shall be submitted for review as specified in Section 01 33 00.
   3. Equipment, material, and articles installed or used by the contractor without required review, shall be at the contractor’s risk.

J. Substitutions shall comply with or exceed all requirements of size, function, structure, durability, and appearance without exception.
   1. Use of accepted substitutions shall in no way relieve the contractor from responsibility for compliance with the Contract Documents after installation.
   2. The contractor shall assume all extra costs caused by the use of such substitutions where they affect other work or trades.

1.04 SUBSTITUTION REQUEST FORM

A. All requests for alternate materials or substitutions shall be submitted on the attached Substitution Request Form with descriptive information outlining the equivalent characteristics of the alternate product or material.

PART 2 PRODUCTS - Not applicable.

PART 3 EXECUTION

3.01 SUBSTITUTION REQUEST FORM

A. For all proposed substitutions, the contractor shall complete the attached Substitution Request Form, attach all substantiating back-up literature and submit to the Owner’s representative within time limit specified above.

END OF SECTION
ATTACHMENT: Substitution Request Form
SUBSTITUTION REQUEST FORM

DATE:

TO: OWNER’S REPRESENTATIVE

PROJECT NAME:

SPECIFIED ITEM: Section _____ Page _____ Item Number _____ Paragraph

DESCRIPTION:

The undersigned requests consideration of the following:

PROPOSED SUBSTITUTION: (put N/A where not appropriate)

Manufacturer:__________________ Color:

Model Number:__________________ Material:

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the requests; applicable portions of the data are clearly identified.

Attached data also includes description of changes to Contract Documents which the proposed substitution requires for proper installation.

The undersigned states that the following paragraphs, unless modified on attachments, are correct:

1. The proposed substitution does not affect dimensions shown on Drawings. If, in fact, it does affect dimensions, the contractor shall provide shop drawings, accurately showing changes to documents.
2. The undersigned shall pay for changes to the design, including engineering design, detailing, and construction costs caused by the requested substitution.
3. The proposed substitution shall not adversely affect other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts are locally available for the proposed substitution.

The undersigned further states that the function, appearance, and quality of the proposed substitution are equivalent or superior to the specified item.

Submitted by:

Signature:_________________________ Title:__________________________

RAY PARK TURF REPLACEMENT PROJECT
Verde Design JOB NO. 1801800
01 62 00 - 4
OWNER'S REPRESENTATIVES REVIEW:

* NO EXCEPTIONS TAKEN     * EXCEPTIONS TAKEN (SEE ATTACHED COMMENTS)

* FURNISH AS CORRECTED    * REVISE AND RESUBMIT

By: ___________________________________

Date: _________________________________

Comments:

Attachments:
SECTION 01 70 00

CONFORMANCE SURVEYING

PART 1 GENERAL

1.01 SUMMARY

A. Conformance Surveying work shall be completed by a Licensed Surveyor and be based on established site bench marks, monuments, lines, and levels necessary for the work covered by this Contract.

B. Scope of work:
Providing conformance surveying required for proper completion of the work may include, but may not be limited to:
1. Natural turf field construction
2. Other applicable project components.

C. Related sections can include, but may not be limited to the following:
1. Section 01 33 00 – Submittals
2. Section 01 71 23 – Field Engineering
3. Section 01 78 39 – Record Drawings
4. Section 31 20 00 – Earthwork
5. Section 32 11 00 – Base Courses
6. Section 32 12 16 – Asphalitic Concrete Paving
7. Section 32 90 00 – Landscaping

1.02 SUBMITTALS

A. Contractor will be required to submit three (3) hard copies and one (1) electronic copy (in AutoCAD or scaled PDF image) of all conformance surveys for the project. The Contractor shall ensure that all survey data is completed with the supervision of a licensed surveyor. The Owner Representative shall provide a written response within two (2) working days of receipt of said drawings and identify any areas out of tolerance.

1.03 QUALITY CONTROL AND REWORK

A. Any portion of the survey that does not conform to the grading tolerance requirements identified in this specification section will be corrected by the Contractor. Areas out of conformance will be resurveyed at the Contractor’s sole expense (following the identical procedure stated above) by the Surveyor, and these revised points shall be added to the original digital file for resubmittal, review and acceptance by the Owner Representative.

B. All delays and costs incurred due to grades out of conformance are the sole responsibility of the Contractor. At any point during construction following acceptance of any portion of the survey by the Owner, the Owner reserves the right to recheck the surface grades (at no cost to the Contractor) to verify it is still in conformance. It is the Contractor’s responsibility to protect the grading and compaction tolerances of the surveyed surface after conformance surveying operations are complete and accepted, and prior to installation of any subsequent materials. Any work identified by the survey that is outside of the acceptable tolerances shall be corrected by the Contractor at its sole expense.

PART 2 PRODUCTS - Not Applicable

PART 3 EXECUTION
3.01 LAYING OUT THE WORK

A. Contractor shall employ a Registered Civil Engineer or Licensed Land Surveyor (hereafter referred to as Surveyor) to perform any conformance surveying work required by the Contractor.

B. Prior to beginning work, Contractor shall secure the electronic grading plan from the Owner or Architect for use by the Surveyor. The surveyor shall provide all conformance survey drawings. The drawings shall provide both the design elevations and the as-constructed spot elevations. These elevations shall be for comparison to those on the contract documents for the same location. Contractor shall also show the difference in these two numbers. In addition, unique reference numbers shall be assigned to each point for reference purposes. For spacing requirements, refer to specific type of improvement identified in this specification section.

C. Accuracy of all surveys provided in this section shall be to 0.01 feet.

D. The surveyor shall provide all conformance survey drawings and all 25’ grid or other grid conformance grades based on the grading plans designed grades.

3.02 NATURAL TURF (native soil) ATHLETIC FIELD CONFORMANCE SURVEYING REQUIREMENTS

A. PRE-TURF INSTALLATION: Upon successful installation of the edges of the natural turf transition edges and the installation of irrigation, drainage, and other various utility systems, as well as the final soil amendment incorporation and fine grading, the Contractor shall be responsible for verifying the proper horizontal and vertical controls of the prepared rootzone. This quality control process does shall be completed by a licensed surveyor. The field natural turf area shall be shot using laser surveying equipment capable of accuracy to 0.01 feet, and shall be shot on a maximum 25 foot spacing. The survey results shall be deemed acceptable when the results show that the field has no field surveyed grade points greater than ¾ inch (0.06 feet) outside its design grade elevation. Any repairs and/or corrections made after the survey has been completed will require those affected areas to be resurveyed at the Contractor’s sole expense.

B. POST-TURF INSTALLATION: Upon acceptance of the pre-turf installation conformance survey, Contractor shall install the specified turf material. If directed by the Owner, the Contractor shall survey the turf prior to final acceptance as outlined above to ensure the turf areas are in contract compliance.

END OF SECTION
SECTION 01 71 23

FIELD ENGINEERING

PART 1  GENERAL

1.01 SUMMARY

A. Layout work as shown on the Drawings with the use of a Licensed Surveyor and establish additional bench marks, monuments, lines, and levels necessary for the work covered by this Contract.

B. Scope of work:
Provide such field engineering services required for proper completion of the work which may include, but is not limited to:
1. Establishing and maintaining hubs, coordinate grid base lines and levels
2. Structural design of shores, forms, and similar items provided by the contractor as part of his means and methods of construction
3. All excavations and elevations, footings and piers required for installation of work items
4. Establishing horizontal and vertical control for site construction items

C. Related sections can include, but may not be limited to the following:
1. Section 01 33 00 - Submittals
2. Section 01 78 39 – Project Record Drawings

1.02 PROCEDURES

A. In addition to procedures directed by the Owner for proper performance of the work, the contractor shall:
1. Locate and protect control points before starting work on the site
2. Preserve permanent reference points during progress of the work
3. Not change or relocate reference points or items of the work without specific review and acceptance by the Owner’s Representative
4. Promptly advise the Owner’s Representative when a reference point is lost or destroyed, or requires relocation because of other changes in the work.
   a. Upon direction of the Owner’s Representative, replace reference stakes or markers according to the original or appropriate survey control.

PART 2  PRODUCTS - Not Applicable

PART 3  EXECUTION

3.01 LAYING OUT THE WORK

A. Contractor shall employ a Registered Civil Engineer or Licensed Land Surveyor (hereafter referred to as Surveyor) to lay out the entire work and set grades, lines, levels, and positions throughout the site.

B. Prior to beginning work, locate or set all general reference points, bench marks, establish monuments and take action as necessary to prevent their destruction, then layout all lines, elevations and measurements for entire work.

C. Verify figures and dimensions shown on the Drawings, notify the Owner’s Representative immediately of any discrepancies and re-direct work to avoid delay. Contractor shall accept responsibility for all errors resulting from failure to notify Owner’s Representative of known discrepancies.

D. Establish monuments on curbs, manholes or pavements with concrete embedded steel pipe with lead plug and/or brass nail with washer, as acceptable to the Owner’s Representative.
E. Show exact locations of the monuments if any are disrupted or destroyed on the Record Drawings in conformance with Section 01 78 39 – Project Record Drawings.

END OF SECTION
SECTION 01 77 00

CONTRACT CLOSE-OUT

PART 1  GENERAL

1.01  SUMMARY

A.  Scope of work:
This section specifies administrative and procedural requirements for project close-out, that may include but are not necessarily limited to:
1.  Inspection and/or observation procedures
2.  Project record document submittal
3.  Operating and maintenance manual submittal
4.  Warranty submittal
5.  Final cleaning

B.  Related sections can include, but may not be limited to the following:
1.  All pertinent Sections of the Specifications

1.02  SUBSTANTIAL COMPLETION

A.  Refer to the General Provisions as applicable, and section 01 42 00 for procedures required to establish Substantial Completion.
1.  Final, regular Certificate for Payment (progress payment) shall be issued when all pertinent requirements of the achieving Substantial Completion are met.  Final retention payment shall be made after project Final Acceptance and conclusion of any specified Landscape Maintenance Periods subject to the discretion of the Owner’s representative.

B.  Inspection Procedures:  Upon receipt of a request for inspection or observation, the Owner’s representative shall either proceed or advise the Contractor of unfilled requirements.  The Owner’s representative shall prepare the Certificate of Substantial Completion following review, or advise the contractor of what must be completed or corrected by "punch-list" before the Certificate is issued.  Upon receipt of "punch-list", contractor shall complete all work described in a timely manner subject to the discretion of the Owner’s Representative.
1.  The Owner’s representative shall repeat inspection and/or observation when requested provided the contractor has made the request within the specified lead time and given written assurance that the "punch-list" work has been completed.
2.  Results of the completed inspection and/or observation shall help form the basis of requirements for Final Acceptance and if acceptable, may signal the beginning of the specified Landscape Maintenance Period.

1.03  UNCORRECTABLE WORK

A.  Should the Owner’s representative determine it is not practical or possible for the contractor to correct work that is damaged or improperly executed, an equitable deduction from the Contract sum may be made at the sole discretion of the Owner’s representative.

1.04  CLOSE-OUT SUBMITTALS

A.  Submit two (2) copies of the following, where applicable, in accordance with applicable Contract Documents:
1.  Project record documents (as-constructed)
2.  Operation and maintenance manuals
3.  Warranties, guarantees, and bonds
4.  Keys and keying schedule
5. Spare parts and extra materials
6. Other items required by the Specifications
7. Binder of all manufactured items final submittal information that were installed or provided for the project.

B. Specified number of copies of above close-out submittals shall be received and accepted by the Owner's representative before Final Acceptance shall be given.

C. In addition to those items previously mentioned in this section, the contractor shall submit to the Owner's representative the following items before a Notice Of Completion will be filed:
   1. Up-to-date sub-contractor list with names, addresses and telephone numbers.

D. Final Adjustment of Account:
   1. Submit a final statement of accounting to the Owner's representative showing all adjustments to the Contract sum.

1.05 MAINTENANCE MANUALS

A. Submit two (2) copies of proposed manual(s) to the Owner's representative for review and acceptance. All maintenance manuals shall be received and accepted by the Owner's representative before Final Acceptance shall be given.

B. Organize operating and maintenance data into properly indexed heavy duty 2-inch, 3-ring vinyl covered binders. Mark appropriate identification on front and spine of each binder. Manuals can include but are not limited to the following types of information:
   1. Emergency instructions
   2. Spare parts list
   3. Copies of warranties or actual warranty cards
   4. Wiring diagrams
   5. Recommended "turn around" cycles
   6. Inspection procedures
   7. Shop drawings and product data
   8. Fixture lamping schedule

C. Product submittal items (1.04-A-7) can be provided with warranty information binders.

1.06 DEMONSTRATION

A. Prior to Final Acceptance, the contractor shall fully instruct Owner's representative's designated operating and maintenance personnel in the operation, adjustment and maintenance of all products, equipment, and systems installed.
   1. Provide services of factory trained instructors from the manufacturers of each major item of equipment or system, if necessary or requested by the Owner's representative.

B. Operation and maintenance manual(s) shall be fully described at this instruction meeting.
   1. Review contents of manual(s) with personnel in full detail to explain all aspects of operations and maintenance such as:
      a. Maintenance manuals
      b. Record documents
      c. Spare parts and materials
      d. Tools
      e. Fuels
      f. Identification systems
      g. Control sequences
      h. Hazards
      i. Cleaning
      j. Warranties and bonds
k. Maintenance agreements and similar continuing commitments.

2. As part of instruction for operating equipment, demonstrate the following procedures:
   a. Start-up
   b. Shutdown
   c. Emergency operations
   d. Noise and vibration adjustment
   e. Safety procedures
   f. Economy and efficiency adjustments
   g. Effective energy utilization

1.07 WARRANTY/GUARANTY FORMAT

A. Provide written warranties, guaranties (except manufacturers' standard printed warranties and/or guaranties), addressed to the Owner's representative, in the format shown at the end of this section. Manufacturers' standard printed warranties and/or guaranties shall be submitted as-is.

B. Warranties and guaranties shall be submitted in duplicate, in the attached format, signed by all pertinent parties and by the contractor in every case, with modifications as accepted by the Owner's representative to suit the conditions pertaining to the warranty or guaranty. Collect and assemble written warranties and guaranties into bound booklet form, and deliver bound books to the Owner's representative for review.

1.08 REMOVAL OF TEMPORARY FACILITIES

A. Prior to final inspection, the contractor shall remove tools, materials, sheds, temporary power poles, temporary tree protection, and other articles from the project site. Should the contractor fail to take prompt action, the Owner's representative may, given 30 days written notice, treat them as abandoned property.

1.09 FINAL SITE CLEANING

A. Broom clean and power wash exterior paved surfaces and adjacent public streets. Utilize appropriate cleaning methods to remove spills, stains, tire tracks, etc. from all paved surfaces. Rake clean other surfaces of the site.

B. Hose down and scrub walls and paving surfaces dirtied or stained as a result of the construction work, as directed by the Owner's representative.

C. Remove from the site construction waste, unused materials, excess earth, and debris resulting from the work.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

ATTACHMENT: Warranty/Guaranty Form
WARRANTY/GUARANTY FORM

TO: Margaret Glomstad
Parks and Recreation Director
850 Burlingame Avenue
Burlingame, CA 94010

We, the undersigned, do hereby warranty and guaranty that the parts of the Work described above which we have furnished and/or installed for:

are in accordance with the Contract Documents and that all said work as installed will fulfill or exceed the Warranty and Guaranty requirements. We agree to repair or replace work installed by us, together with any adjacent work which is displaced or damaged by so doing, that proves to be defective in workmanship, material, or operation within a period of one (1) year from the date of Final Acceptance by Owner’s representative or from the date of Certificate of Substantial Completion, whichever is the earlier, at no cost to the Owner, ordinary wear and tear and unusual neglect or abuse excepted.

In the event of our failure to comply with the above-mentioned conditions within a reasonable time period determined by the Owner’s representative, after notification in writing, we, the undersigned, all collectively and separately, hereby authorize the Owner’s representative to have said defective work repaired and/or replaced and made good, and agree to pay to the Owner upon demand all moneys that the Owner’s representative may expend in making good said defective work, including all collection costs and reasonable attorney fees.

Date: _______________________

(Sub-Contractor, Sub-subContractor, Manufacturer or Supplier)

By: _______________________

Title: _______________________

State License No.: _______________________

Local Representative: For maintenance, repair, or replacement service, contact:

Name: _______________________

Address: _______________________

Phone Number: _______________________
SECTION 01 78 39

PROJECT RECORD DRAWINGS

PART 1  GENERAL

1.01  SUMMARY

A.  Scope of work:
   1. Prepare Project Record Drawings of as-constructed conditions as required by various sections of these Specifications and whenever work is installed differently than as shown in the Construction Documents as bid.
   2. Maintain a continually updated Job Set of as-constructed Contract Documents at the job site for review by the Owner’s representative at all times.

B.  Related sections can include, but may not be limited to the following:
   1. Section 32 80 00 - Irrigation
   2. Section 33 40 00 - Storm Drainage
   3. Section 33 11 00 – Domestic Water Systems

1.02  REFERENCES AND REGULATORY REQUIREMENTS

A.  State of California Department of Transportation Standard Specifications, Current Edition

1.03  SUBMITTALS

A.  Submit full Job Set to Owner’s representative for review and acceptance prior to preparation of final Project Record Drawings.

B.  After acceptance, prepare and submit final Project Record Drawings to Owner’s representative at Contract Close-Out. Final Record Drawings shall be received prior to Final Acceptance.

1.04  QUALITY ASSURANCE

A.  Job Set maintenance shall be delegated to one person on contractor’s staff who will be present at all meetings.

B.  Final Record Drawings shall be clearly drafted by a competent draftsperson on reverse-reading erasable sepia mylar sheets

1.05  DELIVERY, STORAGE, AND HANDLING

A.  Store Job Set separate from Construction Document sets in a safe fire-resistant location.

B.  Protect Job Set and completed final Record Drawings from damage at all times.

C.  Maintain all documents in neat, legible condition.

PART 2  PRODUCTS  - Not Used

PART 3  EXECUTION

3.01  MAINTENANCE OF JOB SET
A. Clearly mark the designated Contract Documents as "Job Set."

B. Record all deviations from the "as-bid" Contract Documents onto Job Set daily prior to covering of all work that has deviated.

C. Convert schematic lay-outs to portray precise physical lay-out (including depths) of all exposed and concealed work.

D. Clearly identify deviations by drawing a "cloud" around affected area and make sufficient notations to describe the change.

E. Contractor shall solely bear any cost of uncovering, recording and re-covering work not recorded on Job Set.

3.02 FINAL RECORD DOCUMENTS

A. Submit Job Set for review and acceptance by the Owner's representative prior to preparing final Record Drawings.

B. After acceptance by Owner's representative, the contractor shall cleanly and clearly draft, on the non-erasable side of the sheet, all information contained in the accepted Job Set. The final Record Drawing sheet material shall be as specified above in 1.04 - Quality Assurance. One set of reproducible Drawings shall be provided for the contractor by the Owner's representative at no cost.

C. Deliver the Job Set and mylar final Record Drawings, plus one set of blueline prints of final Record Drawings to the Owner's representative prior to Final Acceptance.

END OF SECTION
SECTIO:N 02 41 00
SITE CLEARING AND DEMOLITION

PART 1  GENERAL

1.01  SUMMARY
A. Furnish all labor, materials, equipment, facilities, transportation and services to complete all site clearing and demolition work plus all related activities as shown on the Drawings and/or specified herein.

B. Scope of work: The general extent of the site clearing and demolition work is shown on the Drawings and can include, but is not necessarily limited to the following:
   1. Demolition, removal and disposal of designated items
   2. Careful removal, protection and re-installation of designated items
   3. Careful removal and salvage of designated items
   4. Disconnection and capping of existing utility and/or irrigation lines
   5. Incidental demolition of abandoned utility and irrigation lines
   6. Spraying until dead, clearing, grubbing vegetated areas and/or roto-tilling in existing turf areas.
   7. Protection of existing plant material
   8. Removal of designated trees and planting areas

C. Related sections can include, but may not be limited to:
   1. Section 31 13 00 - Tree Protection
   2. Section 31 20 00 – Earthwork

1.02  REFERENCES AND REGULATORY REQUIREMENTS
A. State of California Department of Transportation Standard Specifications, Current Edition

1.03  SUBMITTALS
A. Conform to requirements of Section 01 33 00 Submittals and/or applicable Division One and Division Two specifications, General Conditions and Special Provisions.

B. Indicate the proposed time line for site clearing and demolition work including all required shut off times and capping of utility services on the project schedule.

C. Provide product information on herbicides to be used for approval prior to use.

1.04  QUALITY ASSURANCE
A. The Owner shall obtain and pay for all permits required in connection with this work. Fees for the dumping of debris shall be paid for by the Contractor.

1.05  PROJECT CONDITIONS
A. Dust Control:
   1. The contractor shall, at all times, prevent the formation of airborne dust on and around the project site with the use of sprinkled water or other means acceptable to the Owner’s representative. Non-compliance with proper dust control measures shall be grounds for issuance of “stop work” orders by the Owner’s representative until such time as satisfactory measures are implemented.
B. Utility Services:
1. Issue written notices of planned demolition operations to utility companies and coordinate site clearing and demolition improvements as requested by said utility companies.
2. Existing power poles and lines serving existing occupied buildings shall remain. Arrange all necessary work in order to maintain utilities not designated for removal.
3. Coordinate work in order to maintain utilities to any applicable temporary on-site facilities.

PART 2 PRODUCTS

2.01 Herbicides

A. All herbicides shall conform to Owner’s approved chemicals list.

B. Herbicide shall be non-selective broad spectrum systemic herbicide for perennial vegetation and straight contact herbicide for annual vegetation in accordance with a licensed pest control advisor or herbicide manufacturers recommendations.

PART 3 EXECUTION

3.01 EXAMINATION

A. Conform to Section 01 45 00 - Quality Control (as applicable).

B. Carefully identify limits of demolition.

C. Mark project areas as directed by the Owner’s representative and as necessary to clearly identify the interface of items to be removed and items to be left in place intact.

3.02 PREPARATION

A. Protection:
1. Make provisions and take necessary precautions to protect all existing items not designated for removal. Any existing item or area damaged during construction operations shall be replaced or repaired to an “as-was” or better condition at no additional cost to the project and subject to the acceptance of the Owner’s representative.
2. Erect barriers, fences, guard rails, enclosures, chutes, and shoring as necessary to protect personnel, structures, and utilities remaining intact.
3. Provide warning signs and lighting as necessary for vehicular and personnel protection. Maintain warning signs during construction as required by applicable safety ordinances and as reasonably prudent.
4. Coordinate arrangements for items to be salvaged and turned over to the Owner.
5. Notify Underground Service Alert (USA), (800) 642-2444, and local utility companies to verify locations of existing utilities a minimum of 48 hours prior to beginning work.
6. Provide tree protection fencing prior to any demolition work.

B. Traffic Access:
1. Ensure minimum interference with roads, streets, driveways, sidewalk and adjacent facilities.
2. Do not close or obstruct streets, sidewalk, alleys or passageways without acceptance from the Owner’s representative.
3. Provide approved alternate routes around closed or obstructed traffic ways as required by the Owner’s representative.
4. Maintain access to adjacent existing buildings to ensure uninterrupted operations during demolition work.

3.03 DEMOLITION
A. General:
   1. Refer to drawings for extent of demolition work.

B. Paving:
   1. Demolish paving in accordance with local noise ordinance regulations and as acceptable to the Owner’s representative.

C. Filling:
   1. Completely fill below-grade areas and voids resulting from demolition work. Install appropriate, acceptable fill material consisting of soil, gravel or sand, free of trash and debris, stones over 6” diameter, roots or other organic matter. Meet compaction requirements as specified.

D. Other:
   1. If unanticipated mechanical, electrical or structural elements which conflict with intended function or design are encountered, investigate and measure both the nature and extent of the conflict. Submit report to Owner’s representative in written, accurate detail. Pending receipt of directive from Owner’s representative, rearrange selective demolition schedule as necessary to continue overall job progress without delay.

E. Clearing and Grubbing:
   1. Remove trees as shown on Drawings. Removal shall include trunks and roots over one inch (1”) in diameter to a depth of eighteen inches (18”) below subgrade elevations.
   2. Mow all existing turf areas to a height of 1” and remove cuttings.
   3. Prior to site clearing, all existing vegetation (below twelve inches (12”) in height) and turf areas to be removed shall be sprayed with a non-selective broad spectrum systemic herbicide for perennial vegetation and straight contact herbicide for annual vegetation in accordance with a licensed pest control advisor or herbicide manufacturers recommendations.
   4. Allow a sufficient period of time to ensure that all sprayed vegetation is dead (refer to manufacturer’s recommendations).
   5. Irrigation heads, valves, and controllers shall be salvaged and provided to Owner.
   6. Clear/strip vegetative material from soil surface and remove unless noted otherwise. Existing turf areas to be removed shall be pulverized to a minimum six inch (6”) depth. Remaining clods of turf shall be no larger than two inches (2”) in diameter.
   7. Contractor is responsible for stockpiling and protecting all topsoil needed for landscaping improvements. Refer to Earthwork and Landscape Specifications.

G. Utilities and Related Equipment:
   1. The locations of existing utilities, as may be shown on the Drawings, are approximate. Should existing utilities not shown on the Drawings be encountered during construction operations, notify the Owner’s representative immediately, and re-direct work to avoid delay. The Owner’s representative shall then determine what action, if any, is required.
   2. Remove all abandoned utilities as indicated and as uncovered by the work, and terminate in a manner conforming to code.
   3. Remove and salvage designated items and related equipment and deliver to a location acceptable to the Owner’s representative.

H. Underground Piping:
   1. Existing storm drain and irrigation systems, as may be shown on the Drawings, may be modified to allow for construction of new items as a part of this project. Caution shall be exercised so as not to damage underground piping not scheduled for removal.
   2. Remove underground piping as indicated, or as necessary, and backfill to designated compaction density.
   3. Manholes and lines scheduled for removal which connect to active systems shall have their active remaining portions capped, plugged, or blind-flanged as appropriate.
4. Materials used for pipe terminations and temporary connections shall be the same as the existing lines. Fittings and flanges shall be of weight and class suitable for the service in which used.

3.04 SALVAGE

A. Demolition:
   1. Materials or equipment to be demolished shall become the property of the Contractor except for items specified to be salvaged for the Owner.
   2. Carefully remove items to be salvaged to avoid damage.
   3. Irrigation heads, valves and existing controller shall be salvaged and provided to Owner. Contractor shall clean and box items. Items shall be returned to Owner corporation yard.

B. Replacement:
   1. In the event items not scheduled to be demolished are damaged, promptly replace or repair such items to an as-was or better condition per the discretion of the Owner’s representative at no additional cost.

C. Materials scheduled for removal shall not be placed on view to prospective purchasers or sold on site.

3.05 CLEANING

A. Debris and Rubbish:
   1. Remove and transport debris and rubbish as it accumulates and dispose in a legal manner via recognized haul routes per Section 01 50 00, in a manner that will prevent spillage on streets or adjacent areas.
   2. Remove all tools, equipment and appliances used for demolition from the site upon completion of the work.
   3. Clean entire project area, adjacent streets, and pavements to a broom-clean, “stain-free” condition per the discretion of the Owner’s representative.

END OF SECTION
SECTION 12 93 00
SITE FURNISHINGS

PART 1 GENERAL

1.01 SUMMARY

Furnish all labor, materials, miscellaneous hardware, foundations, miscellaneous appurtenances, facilities, transportation and services required for installation of all site furnishings and related work as shown on the Drawings and/or specified herein.

A. Scope of work:
The general extent of work contained in this section is shown on the drawings and can include, but may not be limited to, installation of the following:

1. Pitching rubbers, home base and anchors
2. Softball netting
3. Drinking Fountain

B. Related sections can include, but may not be limited to:
1. Section 01 33 00 - Submittals
2. Section 32 12 16 - Asphalt Concrete Paving
3. Section 32 13 13 - Portland Cement Concrete
4. Section 32 18 00 - Miscellaneous Paving and Surfacing

1.02 REFERENCES AND REGULATORY REQUIREMENTS


1.03 SUBMITTALS

A. Conform to Section 01 33 00 Submittals and applicable Division One and Division Two specifications, General Conditions and/or Special Provisions.

B. Product Data: Submit catalog cut sheets of all materials and equipment proposed to be furnished and/or installed under this portion of the work. Include the manufacturer and distributor name, sub-contractor as applicable. Insure that the cut sheets clearly describe the specific product by catalog number and that additional non-specified products that may appear on the same cut sheet are crossed out where applicable.

C. Samples: Submit samples of colors and finishes for all applicable products and furnishings for selection by Owner’s Representative.

D. Shop Drawings: Submit complete shop drawings for all materials or furnishings requiring field or shop fabrication.

1.04 QUALITY ASSURANCE

A. Review: All equipment shall be reviewed for conformance with the intent of the Contract Documents and accepted by the contractor prior to installation. All site furnishings shall be in a new, “first-class” condition, per the discretion of the Owner’s Representative, prior to Final Acceptance.

1.05 DELIVERY, STORAGE AND HANDLING

A. The contractor is responsible for coordination of the delivery, acceptance, handling and storage of all site furnishings.
B. Store and handle site furnishings as acceptable to the Owner’s Representative and so that work or access of others is not impeded.

C. The contractor shall protect all site furnishings from theft or damage at all times until such items have been accepted by the Owner.

PART 2 PRODUCTS

2.01 SITE FURNISHINGS

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<th>Description</th>
<th>Manufacturer</th>
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<td>B. Home Plate</td>
<td>Bolco</td>
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<td>White/wood</td>
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<td></td>
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<tr>
<td>C. Base Anchors</td>
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<td></td>
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<td>D. Softball Netting</td>
<td>West Coast Netting</td>
<td>K42T-1 ¾”</td>
<td>Silver poles with black net</td>
<td>1.800.854.5741</td>
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<tr>
<td></td>
<td>Sportsfields Specialties</td>
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<td>LK4430BF1U</td>
<td>Evergreen</td>
<td>Provided by City and Contractor to install</td>
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</table>

PART 3 EXECUTION

3.01 SEQUENCING AND SCHEDULING

A. Coordinate construction timing of installation of site furnishings in conformance with all other pertinent work.

B. Concrete footings shall conform to requirements of Section 321313 Portland Cement Concrete unless noted otherwise.

3.02 INSTALLATION

A. Concrete Footings: Install as shown in Drawings unless noted otherwise.

B. Equipment: Conform to layout shown on Drawings. Erect in strict conformance with Details, accepted Shop Drawings, and manufacturer’s instructions.

C. All bolts shall be cut back to within three threads of the nut. Relevant to benches, bleachers, and other materials with exposed bolts.

3.03 FIELD QUALITY CONTROL

A. All site furnishings shall be inspected and accepted upon delivery by the Contractor. Final acceptance of site furnishings and locations of site furnishings shall be per the discretion of the Owner’s Representative.
PART 1 GENERAL

1.01 SUMMARY

A. Furnish all labor, materials, facilities, transportation and services to complete all landscape maintenance and related work as shown on the Drawings and specified herein.

B. Scope of work:
The general extent of landscape maintenance can include, but may not be limited to the following:
1. Tree, shrub, ground cover and turf areas
2. Irrigation systems
3. General site clean-up

C. Related sections can include, but may not be limited to:
1. Section 32 80 00 - Irrigation
2. Section 32 90 00 - Landscaping

1.02 REFERENCES AND REGULATORY REQUIREMENTS


1.03 QUALITY ASSURANCE

A. Control of work: Comply with Section 5 of the Standard Specifications.

B. Control of materials: Comply with Section 6 of the Standard Specifications.

C. The Maintenance Contractor shall be experienced in horticulture and landscape maintenance, practices and techniques, and shall provide sufficient number of workers with adequate equipment to perform the work during the Landscape Maintenance Period.

1.04 LANDSCAPE MAINTENANCE PERIOD

A. Landscape Maintenance Period shall be 90 calendar days.

B. Continuously maintain the entire project area during the progress of the work, during the specified Landscape Maintenance Period or until Final Acceptance of the project by the Owner’s Representative.

C. Landscape Maintenance Period shall not start until all elements of construction, planting and irrigation for the entire project are in accordance with Contract Documents. A prime requirement is that all turf and landscape areas shall be planted and that all turf areas shall show an even, healthy stand of “sod-like” turf which shall have been mown twice. If such criteria are met to the satisfaction of the Owner’s Representative, a written notification shall be issued to establish the effective beginning date of Landscape Maintenance Period. Additionally, all elements contained on the Pre-maintenance Punch-list shall have been completed to the satisfaction of the Owner’s Representative. The Landscape Maintenance period shall, per the discretion of the Owner’s Representative, be allowed to start and finish at different times in different areas as applicable.

D. Any day of improper maintenance, as determined by the Owner’s Representative, shall not be credited as an acceptable Landscape Maintenance Period day. The Landscape Maintenance Period shall be extended on a day-for-day basis should this occur until proper maintenance, as determined by the Owner’s Representative, is being performed.
E. Contractor shall secure the project site against trespass, vandalism or theft during the Landscape Maintenance Period subject to the discretion of the Owner’s Representative.

F. Each project site may be granted access to the fields prior final acceptance of turf or completion of maintenance period. Softball and baseball fields are expected be used by site for games or practice. Multi-purpose fields may also be utilized for games and practice. Contractor shall coordinate with owner representatives on mowing schedule and other maintenance schedules. School use will have priority over maintenance.

1.05 GUARANTEE

A. All work executed under this section shall be guaranteed against any and all poor, inadequate or inferior materials and/or workmanship, as determined by the Owner’s Representative, for the entire Landscape Maintenance Period and for a period of one year after Final Acceptance of project.

B. The contractor shall install all replacement material in conformance with the Contract Documents.

1.06 FINAL ACCEPTANCE

A. Upon completion of all project work, including Landscape Maintenance Period, the Owner’s Representative will, upon written request from the contractor (2 working day minimum notice), make an observation to determine conformance with the Contract Documents.

B. If, at the final project observation, work is found at variance with the Contract Documents, or is otherwise unacceptable, the Owner’s Representative shall issue a punch-list of items requiring attention to the contractor. The contractor shall repair, replace or otherwise correct all non-compliant work, continue Landscape Maintenance Period, and make another written request to the Owner’s Representative to verify punch-list completion. If punch-list is found to be incomplete, or if site is still found to be unacceptable, the contractor shall be back-charged as necessary for all additional observations required to issue Final Acceptance. All replacement materials and installations shall be in accordance with the Contract Documents. Remove rejected work and materials immediately from project. Prior to Final Acceptance, contractor shall provide the Owner’s Representative with all Record Drawings and written Guaranty Statements in accordance with the Contract Documents.

PART 2 PRODUCTS

2.01 MATERIALS

A. All materials used shall either conform to Specifications in other sections or shall otherwise be acceptable to the Owner’s Representative. The Owner’s Representative shall be given a monthly record of all herbicides, insecticides and disease control chemicals used.

B. Maintenance fertilizer: shall be “Gro-Power High Nitrogen” as available through Gro-Power, Inc. (800) 473-1307, and shall contain the following chemical analysis (or approved equal):

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td>14%</td>
</tr>
<tr>
<td>Phosphoric Acid</td>
<td>4%</td>
</tr>
<tr>
<td>Potash</td>
<td>9%</td>
</tr>
</tbody>
</table>

PART 3 EXECUTION

3.01 MAINTENANCE

A. General: Proper maintenance, including watering, weeding, mowing, edging, fertilization, repairing and protection shall be required until entire project is finally accepted, but in any event for a period of not less than the specified Landscape Maintenance Period.
B. Watering: Water appropriately (based on plant type) to insure vigorous and healthy growth until work is accepted. Water or irrigate in a manner to prevent runoff or erosion. When hand watering, use a “water wand” to break the water force.

C. Weeding: Entire project site shall be kept free of weeds at all times. Control new weed growth with pre-emergent herbicides. If weeds develop, use legally approved herbicides.
   1. No herbicide shall be used without the Owner’s Representative prior consent. Use only herbicides in accordance with manufacturer’s recommendations. If selective herbicides are used, extreme caution shall be observed so as not to damage any other plants. Spraying shall be done only under windless conditions.
   2. Disease and Pest Control: Disease and insect damage shall be controlled by the use of fungicides and insecticides, subject to the prior consent of the Owner’s Representative. Mole and gopher mitigation shall be accomplished using legal means other than poison baits.

D. Tree “rings” in turf areas: Remove turf from around each tree to create a four (4) foot diameter turf free area.

E. Pruning:
   1. Trees: Prune trees to select and develop permanent scaffold branches; to eliminate narrow v-shaped branch forks that lack strength; to reduce potential toppling and wind damage by thinning out crowns; to maintain a natural appearance and to balance crown with roots. Prune only as directed by the Owner’s Representative.
   2. Shrubs: The objectives of shrub pruning are the same as for trees. Shrubs shall not be clipped into balled or boxed forms unless such is required by the design.
   3. All pruning cuts shall be made to lateral branches, buds or near flush with the trunk. “Stubbing” or heading cuts shall not be permitted.
   4. Only skilled workers shall perform pruning work in accordance with standard horticultural pruning practices. Remove from the project all pruned branches and material. Remove and replace any plant material excessively pruned or malformed resulting from improper pruning practices at no additional cost to the Owner.

F. Staking: Stakes shall remain in place through the maintenance and guaranty periods and shall be periodically inspected and adjusted by the contractor to prevent rubbing that causes bark wounds, loosen for proper growth or other appropriate reasons.

G. Protection: The contractor shall maintain protection of all planting areas until Final Acceptance. Damaged areas shall be repaired or replaced at the contractor’s expense. Install a temporary maintenance fence (4’ blaze orange with steel driven stakes or acceptable equal) around all turf areas for the entire length of Landscape Maintenance Period.

H. Trash: Remove trash in all project areas plus adjacent pedestrian walkways and parking areas.

I. Replacement: Refer to the Guaranty portion of this Section.

J. Fertilizing: Fertilizing: Turf shall be fertilized on day 45 and 85 after initial seeding or installation. Turf shall be fertilized with 20 lbs of fertilizer per 1,000 square feet.

3.02 ATHLETIC FIELD TURF MAINTENANCE AND ACCEPTANCE

A. Current cultural management practices may be modified in accordance with tissue test results or environmental conditions. Fertilizer composition, rate, and/or source may be adjusted based on current soil and tissue test results and existing environmental conditions.
B. The following list represents the minimum required data that must be recorded in a field operations log:

1. Chemical application logs – All labels, application rates, equipment used to apply chemicals shall be kept in the maintenance log. Chemicals shall include all fertilizers, bio-stimulants, growth regulators, and pesticides.
2. All cultural maintenance activities such as mowing, sample collection and seeding shall be recorded.
3. Irrigation applications – Any use of the irrigation system should be documented as to zones used, duration of application, and any problems with coverage or system components.
4. System repair logs for each system must be maintained. Record replaced or repaired items such as irrigation heads and valves, or any drainage components in the appropriate system repair log.

C. The Contractor shall be responsible for the performance and operation of the playing field system during the construction, maintenance periods and until final acceptance. The Contractor shall keep a technically qualified man on site and maintain adequate labor, equipment and supplies in reserve to immediately repair the system or components in the event of any deficiency or failure, during the interim maintenance period.

D. Contractor shall provide all operations necessary to maintain the field throughout the Maintenance Period. The following list of items represents the minimum operations necessary to maintain the fields. Maintenance items should, at the minimum, include:

1. Mowing: Turf will be cut with a dedicated mower. Cutting height will be determined by environmental conditions, condition of sod, and time of year or activities. Turf height will be maintained using only sharp, clean equipment capable of cutting heights of 1.00 to 2.25 inches. The initial cutting or subsequent cuttings will remove not more than 1/3 of the grass leaf. Turf will be maintained to a neat appearance. Remove cuttings from site. Turf shall not be allowed to exceed two and one quarter (2.25) inches in height and shall not be mown shorter than one and one half (1.5) inches in height.
2. Turf shall be established to be turned over with a one and one half (1.5) inches in height for mowing.
3. Weed and Pest Control: The Contractor is to maintain the turf free from disease and infestation. Required treatments will be made according to the needs of the field as determined by the District Representative. Comply with applicable requirements of Federal, State, and Local laws, regulations and codes having jurisdiction over chemical treatments. The contractor is to apply suitable preventative or post infection fungicides to protect the quality of the turf. Special attention shall be required during the seedling establishment period for damping off diseases.
4. Let turf areas dry out enough so that mower wheels do not skid, tear or mark the surface.
5. Edges shall be trimmed at least twice monthly or as needed for neat appearance. Clippings shall be removed and disposed of.

E. Turf Acceptance: Final acceptance will follow District Representative’s final approval of the punch list and the following criteria:

1. Turf has rooted into the rootzone mix to a depth of six inches (6”) and has formed a mature sod mat. This will be determined by random samples being pulled from the rootzone with the City and Architect in attendance. If less than 80% of the random tests pass (a minimum of 15 samples will be pulled from the field areas), then the fields will not be considered acceptable. If any tests are below five inches (5”), then the field in question shall not be accepted.
2. The playing field surface is in a safe and playable condition.
3. Turf is free of dead or bare spots in excess of 3 square inches.
4. Maintenance log is complete and all equipment manuals and documentation delivered to the owner.

3.03 IRRIGATION SYSTEM

A. System Observation: The contractor shall visually check all systems for proper operation on a
weekly basis and make all necessary repairs. All equipment shall be adjusted as necessary for proper coverage and function.

B. Controllers: Program automatic controllers for appropriate seasonal water requirements. Perform a full instruction session in the presence of the Owner’s designated maintenance personnel demonstrating programming, system testing, trouble shooting, etc. Include instructions on how to turn off system in case of emergency.

C. Repairs: All repairs made to the irrigation system shall be at the contractor’s expense. All repairs shall be made within twenty-four (24) hours.

3.04 INFIELD MAINTENANCE

A. Infield fine shall be maintained during maintenance period. This includes warning tracks, bullpens, mounds, home plate area, etc.

B. Areas shall be kept free of weeds and trash.

C. Pitching mound / area and home plate area shall be covered during rains. Cover shall be removed after rains.

D. Mound area and home plate shall be turned over being firm and finished per plans.

E. Any erosion or loss of material shall be replaced.

3.05 FIELD QUALITY CONTROL

A. Final Review: At, or near the end of specified Landscape Maintenance Period, the contractor shall make written request for a final review and the work shall be reviewed for conformance with the Construction Documents. If work is not accepted at time of review, a punch-list of items requiring attention will be issued to the contractor for correction. The Landscape Maintenance Period shall be extended at contractors sole cost as necessary. Upon completion of the punch-list the contractor shall again make written request for review. If, upon re-visiting the site, it is found that the punch-list has not been completed, the review shall end and the contractor shall be back-charged for all additional visits.

B. All re-inspections required due to contractor not being prepared or non-conformance with the Construction Documents shall be back charged to the contractor.

C. Final Acceptance: When work is found to be in conformance with the Contract Documents, subject to the discretion of the Owner’s Representative, a statement of Final Acceptance shall be issued to the contractor.

END OF SECTION
PART 1  GENERAL

1.01  SUMMARY

A.  Scope of work:
   1. Protect, prune, irrigate and maintain all existing trees and other vegetation not designated for removal.

B.  Related sections can include, but may not be limited to:
   1. Section 02 41 00 - Site Clearing and Demolition
   2. Section 31 01 90 - Landscape Maintenance
   3. Section 31 20 00 - Earthwork
   4. Section 31 23 00 - Excavation, Backfill and Compaction
   5. Section 32 80 00 - Irrigation
   6. Section 32 90 00 - Landscaping
   7. Section 33 40 00 - Storm Drainage

1.02  REFERENCES AND REGULATORY REQUIREMENTS

A.  American Joint Committee on Horticultural Nomenclature (AJCHN), Standardized Plant Names
B.  American Association of Nurserymen, Inc. (AAN), American Standard for Nursery Stock.
C.  Sunset Western Garden Book, Lane Publishing CO.
D.  Agricultural Code of California.

1.03  SUBMITTALS

A.  Conform to requirements of Section 01 33 00 and/or applicable Division One and Division Two specifications, General Conditions and Special Provisions.
B.  Submit four (4) copies of product data or “cut-sheets” for all products proposed for use.

PART 2  PRODUCTS

2.01  MATERIALS

A.  Protective Fencing:
   1. Protective fencing shall consist of four foot (4’) to six foot (6’) high “blaze orange” plastic fencing material installed with metal posts and wire ties. Fence fabric shall be accepted by Owner’s representative.
   2. Metal posts shall be accepted by Owner’s representative.

PART 3  EXECUTION

3.01  GENERAL

A.  Protect, prune, irrigate and maintain all existing trees and other vegetation not designated for removal.

B.  At a minimum, protect existing all existing trees and other vegetation not designated for removal from
the following:
1. Breaking, cutting and/or skinning of branches, bark and/or roots
2. Stockpiling of building materials, soil or trash within dripline
3. Vehicular traffic and parking

C. Trees (and other vegetation not designated for removal) that become damaged during the life of the project shall be repaired or replaced by the contractor at no cost to the Owner subject to the discretion of the Owner’s representative.

3.02 PROTECTIVE FENCING

A. Prior to site clearing, demolition or grading, install acceptable protective fencing around all existing trees and other vegetation not designated for removal one (1) foot beyond dripline or as directed by Owner’s representative.

B. Locate structural roots by hand probing and set posts with care to preclude root damage.

C. Space protective fencing posts at 6'-0" centers maximum and securely attach fabric.

D. Maintain protection until Final Acceptance of project.

E. Install signage indicating that the protective fencing and area within shall not be disturbed.

F. When work is required within the fenced protection area, submit a written request to the Owner’s representative stating work to be performed and approximate time of completion. No work shall be allowed within the protected fenced area without the prior acceptance by the Owner’s representative. Fencing shall be replaced promptly following completion of said work.

3.03 GRADING AND TRENCHING

A. The earth surface within protective fencing shall not be altered except as acceptable to the Owner’s representative. Any grading or trenching necessary within the dripline shall be done by hand per the discretion of the Owner’s representative.

3.04 IRRIGATION

A. Provide and/or maintain irrigation for all existing trees and other vegetation not designated for removal as necessary to promote healthy, vigorous growth. Weekly watering shall occur with a 20 minute soak equivalent to 100 gallons per tree.

3.05 ROOT PRUNING

A. Root pruning shall consist of a smooth, final cut and shall be performed wherever a root 2" or more in diameter has been broken or severed.

3.06 CANOPY PRUNING

A. All pruning shall be completed by a tree care contractor or under supervision of a licensed arborist.

B. Prune all existing trees to remain and be protected per the following:
1. Proper removal of all dead branches and live “stubs” three (3) inches and over in diameter.
2. Removal of all broken or loose branches and other debris lodged in trees and shrubs.
3. Removal of all live branches which interfere with tree structural strength and healthful development. These include:
   a. Limbs which rub and abrade a more “important” or dominant branch, and as directed by the Owner’s representative
   b. Limbs of weak structure
c. Limbs with twigs and foliage obstructing the development of more "important" branches, as directed by the Owner's representative

d. Branches near the end of a limb which may produce more weight than the limb is likely to support

e. Branches conflicting with building or vehicular roadways

4. Removal of all branches located between grade level and ten (10) feet above grade over pedestrian walkways.

C. Selectively prune branches as deemed necessary by the Owner's representative.

3.07 PRUNING REPAIRS

A. Prune and treat any damaged area as directed by the Owner's representative.

3.08 CLEAN-UP

A. Branches, trimmings and debris remaining upon completion of each operation shall become property of the Contractor and shall be promptly removed from the site.

END OF SECTION
PART 1 GENERAL

1.01 SUMMARY

A. Furnish all labor, materials, equipment, facilities, transportation and services to complete all earthwork and related work shown on the Drawings and/or specified herein.

B. Scope of work:
The general extent of the earthwork is shown on the Drawings and can include, but is not necessarily limited to the following:
1. Topsoil stripping, stockpiling, and replacement into planting areas
2. Rough grading
3. Filling and backfilling to attain required grades
4. Excavating for paving, footings and foundations
5. Adherence to requirements, recommendations and/or Best Management Practices (BMPs) for storm water management as may be outlined in the Project Storm Water Pollution Prevention Plan (SWPPP), or as required by governing agencies

C. Related sections can include, but may not be limited to:
1. Section 01 33 00 - Submittals
2. Section 01 71 23 - Field Engineering
3. Section 01 78 39 - Project Record Drawings
4. Section 02 41 00 - Site Clearing and Demolition
5. Section 31 13 00 - Tree Protection
6. Section 32 11 00 - Base Courses
7. Section 32 90 00 - Landscaping

1.02 REFERENCES AND REGULATORY REQUIREMENTS

A. 2016 California Building Code (CBC)
B. American Society for Testing and Materials (ASTM):
   1. D 1557-07 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort
C. California Occupational Safety and Health Standards (OSHA):
   1. Article 6 - Excavations and Shoring.
D. State of California Department of Transportation Standard Specifications, Current Edition

1.03 SUBMITTALS

A. Conform to requirements of Section 01 33 00 Submittals and/or applicable Division One and Division Two specifications, General Conditions and Special Provisions.

B. Project Record Drawings:
   1. Conform to Section 01 78 39 and/or applicable Division One and Division Two specifications, General Conditions and Special Provisions.
   2. Accurately record locations of utilities remaining, re-routed utilities, new utilities, and newly discovered utilities by horizontal dimensions, elevations, inverts, and slope gradients.
1.04 QUALITY ASSURANCE

A. Geotechnical Investigation:
1. A geotechnical investigation report has been prepared for use on this project for the new parking area. The recommendations contained therein have been incorporated into the Contract Documents.
2. The Owner may designate and pay for the services of a Geotechnical Engineer to make recommendations based on the soil conditions encountered, the results of field and laboratory tests, and observations of the activities performed under this Section.
3. Compaction densities specified for structural fills under footings, slabs, or pavements shall be determined in accordance with the geotechnical engineer’s written recommendations.

B. Certification:
1. The contractor shall certify source and type of backfill and topsoil proposed to be incorporated into the work, at the request of the Owner’s Representative.
2. The contractor shall certify elevations of excavations, footings, subgrades and finish grades with the use of a Licensed Surveyor, at contractor’s expense, at the request of the Owner’s Representative.

C. Control of Work: Conform to Section 5 of the Standard Specifications.

D. Control of Materials: Conform to Section 6 of the Standard Specifications.

1.05 PROTECTION

A. Protect all existing structures, fences, roads, sidewalks, paving, curbs, and other items as necessary from earthwork activity.

B. Protect above or below grade utilities which are to remain.

C. Protect trees to remain in accordance with Section 311300 - Tree Protection (as applicable).

D. Repair damage to any existing site features which are to remain. Repair and restoration shall be equal to quality and appearance of prior condition and to the satisfaction of the Owner’s representative.

1.06 PROJECT / SITE CONDITIONS

A. Underground Utilities: Unknown buried utility lines may exist. If encountered, notify Owner’s representative immediately for direction and re-direct work to avoid delay.
1. Cooperate and coordinate with Owner’s representative and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
2. Do not interrupt existing utilities serving occupied facilities without proper notification to, and written direction from, Owner’s representative.

B. Wet Conditions: No grading operations shall be conducted when excessively wet conditions exist as determined by the Owner’s representative.

C. Contractor shall provide de-watering equipment as required to continue scheduled operations and provide optimum working conditions at no additional cost to Owner.

D. Dry Conditions: Contractor shall apply sufficient water to materials during construction to properly compact materials and control dust. Contractor shall provide dust control in conformance with Section 10 of Standard Specifications and shall provide water to subgrades as necessary to achieve compaction goals.
1.07 GRADE STAKES AND LINES
A. All grading and subgrading shall be controlled by contractor-installed intermediate grade stakes and lines necessary to obtain the finished grade elevations shown or implied in the Drawings. Subgrade and finish grade surfaces shall conform to the control planes established by these grade stakes and lines.
B. Protect and maintain all existing bench marks, monuments and other reference points. If disturbed or destroyed, they shall be replaced at the Contractor's expense.
C. Contractor shall set temporary bench marks as necessary to properly complete construction operations.

1.08 SURVEYING
A. Contractor shall be responsible for hiring a licensed professional surveyor to perform all surveying, layout and staking. Contractor shall be responsible for informing Owner's representative (minimum two (2) working days notice) when staking and layout is scheduled so that a review of completed chalk lines and staking can take place.

1.09 TOLERANCES
A. Refer to related specification sections for grading tolerances of specified improvements.

PART 2 PRODUCTS

2.01 MATERIALS
A. Select material for structural backfill shall be in accordance with applicable portions of Section 19 - Earthwork, of the Standard Specifications, unless modified by this section or by recommendations and requirements of the Project Geotechnical Report.
B. Topsoil: Excavated material from top 6 inches (maximum) of existing grade (unpaved areas) and/or acceptable import material graded free of roots and rocks larger than two inches, subsoil, debris, weeds, large mats of grass, and other deleterious material.
C. Subsoil: Excavated material below top 6 inches of existing grade, graded free of clay clods larger than 6 inches, rocks larger than 3 inches, and debris.

PART 3 EXECUTION

3.01 PREPARATION
A. Identify all required lines, levels, contours, datum, control points and property lines required to properly establish limits of work.
B. Verify elevations of critical existing grades as noted on Drawings and as directed by Owner's representative. Notify Owner's representative of discrepancies prior to start of work and re-direct work to avoid delay.
C. Identify all known below grade utilities. Stake and flag locations.
D. Identify and flag surface grades and utilities.
E. Contact Underground Service Alert (USA) (800-642-2444) and local utility companies to verify locations of existing utilities a minimum of two (2) working days prior to excavation.
3.02 PROTECTION

A. Maintain and protect existing utilities remaining which pass through work area.

B. Perform excavation work near utilities by hand. Provide necessary protection as the work progresses.

C. Provide and maintain protection for walks, curbs, drains, trees, corners of structures, etc., as necessary to prevent damage.

D. Barricade and/or cover open excavations occurring as part of this work and post with warning lights to the satisfaction of the Owner’s representative. Operate warning lights during hours from dusk to dawn each day and as otherwise required.

E. Keep adjacent properties, streets and drives clean of any dirt, dust, or stains caused by earthwork operations.

F. Upon discovery of unknown utility or concealed conditions, notify the Owner’s representative immediately and re-direct work to avoid delay.

G. Control dust on and near the work, and on and near off-site borrow areas.
   1. Thoroughly moisten surfaces as required to prevent dust from being a nuisance to the public, neighbors, and concurrent performance of any other activities that may occur on the site.
   2. Non-compliance with proper dust control measures shall be grounds for issuance of “stop work” orders by the Owner’s representative until such time as satisfactory measures can be implemented.

3.03 TOPSOIL EXCAVATION

A. Excavate topsoil from all areas scheduled for paving or rough grading and stockpile material in neat wind-row(s) in location(s) that have been previously established which will cause least interference to construction operations, and which is/are acceptable to the Owner’s representative.

B. Do not excavate topsoil that has become wetted to, or beyond, the saturation point that would be required for optimum compaction.

C. Stockpile topsoil in wind-row(s) of a height not to exceed 8 feet, protect from erosion, and cover as necessary to prevent formation of dust.

D. Topsoil excavation shall occur for the entire area or per field. No topsoil excavation shall occur for partial field areas without approval.

E. Topsoil staging areas shall be clearly defined and protected from other grading and utility operations.

3.04 ROUGH GRADING

A. Grade site subsoil to establish proper subgrade elevations and site contouring as described or implied in the Drawings:

B. Contouring:
   1. Construct landforms depicted in the Drawings to the satisfaction of the Owner’s representative.
   2. "Round-off" all tops of slopes.
   3. "Feather" all toes of slopes.
C. Compaction: Compact subgrade for the specific areas as follows unless otherwise noted:

1. **Areas to be planted:** Maximum eight inch (8") loose lifts to be between 85% and 80% relative compaction.

2. **Areas to be paved:** Shall be as follows:
   a. Maximum eight inch (8") loose lifts to at least 95% relative density.
   b. Additional lifts should not be placed if the previous lift did not meet the required density, relative compaction, moisture content or if the soil conditions are not stable.
   c. All fill soils shall be compacted to no less than 95% relative compaction at moisture content of 2 to 4 percent for pavement area.
   d. Compacted subgrade should be non-yielding under construction traffic, including a loaded ten-wheel truck such as a water or dump truck, in all pavement areas. Removal and subsequent replacement of some material (i.e. areas of excessively wet materials, unstable subgrade, or pumping soils) may be required to obtain the minimum 95 percent compaction to the recommended depth of 12 inches.
   e. Subgrade preparation for pavement areas shall extend laterally for at least two feet beyond the edge of pavement.

D. Remove all excess subsoil material from site and dispose of in a legal manner. Refer to “Material Storage” below.

E. Entire project or individual field area shall be rough graded at one time. No earthwork operation shall occur for partial field areas without receiving direction from the Owner or prior written approval from the Owner.

3.05 **EXCAVATION**

A. Remove and dispose of all miscellaneous materials encountered when establishing required grade elevations:
   1. Miscellaneous materials can include but are not limited to: pavements and other obstructions, underground structures, utilities, abandoned irrigation materials, and other materials encountered per the discretion of the Owner's representative.

B. Stability of Excavations:
   1. Comply with any applicable recommendations contained within the Project Geotechnical Report and requirements of agencies having jurisdiction.
   2. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.

C. De-watering: Provide and maintain, at all times during construction, ample means and devices with which to promptly remove and properly dispose of water from any source entering structural excavation, pipe trenches, or other excavations. All costs incurred from de-watering activities shall be paid for by the contractor.

D. Excavation for Structures:
   1. Conform to elevations and dimensions shown in the drawings within a tolerance of plus-or-minus one tenth (0.10') of a foot, and extending a sufficient distance from footings and foundations to permit placing and removal of concrete form-work, installation of services, and quality review.

E. Excavation for Pavements:
   1. Cut surface under pavements to comply with cross-sections, elevations, and grades as shown in the Drawings.

F. Material Storage: Stockpile satisfactory excavated materials where appropriate, until required for use.
Stockpile topsoil and subgrade soil in separate piles.

Place, grade and shape stockpiles for proper drainage.

1. Locate and retain stockpiles away from edge of excavations.
2. Dispose of excess soil material in a legal fashion after it has become evident that the material is no longer needed on the project and is of no value to the Owner.

3.06 TOPSOIL PLACEMENT

A. Thoroughly cross-rip all subgrade soil to a depth of twelve (12) inches prior to placing the specified thickness of topsoil back into all applicable planting areas. Secure review and acceptance of ripping depth prior to placement of topsoil. Refer to Section 32 90 00 – Landscaping for this process.

B. Topsoil placement requirements for planting areas shall be as follows:
   1. All planting areas: Shall contain or receive a minimum of six (6) inches of clean, acceptable topsoil.
   2. Topsoil shall not be placed until all earthwork and utility operations are complete.
   3. Topsoil shall be installed at one time for entire project or entire field area. No partial placements shall occur.

C. Compact topsoil to 84% to 89% relative density.

D. Maintain all slopes and gradients established during subgrade operations and shape landforms to satisfaction of the Owner’s representative.

E. Refer to Section 32 90 00 - Landscaping for finish grading information and finish grades at edge of planting areas and hardscape.

3.07 TOLERANCES

A. Shall conform to Conform to Section 26 of the Standard Specifications, unless more stringent requirements in these Contract Documents are provided, in which place the more stringent tolerances shall govern. Refer to specification section 01 71 23 for additional project requirements.

3.08 FIELD QUALITY CONTROL

A. The Owner Representative shall review and accept work at the following stages:
   1. Topsoil removal and stockpile.
   2. Grading plan for project. Plan shall provide strategy for grading sequence for entire site at one time or by field. Limits and sequence shall be reviewed and coordinated.
   3. Cross ripping of subgrade shall be reviewed and observed.

END OF SECTION
SECTION 31 23 00

EXCAVATION, BACKFILLING, AND COMPACTING

PART 1   GENERAL

1.01 SUMMARY

A. Furnish all labor, materials, equipment, facilities, transportation, and services to complete all
excavation, trenching, backfilling, compaction, and related work as shown on the Drawings and/or
specified herein.

B. Scope of work:
The general extent of all trenching, backfilling, and compaction is shown on the Drawings and may
include, but is not necessarily limited to, the following:

1. Storm Drainage System Installation
2. Irrigation System Installation
3. Paving Installation

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

1. Section 01 71 23 - Field Engineering
2. Section 01 78 39 - Project Record Drawings
3. Section 31 13 00 - Tree Protection
4. Section 31 20 00 - Earthwork
5. Section 32 12 16 - Asphalt Concrete Paving
6. Section 32 13 13 - Portland Cement Concrete
7. Section 32 80 00 - Irrigation
8. Section 32 90 00 - Landscaping
9. Section 33 40 00 - Storm Drainage

1.02 REFERENCES AND REGULATORY REQUIREMENTS


1.03 SUBMITTALS

A. Project Record Drawings:
1. Conform to requirements of Section 01 78 39 and/or applicable Division One and Division Two
   specifications, General Conditions and Special Provisions.
2. Accurately record locations of utilities remaining, re-routed utilities, new utilities, and newly
discovered utilities by horizontal dimensions, elevations, inverts and slope gradients as practical.

1.04 QUALITY ASSURANCE

A. Control of Work: Comply with Section 5 of the Standard Specifications.

B. Control of Materials: Comply with Section 6 of the Standard Specifications.

C. Trench Safety: Comply with applicable portions of Sections 5 and 7 of the Standard Specifications
and requirements of other agencies having jurisdiction (OSHA etc.).

1.05 PROJECT/SITE CONDITIONS

A. Wet Conditions: No trenching shall occur when excessively wet conditions exist in the opinion of the
Owner’s Representative.
B. **Dry Conditions:** Contractor shall provide dust control in conformance with Section 10 of Standard Specifications and shall provide water to work as necessary to achieve compaction goals.

1.06 **SEQUENCING AND SCHEDULING**

A. Refer to all other Contract Documents, determine the extent and character of related work, and properly coordinate work specified herein with that described elsewhere to produce a complete, operational installation.

**PART 2 PRODUCTS**

2.01 **MATERIALS**

A. Provide materials as described below free of debris, roots, wood, scrap material, vegetative matter, refuse, soft unsound particles, or other deleterious and objectionable materials.

B. **Select Backfill:** Select backfill material shall be sand conforming to Section 19-3.02F(2) of the Standard Specifications.

C. **Native Backfill:** Native backfill shall be acceptable soil material excavated from the project site. This material will be considered unclassified and no testing other than for compaction will be required. Additional material required for backfill shall be acceptable to the Owner’s Representative.

D. **Permeable Material:** Permeable material shall be Caltrans Class II permeable rock material.

E. **Aggregate Base:** Refer to Section 32 11 00 – Base Courses.

**PART 3 EXECUTION**

3.01 **PREPARATION**

A. **General:**

1. Prior to trenching, the contractor shall pothole existing utilities at locations indicated or implied on the plans, where new piping or utilities will cross existing utilities of uncertain depth to determine the elevation of the utility in question and ensure that the new line will clear the potential obstruction.

2. **Excavation:** Excavation shall include removal of all water and materials that interfere with construction. Remove any water which may be encountered in the trench by pumping or other methods prior to pipe laying, bedding and backfill operations. Trenches shall be sufficiently dry to permit proper jointing and compaction.

3. **Mark Out:** It shall be the contractor’s responsibility to direct vehicular and pedestrian traffic safely through or around the work area at all times.

3.02 **TRENCH EXCAVATION**

A. **General:**

1. **Mark Out:** Excavation shall include removal of all water and materials that interfere with construction. Remove any water which may be encountered in the trench by pumping or other methods prior to pipe laying, bedding and backfill operations. Trenches shall be sufficiently dry to permit proper jointing and compaction.

2. **Mark Out:** It shall be the contractor’s responsibility to direct vehicular and pedestrian traffic safely through or around the work area at all times.

3. The contractor shall relocate, replace, reconstruct or repair, to an “as-was” or better condition, all surface or subsurface improvements which are in the line of construction or which may be damaged, removed, disrupted or otherwise disturbed by the construction activities. Except as specified in other Sections or shown in the Drawings, this provision applies to all surface improvements of whatever nature such as walls, fences, above-grade utilities, landscaping,
paving, structures, or other physical features whether shown in the Drawings or not and to all subsurface improvements such as utilities which may be indicated in the Drawings or marked in the field. The contractor shall connect such utilities to existing systems and leave all in a workable and operating condition. The cost of this work shall be considered as included in other items of work and no additional compensation will be allowed.

4. The maximum allowable trench width at the top of pipe shall be 18 inches greater than the pipe diameter.

5. New utility trenches extending deeper than 2 feet below finish grade should be located a minimum of five feet away from foundations.

B. Existing Paving Areas:

1. Existing asphalt concrete paving over new trenches shall be sawcut, removed, and legally disposed. Existing asphalt concrete paving shall be neatly sawcut one foot (1') greater on each side than the trench width. If a longitudinal pavement joint or edge of pavement is located within three feet of the limit of excavation, all intervening pavement shall be removed and replaced after completion of backfilling. If concrete curb and/or gutter are to be replaced, the adjacent existing asphalt concrete paving shall be sawcut two feet (2') from the edge of concrete curb and/or gutter.

2. Existing Portland cement concrete paving over new trenches shall be sawcut to a minimum depth of 1-1/2 inches in straight lines either parallel to the curb or at 90 degree angles to the alignment of the sidewalk prior to being broken out. No section to be replaced shall be smaller than 30 inches in either length or width. If the sawcut would fall within 30 inches of a construction joint, expansion joint, or edge, or within 12 inches of a score mark, the concrete shall be removed to the joint, edge, or mark.

C. Walkway Areas:

Backfill for trenches or other excavations within walkway areas should be compacted in six inch (6") maximum layers, unless otherwise noted, with hand-held tampers to assure adequate subgrade support.

D. Compacted Fill Areas:

Where trenches must be excavated in compacted fill, these trenches shall be backfilled with the fill materials excavated and re-compact ed in the layers and to the density specified for the particular area.

E. Open Trench:

1. No trench shall be left in an open un-protected condition at the end of the day. At the end of the day any open trench shall be protected in a manner acceptable to the Owner's Representative.

2. Provisions for trench crossings and access shall be made at all street crossings, driveways, water gate valves, and fire hydrants unless otherwise acceptable to the Owner's Representative.

F. Excavated Material:

1. All excavated material not required for backfill or of value to the Owner shall be removed and legally disposed of by the contractor at no additional cost.

2. Material excavated in streets and roadways shall be laid alongside the trench no closer than two feet from the trench edge and kept trimmed to minimize inconvenience to public traffic.

3. Provisions shall be made whereby all storm and waste water can flow uninterrupted in gutters or drainage channels to drainage structures.

4. Excavated material shall not be stored on existing landscaping or paving without provisions being made to protect the surface below from being stained or otherwise adversely affected.

G. Shoring

1. Should excavations extend more than 4 feet below existing ground surface, shoring will be required.

2. Excavations can be sloped back to an inclination of 1.5 horizontal to 1 vertical as an option for shoring in these conditions.

3. Utility trenches shall be excavated according to accepted engineering practices following
3.03 PIPE BEDDING

A. Stabilization of Trench Bottom:
When the trench bottom is unstable due to wet or spongy foundation, trench bottom shall be de-
watered as necessary. The Owner’s Representative shall determine the suitability of the trench bottom
and the amount of sand, gravel, or crushed rock needed to stabilize the soft foundation.

3.04 TRENCH BACKFILL AND COMPACTION

A. General:
1. Construct backfill in two operations (initial and final).
2. Do not backfill where the foundation material in trench is already saturated, except as
acceptable to the Owner’s Representative. Provide a minimum cover as may be specified.
3. Where settling greater than the tolerance allowed for grading occurs in trenches and pits due to
un-stable subgrade material, excavate to the depth necessary to rectify the problem, then
backfill and compact the excavation as specified herein and restore the surface to the required
elevation.
4. For utilities under roads, streets, concrete slabs or other areas to be paved and synthetic turf
subgrade areas, place final backfill in 6-inch maximum loose lifts. Compact all backfill
surrounding ducts, conduits, pipes and other structures, including the top 12-inches of subgrade
to 95 percent of ASTM D1557 maximum density. Backfill to permit the rolling and compacting
of the completed excavation with the adjoining material providing the specified density
necessary to enable rock placement of paving of the area immediately after backfilling has
been completed.

B. Initial Backfill:
1. Prior to trench backfill, the condition of the trench and laying of pipe shall be acceptable to the
Owner’s Representative.
2. Select backfill material shall be used as initial backfill for all utilities except irrigation piping,
unless otherwise noted. After the pipe has been properly laid and accepted by the Owner’s
Representative, select backfill material shall be placed on both sides of the pipe and
compacted to the depth shown in the Drawings.
3. Compaction: The initial backfill material shall be hand tamped in layers not exceeding four
inches (4") in uncompacted depth and shall be brought up uniformly on both sides of the pipe to
avoid bending or distortional stress. After handtamping, the relative compaction of the initial
backfill material shall be at least 95% relative compaction.

C. Final Backfill:
1. Native backfill material shall be used for final backfill, unless otherwise noted.
2. Compaction: Final backfill compaction shall be by mechanical means with backfill material
placed in layers not exceeding six inches (6") in loose depth. Each layer shall be thoroughly
compacted before succeeding layers are placed. The use of machine tampers, except manually
held types, shall not be permitted. Final backfill shall be compacted to a relative compaction of
95% for paving areas. In planting areas, provide acceptable topsoil to required depth
compacted to 85% to 89% maximum relative compaction.

D. Jetting: No jetting shall be allowed.

3.05 TRENCH SURFACING

A. General:
1. In unimproved areas, the trench surface shall be restored to its original condition. No mounds of
earth shall be left along the trench.
2. All backfill shall be flush with adjoining grade in a firm, unyielding position with no visible
settling for a period of one year after Final Acceptance.
B. Paved Areas:
   1. Temporary surfacing acceptable to the Owner’s Representative shall be laid within one day after backfilling (except where the contractor elects to place permanent surfacing within this time period) until permanent paving is installed.

END OF SECTION
PART 1  GENERAL

1.01 SUMMARY

A. Furnish all labor, materials, equipment, facilities, transportation and services to complete all domestic and fire water systems and related work shown on the Drawings and/or specified herein.

B. Scope of work:
The general extent of the domestic water and fire system work is shown on the Drawings and can include, but is not necessarily limited to the following:
1. Water supply and distribution system(s):
   a. Domestic water system, including all pipes, fittings, valves, valve boxes, connections, and fire hydrants
   b. Compliance with AWWA C-600-87
   c. Intermediate staking and layout for domestic water system

C. Related sections can include, but may not be limited to:
1. Section 32 11 00 - Base Courses
2. Section 32 13 13 - Portland Concrete Cement
3. Section 32 80 00 - Irrigation
4. Section 32 90 00 - Landscaping

1.02 REFERENCES AND REGULATORY REQUIREMENTS

A. AWWA - current edition
B. California Plumbing Code - current edition

1.03 SUBMITTALS

A. Submit copies of product data or “cut-sheets” for all products proposed for use.

1.04 RECORD DOCUMENTS

A. Project Record Drawings:
   1. Contractor shall provide accurately record locations of utilities remaining, re-routed utilities, new utilities, and newly discovered utilities by horizontal dimensions, elevations, inverts, and slope gradients.

1.05 QUALITY ASSURANCE

A. Unless otherwise specified, install all materials in accordance with manufacturer’s recommendations. Contractor shall make all necessary repairs to the domestic water system as well as to other work affected by defects in the system through project Final Acceptance and specified warranty period. All repairs shall be made at the contractor’s sole expense.
1.06 DELIVERY, STORAGE, AND HANDLING

A. Store pipe in a neat and orderly manner fully supported and protected from sunlight.

B. Do not dump pipe off truck. Pipes are to be delivered, unloaded and handled so as to prevent damaging the material.

1.07 PROJECT/SITE CONDITIONS

A. PVC pipe shall not be cemented during wet conditions as determined by the Owner’s Representative.

B. Trench excavation and backfilling shall not be executed during excessively wet conditions as determined by the Owner’s Representative.

1.08 SEQUENCE AND SCHEDULING

A. Refer to all other Contract Documents, determine the extent and character of related work, and properly coordinate work specified herein with that described elsewhere to produce a complete, operational installation.

B. Contractor shall be solely responsible for coordinating, sequencing, and scheduling all work with all applicable trades and/or sub-contractors so as to insure proper and timely performance.

1.09 GUARANTY

A. Contractor shall provide a written guarantee covering entire system against defects in installation, workmanship, and equipment for a period of one year from date of final acceptance.

B. Contractor shall make necessary repairs to the system as well as to other work affected by defects in the system during warranty period. Repairs shall be made at the Contractor’s sole expense.

1.10 MAINTENANCE

A. Service: Contractor shall service and maintain domestic water system as necessary until project Final Acceptance.

PART 2 PRODUCTS

2.01 PIPE AND FITTINGS

A. General:

1. Pipe materials for domestic and fire water lines shall be in conformance with the Uniform Plumbing Code and local agencies.

2. Plans and details, if shown, are schematic in nature and do not necessarily identify all fittings and appurtenances required to provide a complete installation. The contractor is responsible for providing complete and functional systems.

3. Materials and procedures not specifically addressed herein shall comply with the appropriate AWWA standard.

4. All materials proposed for use shall be in a new, “first class” condition unless otherwise noted.

B. Water Lines 3 Inches and Greater Diameter:

1. Ductile Iron Pipe (DIP): Pipe shall conform to AWWA C151, minimum Class 52. All ductile iron pipe shall be cement mortar lined in conformance with AWWA C104. Pipe shall be of domestic manufacture; U.S. Pipe Tyton joint, Pacific States; or acceptable equal. Buried ductile iron pipe and fittings shall be wrapped in an 8-mil. thick polyethylene film sleeve. The Contractor shall furnish certification that all pipe supplied for this project has been...
manufactured in compliance with all requirements of AWWA C151.

2. Polyvinyl Chloride Pipe (PVC): Pipe shall conform to AWWA C900, Class 200, cast iron O.D. sizes. Pipe shall be of domestic manufacture; JM Mfg. Co., PW Pipe, Certain teed Fluid-Tite; or acceptable equal. Pipe shall be furnished with integral bells. Spigot end pipe with separate double hub couplings is not acceptable. The Contractor shall furnish certification that all pipe supplied for this project has been manufactured in compliance with all requirements of AWWA C900.

C. Water Lines 2 (two) Inches and Smaller Diameter: Shall be one of the following:
   1. Pipe shall be annealed (soft) Type “K” copper (Cu).
   2. Polyvinyl Chloride Pipe (PVC): Pipe shall conform to AWWA C900, Class 200, cast iron O.D. sizes. Pipe shall be of domestic manufacture; JM Mfg. Co., PW Pipe, Certain teed Fluid-Tite; or acceptable equal. Pipe shall be furnished with integral bells. Spigot end pipe with separate double hub couplings is not acceptable. The Contractor shall furnish certification that all pipe supplied for this project has been manufactured in compliance with all requirements of AWWA C900.

D. Couplings and Sleeves:
   1. General: Couplings and Sleeves shall be a minimum of 200-psi working pressure-rated unless otherwise noted. Couplings and sleeves shall be mechanical joint type.
   2. For DIP and PVC Pipe 3” thru 12”:
      a. Unless otherwise noted, couplings and sleeves for DIP and PVC shall be ductile iron conforming to AWWA C153, and shall be 350 psi working pressure rated. Couplings, sleeves, and accessories shall be of domestic manufacture; U.S. Pipe Trim Tyte, Union Foundry, Tyler; or acceptable equal.
      b. Unless otherwise noted, flanges on all DIP spools shall conform to AWWA C115.
   3. For PVC Pipe 2 1/2” and smaller:
      a. Schedule 40, solvent-weld PVC socket couplings.
   4. For Copper Tubing:
      a. Couplings for copper tubing shall be Mueller 110 compression connections or acceptable equal.

E. Valves:
   1. Gate valves:
      a. Use gate valves designed for a working pressure of not less than 150 psi.
      b. Provide connections as required for the piping in which they are installed.
      c. Provide an arrow on the operating nut or wheel, cast in metal, indicating direction of opening.
   2. Thrust Blocks:
      a. Thrust blocks shall be constructed of Class “A” concrete. Thrust block dimensions shall conform to the California Plumbing Code.

F. Valve Boxes
   1. Shall be 10” round boxes for gate valves.
   2. Valves shall be labeled with “water” on lid.
   3. Boxes located in landscape areas shall be plastic. Valve boxes shall be round model equivalent to Carson Model 910-10 with 910-4 lid.
   4. Boxes located in paving shall be concrete with concrete lid.
   5. Valve boxes shall have a bolt down lid.

G. Pipe Detection Tape: "Sentry Line” three (3) inch wide, detectable, "Caution Water Line Buried Below" tape as available from Terra Tape Inc. Houston, Texas (800)-231-6074 or acceptable equal.

3.01   EXAMINATION

A. Prior to starting work, test and verify that water pressure levels meet the domestic water system requirements. Notify the Owner’s Representative immediately of any discrepancies and re-direct work to avoid delay.

B. The utility plan and the piping details are diagrammatic. Pipe lines shown parallel in the Drawings may be placed in a common trench, provided that a minimum horizontal distance of six (6) inches is maintained between buried lines, except for sanitary sewer lines, which require ten feet (10') horizontal clearance.

3.02   HANDLING

A. Handle pipe accessories so as to ensure delivery to the trench in sound, undamaged condition.

B. Use pinch bars or tongs for aligning or turning the pipe only on the bare end of the pipe.

C. Thoroughly clean interior of pipe and accessories before lowering pipe into trench. Keep clean during laying operations by plugging or other acceptable method.

D. Before installation, inspect each piece of pipe and each fitting for defects:

E. Replace all material found to be defective (before or after laying) with sound material meeting the specified requirements, without additional cost to the Owner.

F. Rubber gaskets: Store in a cool dark place until just prior to time of installation.

3.03   PIPE CUTTING

A. Cut pipe neatly and without damage to the pipe.

B. Unless otherwise recommended by the pipe manufacturer, cut pipe with mechanical cutter only.

C. Use wheel cutters when practicable.

D. Cut pipe square, and remove all burrs prior to use.

3.04   TRENCHING

A. Conform to specification section 31 23 00.

B. Excavate trenches with vertical sides uniform bottom, free of deleterious materials, and wide enough for pipes to lay side by side, fully supported on bottom.
   1. No lines shall be installed parallel to and directly over another line.
   2. When lines must cross, the angle shall be forty-five to ninety degree (45-90°), and a minimum of six (6) inch vertical clearance shall be maintained.

C. Provide minimum coverage as follows:
   1. Pressurized service: 24" in landscape areas, 30" under pavement.

3.05   PLACING AND LAYING

A. General:
   1. Lower pipe and accessories into trench by means recommended by the manufacturer.
   2. Except where necessary in making connections to other lines, lay pipe with the wide bell end opening facing source.
   3. Rest the full length of each section of pipe solidly on the pipe bed, with recesses excavated to accommodate wells, couplings, and joints.
   4. Replace pipe that has been disturbed after laying.
5. Do not lay pipe in water, or when trench conditions are unsuitable for the work. De-water trench until jointing is completed.
6. Securely close open ends of pipe and valves when work is not in progress.
7. Where any part of coating or lining is damaged, repair at no additional cost to the Owner.
8. Follow manufacturer’s detailed instructions in installing and assembling pipe.

B. Plastic Pipe:
1. Position pipe and fittings in trench in a manner that identifying markings will be readily visible for inspection.
2. Cutting and joining:
   a. Protect against abrasion from serrated holding devices.
   b. Remove burrs and glosses from surfaces to be jointed; use abrasive paper, file, or steel wool.
   c. Remove dirt, dust, and moisture by wiping clean with dry cloth.
3. Align pipe system components without strain.
4. Support plastic pipe in trenches with a two (2) inch min. layer of bedding. Provide a min. three (3) inch bedding sand cover. Allow no rocks, debris, or potentially damaging substances within six (6) inches of plastic pipe in trenches.

C. Connections:
1. Use appropriate fittings to suit the actual condition where connections are made between new work and service points.

3.06 JOINTING

A. Other joints:
1. Mechanical joints and push-on type joints: Install in accordance with AWWA C600, modified as necessary by the recommendation of the manufacturer to provide for special requirements of specified pipe.
2. Make connections between different types of pipe and accessories with transition fittings.
3. Rubber gaskets: Handle and install in strict accordance with the recommendations of the manufacturer. Lubricants for gaskets shall be manufactured by or approved by the pipe manufacturer for use under the conditions found in the field.

3.07 SETTING VALVES AND VALVE BOXES

A. General:
1. Center valve boxes on the valves, setting plumb.
2. Tamp earth fill around each valve box to a distance of four feet on all sides, or to be undisturbed trench face if less than four feet.
3. Tighten mechanical joints, and fully open and close each valve to assure that all parts are in working condition.

3.08 THRUST BLOCKS

A. General:
1. Provide and install thrust blocks in accordance with California Building Code requirements and installation guidelines.

3.09 TESTING, INSPECTING, AND DISINFECTION

A. Closing uninspected work: Do not allow or cause any of the work of this Section to be covered up or enclosed until after it has been completely inspected and tested, and has been accepted.

B. Time for making test:
1. Except for joint material setting, or where concrete reaction backing necessitates a five day delay, pipelines joints, or couplings may be subjected to hydrostatic pressure, inspected, and tested for leakage at any time after partial completion of backfill. All testing of water service shall be in accordance with the requirements of AWWA C600 for hydrostatic testing.
Contractor to keep records of each piping test, including date and time of test, name of witnessing Owner representative, test pressure, description of piping tested, and remarks (i.e. leaks and repairs made). All tests shall last 4 hours and be tested at 200 psi.

C. Disinfection:
   1. Before acceptance of the potable water system, disinfect each unit of completed service line in accordance with AWWA C601 and criteria of the local governing jurisdiction.
      a. Proposed method shall be submitted to the Owner’s Representative for review and acceptance.
      b. Perform all tests and disinfection in a manner acceptable to governmental agencies having jurisdiction.
   2. Furnish two copies of a Certificate of Compliance to the Owner.

3.10 BACKFILLING

A. General:
   1. Backfill only after specified tests have been performed and accepted.
   2. Clean trenches of all debris and deleterious material before backfilling.
   3. Backfill, as specified or shown in Drawings free from deleterious material.
   4. Compact trenching to 95% relative compaction under pavement and 85% relative compaction within planting areas.
   5. Trench surfaces shall be flush with finish grade. All trench settling shall be corrected by the contractor at no additional cost to the Owner.
   6. Install pipe detection tape and reinforced tracer wire above all pressurized lines.

3.11 DEMONSTRATION

A. Contractor shall instruct Owner’s personnel in complete and proper operation of domestic water system per prior to contract closeout.

3.12 FINAL REVIEW

A. Provide Owner’s Representative with all Guaranty and record drawing requirements prior to Final Review.

END OF SECTION
PART 1  GENERAL

1.01  SUMMARY

A. Furnish all labor, materials, equipment, facilities, transportation, and services to complete all asphalt paving, and related work as shown on the Drawings and/or specified herein.

B. Scope of Work: The general extent of the asphalt paving is shown on the Drawings and may include, but is not necessarily limited to, the following:
   1. Asphalt Concrete installation
   2. Edgeband installation

C. Related sections can include, but may not be limited to the following:
   1. Section 01 33 00 - Submittals
   2. Section 12 93 00 - Site Furnishings
   3. Section 31 20 00 - Earthwork
   4. Section 32 11 00 - Base Courses
   5. Section 32 13 13 - Portland Cement Concrete
   6. Section 33 40 00 - Storm Drainage

1.02  REFERENCES AND REGULATORY REQUIREMENTS

A. State of California Department of Transportation Standard Specifications, Current Edition

1.03  PROTECTION OF WORK

A. Curbs and other work shall be covered with suitable material and protected from staining or injury by equipment and contact with oil, emulsion, and asphalt. All manholes, catch basins, and other gratings shall be covered with suitable material so that no asphalt or emulsion will come in contact with the inside walls or floors of the structures. Any damage to such work shall be repaired and/or replaced at the contractor’s expense.

1.04  SUBMITTALS

A. Conform to requirements of Section 01 33 00 Submittals and/or applicable Division One and Division Two specifications, General Conditions and Special Provisions.

B. Submit cut-sheets, mill certificates, certificates of compliance etc. for all products proposed for use on the project.

1.05  QUALITY ASSURANCE

A. Control of Work: Conform to Section 5 of Standard Specifications.

C. Control of Materials: Conform to Section 6 of Standard Specifications.

1.06  SEQUENCING AND SCHEDULING

A. Time delay between placement and compaction of base material and installation of asphaltic concrete shall not be more than 5 calendar days. Base material left unpaved longer than this time period shall be subject to testing and re-compaction at the expense of the contractor.
1.07 GENERAL REQUIREMENTS

A. Asphalt paving surfaces shall have positive drainage as indicated on the Drawings. Upon completion of the work, paved areas included in this section shall be subject to a water drainage test. Areas that fail to drain properly, as determined by the Owner’s Representative, shall be corrected and repaired at no additional cost. If repaired, the entire surface shall have a seal coat applied at contractor’s cost. Type of seal coat will be determined by the Owner’s Representative.

B. Asphalt concrete paving shall be free from excessive segregation (gaps between aggregate visible at 3/16" or larger), cracking, potholes, raveling, slippage, depressions, corrugations, or other defects at the date of completion and acceptance of the project.

C. All repairs shall be made within fifteen calendar days of notification at the expense of the contractor.

PART 2 PRODUCTS

2.01 ASPHALT CONCRETE PAVING (as applicable)

A. Paving Asphalt Binder: Shall be PG 64-10, conforming to Section 92 of the Standard Specifications.

B. Prime Coat: Liquid asphalt to conform to the requirements for SC-70 liquid asphalt as per Section 93 of the Standard Specifications.

C. Tack Coat: Asphaltic emulsion to be penetration type conforming to the RS-1 (or SS-1, if seal coat is specified) requirements of Section 94 of the Standard Specifications.

D. Aggregates (all aggregates in asphalt mix to be virgin material):
   1. Traffic Areas: Aggregate for all surfaces shall be 1/2 inch medium per Section 39 of the Standard Specifications, unless otherwise specified or noted. Traffic area aggregate shall be used in parking and street areas.
   2. Pedestrian Areas: Aggregate for shall be 3/8 inch maximum or No. 4 maximum aggregate per Section 39 of the Standard Specifications, unless otherwise specified or noted. Pedestrian area aggregate shall be used in all other asphalt areas.

2.02 EDGEBAND: As detailed and shown on Drawings.

2.03 AGGREGATE BASE

A. Aggregate base shall conform to Section 32 11 00 Base Courses.

PART 3 EXECUTION

3.01 EDGEBAND INSTALLATION

A. Install as to conform with shapes, lines, dimensions and grades shown on Drawings.

B. All radii shall be smooth and constant with properly aligned tangent points.

3.02 INSTALLATION

A. Conform to Sections 37 and 39 of Standard Specifications.

B. Prime Coat: Apply specified material to compacted base at a rate of 0.25 gallons per square
C. Tack Coat: Apply specified material to all vertical surfaces of existing pavement, curbs, and header boards.

D. Asphaltic Concrete:
   1. Place and compact in accordance with Section 39 of the Standard Specifications.
   2. Base lifts shall not exceed 2 inches.
   3. Surface lift shall not exceed 2 inches.

E. Asphalt concrete shall be compacted to a minimum of 96 percent of the maximum laboratory compacted (Hveem) unit weight. Subgrade and aggregate base shall be compacted to a minimum of 95 percent relative compaction. Moisture content of subgrade shall be 2 percent or above, moisture content of aggregate base shall be near optimum.

3.03 EQUIPMENT

A. Spreading and rolling equipment shall be in accordance with Section 39-3.03 of the Standard Specifications.

B. Spreading and compaction shall be in accordance with Section 39-3.04 of the Standard Specifications.

END OF SECTION
1.01 SUMMARY

A. Furnish all labor, materials, equipment, facilities, transportation, and services to complete all concrete and related work as shown on the Drawings and/or specified herein.

B. Scope of work:
   The general extent of the concrete work is shown on the Drawings and may include, but is not necessarily limited to the following:
   1. Vertical Curbs and Seatwalls
   2. Curbs and Gutters
   3. Valley Gutters and Concrete Swales
   4. Mowbands and Edge bands
   5. Accessible Ramps
   6. Driveway Aprons
   7. Flatwork, Slabs and Walkways
   8. Expansion, Deep Score and Score Joints
   9. Misc. Footings
   10. Reinforcement and/or Dowelling

C. Related sections can include, but may not be limited to:
   1. Section 01 33 00 - Submittals
   2. Section 12 93 00 - Site Furnishings
   3. Section 31 20 00 - Earthwork
   4. Section 32 11 00 - Base Courses
   5. Section 32 80 00 - Irrigation
   6. Section 32 90 00 - Landscaping
   7. Section 33 40 00 - Storm Drainage

1.02 REFERENCES AND REGULATORY REQUIREMENTS

A. State of California Department of Transportation Standard Specifications, Current Edition

B. California Building Code 2010

1.03 SUBMITTALS

A. Conform to Section 01 33 00 and applicable Division One and/or Division Two specifications, General Conditions and Special Provisions.

B. Submit cut-sheets, mill certificates, certificates of compliance etc. for all products proposed for use on the project.

1.04 QUALITY ASSURANCE

A. Concrete
   1. Conform to Section 01 45 00 Quality Control (as applicable).
   2. All formwork, joint patterns, base material, reinforcement and other miscellaneous items such as “dobies” and ties shall be reviewed and accepted by the Owner’s Representative prior to pouring concrete. Contractor shall have any and all such items in place and shall
give a minimum of two (2) working day lead-time notice to Owner’s Representative when scheduling the review request. Contractor shall also schedule and allow a minimum of two (2) working days after review for possible modifications to concrete preparation work, at no cost or delay to the project.

3. The Owner’s Representative shall at all times have access to any off-site batch plant or quarry supplying materials for subject project and trucks en route to the project site. The Owner’s Representative may at any time request slump tests and secure samples of concrete, cement, aggregates or other materials. All applicable materials shall be provided by the contractor at no additional cost to the Owner.

4. Any specified review or observation by the Owner’s Representative of the concrete work shall be requested by the contractor at least two (2) working days prior to the need for the review or observation.

5. Finishes and colorants other than the concrete darkening agent (see Part 2 Products) are called out in the Drawings. A four foot by four foot (4’ x 4’) sample of all concrete colorants (including concrete darkening agent) and finishes shall be poured by the contractor in the field for review and acceptance by the Owner’s Representative. Sample shall include all joints, finishes and tooled conditions for approval. Contractor shall schedule review well in advance of concrete operations to allow for color and/or finish modifications if necessary.

6. Codes and Standards: Comply with the provisions of the following codes, specifications and standards, except where more stringent requirements are shown or specified:
   a. California Building Code 2010, Title 24, Part 2, Chapter 19A - Concrete
   c. ACI 301 Specifications for Structural Concrete for Buildings
   d. ACI 318 Building Code Requirements for Reinforced Concrete
   e. ACI 614 Recommended Practice for Measuring, Mixing, and Placing Concrete
   f. Concrete Reinforcing Steel Institute, Manual of Standard Practice

7. Concrete Testing Service: The Owner may retain and engage a testing laboratory to perform material evaluation tests.

1.05 DELIVERY AND STORAGE

A. Deliver concrete reinforcement to job site properly tagged and ready to set. Store above ground surface on platforms, skids, or other supports. Coordinate delivery and storage of all other materials as appropriate.

PART 2 PRODUCTS

2.01 CONCRETE MATERIALS

A. Concrete shall be Portland Cement Concrete conforming to Section 90 of the Standard Specifications. Unless otherwise specified, all concrete shall be Class B at a minimum.

B. Cement shall be Type II cement conforming to ASTM Designation C150 as modified by Section 90 of the Standard Specifications.

C. Mortar shall conform to Section 51 of the Standard Specifications. Mortar, when used for patching, shall match the color of the work to be patched.

D. Water used for mixing shall be potable.

E. Minimum mix requirements: It shall be the contractor’s responsibility to design the concrete mixes to provide the minimum requirements listed below. Increase cements content over that listed if necessary to obtain the specified compressive strength. Minimum ultimate compression strength of concrete at 28 days is as follows:
<table>
<thead>
<tr>
<th>Item</th>
<th>Strength</th>
<th>Max. slump</th>
<th>Size of aggregate</th>
<th>Cement (# of 94 lb. sacks per yard)</th>
<th>W/C Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slab-On-Grade</td>
<td>3,000</td>
<td>4&quot;</td>
<td>3/4&quot;-1&quot;</td>
<td>5</td>
<td>.60</td>
</tr>
<tr>
<td>Walls/Footings</td>
<td>3,000</td>
<td>4&quot;</td>
<td>3/4&quot;-1&quot;</td>
<td>5</td>
<td>.60</td>
</tr>
<tr>
<td>Thrust Blocks</td>
<td>2,500</td>
<td>4&quot;</td>
<td>3/4&quot;-1'</td>
<td>4.5</td>
<td>.45</td>
</tr>
</tbody>
</table>

2.02 OTHER MATERIALS

A. Formwork materials shall be surfaced lumber, plywood, metal, metal-framed plywood faced or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings. Provide from material with sufficient thickness to withstand pressure of newly-placed concrete without bow or deflection, and as follows:

1. All form panels shall be placed in a neat, symmetrical pattern, subject to the acceptance of the Owner’s Representative.
2. Form clamps or bolts shall be used to fasten forms. The use of ties consisting of twisted wire loops to hold forms in position during the placing of concrete shall not be permitted unless noted otherwise.
3. All exposed sharp edges shall be bullnosed to prevent mortar runs and to preserve smooth, straight lines, unless otherwise acceptable to the Owner’s Representative or noted in the Drawings.
4. Before concrete is placed in forms, all inside surfaces of forms which will later be removed shall be thoroughly coated with commercial quality form oil, which will permit the ready release of the forms and will not discolor the concrete.
5. Where form panels are attached directly to the studding or joists, the panels shall be not less than five-eighths of an inch (5/8") thick, and the studding, or joists, shall be spaced not more than twelve inches (12") center to center.
   a. Form panels less than five-eighths of an inch (5/8") thick, otherwise conforming to the requirements specified, may be used with a continuous backing of surfaced material three-fourths of an inch (3/4") thick.
   b. Form panels more than five-eighths of an inch (5/8") thick spaced at more than twelve inches (12") center to center may be used, provided that the deflection of the panel between studding or joists does not exceed that of a five-eighths inch (5/8") thick panel attached to studding or joists spaced at eighteen inches (18") center to center.
6. Curved surfaces shall be formed with timber, plywood, masonite, or sheet metal as appropriate. Sheet metal shall have masonite or plywood backing. Plywood for forming shall be ACX or better grade.

B. Expansion Joints:

1. Joint primer: Sonneborn horizontal paving joint primer No. 733, or No. 766, one component solvent based primer or acceptable equal.
2. Key Kold joint: Burke or approved equal
3. Expansion joint: One-half inch (1/2") asphalt impregnated fiber strips in compliance with ASTM D1751 or acceptable equal. Expansion joint material shall be variety with “zip-strip” H-channel joint sealant receptacles. If proposed joint material is not installed with sealant receptacles then, the expansion joint material shall be completely covered with a Sonneborn “Sonofoam” closed cell backer rod or acceptable or equal prior to application of joint sealant. Provide three eighth inch (3/8") tooled edges each side of joint material. Refer to Drawings for additional information.
4. Expansion joint sealant: Self leveling sonolastic elastomeric polyurethane joint sealant in accordance with Federal Specification TT-S-00227E, Type I, Class A-Sonneborn SL-2,
Sonneborn products are available through the Cade Co. San Jose, CA (408) 292-3435.

C. Score Joints:
   1. Score joints: Shall be three eighth inch (3/8") radius tooled joints to a one inch (1") depth.

D. Reinforcing bars: Comply with Section 52-1.02B of Standard Specifications, Section 1907 of IBC, Title 24, C.C.R. and ASTM A-615A. Grade 60, deformed, except #3 and smaller may be Grade 40. Test in accordance with IBC Section 1704.4, Title 24, C.C.R. Bars shall be in a new, “first-class” condition.

E. Smooth Dowel Steel Bars for Expansion Joints: ASTM A-29, #3 smooth Grade 40. Provide as indicated on drawings. Where shown, provide metal dowel sleeve at one end of dowel (or other approved break-bond method), to permit lateral movement at dowel within concrete section. Provide for movement with equals joint width plus one-half inch (1/2"). Bars shall be in a new, “first-class” condition.

F. Tie Wires: Black annealed, ASTM A-82, minimum 16 gauge.

G. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers and other devices for spacing, support and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying owner CRSI specifications, unless otherwise acceptable.

H. Welded wire mesh (WWM) shall conform to ASTM A-185 and shall be 6 x 6 #10 unless noted otherwise in the Drawings. Wire mesh shall be "chaired" up with 2" x 2" x 2" concrete blocks to insure uniform embedment into concrete section to dimension as shown in the Drawings.

I. Concrete Darkening Agent: Add one quarter pound (1/4 lb.) of Davis Colors Inc. colorant #8084 Black (or acceptable equal) per 94 lb. sack of cement to all exterior concrete which will be exposed to view when cured (Drain rims and concrete receiving other colorants excluded). Contact Davis Colors Inc. for local distribution information Ph.: (800)-800-6856 Fx.: (213)-269-1053. Other colorants shall be as noted in the Drawings.

J. No admixtures will be allowed without prior acceptance by the Owner’s Representative.

K. Fiberglass additive into the track trench drain concrete bedding shall be done at the batch plant. Fibers (FM 300) shall be 1.5 lbs. per cubic yard of concrete.

PART 3 EXECUTION

3.01 EXCAVATION

A. In addition to the general grading excavation required, the contractor shall excavate to the required depths in the locations shown for flatwork, retaining walls, curbs, footings, etc. Excess excavation shall be replaced with concrete poured monolithically with the wall or pavement, at no additional cost to the Owner.

3.02 FORMING

A. All forming shall conform to Section 51 of the Standard Specifications and as follows:
   1. The Contractor shall build forms with a high degree of care and shall select from materials of adequate strength and smoothness to produce smooth, even surfaces of uniform texture and appearance, free of bulges, depressions, or other imperfections per the discretion of the Owner’s Representative. Remove any residue remaining on concrete after forms are removed.
2. Concrete walls are to be vibrated as necessary to provide uniform density. No concrete surfaces with “rock pockets” or “honeycombing” shall be accepted.

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

3.03 CONCRETE CONSTRUCTION

A. All concrete shall be mixed in accordance with Section 90 of the Standard Specifications.

B. Construction of concrete substructures shall conform to applicable provisions of Section 51 of the Standard Specifications.

C. Construction of concrete curbs, gutters, sidewalks, wheelchair ramps, and driveway aprons shall conform to Section 73 of the Standard Specifications.

D. At the termination of all curbs, the final eighteen inch (18”) length of curb shall be tapered from the full curb height to the gutter flow line or adjacent pavement elevation unless noted otherwise on the plans.

3.04 CONCRETE JOINTS

A. Joints shall be constructed at locations indicated and as detailed in the Drawings.

B. Construct concrete joints as follows:
   1. Expansion Joints:
      a. General. Refer to drawings for location and type expansion joints.
      b. Install to full depth of slab per drawings and manufacturer’s instructions.
      c. Key kold joints – install per manufacturer’s recommendations and joints shall not be covered with concrete. Tool joint to remove concrete from edge of metal.
      d. Fiber expansion joints - After allowing concrete to fully cure, remove zip strips and install expansion joint sealant. Expansion joint sealant. Install per drawings and manufacturer’s instructions.
   2. Score Joints: Refer to drawings for locations.

C. Curb and edge band joint locations – unless otherwise noted on plans
   1. Every five feet for score joints
   2. Install fiber expansion joints fifteen feet maximum.
   3. Align score and fiber expansion joints with proposed fence posts.
   4. Install fiber expansion joints at all corners, beginnings and endings of radii.

3.05 EDGING

A. All edges of slabs, curbs, and other structures shall be tooled with a one-half inch (1/2") radius edging tool, unless otherwise specified in the Drawings.

B. All trowel marks resulting from tooling of edges shall be carefully troweled out.

3.06 REINFORCEMENT

A. Reinforcement installation shall conform to the provisions of the Standard Specifications as follows:
   1. Cleaning - Section 52-1.03B
   2. Bending - Section 52-1.03C
   3. Placing - Section 52-1.03D
   4. Splicing - Section 52-6
   5. Lapped Splices - Section 52-6.03B
3.07 CONCRETE PLACEMENT

A. Concrete placement shall conform to Section 40-103H of the Standard Specifications.

B. Concrete shall not be dropped freely where reinforcing bars will cause segregation, nor shall it be dropped freely more than six feet. Spouts, elephant trunks, or other acceptable means shall be used to prevent segregation.

3.08 SURFACE DRAINAGE

A. Finish surfaces shall drain properly with no areas of standing water. Tops of curbs, walls and foundations shall be level unless otherwise specified.

3.09 CURING

A. All newly placed concrete shall be cured in accordance with the provisions in Section 90 of the Standard Specifications.

3.10 PROTECTION

A. All newly placed concrete shall be protected in accordance with the provision in Section 40-1.03P of the Standard Specifications.

B. Provide all necessary security to protect the concrete from vandalism. Any concrete which is defaced or damaged during the course of this contract shall be replaced by the Contractor at no additional cost to the Owner.

3.11 CONCRETE FINISHES

A. Patching of concrete to repair or disguise flaws, imperfections or other damage, shall commence only with the acceptance of the Owner’s Representative. Patching color and finish shall conform to the original adjacent concrete color and finish and the Owner’s Representative shall be the sole judge in this respect. Any patching of concrete walls must occur prior to final wall finishing.

B. Provide concrete finishes where shown in the Drawings and as follows:
   1. Trowel Finish: Trowel finish shall be smooth and clean with no obvious trowel marks.
   2. Broom Finish: Broom with medium bristled broom to a uniformly roughened surface. Finished surface shall be clean with uniform and straight lines.
   3. Provide samples, as previously specified, of all concrete finishes for review and acceptance prior to pouring concrete. All accepted samples shall be left on Job site as quality control examples until removal and disposal of samples is acceptable to the Owner’s Representative.
   4. Paving with a slope greater than 6% shall be heavy broom finish and paving less than 6% shall be a medium broom finish.

3.12 BUILT-INS

A. Refer to drawings for additional information relating to built-ins that shall be coordinated with concrete work (e.g., light fixtures, benches, handrails, guardrails, site furnishings, signs, etc).

3.13 CLEANING

A. Remove excess base material, concrete spills, cement stains and all other excess materials from all project areas prior to Final Acceptance.

3.14 TOLERANCES
A. Concrete

1. Vertical deviation from specified grades shall not exceed 0.04 foot.
2. Surface smoothness deviations shall not exceed 1/8 inch in 8 feet, in any direction.
3. Thickness shall not be more than 0.01 foot less than planned thickness at any point.

END OF SECTION
SECTION 32 18 00

MISCELLANEOUS PAVING / SURFACING

PART 1  GENERAL

1.01  SUMMARY

A. Furnish all labor, materials, equipment, facilities, transportation, and services to install and complete all miscellaneous paving and surfacing and related work as shown on the Drawings and/or specified herein.

B. Scope of work:
The general extent of the miscellaneous paving surfacing is shown on the Drawings and may include, but is not limited to:

1. Infield fines mix

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

1. Section 12 93 00 - Site Furnishings
2. Section 31 20 00 - Earthwork
3. Section 32 11 00 - Base Courses

1.02  REFERENCES AND REGULATORY REQUIREMENTS

A. State of California Department of Transportation Standard Specifications, Current Edition

1.03  SUBMITTALS

A. Conform to Section 01 33 00 and applicable Division One and/or Division Two specifications, General Conditions and Special Provisions.

B. Submit two (2) (unless noted otherwise) one quart samples of the following:

1. Infield fines mixture

1.04  QUALITY ASSURANCE

A. Materials Source: Sources of materials specified herein shall not be changed during course of work without review and written acceptance by the Owner’s Representative.

1.05  SEQUENCING AND SCHEDULING

A. Coordinate all applicable subgrade preparations, installations of base course materials and all other work with work of this section to insure a proper, timely installation.

PART 2  PRODUCTS

2.01  MATERIALS

A. Infield Fines: Infield mixes shall be free of rocks, debris, vegetation, clay balls, foreign materials, etc. Infield mixes shall be sterilized to eliminate the possibility of any growth of vegetation. The composition of the mixes shall be achieved using mechanical blending equipment prior to delivery to the site and shall be as follows:

1. Infield Fines and Warning Track Fines Mix: shall be Gold Granite Track (1/8” minus).
Available from: Vineyard Rock Products, Hollister, CA.

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>% Retained</th>
<th>% Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>75 mm</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>50 mm</td>
<td>0</td>
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</tr>
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<td>37.5 mm</td>
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<td>19 mm</td>
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</tr>
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<td>81</td>
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<td>1.18 mm</td>
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<td>47</td>
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<tr>
<td>600- µm</td>
<td>72</td>
<td>28</td>
</tr>
<tr>
<td>300- µm</td>
<td>81</td>
<td>19</td>
</tr>
<tr>
<td>150- µm</td>
<td>85</td>
<td>15</td>
</tr>
<tr>
<td>75- µm</td>
<td>89</td>
<td>11</td>
</tr>
</tbody>
</table>

B. Aggregate Base: shall be per Section 32 11 00 - Base Courses.

**PART 3 EXECUTION**

3.01 SAND

A. Not Applicable.

3.02 INFIELD FINES / WARNING TRACK MIX

A. Spread infield fines mix evenly where shown in drawings and screed in two inch lifts. Thoroughly water each lift until the entire depth is moist.

B. Compact with a 1,000 to 3,000 pound roller after grading and wetting final lift.

C. Allow material to dry, then spike and mat drag to establish finish grade at specified elevations.

D. Water to settle.

E. Finish grade of infield and warning track fines shall be flush with concrete edgebands or turf as applicable. If edge condition is a tall curb set finish grade to finish grade established on grading plans.

F. Bottom of proposed infield and warning track fines to be composed of reused/existing infield fines.

3.05 AGGREGATE BASE

A. Install as per Drawings.

3.10 TOLERANCES

A. Vertical deviation from specified lines, grades, and detail cross sections shall not exceed 0.04 foot for all surfacing specified in this section.
PART 1  GENERAL

1.01  SUMMARY

A. Furnish all labor, materials, equipment, facilities, transportation and services to complete all chain link fencing installations and related work as shown on the Drawings and/or specified herein.

B. Scope of work:
The general extent of the chain link fencing improvements is shown on the Drawings, and can include but is not necessarily limited to the following:
1. Galvanized chain link fabric, posts, gates, hardware, and related appurtenances
2. Chain link fence with integrally woven privacy plastic "slats"
3. Concrete footings and/or mowbands
4. Softball Netting

C. Related sections can include, but may not be limited to:
1. Section 01 33 00 - Submittals
2. Section 12 93 00 - Site Furnishings
3. Section 32 13 13 - Portland Cement Concrete
4. Section 32 90 00 - Landscaping
5. Structural Plans

1.02  REFERENCES AND REGULATORY REQUIREMENTS

A. ASTM:
1. A53/A53M-04a Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
5. ASTM F1043 Standard Specification for Strength and Protective Coatings on Steel Industrial Chain Link Fence Framework
6. ASTM F1083 Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures
7. ASTM A500 (HSS) Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes

B. Chain Link Fence Manufacturers Institute (CLFMI)
C. Industrial Steel Guide for Fence, Rails, Posts, Gates and Accessories
D. State of California Department of Transportation Standard Specifications, current ed.

1.03  SUBMITTALS

A. Product Data: Submit manufacturer's descriptive literature and/or standard catalog "cut-sheets" of all materials, coatings, fittings and equipment proposed to be furnished and installed under this portion of the work. Include the manufacturer's name and catalog number for each item where applicable. Clearly annotate (star or asterisk—in black ink) which portions of "cut-sheets" are applicable if more than one product is shown.

B. Shop Drawings: Submit complete Shop Drawings for all different types and sizes of backstop
unit(s), gates and fencing systems.

1. Shop Drawings shall include, but may not be limited to:
   a. Structural items related concrete footings and reinforcement
   b. All information regarding clearances, connections, components and any miscellaneous related appurtenances (such as wood baseboards at backstops, locking mechanisms etc.)
   c. Concrete footing and reinforcement information

C. Installation Instructions and/or Drawings: Submit as applicable.

D. Samples:
   1. Sample of privacy slat system

1.04 SEQUENCE AND SCHEDULING

A. Contractor shall coordinate construction timing of all chain link fencing and related work with installation of concrete work (Section 32 13 13 - Portland Cement Concrete) and all other work.

PART 2 PRODUCTS

2.01 MATERIALS - General Note: It is intended that all fencing, by area, receive the same finish coating wherever possible. Nuts, bolts, applicable moving portions of hinges etc. shall match framework finish.

A. Fabric:
   1. Selvage: Knuckled finish top and bottom.
   3. Size: Two (2) inch mesh, 9-gauge (0.148 inch diameter) unless noted otherwise.
   3. Size: Three and a half by five and a half (3.5 x 5.5) inch diamond mesh, 9-gauge (0.148 inch diameter) for fences with Privacy Plastic Slats, unless noted otherwise.
   4. Galvanized Wire: Zinc coated wire-ASTM A 392, Class 1, with not less than 1.2 oz. zinc. per sq. ft.

B. Framing:
   1. Strength requirements for posts and rails shall conform to ASTM F 1043.
   2. Pipe shall be straight, true to section, material, and sizes specified, and shall conform to the following weights per foot:

<table>
<thead>
<tr>
<th>NPS in inches</th>
<th>Outside Diameter (OD) in inches</th>
<th>Type I Steel</th>
<th>Type II Steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.315</td>
<td>1.68</td>
<td>1.35</td>
</tr>
<tr>
<td>1.25</td>
<td>1.660 (1-5/8&quot;)</td>
<td>2.27</td>
<td>1.84</td>
</tr>
<tr>
<td>1.5</td>
<td>1.900 (2&quot;)</td>
<td>2.72</td>
<td>2.28</td>
</tr>
<tr>
<td>2</td>
<td>2.375 (2-1/2&quot;)</td>
<td>3.65</td>
<td>3.12</td>
</tr>
<tr>
<td>2.5</td>
<td>2.875 (3&quot;)</td>
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<td>18.97</td>
<td>---</td>
</tr>
<tr>
<td>8</td>
<td>8.625</td>
<td>28.55</td>
<td>---</td>
</tr>
</tbody>
</table>

C. Steel Framework:
   1. Posts, Rails, Braces, and Gate Frames:
      a. Type I Steel Pipe: Hot-dipped galvanized steel pipe conforming to ASTM F
1083, plain ends, standard weight (Schedule 40) with not less than 1.8 oz. zinc per sq. ft. of surface area coated.

b. Type II pipe: not applicable

2. End, corner, and pull posts for following fabric heights: Per plans.

3. Line or intermediate posts for following fabric heights: Per plans.

4. Top, Bottom and Horizontal Intermediate Rails:
   a. Top, bottom and horizontal intermediate rails (as applicable) shall be 1.66” OD (1-5/8”OD)

5. Gate Posts: Furnish posts for supporting single gate leaf, or one leaf of a double gate installation, for nominal gate widths as follows: Per plans.

6. Gate Frames: Furnish frames (single or double gate), for nominal gate widths as follows:
   a. 6 feet to 10 feet: 1.90” OD (2” OD)
   b. Under 6 feet: 1.66” OD (1-5/8”OD)

7. Dugout roof: Per plans.

D. Fittings and Accessories:

1. Material: Comply with ASTM F 626. Mill-finished aluminum or galvanized iron or steel, to suit manufacturer’s standards.
   a. Zinc Coating: Unless specified otherwise, steel fence fittings and accessories shall be galvanized in accordance with ASTM A 153, with zinc weights per Table 1 of ASTM A153.

2. Tension Wire: 7-gauge (0.177 inch diameter) coil spring steel with finish to match fabric (where applicable).

3. Tie Wires: 9 gauge (0.148 inch diameter) steel with finish to match fabric.

4. Post and Line Caps: Provide weather tight closure cap for each post. Provide line post caps with loop to receive wire or top rail with finish to match fabric.

5. Tension Bars: Hot-dip galvanized steel with minimum length 2 inches less than full height of fabric, minimum cross-section of 3/16 inch by 3/4 inch and minimum of 1.2 oz. zinc coating per sq. ft. of surface area.


7. Truss Rods: Hot dipped galvanized steel rods with a minimum diameter of 5/16” (7.9 mm).

8. Hinges: Master Halco heavy duty, or acceptable equal.

9. Concrete: REFER TO STRUCTURAL PLANS / SPECIFICATIONS.

10. Privacy Plastic Slats: Shall be the pre-woven variety in 3.5” x 5.5” galvanized chain-link mesh. Color shall be determined by Owner’s Representative; submit color choices for review.

E. Edgebands: All fencing shall be provided with concrete edgebands unless otherwise noted. Edgebands shall have a minimum 4” clearance from edge of post to edge of concrete. Gates will have the same edgeband width as adjacent fencing.

F. Baseball Netting: Per plan and netting is specified in the site furnishings. Netting posts shall be painted to match galvanized finish.

PART 3 EXECUTION

3.01 PREPARATION

A. Prior to excavation, layout all fencing locations for review and acceptance by Owner’s Representative.

3.02 INSTALLATION

A. Conform to layout shown on Drawings, except as modified by the Owner’s Representative.

B. Erect fencing in strict conformance with reviewed and accepted Drawings, Shop Drawings, and

RAY PARK TURF REPLACEMENT PROJECT
Verde Design  JOB NO. 1801800
32 31 13 - 3
manufacturer’s recommendations.

C. Install new footings as shown on Drawings.

D. Posts shall be installed vertical and plumb.

E. General: Install fence in compliance with ASTM F 567. Do not begin installation and erection before final grading is completed, unless otherwise permitted.

F. Excavation: Drill or hand-excavate holes for posts to diameter and spacing indicated in firm, undisturbed or compacted soil.
   1. Unless noted otherwise, excavate holes for each post to minimum diameter recommended by fence manufacturer, but not less than 4 times largest cross section of post.
   2. Unless noted otherwise, excavate hole depths approximately 3 inches lower than post bottom, with bottom of posts set not less than 36 inches below finish grade surface.

G. Setting Posts: Center and align posts in holes 3 inches above bottom of excavation. Space chain link posts maximum 8 feet o.c. unless noted otherwise. Surface mount posts with mounting plates where indicated. Fasten with lag bolts and shields.

H. Top Rails: Run rail continuously through line posts caps, bending to radius for curved runs and at other posts termination into rail end attached to posts or post caps fabricated to receive rail. Provide expansion couplings as recommended by fencing manufacturer.

I. Bottom Rails: Install bottom rails between posts with fittings and accessories as shown in Drawings (as applicable).

J. Brace Assemblies: Install braces so posts are plumb when diagonal rod is under proper tension.

K. Tension Wire: As applicable, install at bottom of fabric (and at top if top rail is not specified) as shown in Drawings. Install tension wire before stretching fabric and attach to each post with ties. Secure wire to fabric with 12.5 gauge hog rings at 24” on center maximum.

L. Fabric: Leave approximately 2 inches between finish grade and bottom selvages (1 inch at backstops) unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Install fabric on infield or primary use side of fence (unless noted otherwise), and anchor to framework so that fabric remains in tension after pulling force is released.

M. Tension Bars: Provide one bar for each gate and end post, and two for each corner and pull post, except where fabric integrally woven into post. Thread through fabric, and secure to end, corner, pull, and gate posts with tension clips spaced not over fifteen (15) inches on center.

N. Tie Wires: Use U-shaped wire of proper length to secure fabric firmly to posts and rails with ends twisted at least 2 full turns. Bend ends of wire to minimize hazard to persons or clothing. Tie fabric to line posts 12 inches maximum on center and to rails and braces 24 inches maximum on center.

O. Fasteners: Install nuts for tension clips and hardware bolts on side of fence opposite fabric side. Peen ends of bolts or score threads to prevent removal of nuts. Cut all bolts within three threads of nut or less.

P. Welding: All welds shall be shop fabricated prior to galvanizing unless otherwise acceptable to Owner’s Representative. Any and all field welds shall be completed by a Certified Structural Welder and shall be “spray-galvanized” or otherwise treated subject to the discretion of the Owner’s Representative.
Q. All bolts shall be cut back to within three threads of the nut.
R. All fence post caps and backstop caps shall be spot welded to post.
S. All hinges shall be spot welded to the gate post.
PART 1 GENERAL

1.01 SUMMARY

A. Furnish all labor, materials, equipment, facilities, transportation and services to complete all water supply, irrigation system and related work as shown on the Drawings and specified herein.

B. Scope of work:
The general extent of the water supply and irrigation system work is shown on the Drawings and may include, but is not necessarily limited to the following:
1. Installation of water backflow prevention system
2. Installation of automatic irrigation systems and controls
3. Fertigation System

C. Related sections can include, but may not be limited to:
1. Section 31 01 90 - Landscape Maintenance
2. Section 31 23 00 - Excavation, Backfilling and Compacting
3. Section 32 90 00 - Landscaping

1.02 REFERENCES AND REGULATORY REQUIREMENTS

A. American Society for Testing and Materials (ASTM)
6. F477 Specification for Elastomeric seals (gaskets) for joining plastic pipe.

B. National Sanitation Foundation (NSF), requirements for Seal of Approval.

C. Plastics Pipe Institute (PPI), recommendations for hydrostatic design stresses for PVC pipe.


E. Permits and Fees: Contractor is responsible to obtain all required permits and pay all associated fees unless otherwise noted.

1.03 SUBMITTALS

A. Conform to requirements of Section 01 33 00 and/or applicable Division One and Division Two specifications, General Conditions and Special Provisions.

B. Submit the following at the beginning of the project:
1. Four (4) copies of Materials List of all products specified.
2. Four (4) copies of the Product Data or cut sheets of all products specified. No substitutions shall be permitted without written acceptance by the Owner’s Representative.

C. Submit the following at project close-out:
1. Final Record Drawings: Two sets of these shall be produced, one for placement at or within the irrigation controller cabinet reduced to 11” x 17”. One full size set for storage at another location desired by the Owner’s Representative.
2. Both sets shall have all the irrigation valve zone lateral lines color-coded so as to readily
distinguish between adjacent zones. The valve size, station number and gallons per minute shall be legible at each valve and shall match how the controller is wired. Additionally, each valve shall be annotated to describe which type of irrigation it is, i.e.: spray, rotor, bubbler, etc.

3. The color-coded copies shall then be professionally laminated in minimum 5 mil clear plastic.

4. Turn-over Materials: Provide one (1) each of the following to the Owner’s Representative:
   a) One (1) Quick Coupler attachment key equipped with standard thread hose bib per (5) Quick Couplers installed on the project.
   b) One (1) key for locking Quick Coupler covers per (5) Quick Couplers installed on the project.

5. Full set of remaining nozzles for each rotor sprinkler

1.04 RECORD DOCUMENTS

A. Comply with Section 01 78 39 and applicable Division One and Division Two specifications, General Conditions and/or Special Provisions.

B. Accurately record locations of all piping and equipment that varies from what is shown on the Drawings horizontally to within one (1) foot and vertically to within 0.5 feet.

1.05 QUALITY ASSURANCE

A. Unless otherwise specified, install all materials in accordance with manufacturer’s recommendations.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store PVC pipe in a neat and orderly manner fully supported and protected from sunlight.

B. All equipment shall be delivered, unloaded and handled so as to protect from damage at all times.

1.07 PROJECT/SITE CONDITIONS

A. PVC shall not be cemented during wet conditions per the discretion of the Owner’s Representative.

B. Trench excavation and backfilling shall not be performed during excessively wet conditions per the discretion of the Owner’s Representative.

1.08 SEQUENCE AND SCHEDULING

A. Contractor shall be solely responsible for coordinating, sequencing and scheduling all work with all applicable trades and/or sub-contractors so as to insure proper and timely performance.

1.09 GUARANTY

A. Conform to Section 01 77 00 and/or applicable Division One and Division Two specifications, General Conditions and Special Provisions.

B. Contractor shall provide a written guaranty covering entire system against defects in installation, workmanship and equipment for a period of one year from date of Final Acceptance.

C. Contractor shall make necessary repairs to the system as well as to other work affected by defects in the system during guaranty period. Repairs shall be made at the Contractor’s sole expense.

1.10 MAINTENANCE

A. Conform to Section 31 01 90 - Landscape Maintenance.

B. Service: Contractor shall service and maintain system during specified Landscape Maintenance Period.
C. The entire irrigation system shall be under full automatic operations for a period of two days prior to any planting.

D. Final Acceptance and start of guaranty period shall occur no later than the end of the specified Landscape Maintenance Period.

PART 2 PRODUCTS

2.01 GENERAL

A. Use only new materials of brands shown on Drawings, specified herein or as acceptable to the Owner’s Representative.

2.02 PIPE

A. PVC Pipe – Main Lines: Polyvinyl chloride (Type I) plastic pipe PVC 1120 and NSF approved per plan. Constant-pressure mainline piping 2 inches and smaller shall be schedule 40 PVC pipe, 2-1/2 inches and larger shall be class 200 PVC pipe.

B. Intermittent-pressure lateral piping: Shall be schedule 40 PVC pipe. If copper pipe is noted on the irrigation legend, pipe shall be type “K”.

C. All pipe feeding from the fertigation system will be purple pipe for mainlines and laterals.

2.03 PVC FITTINGS

A. PVC Fittings: Polyvinyl chloride (Type I) plastic fittings 1120, Schedule 40 or Schedule 80 as may be noted in the Drawings.

B. PVC Nipples: Polyvinyl chloride (Type I) plastic fittings 1120, Schedule 80.

2.04 SWING JOINTS

A. Swing Joints for pop-up heads shall be as per detail.

B. Swing Joints for rotors shall be by LASCO Fittings, Inc. with ASTM F2768 Standard for Swing Joint ACME Threads, or equal.

2.05 BACKFLOW PREVENTER DEVICE

A. As specified on Drawings.

2.06 BACKFLOW PREVENTER ENCLOSURE

A. Strongbox model series SBBC-CR.

C. Enclosure size to be verified with size of installed backflow device by Contractor.

D. Insulation Blanket: WeatherGaurd Blanket by Best Choice USA, or equal.

2.07 VALVES AND SENSORS

A. Master Valve: As specified on Drawings.

B. Flow Sensors: (FS) As specified on Drawings. Flow sensor wiring conduit: Shall be Schedule 80 grey
PVC electrical conduit ASTM F-512, size as required

C. Gate Valves / Ball Valves: (GV/BV) As specified on Drawings. Ductile Iron Gate Valves: Ductile Iron Gate Valves shall have 4710, DR 11 Pipe Ends per ASTM F714 or ASTM D3035 with a minimum pressure rating of 200 psi and comply with AWWA C515. Gate Valves shall be Model 66 series as manufactured by American AVK and supplied by The Harrington Corporation or approved equal.

D. Remote Control Valves: (RCV) As specified on Drawings.

E. Quick Coupling Valves: (QCV) As specified on Drawings.

F. Rain Sensors: As specified on Drawings.

2.08 PLASTIC VALVE BOXES

A. Master Valve: MV valve box shall be rectangular model equivalent to Carson 1419-12 with 1419-T locking lid for 1” and 1-1/2” valves, 1730-18 with 1730T locking lid for valves 2” and larger. Boxes shall be labeled as "Irrigation - MV" on lid.

B. Flow Sensor: FS valve box shall be rectangular model equivalent to Carson Model 1419-12 with 1419-T locking lid for sensors up to 3”. Boxes shall be labeled as Irrigation - "Irrigation - FS" on lid.

C. Gate Valves / Ball Valves: GV/BV valve boxes shall be round model equivalent to Carson Model 910-10 with 910-T locking lid. Boxes shall be labeled as “Irrigation – Valve” on lid.

D. Remote Control Valves: RCV valve boxes shall be rectangular model equivalent to RainBird PVBJMB with Drop-in Lockable lid. Boxes shall be labeled as “Irrigation – RCV” on lid.

E. Quick Coupling Valves: QCV valve boxes shall be round model equivalent to Carson Model 910-10 with 910-T locking lid. Boxes shall be labeled as “Irrigation – QC” on lid.

F. Valve Boxes: Valve boxes shall have locking or bolt down type lids. Approved box manufactures as equals: Applied Engineering Inc., NDS, Christy and Carson Industries.

G. Final valve box model and sizes are to be determined by the contractor to ensure the valve and union assembly fits within the box with clearances as per the details.

H. All control valve boxes within a manifold are to be the same size as the largest box necessary for the largest control valve. For layout of control valve, isolation valve and quick coupler valve boxes, refer to Valve Box Layout Detail.

I. Color of plastic boxes shall be green, unless the irrigation system is designed for recycled water, in which case boxes shall be purple. If black or green valve boxes are required by the client to be used on recycled water systems, the lids shall be purple or shall have a warning label or nameplate permanently molded into or attached onto the lid with rivets, screws, or bolts. Warning labels shall be per city standard details.

2.09 AUTOMATIC CONTROLLER AND ENCLOSURE

A. Controller: As specified on Drawings.

B. Enclosure: As specified on Drawings.

2.10 VALVE WIRING

A. Low Voltage:

1. Conductors:
a) Control wires shall be UL rated for direct burial, Type UF, 14 gauge wire. Insulating jacket color shall be red.
b) Common wires shall be UL rated for direct burial, Type UF, 12 gauge wire. Insulating jacket color shall be white.
c) Spare control wires shall be UL rated for direct burial, Type UF, 14 gauge wire, Insulating jacket color shall be blue.
d) Spare common wire shall be UL rated for direct burial, Type UF, 12 gauge wire. Insulating jacket color shall be green.

2. Splice connectors: 3M “DBY” splice connectors or acceptable equal.

2.11 CONNECTING COMPOUNDS
A. Primer: IPS Corporation Weld-on #P-70.
B. Cement:
   1. IPS Corporation Weld-on #705 low VOC PVC solvent cement for Class 200 P.V.C. or schedule 40 P.V.C. (up to 6” diameter).
   2. IPS Corporation Weld-on #711 low VOC PVC solvent cement shall be used for larger pipe diameters and schedule 80 P.V.C.
   3. IPS Corporation Weld-on #795 low VOC PVC solvent cement for flexible P.V.C. to rigid P.V.C. connections.

2.12 SPRINKLER HEADS
A. Sprinkler Heads: As specified on Drawings. As applicable, install with purple head caps or rotor covers if system is designed for recycled water.

2.13 FERTIGATION SYSTEM
A. See Landscape Specification.

2.13 ADDITIONAL MATERIALS
A. Pipe Detection Tape: "Sentry Line" three (3) inch wide, detectable, "Caution Water Line Buried Below" tape as available from Terra Tape Inc. Houston, Texas (800)-231-6074 or acceptable equal.
B. Sleeves: All sleeves shall be PVC class 200. Install sleeves in locations and at the depths shown on the drawings. Sleeves shall extend a minimum of 6” past the above hard surface for ease of location.
C. Teflon tape shall be of a variety commonly used for wrapping threaded connections.
E. Valve Tags: Plastic pre-labeled station tags. Provide purple valve tags for stations on fertigation system.
F. Drain Rock: Shall be ¾” washed drain rock.

PART 3 EXECUTION
3.01 EXAMINATION
A. Prior to starting work, test and verify that water pressure levels meet the requirements specified on the Drawings. Notify the Owner’s Representative immediately of any discrepancies.
B. Irrigation plans are diagrammatic. Pipe lines shown parallel in the Drawings may be placed in a
common trench, provided that a minimum horizontal distance of three inches (3") is maintained between buried lines.

C. Sprinkler heads are shown schematically. Suspected discrepancies in coverage or sizes of areas to be irrigated shall be brought to the attention of the Owner’s Representative prior to installation. Contractor shall re-direct work to avoid delay while awaiting resolution.

3.02 PREPARATION

A. Contractor shall make provisions and take necessary precautions to protect existing work or features.

B. Layout: Coordinate lay-out of system with Owner’s Representative as necessary.

3.03 TRENCHING

A. Conform to Section 31 23 00 and/or applicable Division One and Division Two specifications, General Conditions and Special Provisions.

B. Excavate trenches with vertical walls, uniform bottom, free of deleterious materials, and wide enough for pipes to lay side by side, fully supported on bottom. There shall be a minimum three inch (3") clearance between all pipes.
   1. No lines shall be installed parallel to and directly over another line.
   2. When lines must cross, the angle shall be forty-five to ninety degrees, and a minimum of three inch (3") vertical clearance shall be maintained.

C. Provide minimum coverage depths as follows:
   1. Mainline: 24" in landscape areas, 30" in sleeves under paving.
   2. Lateral Lines: 18" in landscape areas, 30" in sleeves under paving.

D. Hydraulic driving methods shall not be used under paved surfaces.

3.04 PIPE INSTALLATION

A. Comply with applicable Division One and Division Two specifications, General Conditions and/or Special Provisions and manufacturer’s instructions.

B. Rubber Ring Seal Joint:
   1. Use factory-made male end or prepare field-cut male end to exact specifications of factory-made end.
   2. Carefully clean bell or coupling and insert rubber ring without lubricant. Position ring carefully according to manufacturer’s specifications.
   3. Lubricate male end according to manufacturer’s instructions and insert male end to specified depth. Use hands only when inserting PVC pipe.

C. Thrust Blocks:
   1. Thrust blocks shall be provided on 3" and 4" main lines where specified and as necessary to resist system pressure on pressurized lines and fittings. Thrust blocks shall be concrete and the size shall be based on an average soil safe bearing load of 3,000 pounds per square foot.
   2. Main lines of 3" and 4" with operating pressures of 90 PSI or more shall have mechanical restraints at all changes of flow direction.
   3. Main lines 6" and larger shall have ductile iron fittings with joint restraints installed at all changes in flow direction.
   4. Form thrust blocks in such a manner such that concrete comes in contact only with the fittings. Thrust blocks shall be between solid soil undisturbed and the fitting.
   5. Install thrust blocks as shown in Drawings and as described above.

D. Solvent Welded Joints:
   1. Assemble above ground where possible.
   2. Cut square, ream, and thoroughly clean.
3. Make joint using specified primer and cement, continuously wiping off excess.
4. Allow sixty (60) minutes of set-up time before handling and twenty-four (24) hours curing before applying water pressure.

E. Threaded Joints:
1. Use Teflon tape on all pressurized, threaded plastic to plastic and plastic to steel joints.
2. Hand tighten and use only light strap-type friction wrench pressure to complete.

F. Snake pipe a minimum of one (1) additional foot per one hundred (100) feet of pipe to allow for expansion and contraction.

G. Pipe shall be installed as specified and generally as shown in Drawings.

H. Cap or plug openings as soon as pipes have been installed to prevent intrusions of debris.

I. Sleeves:
1. Install pipe sleeves where necessary, where shown and at all points where pipes pass through concrete or masonry. In footings, install sleeving that allows one inch (1") min. clearance around pipe(s).
2. Each end of sleeve shall extend a minimum of six inch (6") beyond edge of paving or structure above. Provide removable non-decaying plug or cap at each end of sleeve, to prevent earth from entering pipe.

J. Thoroughly flush system prior to installing valves and nozzles.

K. Install pipe detection tape and reinforced tracer wire above mainline.

3.05 EQUIPMENT AND INSTALLATION

A. Reduced Pressure Backflow Prevention Device: Install in accordance with local codes and as shown in Drawings.

B. Remote Control Valves:
1. Install as shown in Drawings.
2. Valve boxes shall be set plumb and square with adjacent structures.
3. Valves shall be installed in valve boxes to provide 3" clearance between the highest point of the valve and the bottom of the valve box lid.
4. Install valve tags in an acceptable manner with valve station and controller number.
5. Provide twelve (12) inches minimum separation when valve boxes are grouped together and align in a parallel, even, and orderly manner.
6. Locate all boxes a minimum of 10 feet from striping of any field of play.
7. Locate valves in shrub/ground cover areas whenever possible.

C. Gate Valves / Ball Valves:
1. Install as shown in Drawings.
2. Gate Valves shall be installed in valve boxes to provide a minimum of 3" clearance between the highest point of the valve and the bottom of the valve box lid.
3. Gate valves shall not be installed in any area that is within the athletic field of play. All valves shall be located within valve boxes set 12" from fencing or edgebands as per details.
4. Locate all boxes a minimum of 10 feet from striping of any field of play.

D. Quick Coupler Valves:
1. Install as shown in Drawings.
2. Quick Coupling Valves shall be installed in valve boxes to provide 2" clearance between the highest point of the valve cover and the bottom of the valve box lid.
3. Locate all boxes a minimum of 10 feet from striping of any field of play.
4. All quick couplers in synthetic fields shall be located against edgeband / curb.

E. Controller:
1. Install as shown in Drawings.
2. Owner’s Representative shall determine final approved controller location(s).
3. Label cabinet door exterior with permanent, one (1) inch tall (minimum) letter or number of controller designations corresponding with plan designations (as applicable).
4. 120 power, junction box and conduit from power source to controller is to be provided and installed by an Electrical Contractor.
5. Affix reclaimed water warning on controller enclosure (as applicable).

F. Control Wire:
1. Connect control wires to controller in sequential arrangement according to identification number in the Drawings. Label each controller station with permanent non-fading labels indicating identification number of valve controlled.
2. Install as shown in Drawings.
3. Bundle multiple wires with tape or ties at twenty (20) foot intervals maximum. Do not tape wires in sleeves.
4. Make all splices in valve boxes using only specified connectors.
5. Provide thirty (36) inch wire coil at each remote control valve and at all mainline directional changes.
6. Install two spare control wires and one looped spare common wire to run by, and loop into, every remote control valve on system. Terminate wires inside controller enclosure unconnected and clearly labeled as extra.
7. All wiring under paving shall be installed in a PVC pipe sleeve large enough to allow withdrawal and insertion of individual proposed wires and room for (12) additional wires.
8. If any control wire run is over 2000’, up-size applicable control wire to be 12 gauge.

G. Spray, Rotator and Rotor Heads:
1. Install as shown in Drawings.
2. Install plumb with finish grade.
3. Thoroughly flush all lines prior to installing nozzles.

H. Tree Bubblers:
1. Install in drain pipe sump as may be shown in Drawings.
2. Coordinate installation with planting operations to ensure timely and proper placement of heads.

I. Valves in Bullpens:
1. Center the valves in the bullpens between the pitching rubber and home plate.
2. Boxes shall be 12 inches from and parallel to hardscape edge of bullpen, and evenly spaced.

3.06 FIELD QUALITY CONTROL

A. General:
1. Notify Owner’s Representative for the following reviews, with 2 working days minimum notice:
   a.) Pressure testing mains and laterals prior to installing heads.
   b.) Coverage test prior to planting turf shrubs and or groundcover.
   c.) Pre-maintenance observation prior to acceptance of installed irrigation system.
   d.) Final observation prior to release of project to Owner.
2. Contractor shall provide all equipment and personnel required to conduct tests.
3. Provide up-to-date Project Record Drawings at each review.
4. If Owner’s Representative is called out for review prior to the system being ready as specified, the contractor shall be back-charged for the full cost of the review.

B. Pressure Tests:
1. Do not install remote control valves, quick couplers, or any other valve assembly until testing of pressure main lines has been accepted by the Owner’s Representative.
2. Testing shall occur with trenches open. Small amounts of backfill between fittings shall be allowed to prevent pipe displacement. All fittings shall be visible prior to testing.
3. Test all pressure supply lines under hydrostatic pressure of 125 p.s.i. minimum. Pipe shall hold
pressure for a period of six (6) consecutive hours with no more than five (5) p.s.i. loss in order to pass test.

4. Lateral lines shall be tested under full line pressure for a period of one (1) hour prior to backfilling. Cap all heads and center load pipe between fittings prior to testing.

5. Correct all deficiencies revealed by tests to the satisfaction of the Owner’s Representative.

C. System Flushing:
1. After sprinkler pipe lines and risers are in place and connected, and prior to installation of automatic valves, quick couplers, and sprinkler nozzles, thoroughly flush all lines with water to completely clean lines of debris.

2. Install sprinkler nozzles only after lines have been flushed to the satisfaction of the Owner’s Representative.

D. Coverage Tests:
1. Perform coverage tests after all systems are completed and operational, after finish grading (Refer to Section 32 90 00 - Landscaping) has been completed, but prior to any planting, in the presence of the Owner’s Representative.

2. Correct all deficiencies to the satisfaction of the Owner’s Representative prior to planting.

3. No overspray or runoff of recycled water is allowed on any non-approved use area.

3.07 BACKFILLING

A. General:
1. Backfill only after specified tests have been performed and accepted.

2. Clean trenches of all debris and deleterious material before backfilling.

3. Backfill, as shown in Drawings, with native material granular in nature and free from deleterious material. Install pipe detection tape over entire run of mainline as shown in Drawings.

4. Compact trenching to 95% relative density under pavement and 85% relative density within planting areas.

5. Dress off and compact trench surfaces with finish grade in a manner to ensure no settling of trenches will occur.

3.08 ADJUSTING

A. Adjust and balance system to eliminate over spray and fogging/misting and as directed by Owner’s Representative.

3.09 DEMONSTRATION

A. Instruct Owner’s personnel in complete and proper operation and maintenance of system prior to Final Acceptance.

3.10 FINAL REVIEW

A. Provide Owner’s Representative with all Record Drawing submittals, turn-over materials, salvaged items and warranty requirements prior to Final Review.

END OF SECTION
SECTION 32 90 00

LANDSCAPING

PART 1    GENERAL

1.01 SUMMARY

A. Furnish all labor, materials, facilities, transportation and services to complete all landscaping and related work as shown on the Drawings and specified herein.

B. Scope of work:
The general extent of the landscaping is shown on the Drawings and can include, but may not be limited to the following:
   1. Soil preparation
   2. Fine grading
   3. Turf planting
   4. Tree, shrub, and ground cover planting
   5. Turf Establishment Period
   6. Landscape Maintenance Period
   7. Fertigation System

C. Related sections can include, but may not be limited to:
   1. Section 02 41 00 - Site Clearing and Demolition
   2. Section 31 01 90 - Landscape Maintenance
   3. Section 32 80 00 - Irrigation

1.02 REFERENCES AND REGULATORY REQUIREMENTS

A. American Joint Committee on Horticulture Nomenclature (AJCHN):
   Standardized Plant Names

B. American Association of Nurserymen, Inc. (AAN):
   American Standard for Nursery stock

C. Sunset Western Garden Book, Lane Publishing CO.

D. Agricultural Code of California.


1.03 SUBMITTALS

A. Conform to requirements of Section 01 33 00 and/or applicable Division One and Division Two specifications, General Conditions and Special Provisions.

B. Plant Materials and Products:
   1. Thirty (30) days prior to planting, submit four (4) copies of documentation that all plants specified have been ordered. Include names and addresses of all suppliers.
   2. Substitutions: If substitutions are required, they shall be brought to the attention of the Owner’s Representative, at time of submittal, for any requested substitutions.
   3. Submit four (4) copies of product data or “cut-sheets” for all products proposed for use.

C. Samples: Submit four (4) samples of the following (1 quart size “zip-lock” plastic bag min. each):
   1. Soil amendment (with current evaluation and sieve analysis)
   2. Bark mulch top dress
   3. Topsoil (as applicable, with current fertility and structure analyses)
D. Certificates: Submit “cut-sheets” or other product literature showing certified chemical analysis of the following:
1. All fertilizers
2. All herbicides

1.04 SOURCE/QUALITY ASSURANCE

A. Control of work: Comply with Section 5 of the Standard Specifications.

B. Control of materials: Comply with Section 6 of the Standard Specifications.

C. Contractor shall employ on-site at all times during execution of this Section at least one person who is thoroughly familiar and experienced with the materials and products being installed and proper methods of their installation. Notify the Owner’s Representative immediately of all changes in supervision.

D. General: Ship plant material and seed with certificates of inspection required by governing authorities. Comply with regulations applicable to plant materials (as applicable).

E. Tree, Shrubs and Plants: Provide trees, shrubs and plants of quantity, size, genus, species and variety shown and scheduled for landscape work and complying with recommendations and requirements of ANSI Z60.1 “American Standard for Nursery Stock.” Provide healthy, vigorous stock, grown in a recognized nursery in accordance with good horticultural practice and free of disease, insects, etc., larvae, and defects such as girdling or bound roots, knots, sun-scald, injuries, abrasions or disfigurement.

F. Analysis and Standards: Package standard products with manufacturers certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agriculture Chemists, wherever applicable.

G. Quality Review: The Owner’s Representative shall review all trees and shrubs before planting for compliance with specified requirements for genus, species, variety, size and quantity. Owner’s Representative retains right to further review trees and shrubs for size and condition of root systems, trunks, stems branches or structure, buds, etc., and to disqualify unsatisfactory or defective material at any time during the progress of work. Remove disqualified trees or shrubs immediately from project site with materials acceptable to Owner’s Representative.

1.05 DELIVERY, STORAGE, AND HANDLING

A. General:
1. Handle and store all products of this Section in such a manner as to protect them from damage at all times.
2. Storage of products on-site shall be coordinated by the contractor in an orderly manner so as not to unnecessarily impede the work or reasonable use of project site.

B. Plants:
1. Delivery: Coordinate with Owner’s Representative. Provide proper identification for landscape labor force and vehicles at all times while on site.
2. Storage: Coordinate with Owner’s Representative. Provide exposure as required by plant variety and provide wind protection for all plants. Water regularly to maintain thorough moisture in root zone. Temporary, automatic irrigation system will be required at discretion of Owner’s Representative if extended storage period becomes necessary. Protect dark colored plant containers from direct exposure to the sun.
3. Labeling: At least one plant of each variety or type shall be legibly labeled at all times clearly indicating correct plant name as indicated on Drawings. Labels shall be durable with waterproof ink.

C. Fertilizers:
1. Deliver in original, unopened containers with original labels intact and legible which state
D. Bulk Material:
1. Coordinate delivery and storage of bulk material with Owner’s Representative.
2. Confine materials to neat piles in areas acceptable to the Owner’s Representative.

1.06 PROJECT/SITE CONDITIONS

A. Planting operations shall not be conducted under the following conditions, subject to the discretion of the Owner’s Representative:
1. Freezing weather
2. Excessive heat
3. High winds
4. Excessively wet conditions

1.07 GUARANTEE

A. All work executed and all materials provided or used under this Section shall be guaranteed to be free of defects and poor workmanship for a period of one year after Final Acceptance.

B. All plant materials shall be guaranteed to be in a healthy and thriving condition one (1) year after Final Acceptance, unless it can be proven that the unhealthy or non-thriving material is due to causes other than the contractor’s materials or workmanship.

C. Replace all dead plants and plants not in vigorous condition immediately upon notification by Owner’s Representative during Guaranty Period. Replaced plants shall be subsequently guaranteed by the contractor for an additional year following date of replacement.

D. Repair all defective materials and work as acceptable to the Owner’s Representative during guaranty period.

1.08 TURF ESTABLISHMENT PERIOD

A. Turf Establishment period shall include complete germination or rooting of ALL turf and at least two mowings as specified herein, prior to the commencement of the specified Landscape Maintenance Period.

1.09 MAINTENANCE PERIOD

A. Refer to Section 31 01 90 - Landscape Maintenance for information.

PART 2 PRODUCTS

2.01 TOPSOIL

A. Topsoil shall be clean on-site material that has been previously stripped from the top 6 inches of original grade or acceptable import material (as applicable). Acceptable topsoil shall be free from “rocks” (rock, stones, rubble, clay clods, etc. over 2” in diameter), roots, toxins, and any other deleterious materials per the discretion of the Owner’s Representative. Refer to Section 31 20 00 – Earthwork.

B. All import topsoil proposed for use shall be submitted to the Owner’s Representative for review and acceptance prior to use. Submit samples and current soil fertility and structure analyses in the quantity previously specified.

2.02 FERTILIZERS

A. General:
1. All fertilizers shall be of an acceptable brand with a guaranteed chemical analysis as required by USDA regulations.

2. All the fertilizers listed in the Pre-Plant fertilizers are based on the existing soil conditions before placement of the soils and are to be used for bid purposes. These quantities and products may change after the placed soils have been analyzed.

3. Pre-Plant and Post Plant Fertilizers.
All products, amendments, procedures and equipment listed below have been specified just for this project based on the specific soil conditions and growing conditions and have been submitted for testing to ensure that they meet the specifications listed below and that they are compatible with the conditions of this site.

4. Any other products that are to be submitted as substitutes must be tested and approved pre-bid by the same laboratories and the results will be used by the soil consultant to determine if they meet the specifications based on technical results. Contractor must allow at least two weeks from the day he overnights the samples to the laboratory for the results and approval for substitution at least 3 weeks before the bid opening.

B. Pre-Plant Fertilizer:

1. Concentrated Growth Medium-All available- bio carbon with a pre digested humic / fulvic acid. Has primary, secondary and micronutrients + 75 colloidal minerals to re-mineralize the soil. Has a scope of microbes, bacteria, fungi, protozoa, actinomycetes and predator nematodes to improve soil health, organic degradation and nutrient utilization.
Approved product - EF Angel Concentrated Soil Conditioner-(no known equal)
Quantities: Baseball Field: 2.5 yards/acre

2. Liquid Nitrogen with catalyst- Nutrient Analysis-27-0-0
Approved product -EF Nitro Blend or Pre-Bid Approved Equal
Quantities Baseball Field 1.72) Gallons/1,000 sq. ft.

3. Liquid Phosphorus with catalyst
Nutrient Analysis-3-15-0 Approved product –EF Phos Pro or Pre-Bid Approved Equal
Quantities Baseball Field 2.56 Gallons/1,000 sq. ft.

5. Liquid Potassium with catalyst
Nutrient Analysis-0-0-27- Approved product –EF Foliar Blend 27-0-0 or Pre-Bid Approved Equal
Quantities Baseball Field: 4.3 Gallons/1,000 sq. ft.

6. Liquid All organic root growth hormone /bio-stimulant,
Approved product -EF Solu-Plus 1-0-1 or Pre-Bid Approved Equal
Quantities Baseball Field: 2.5 gallons/acre

7. Liquid All organic Kelp Product /bio-stimulant,
Approved product -EF Solu-Kelp 1-1- or Pre-Bid Approved Equal
Quantities Baseball Field 2.5 gallons/acre

8. All organic root growth hormone/seed germinator/bio-stimulant,
Approved product -EF Biology Boost or Pre-Bid Approved Equal
Quantities Baseball Field: 2.5 lbs./ per acre

9. Concentrated PRO Magnesium 36% magnesium-no known equal
Quantities Baseball Field: 7.8 lbs. / 1000 sq. ft.

10. Concentrated Lime 35% Calcium
Quantities: Baseball Field: 170 lbs. / 1000 sq. ft.
11. Concentrated Potassium 0-0-50 or equal
   Quantities: Baseball Field: 10.2 lbs. /1,000 sq. ft.

12. Sodium Leaching Aid
   Approved product – Cal Fresh or pre-bid approved equal
   Quantities: Baseball Field: 2 gallons per acre during incorporation

13. Concentrated Wetting Agent - Baseball Field - Pen Max or equal
   Quantities: .5 gallons /acre for incorporation

C. Post- Plant Fertilizer

1. Granular 46% Controlled release Nitrogen
   Quantities: Baseball Field:
   Approved Product- UFLEX 46%
   Quantities: 312 lbs./acre per month of grow-in applied immediately after sodding

2. All organic root growth hormone/seed germinator/bio-stimulant,
   Approved product - EF Biology Boost or Pre-Bid Approved Equal
   Quantities: Baseball Field: 2.5 lb. per acre

3. Approved fertilizer supplier - Ecofert-Lou-714-931-9055 or pre bid approved equal

D. Plant Tabs: Shall be “Gro-Power” 7 gram tabs designed for 12 month slow release with the
   following chemical analysis by weight (no known equal): “Gro-Power Inc. Ph.: (800) 473-1307.
   1. 12% Nitrogen
   2. 8% Phosphoric Acid
   3. 8% Soluble Potash
   4. 20% Humus
   5. 4% Humic Acid
   6. 3.5% Sulfur
   7. 2% Iron
   8. Micronutrients

2.03 SOIL ADDITIVES

A. Soil Amendment

1. Organic Composted Soil Amendment: Compost must have the following characteristics:
   a. PH of less than 8
   b. Double screened to 1/4" minus (no 1/4" pencils allowed)
   c. Soluble salts EC less than 4
   d. Carbon to nitrogen ratio 20/1 or less
   e. Organic content above 20% based on dry weight
   f. Shall be free of rocks, glass, metal, plastics and all debris. All trucks hauling
      compost to the site must be washed thoroughly and free of these contaminates
      between each load. If any of these are found in compost that has been delivered,
      the compost manufacturer, the hauler and the landscape contractor will be
      responsible for removing and replacing the bad compost.
   g. Compost shall contain no sewer sludge
   h. Odor shall be soil-like (musty or moldy) not sour, ammonia -like or putrid
   i. Can have no nitrogenized wood product in it
   j. Quantities: All sports field and surrounding turf areas except native grass seeded
      areas: 6 cubic yards/1,000 sq. ft.
   k. Approved Suppliers:
“Organic Compost” as available from Z-Best Products Inc. 980 State Highway 25 Gilroy, Ca. 95020 Ph.: (408) 846-1577 Fx.: (408) 846-1573 or analyses-proved equal.

2. Sand for incorporation with the following characteristics:
   a) Shall be washed concrete sand with 97% passing a #4 screen and less than 4% passing a #200 screen.
   b) Minimum of 97% sand and no more than 3% silt & clay
   c) Quantities: 3" compacted and verified by survey on 20' centers or quantities based on 1.8 tons per cubic yard will be acceptable.
   d) Approved product- Steven's Creek Quarry- Shane-408-605-5584 or pre-bid approved equal

2.04 MULCH TOP DRESS

A. Mulch top dress shall be a medium-sized (3/4"-2") decorative chipped wood product free of deleterious and inorganic materials. Material shall be homogenous in appearance, free from sticks or shredded/stringy/fibrous materials.

B. Golden Nuggets from United Forest Products is acceptable. Contact information 707.585.6056.

C. MBC Red from My Bark Company is acceptable. Contact information 209.786.4042 and fax 209.786.4043.

2.05 PLANTS

A. General
   1. All plants shall conform to the species and minimum sizes shown on the Drawings.
   2. Quantities shown on the Drawings are for the contractors bidding convenience only. Contractor shall provide plant material to fulfill the intent of the Planting Plan per the discretion of the Owner’s Representative.

B. Condition: All plants shall conform to the following minimum requirements:
   1. Nursery grown unless otherwise specified
   2. Supplied in appropriate container, balled and burlapped, or bare root as specified on Drawings

2.06 TURF SOD

A. Sod shall be as follows:
   1. Bluegrass and Rye grass blend with the following seed count percentage:
      a) 80% Bluegrass
      b) 20% Rye grass
   2. Sod shall have a ¾" cut or thickness
   3. Sod shall be large roll
   4. Sod shall be grown on soil with 70% or above sand content, no peat based
   5. Netting shall be removed before or during laying process
   6. Quick couples or hoses shall be available for hand watering sod as it is layed
   7. Sod shall not be allowed to dry out as it is being layed or after
   8. Sod bed shall be free of debris and any foreign material that could affect rooting including stones, PVC pipe and hydraulic line breakage residue
   9. People laying sod shall carry a 5-gallon bucket and a rake with them for removing additional debris discovered during the laying process.
   10. Any low spots created by removal of debris shall be filled in before sodding and tamped in dry
   11. Supplier shall be- West Coast Sod, The only company with 70% sand content sod-

2.07 NATIVE MOW FREE SOD
A. Sod shall be as follows:
   1. Sod shall be a non mowed **Fine Fescue** blend.
   2. Sod shall have a ¾” cut or thickness.
   3. Sod shall be standard roll cut.
   4. Sod shall have a sandy loam base.
   5. Sod shall be free of non specified turf types, weeds and other deleterious materials.
   6. Sod is available at:
      a. Delta Bluegrass Co. - Native Mow Free: Blend of 3 Fine Fescues
         111 N Zuckerman Road, Stockton, California 95201; 209-469-7979
      b. West Coast Turf - Hillside Fine Fescue: Blend of 3 Fine Fescues.
         1570 Howard Road, Livingston, CA 95334; 888-893-8873

2.08 HERBICIDES

A. Pre-emergent: “Ronstar-G” pelletized, “Surflan” liquid, or acceptable equal.

B. Other: All other herbicides shall be accepted by Owner’s Representative prior to use.

2.09 TREE STAKES AND TIES

A. Tree stakes and ties shall be as specified on Drawings.

2.10 FERTIGATION SYSTEM

A. Fertigation system consisting of 2 tanks and pumps-no syphon systems- contractor shall install,
   maintain and make monthly visits to put fertilizers in the tank- Ecofert Inc- Lou-949-766-5800.

2.11 OTHER MATERIALS

A. Header Board: As may be specified on the Drawings.

B. Tree Ties: Shall be V.I.T Cinch Ties, Hose and Wire Tree Supports; HW27 for 5-15 gallon trees,
   HW36 for 24” box trees. Or, V.I.T. Cinch-Tie Tree Supports; CT24 for 5-15 gallon trees, CT32 for
   24” box trees. Available from V.I.T. Products, 800-729-1314, or equal.

C. Root Barriers: Shall be Model #UB 24-2 “Universal Barrier” by Deep Root Partners LP, 800-458-
   7668. Root Or, DeWitt 12YR3100 Non-woven Polypropylene barrier fabric. as produced by
   DeWitt, 905 S Kings Highway, Sikeston, MO 63801, Ph: 800-888-9669; or equal.

D. Jute Netting
   1. Poly Jute Netting (model 814312) and Anchor Stakes (model 00042579500581 –
      DeWitt Co. – 905 S. Kings Highway, Sikeston MO 63801, 800-888-9669.
   Or
   2. Geo Jute Netting with ½” x ¾” holes made from hemp use with 8” jute staples.

E. Weed barrier: Pro Weed Barrier model 24003080 available in 12’ by 250’ roles (or approved
   equal). Stables to be 8” jute staples.

F. Provide all other materials necessary to complete landscaping work as shown on Drawings and
   specified herein.

G. All products and materials, including those specified above, shall be new, first quality as
   acceptable to the Owner’s Representative.

PART 3 EXECUTION

3.01 TOPSOIL INSTALLATION
A. Subgrade soil shall be cut or filled to the depth required such that after placement of required amount of topsoil and specified preparation procedures have been accomplished, specified finish grades will be attained.

B. All subgrade soil shall be cross-ripped to a twelve (12) inch minimum depth prior to placement of accepted topsoil. Refer to Preparation (3.02) below. – Confirm you want this step and coordinate with grading specifications.

C. All planting areas shall contain a minimum of six (6) inches of acceptable topsoil. As applicable and where needed. Only previously accepted topsoil shall be installed.

D. Refer to Section 31 20 00 - Earthwork for rough grading for information.

3.02 PREPARATION

A. Make provisions and take necessary precautions to protect all existing and new improvements from damage during execution of this work.

B. When site is roto-tilled make the first pass completely around the site as close to valve boxes and sidewalks as safely possible. Then while the rototiller continues, use a front-end loader to pull the amendments, back from the edges and spread them evenly over the just mixed row. Be sure to do this 6” deep to get all of the rootzone. After the rototiller has come back over these amendments, use the front-end loader to pull the material back up against the edges where it came from.

C. Schedule of required installation equipment

1. Rototiller shall be Caterpillar 500 Road Renovator or equal-Pavement Recycling Systems Systems-Sharon-916-685-2204 or cell-916-870-6304.
2. Dry spreader for spreading bagged fertilizer material (can be sling type or drop type-1000 lbs. or larger).
3. Boom sprayer for spraying liquid fertilizers-14-20ft. Boom and 150 gallons plus capacity.
4. Top dresser with a minimum of 4 yards capacity.
5. Dual plane laser controlled (not GPS, not laser guided, not laser surveyed) road grader for sub grading and final grading and laser controlled (not laser guided or laser surveyed) box scraper for last final grading and grading around heads after they have been brought to the surface.
6. Six to ten-foot reel mower with blades kept sharpened for mowing all turf areas 3 times per week during the establishment period.
7. All Equipment used for any of the tasks involved in the completion of this project must have wide turf tires, no lugged tires (Ag) allowed.

D. Concrete Mow bands and Wood Header Boards: Install per Drawings and repeat initial preparations described above as necessary.

3.03 SOIL PREPARATION / FINISH GRADES

A. Thoroughly roto-till the following additives into the top six inches of all planting areas.

1. Spread approved Lime at the rate of 170 lbs./1,000 sq. ft.
2. Spread approved sand at the rate of 3” evenly over the areas.
3. Spread approved compost at the rate of 6 cubic yards per 1,000 sq. ft.
4. Spread EF Concentrated Soil Conditioner over the area at the rate of 2.5 yards per acre with the top dresser for even distribution (no front-end loaders or manual spreading).
5. Mix EF Nitro Blend at the rate of 1.72 gallons / 1,000 sq. Ft, with enough water to spray evenly over the areas.
6. Mix EF Phos Pro at the rate of 2.56 gallons / 1,000 sq. Ft, with enough water to spray evenly over the areas.
7. Mix EF Foliar Blend 27 -Potassium at the rate of 4.35 gallons / 1,000 sq. ft, with enough water to spray evenly over the areas.
8. Mix Cal Fresh at the rate of 2 gallons per acre and Pen Max at the rate of .5 gallons per acre together in the same tank with enough water to spray evenly over the areas.
9. Mix EF Solu Plus 1-0-1 at the rate of 2.5 gallons and Pen Max at the rate of .5 gallons per acre with enough water to spray evenly over the areas.
10. Mix Solu-kelp at the rate of 2.5 gallons per 1,000 sq. ft.
11. Spread the Dry Biology Boost at the rate of 2.3 pounds per acre
12. Spread Concentrated granular pro Magnesium fertilizer evenly over the area at the rate of 7.8 lbs per 1,000 sq. ft.
13. Spread Concentrated 0-0-50 granular fertilizer evenly over the area at the rate of 10.2 lbs per 1,000 sq. ft.

The above additive recipe shall be used for bid purposes only. A site-specific fertility test shall be performed by the Contractor after rough grading (and applicable topsoil placement or replacement) operations are complete. The results of the test(s) shall be reviewed by the Owner Representative and direction for amendment additives ratio will be provided. Any variance from "the as-bid" additives or quantities shall be handled by specified procedures relating to changes in the work.

After additives are fully incorporated into the soil, the Contractor shall perform another test to check conformance with the newly recommended materials and quantities. If deficiencies are found, the contractor shall be solely responsible for the cost of adding deficient material as necessary and all re-testing required to reach, and prove conformance.

Contractor shall also schedule seven (7) working days after soil samples have been taken to allow for receipt and evaluation of soil tests at no cost or delay to the project.

Soil testing shall be sent to Servitech Labs-1816 East Wyatt Earp, Dodge City KS 67801-620-227-7123 for tests.

B. Planting Area Finish Grades

1. After tilling in additives and re-compaction to 85% relative compaction, rake all planting areas smooth and set finish grades as follows.
2. After soil preparation, finish grades of all planting areas shall be one (1) inch below all adjacent paving, headers, utility boxes, irrigation boxes etc. Finish grade slopes shall be consistent.
3. All drainage structures (i.e. catch basins, area drains, concrete swales, etc) shall be flush with finish grade to allow for proper drainage. Soil shall be sloped consistently from spot elevations provided to drain.
4. In planting areas to receive mulch, depth of mulch shall taper within three (3) feet of paving edge to a depth from 3" to 1" at edge of pavement.
5. Irrigation head elevation relative to finish grade shall be installed per details.
6. Infield fines and warning tracks shall be graded to be flush with depth of sod soil. If sod is a ¾” then that will be the difference of the sod subgrade to the infield fines finish grade prior to placement of the sod.

3.04 SOD INSTALLATION

A. Soil preparation and fine grading shall be as previously specified. Prior to sod installation, roll turf bed until a smooth, firm surface with uniform grade has been produced. The turf bed shall be reviewed and accepted by the Owner’s Representative prior to sod installation.

B. Sod shall be unrolled into place with careful attention to tight joints with no overlapping or stretching. Stagger the joints in each new row like rows of bricks (18" minimum stagger). Use a sharp knife for shaping around trees, flower beds or borders. Immediately after placement, soak sod areas with water. Roll sod after watering to smooth out bumps and air pockets, and roll again if sod is not even. Water frequently for the first 10 - 14 days with enough water to saturate soil to
a depth of 4". DO NOT LET SOD DRY OUT.

C. Provide and install temporary fencing around all completed sod areas if not protected by other fencing. Use 6' temporary fence for protection.

D. Refer to Section 31 01 90 for mowing and maintenance procedures. As applicable, the contractor shall remove sod, re-grade any areas that have been rutted from mowers (or otherwise damaged) and replace sod to the satisfaction of the Owner’s Representative.

E. Until project Final Acceptance, should it become evident that certain sod areas have not grown, re-sod the areas immediately with sod of the same type as originally used and maintain as specified.

3.05 TURF ESTABLISHMENT PERIOD

A. Prior to commencement of specified maintenance period, all turf shall be completely germinated and established, and a minimum of two (2) mowings shall have taken place as follows:
   1. First mowing shall take place when turf has reached a height of three inches (3") and turf shall be mown to two inches (2"). Submit written request to the Owner’s Representative for acceptability of initiating first mowing.
   2. Thereafter, turf shall be mown weekly until all turf is sod-like in appearance and quality, and all other contract requirements shall be fulfilled prior to allowing the maintenance period to commence.
   3. Contractor shall receive written notice of acceptance of turf establishment to commence with landscape maintenance period.
   4. Owner’s Representative shall approve any phasing of turf areas to commence into the maintenance period. Areas may be approved in stages but will require contiguous areas of turf that are completely established.

3.06 TREE, SHRUB AND GROUND COVER PLANTING

A. These areas shall receive topsoil and soil amendments per section 3.01, 3.02, and 3.03 prior to commencing with tree, shrub and ground cover planting. Irrigation shall also be installed, reviewed, tested, coverage test approved and operational prior to planting.

B. Layout: Coordinate lay-out of plants with Owner’s Representative for review and acceptance.

C. Plant Pit Excavation:
   1. Excavate pits to sizes indicated in Drawings.
   2. Thoroughly scarify all sides of plant pits to remove "auger slick" and encourage root penetration.

D. Set trees and shrubs in pit on tamped backfill base as per Details. Set plumb and face for best appearance. Thoroughly scarify all plant root balls to eliminate any circling roots and to encourage root growth. Set plant so root crown will level with or be slightly above surrounding grade after settlement.

E. Trees and shrubs planted from boxed containers shall have all box sides and the bottom removed prior to backfilling of the plant pit. Box materials shall be removed in a manner that minimizes damage to the rootball.

F. Backfilling:
   1. Backfill mix for 1 gallon size and larger shall consist of 100% native site soil with plant tabs added per manufacturer’s recommendations.
   2. Tamp backfill mix under and around root balls.
   3. Flood plant pit when half backfilled; allow to drain.
   4. Complete backfilling. Tamp as necessary, do not over compact.

G. Watering:
   1. Thoroughly water plants immediately after planting.
2. Construct water basins as specified in Drawings.

H. Finish Grade Restoration: Restore finish grades by hand raking. Dispose of excess subgrade soil.

3.07 TREE STAKING

A. Stake trees as shown in Drawings.
B. Set stakes plumb, without damage to rootball and sufficiently deep to provide necessary support.
C. Tree ties shall be tied loosely enough to allow movement, yet taut enough to support tree.

3.08 HERBICIDE APPLICATION

A. Apply in accordance with manufacturers’ recommendations.
B. Apply pre-emergent herbicide to soil prior to placement of bark mulch top-dress.

3.09 MULCH TOP DRESS

A. Apply three (3) inches of specified bark mulch top dress to all non-turf planting areas and other areas as may be specified in the Drawings. Trees shall receive the tree well and mulch in the well.
B. Rake mulch top dress evenly to create a uniform surface and pull bark mulch top dress away from trunks or stalks of plants 1” - 2”.
D. Mulch does not dictate finish grade in planting areas. Mulch is to be added to finish grade. Refer to 3.02.

3.10 OTHER MATERIALS

A. Header Board: Install as shown in the drawings.
B. Root Barriers: Install as shown in the drawings.
D. Jute Netting: Install in planting areas as shown on the drawings. Install prior to planting. Stake 36” on center. Install plants and mulch after netting.
E. Root Barriers: Shall be DeWitt 12YR3100 Non-woven Polypropylene barrier fabric, as produced by DeWitt, 905 S Kings Highway, Sikeston, MO 63801, Ph: 800-888-9669, or acceptable equal.

3.11 FIELD QUALITY CONTROL

A. The Owner’s Representative shall review and accept the following prior to the contractor proceeding with subsequent work:
   1. Preparation - At completion of finish grading and prior to planting, grading tolerances and soil preparation shall be checked for conformance to Construction Documents.
   2. Layout - Layout of plants, header board, and other major items shall be as directed and/or accepted by the Owner’s Representative.
   3. Pre-maintenance review - At completion of this Section, work shall be reviewed to check conformance with Construction Documents. Acceptance shall mark beginning of the specified maintenance period. If acceptance is not given, a punch-list of items requiring attention will be issued to the contractor. One more review will be allowed after contractor certifies in writing that the punch-list has been completed. Punch-list shall be completed to the satisfaction of the Owner’s Representative prior to commencement of the Specified Maintenance Period.

B. All costs incurred from repeat reviews required due to contractor not being prepared or
non-conformance with Construction Documents shall be back charged to the contractor.

END OF SECTION
PART 1 GENERAL

1.01 SUMMARY

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

B. Scope of work:
The general extent of the base course work is shown on the Drawings and may include, but is not necessarily limited to, the following:
1. Grading and compaction of subgrade soil for areas to receive pavement, structures, base material, etc.
2. Furnishing and placing of aggregate base material.

C. Related sections can include, but may not be limited to:
1. Section 01 71 23 - Field Engineering
2. Section 31 20 00 - Earthwork
3. Section 32 12 16 - Asphalt Concrete Paving
4. Section 32 13 13 - Portland Cement Concrete

1.02 REFERENCES AND REGULATORY REQUIREMENTS


1.03 SUBMITTALS

A. Conform to the requirements of Section 01 33 00 and/or applicable Division One and Division Two Specifications, General Conditions and Special Provisions.

B. Submit material certificates of compliance and/or sieve analyses for all products and materials proposed to be used in work covered by this Section.

1.04 QUALITY ASSURANCE

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

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

1.05 PROJECT/SITE CONDITIONS

A. Wet Conditions: No subgrade preparation or base material placement shall occur when excessively wet conditions exist in the opinion of the Owner's Representative.

B. Dry Conditions: Contractor shall provide dust control in conformance with Section 10 of Standard Specifications and shall provide water to subgrades and base courses as necessary to achieve compaction goals.
1.06 DELIVERY, STORAGE, AND HANDLING

A. Materials shall be stockpiled on site in locations that, in the opinion of the contractor, cause least interference with construction operations and as acceptable to the Owner’s Representative.

B. Materials shall not be stockpiled in proposed planting areas.

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

1.07 SEQUENCING AND SCHEDULING

A. Work of this section shall not proceed until all underground utilities and irrigation sleeving has been installed and accepted.

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

PART 2 PRODUCTS

2.01 MATERIALS

A. Aggregate Base:
   Aggregate base shall be Class 2, 3/4” maximum material conforming to Section 26-1.02A of the Standard Specifications. All paving and surfacing using aggregate base can use recycled materials.

PART 3 EXECUTION

3.01 SUBGRADE PREPARATION

A. Preparation of subgrade shall conform to Section 6 of the Standard Specifications and as described in section 31 20 00.

B. Remove unsuitable subgrade material as necessary and replace with suitable material or aggregate base per the discretion of the Owner’s Representative.

3.02 BASE MATERIAL PLACEMENT

A. Conform to Section 26 of the Standard Specifications.

B. Obtain acceptance of subgrade preparation work prior to placing base material thereon.

C. Place and compact base material in six inch (6”) maximum lifts unless otherwise noted. Compaction shall be at least 95 percent relative compaction.

D. Base material shall be moisture conditioned to between optimum and 3 percent above optimum prior to placement and compaction.

3.03 TOLERANCES

A. Conform to Section 26 of the Standard Specifications, unless more stringent requirements in these Contract Documents are provided, in which place the more stringent tolerances shall govern.

3.04 CLEAN-UP OF WORK AREA
A. The contractor shall remove and legally dispose of excess materials/spoils and debris from the job site on a daily basis.

3.05 PROTECTION OF FINISHED PRODUCT

A. The contractor shall provide lighted barricades, signs and other devices as necessary to prevent damage to finished base courses.

END OF SECTION
PART 1   GENERAL

1.01 SUMMARY

A. Furnish all labor, materials, equipment, facilities, transportation and services to complete all storm drainage system improvements and related work as shown on the Drawings and/or specified herein.

B. Scope of work: The general extent of the drainage work is shown on the Drawings and includes, but is not necessarily limited to, the following:
   1. Storm drainage system installation

C. Related sections can include, but may not be limited to:
   1. Section 01 33 00 - Submittals
   2. Section 01 78 39 - Project Record Drawings
   3. Section 12 93 00 - Site Furnishings
   4. Section 31 20 00 - Earthwork
   5. Section 31 23 00 - Excavation, Backfilling and Compaction
   6. Section 32 11 00 - Base Courses
   7. Section 32 12 16 - Asphalt Concrete Paving
   8. Section 32 13 13 - Portland Cement Concrete

1.02 REGULATORY REQUIREMENTS AND REFERENCES


1.03 SUBMITTALS

A. Submit cut-sheets or samples of all products to be used in conformance with Section 01 33 00 Submittals and/or applicable Division One and Division Two specifications, General Conditions and Special Provisions.

B. Record Drawings:
   1. Conform to Section 01 78 39 - Project Record Drawings.
   2. Accurately record location of new piping, drain structures, and connections to existing systems using horizontal dimensions, elevations, inverts and slope gradients as applicable.

1.04 QUALITY ASSURANCE

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

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

1.05 PROTECTION OF PROJECT SITE

A. Make provisions for, and take the necessary precautions to protect existing and new work from damage during entire life of project.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Store pipe neatly and orderly, stacked and blocked to prevent damage. Cracked, checked, spalled or otherwise damaged pipe shall be removed from site.

B. Use of chain slings shall not be permitted.

C. All piping, fittings and related materials shall be carefully handled at all times.

D. All pipelines, fittings and drainage structures shall be kept clean and closed during construction.

1.07 PROJECT/SITE CONDITIONS

A. Work of this section shall not be executed when site conditions are detrimental to quality of work as determined by the Owner’s Representative.

1.08 SEQUENCING AND SCHEDULING

A. Coordinate work of this section with all other work contained in the Contract Documents.

PART 2 PRODUCTS

2.01 PIPE AND FITTINGS

A. All pipe and fittings shall be clearly and permanently marked to identify manufacturer, type, class, or schedule and NSF approval as applicable.

B. Corrugated High Density Polyethylene (CHDPE) Pipe (Perforated and Solid - Dual Wall)

1. High-density polyethylene perforated corrugated pipe with an integrally formed smooth waterway. Nominal sizes shall have a full circular cross-section, with an outer corrugated pipe wall and an essentially smooth inner wall (waterway). Corrugations may be either annular or spiral. All sizes shall conform to the AASHTO classification "Type S". Pipe manufacturer for this specification shall comply with the requirements for test methods, dimensions, and markings found in AASHTO Designations M252 and M294. Pipe and fittings shall be made from virgin PE compounds which conform with the requirements of cell class 324420C as defined and described in ASTM D 3350.

   a. The minimum parallel plate stiffness values when tested in accordance with ASTM D2412 shall be as follows:

      | Diameter   | Pipe Stiffness |
      |------------|----------------|
      | 4 inch (100 mm) | 50 psi (340 kPa) |
      | 6 inch (150 mm) | 50 psi (340 kPa) |
      | 8 inch (200 mm) | 50 psi (340 kPa) |
      | 10 inch (250 mm) | 50 psi (340 kPa) |
      | 12 inch (300 mm) | 50 psi (340 kPa) |
      | 15 inch (375 mm) | 42 psi (290 kPa) |

2. The fittings shall not reduce or impair the overall integrity or function of the pipeline. Common corrugated fittings include in-line joint fittings, such as couplers and reducers, and branch or complimentary assembly fittings such as "tees", "wyes", and end caps. These fittings may be installed by various methods, such as snap-on, screw-on, bell and spigot, and wrap around. Couplings shall provide sufficient longitudinal strength to preserve pipe alignment and prevent separation at the joints. Only fittings supplied or recommended by the pipe manufacturer shall be used. Where designated on the plans and as required by the manufacturer, a neoprene or rubber gasket shall be supplied. Installation of the pipe specified above shall be in accordance with ASTM Recommended Practice D2321 as covered elsewhere in these specifications.

3. Corrugated Polyethylene Pipe shall be N-12 drainage pipe as manufactured by Advanced Drainage Systems, Inc. or approved equal.
C. Smooth Polyvinyl Chloride Pipe (P.V.C.) and fittings: Shall be polyvinyl chloride pipe, SDR 26 Spigot, Type I P.V.C. 1120, NSF approved. Comply with ASTM D3034.

D. Reinforced Concrete Pipe (RCP) and fittings: Shall be reinforced concrete pipe conforming to Section 65 of the Standard Specifications. Pipe shall be Class III unless otherwise shown on the Drawings.

F. Flat Panel Pipe: Shall be 12-inch Advanedge as available from ADS, Ph: (510) 913-2211. Contact name is Jim Winslow. All fittings, adaptors, and couplers shall be Advanedge components.


H. All perforated drain lines shall be CHDPE pipe.

2.02 DRAINAGE STRUCTURES (as applicable)

A. Manholes: Provide frame, cover, grade rings, and all related materials as required by the construction drawings for a four foot diameter manhole. Materials available through Hansen Concrete Products. Ph: (408) 262-1091, Fax (408) 262-0936, or approved equal.

B. Catch Basins/Junction Boxes:
   1. 12-inch shall be CB12 supplied by Central Precast – US Concrete (with ADA lockable round grate), or acceptable equivalent product. Ph: (925) 462-6804.
   2. 18-inch basins shall be CB18 as supplied by Central Precast – US Concrete (with lockable round grate), or acceptable equivalent product. Ph: (925) 462-6804. Note that this grate is not ADA compliant and shall not be used in pedestrian hard scape areas.
   3. 24-inch basins shall be CB24 as supplied by Central Precast – US Concrete (with ADA lockable round grate), or acceptable equivalent product. Ph: (925) 462-6804.
   4. 36-inch basins shall be U43 drain box as supplied by Christy Concrete (H20 loading with ADA lockable grate), or acceptable equivalent product. Christy: ph (800) 486-7070.
   5. Grates in paved areas shall have grates that conform to ADA Regulations.
   6. All catch basins to have locking mechanism or screw down grate to frame.
   7. Provide two grade rings at each catch basin.

C. Extensions: Provide box extensions, junction boxes and grade rings compatible with structures as necessary to finish at the proper elevation and to facilitate future elevation adjustments as noted below.

D. Clean Outs: Shall be as shown or noted in the Drawings.

E. Perforated Subdrain: Shall be as shown or noted in the Drawings

F. French Drain: Shall be as shown or noted in the Drawings.

G. Trench Drains: Shall be KS 100S pre-sloped slot channel drain as supplied by ACO Polymer Products, Inc (or acceptable equivalent product). Contact name is Tom Blyndo (209) 572-1511. Contractor to provide appropriate end connections and 600 series catch basin with in-line trash bucket and outlet connections. Use 494Q ADA grate with quick lock locking device. Traffic areas shall use the 411D (galvanized) OR 465Q (stainless steel). All grates shall comply with ADA requirements.

I. Perforated Vertidrain: Shall be the Multi-Flow Drainage System, as available from Reed & Graham, ph: (916) 933-9140. Contact name is Ray Myers. All fittings, adaptors, fittings, and couplers shall also be Multi-Flow components.
2.03 MISCELLANEOUS MATERIALS (as applicable)

A. Drainage Rock: Shall be ¾” inch crushed drain rock or acceptable equal as shown in the drawings, materials available through Stevens Creek Quarry, Cupertino, or TMT Enterprises, San Jose.

B. Pea Gravel: Shall conform to the following gradation requirements:

<table>
<thead>
<tr>
<th>U.S. Standard Sieve Mesh</th>
<th>Allowable Range % Retained on Sieve</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2 inch (12.5 mm)</td>
<td>95% passing</td>
</tr>
<tr>
<td>1/4 inch (6.3 mm)</td>
<td>20 – 45% passing</td>
</tr>
<tr>
<td>10 mesh (2.0 mm)</td>
<td>No more than 10% passing</td>
</tr>
<tr>
<td>18 mesh (1.0 mm)</td>
<td>No more than 5% passing</td>
</tr>
</tbody>
</table>

Material available through Harbor Sand & Gravel, Redwood City, or TMT Enterprises, San Jose.

C. Sand for all perforated drain pipe applications: Shall be a washed sand that meets USGA Greens Specifications (see below for sieve range) with the following characteristics:
1. 100% passing a #4 screen and no more than 4% passing a #200 screen.
2. A total silt and clay % of no more than 5%.
3. Shall be crushed or naturally angled sand – no rounded silica sand.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Sieve Number</th>
<th>Particle Size (mm)</th>
<th>Allowable Range (% Retained on Sieves by weight)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fine Gravel</td>
<td>10</td>
<td>&gt;2.00</td>
<td>0% to 10%</td>
</tr>
<tr>
<td>V. Coarse Sand</td>
<td>18</td>
<td>1.00 – 2.00</td>
<td></td>
</tr>
<tr>
<td>Coarse Sand</td>
<td>35</td>
<td>0.5 – 1.0</td>
<td>82% to 100%</td>
</tr>
<tr>
<td>Medium Sand</td>
<td>60</td>
<td>0.25 – 0.5</td>
<td></td>
</tr>
<tr>
<td>Fine Sand</td>
<td>140</td>
<td>0.1 – 0.25</td>
<td></td>
</tr>
<tr>
<td>V. Fine Sand</td>
<td>270</td>
<td>0.05 – 0.1</td>
<td></td>
</tr>
<tr>
<td>Silt &amp; Clay</td>
<td>--</td>
<td>&lt;0.05</td>
<td>0% to 8%</td>
</tr>
</tbody>
</table>

Note: 50% to 75% of particles to be within diameter of 0.25 to 0.75 mm.


E. French drains and Vertidrains shall have a backfill with one of the following general characteristics:
1. USGA Greens Mix (Approved Supplier- TMT Enterprises – Matt Moore 408-432-9040):
   a. 65% USGA sand (see above for material requirements)
   b. 15% Coir
   c. 15% Lassenite
   d. 5% Worm Castings

F. 90% USGA Sand / 10% Peat Blend (see above for material requirements). Sand/Peat mixture shall be pre-blended at the source and shall be a 90% sand/10% peat as defined by volume.

G. Filter Fabric for French Drain: Shall be Mirafi 140N or acceptable equal.

H. Filter Fabric Fasteners: Metal clip type staple.
I. Mortar: Shall conform to all applicable sections of the Standard Specifications. Mixture shall be a 1:2 Portland Cement to sand mixture with a minimum of water.

J. Reinforcing bars: Refer to Section 32 13 13.

K. Minor concrete: Refer to Section 32 13 13.

L. Structural Adhesives for Manholes, Catch Basins, and Junction Boxes: Shall be Ramnek or equivalent product. Available thru multiple suppliers.

PART 3  EXECUTION

3.01 PIPE LAYING

A. General: Pipe shall be installed per manufacturers’ instructions and in conformance with the Contracts Documents.

B. CHDPE Pipe:
   1. Pipe shall be installed with a minimum cover under the H-20 live load = 12 inches to the top of subgrade elevation.
   2. Minimum compaction for pipe subject to H-20 live load is 90% per Section 19, Standard Specifications.
   3. CHDPE pipe shall be laid and jointed in accordance with generally accepted practice and the following provisions to provide the required work.

C. P.V.C. (perforated and non-perforated) Pipe:
   1. Pipe shall be laid in trench to specified lines and grades fully and evenly supported by bedding material. Excavate bedding as required so bell fittings are clear from soil 12" on each side of joint and to a depth sufficient to avoid contamination of joint.
   2. Pipe shall be laid beginning at the outlet and proceeding with each bell end facing upgrade.
   3. Cut pipe square and ream to remove burrs.
   4. Connections shall be solid, true to grade and watertight. Grease gaskets as necessary to facilitate joining pipe.

D. Flat Panel Piping:
   1. Install per the layout indicated on the Drawings and in strict compliance with Manufacturer’s written recommended installation instructions. Contractor shall exercise caution to not crush or damage the piping during installation of the permeable rock base.

3.02 DRAINAGE STRUCTURES

A. General: Set rim or cover elevations to specified grades utilizing a minimum of two grade rings (or extensions) at top of drainage structure to facilitate potential elevation adjustments in the future.

B. Catch Basins/Junctions Boxes: Install as shown in the Drawings and as follows:
   1. Excavate as required.
   2. Set on firm, unyielding base. Set on compacted select backfill material if directed by Owner’s Representative.
   3. Prefabricated units not having a bottom shall be set on a poured-in-place concrete slab with smooth trowel finish. Mortar and properly seal unit to slab, making a watertight connection.
   4. Install pipe inlets and outlets to specified elevations. Grout and/or seal all joints to a watertight condition with material per manufacturer’s recommendation.

C. Manholes: Install per manufacturer’s recommendations and as shown in the Drawings.

D. French Drains and Cleanouts: Install as shown in the Drawings.
E. Trench Drains: Install as shown in the Drawings and in accordance with the manufacturer’s written recommendations.

F. Drywells, Drinking Fountain Drains, Atrium Drains and Drop Inlets: Install as shown in the Drawings and in accordance with the manufacturer’s written recommendations.

G. Vertidrain Installation:
1. The trench excavations for the Vertidrain shall be to the lines and grades shown in the plans. Over excavation in the bottom of the excavations shall be backfilled to the proper grade with excavated material prior to the placement of the drainage system.
2. All fittings for the drainage system shall be installed in accordance with the manufacturer’s recommendations. Two inch Multi-Flow polyethylene tape shall be used to seal the filter fabric to the fittings and preclude intrusion of backfill between the core and filter fabric.
3. No excavated material shall be used as backfill around geocomposite unless approved by the Engineer. In no case shall any backfill contain any rocks, pieces of pavement or debris with any dimension greater than one inch.

3.03 FIELD QUALITY CONTROL

A. The Owner’s Representative shall review and accept work at the following stages:
1. Excavated trench with bedding in place prior to any pipe being laid.
2. Pipe laid prior to backfilling. Any pipe covered prior to review and acceptance shall be uncovered and re-backfilled at contractor’s expense.
3. Drainage device location and pipe connection.
4. New drainage system shall be flood tested and clean of debris.

END OF SECTION
TABLE OF CONTENTS

TECHNICAL SPECIFICATIONS

Division 2 Sitework

Section 02231 – Site Clearing
Section 02300 – Earth Moving
Section 02315 – Trenching and Backfilling
Section 02752 – Sitework Concrete
Section 02786 – Asphaltic Concrete Paving and Base Material
Section 02761 – Pavement Marking and Accessories
Section 02810 – Irrigation
Section 02920 - Landscape Soil Preparation
Section 02950 - Planting
Section 02970 - Landscape Maintenance
SECTION 02231 SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Refer to the General Conditions, Supplementary Conditions, and Division 1 General Requirements.
B. Refer to the Project's Geotechnical Report prepared by Ninyo & Moore for additional requirements & specifications.

1.2 WORK INCLUDED
A. Provide all clearing and grubbing work, complete, as shown, specified and required.

1.3 RELATED WORK SPECIFIED ELSEWHERE
A. Section 02300 – EARTH MOVING

1.4 JOB CONDITIONS
A. Dust Control: Prevent spread of dust during performance of the Work of this Section. Thoroughly moisten all surfaces as required to prevent dust being a nuisance to the public, neighbors, and concurrent performance of other work on the site. Use sprinkler truck as necessary.
B. Burning: On-site burning will not be permitted.
C. Protection: Protect existing structures, sidewalks, paving, curbs, trees and other existing objects designated to remain against damage. In the event of damage, immediately make repairs and replacements necessary as acceptable to Owner and at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS
A. Provide materials as necessary for clearing and grubbing work.
PART 3 - EXECUTION

3.1 PREPARATION

A. Site Inspection: Prior to all work of this Section, carefully inspect the entire site and all objects designated to be removed and to be preserved. Locate all existing utility lines and determine all requirements for connections as shown on the Drawings. Locate all existing active utility lines traversing the site and determine the requirements for their protection.

B. Clarification: The Drawings may not show all objects existing on the site. Before commencing the Work, verify with the Owner all objects to be removed and all objects to be preserved.

C. Scheduling: Schedule all Work in a careful manner with all necessary considerations for security aspects of the site, employees, neighbors and the public. Avoid interference with the use of, and passage to and from adjacent facilities.

D. Protection of Utilities: Preserve in operating condition all active utilities to remain.

3.2 STRIPPING AND STOCKPILING OF EXISTING TOPSOIL

A. Clearing: Clearing shall consist of cutting, removing, and disposing of shrubs, brush, limbs and other vegetative growth, and shall be performed in such a manner as to remove all evidence of their presence from the surface. Clearing shall also include the removal and disposal of trash, rubbish and fencing.

B. Tree Removal: Trees designated for removal are flagged with white paint.

C. Grubbing: Grubbing shall consist of the removal and disposal of wood or root matter below the ground surface remaining after clearing and shall include roots or root systems no greater than two inches in diameter until approved by the city arborist.

D. Stripping: Stripping shall include the removal of all organic sod, topsoil, grass and grass roots, all evidence of surface improvements and other objectionable material remaining after clearing and grubbing from the areas designated to be stripped.

1. The surface soil shall be stripped to a depth as directed by the Geotechnical Engineer.

2. Topsoil from the stripping operation shall be stockpiled on-site in locations to be determined by the Owner. Stripped material with a high percentage of undecomposed vegetation will not be approved as topsoil. Topsoil to be stockpiled for reuse shall be approved by the Owner.
3.3 REMOVAL OF OTHER ITEMS
   A. This Work shall also include removal of pavement, curbs, gutters, walkways, walls, and lighting including any underlying base material to complete the Work as shown on the Drawings.

3.4 DISPOSAL OF DEBRIS
   A. All debris shall be removed from the site and legally disposed of off-site.

END OF SECTION 02231
SECTION 02300 EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Refer to the General Conditions, Supplementary Conditions, and Division 1 General Requirements.

B. Refer to the Project’s Geotechnical Report prepared by Ninyo & Moore for additional requirements & specifications.

1.2 WORK INCLUDED

A. Excavate and Backfill, complete, as shown and as specified for roads, paved areas, walks, slabs and structures.

1.3 RELATED WORK

Section 02315 - TRENCHING AND BACKFILLING

Section 02786 - ASPHALTIC CONCRETE PAVING & BASE MATERIAL

1.4 REFERENCES

A. American Society for Testing and Materials (ASTM)

B. City of Burlingame - Standard Specifications

C. City of Burlingame - Standard Plans

D. Geotechnical Report as prepared by Ninyo & Moore

1.5 QUALITY ASSURANCE

A. A Geotechnical Engineer will be retained by Owner to observe performance of work in connection with excavating, filling and grading and act as the Owner’s representative for the purposes of this Contract.

B. Observations by the Geotechnical Engineer will be made during the earthwork and grading operations to verify that the work was performed in accordance with accepted specifications. The Contractor is required to notify the Geotechnical Engineer 48 hours prior to performing any work associated with clearing, grubbing, grading, excavation, backfilling, or interruption of utilities.

C. Adjust all work performed that does not meet technical or design requirements but make no deviations from the Contract Documents without specific and written acceptance by the Owner.
1.6 REQUIREMENTS OF REGULATORY AGENCIES

A. State and local code requirements shall control all Work.

B. Obtain and pay for licenses, permits, inspections and certificates of inspection.

C. Comply with OSHA excavation requirements and permits.

1.7 ENGINEERING OBSERVATIONS

A. The Geotechnical Engineer will observe the earthwork construction during preparation of the site, excavation, and the compaction of engineered fill.

B. Geotechnical Engineer will make field observations and tests to determine the adequacy of the site preparation, the acceptability of fill materials, and the extent to which the earthwork construction and the degree of compaction comply with the Specifications requirements.

C. Geotechnical Report: All earthwork and grading shall be done in accordance with the recommendations presented in the Geotechnical Report, dated November 27, 2018 prepared for this site by Ninyo & Moore.

D. The presence or absence of the Geotechnical Engineer does not in any way relieve the Contractor of the obligation for full time supervision or for compliance with the Contract Documents. The requirement for guarantee of all Work is not affected by the presence of those noted above.

1.8 SITE CONDITIONS

A. General: Clearing work shall not begin until temporary fences, barricades, warning signs and other pedestrian control devices are installed.

B. Existing Subsurface Utilities: Existing facilities are shown on the plans to help the Contractor avoid damage to essential utilities which must remain in service. The Contractor shall contact Underground Service Alert to ascertain location of all underground facilities prior to doing work that may damage such facilities. The Contractor shall retain the services of an underground locating company to determine the location of all private facilities. If the Contractor discovers underground facilities not indicated on the plans or in a location different from what is indicated on the plans, the Contractor shall protect such facilities from damage and notify the Owner immediately.

C. Protection

1. If existing live utilities are encountered, protect same from damage and notify the Owner. Do not interrupt service except as directed by the Owner. Allow sufficient time for utility company to arrange for continuation of required services. Record locations on Record Drawings.
2. Do not allow equipment to pass over existing streets or other public and private property without ample protection. Any such property which is damaged as a result of operations under this Section shall be restored to original condition with duplicate materials.

3. Protect open excavations, trenches, and the like with fences, barricades, covers, and railings as required to maintain safe pedestrian and vehicular traffic passage. Prevent erosion of freshly graded areas during construction and until such time as permanent drainage measures have been installed. Assume liability for all claims related to windblown dust and dirt or downstream siltation of waterways due to on-site erosion due to construction.

4. Every precaution shall be taken to prevent spillage when hauling on or adjacent to any public street or highway. If spillage occurs, all such spillage shall be removed and the streets and highways shall be swept, washed, or otherwise cleaned as required by local City and County authorities and/or the State of California.

5. All precautions shall be taken as needed to prevent dust nuisance to adjacent or other public and private properties and to prevent erosion and transportation of soil to down-stream properties due to work under this Section. Any damage so caused shall be corrected or repaired as part of the work under this Section at no additional cost to Owner.

6. If precautions, corrections, or repairs required under this Section are not undertaken promptly, the Owner may take such steps as it may deem necessary and deduct the cost of same from the monies due under the Contract. Any such action or failure to act on the part of the Owner shall in no way alter or relieve the Contractor from complete responsibility for the proper protection of the work and all public and private properties and activities which may be affected thereby.

7. All portions of the Work shall be kept free of standing water at all times. Maintain uniform grades, construct ditches and/or provide and operate pumps to prevent erosion, softening of compacted surfaces and formation of mud in trenches and excavations. Ditches shall be constructed, tamped and maintained in a neat, uniform shape. Do not under any circumstances conduct or pump water or allow water to be diverted or flow toward other areas of the site which may be damaged thereby. Protect inlets from siltation.

1.9 DEFINITIONS

A. Fill: Soils or soil-rock material placed to raise the existing grade of the site or to backfill excavations.
B. On-Site Material: Material obtained from the site including aggregate base or asphalt. Asphalt shall be no larger than one (1) inch.

C. Borrow: Material required for earthwork construction in excess of the quantity of suitable material available from the required grading, cuts and excavations. Borrow may be necessary even though not shown on Drawings.

D. Select Material: Material meeting the requirements as indicated under Part 2 - Products.

E. Embankment: The portion of a fill section situated between the natural ground or exposed excavation surface and the finished surface, excluding any material placed under another Section of these Specifications.

F. Relative Compaction: The ratio of the in-place dry density of constructed fill to the maximum dry density, as expressed as a percentage.

G. The following test procedures will be utilized by the Geotechnical Engineer to determine compliance of materials and placement and compaction methods with these specifications:

<table>
<thead>
<tr>
<th>Test Procedures or Designation</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM Designation: D422</td>
<td>Grain-Size Analysis</td>
</tr>
<tr>
<td>ASTM Designation: D2216</td>
<td>Moisture Content</td>
</tr>
<tr>
<td>ASTM Designation: D4318</td>
<td>Plasticity Index</td>
</tr>
<tr>
<td>ASTM Designation: D1557</td>
<td>Maximum Dry Density</td>
</tr>
<tr>
<td>ASTM Designation: D1556-64</td>
<td>In-Place Density</td>
</tr>
<tr>
<td>ASTM Designation: D6938-08</td>
<td>In-Place Density</td>
</tr>
<tr>
<td>ASTM Designation: D3017-88</td>
<td>In-Place Moisture Content</td>
</tr>
<tr>
<td>ASTM Designation: D4254-83</td>
<td>Relative Density</td>
</tr>
</tbody>
</table>

H. Subgrade: The soil prepared and compacted to support a structure or a pavement system.

I. Imported Material: Material hauled in from off-site borrow areas.
J. Engineered Fill: Embankment that has been constructed to specifications requirements, in the opinion of Geotechnical Engineer.


L. Bridging Material: is a course, angular material used for stabilizing soft subgrade conditions.

M. Materials Manual: is that of the State of California, Department of Public Works, Division of Highways, latest edition.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Requirements for General Fill Materials: All fill material shall be approved by the Geotechnical Engineer. The material shall be a soil or soil-rock mixture which is free from organic matter or other deleterious substances. The fill material shall not contain rocks or lumps over 4 inches in greatest dimension, and with not more than 15 percent larger than 2-1/2 inches.

B. Requirements for Select Material: In addition to the above requirements for general fill material, select non-expansive material shall be a low plasticity soil having a Plasticity Index of 15% or less, and be approved by the soils engineer.

C. Site Material: The native surficial highly expansive soils are not suitable for use as new structural fill within 12 inches of subgrades beneath pavements and/or flatwork.

D. Imported Materials: Imported materials shall be approved by the Geotechnical Engineer prior to use. The Contractor shall give at least 10 working days’ notice prior to using the imported material to enable the Geotechnical Engineer to sample and test the material. All import material shall meet the requirements of the Geotechnical Engineer for the specific purpose the material is to be used for Earthwork and Site Grading purposes.

E. Excess Material: Excess material is material deemed not suitable for use on the site. Excess material shall be disposed of only in lawfully designated areas.

F. Mounding Material: On-site soil containing organic matter considered unsuitable for fill material or topsoil may be used to construct landscape mounds and berms which do not support paving, steps or other structures.

G. Soil materials used on this Project shall not contain asbestos.

PART 3 - EXECUTION

3.1 FAMILIARIZATION
A. Prior to all Work, the Contractor shall become thoroughly familiar with the site and subsurface conditions, and all portions of the work.

3.2 LINES AND LEVELS

A. Accurately lay out lines, grades, elevations and drain locations and set all necessary stakes required for the Work.

B. Protect and maintain existing bench marks and control monuments and stakes and any new bench marks and control monuments and stakes that may be established.

C. Finished grades shown on Plans are given in feet and decimals of feet and are to be the top of graded or paved surfaces. Slope uniformly between given spot grades (minimum slope is 1%) unless otherwise indicated.

D. Transition between slopes and relatively flat areas shall be rounded and gradual.

E. Transition between changes in vertical gradient of walks and paving shall be smooth and gradual with no abrupt or sharp changes.

F. Horizontal curves and radii shall be laid out tangent to adjacent straight lines or adjacent compound curves. Curves shall be smooth and flowing.

3.3 DEWATERING

A. Prevent surface water and subsurface or ground water from flowing into excavations and from flooding project site and surrounding area. Do not allow water to be diverted onto adjacent properties.

B. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rainwater and water removed from excavations to collecting or runoff areas. Do not use trench excavations as temporary drainage ditches.

C. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting of footings, and changes in soil detrimental to stability of sub-grades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.

D. The Contractor shall employ sediment and erosion control measures, as necessary, so that water which is to be discharged into the street, storm drainage system, stream, channel, etc., shall be predominately free of silt and other objectionable particulate matter.

3.4 SITE PREPARATION AND EXCAVATION

A. Excavation
1. Excavation is unclassified and shall be done to the lines, grades and dimensions indicated on the Drawings regardless of the character of the materials encountered.

2. When the required excavations have been made, the Geotechnical Engineer shall examine the exposed conditions. If pockets of debris, soft or weak soils are encountered at the required subgrade, carry the excavations deeper to the limits designated in the field by the Geotechnical Engineer.

B. Utility Removal

1. Any abandoned buried utility pipes encountered on the site shall be capped, sealed and/or grouted closed.

C. Subgrade Compaction

1. After the excavations have been approved by the Geotechnical Engineer, the exposed native soils shall be scarified, moisture-conditioned, and compacted to a minimum depth of 8 inches.

2. After the subgrade is compacted, fill can be placed to provide the desired finished grades.

D. Soft Subgrades

1. Any areas where soft or pumping soils are encountered which will not allow proper compaction should be excavated to firm soil. The areas may then be brought up to planned grade in compacted lifts not exceeding 8 inches in loose thickness. Soft Subgrades shall be prepared as directed by the soils engineer.

E. All excess clean site material not used as part of this project shall be stockpiled as directed by the Owner.

3.5 PLACING AND COMPACTING FILL MATERIAL

A. All fill material shall be compacted as specified below or by other methods, if approved by the Geotechnical Engineer. Fill material shall be spread in uniform lifts of not more than 8 inches in uncompacted thickness. All fills shall be compacted to the minimum relative compactions specified in the soils report. The top 6 inches of subgrade shall be compacted to a minimum relative compaction of 95% in pavement areas.

B. Before compaction begins, the fill shall be moisture conditioned either by: (1) aerating the material if it is too wet; or (2) spraying the material with water if it is too dry. Each lift shall be thoroughly mixed before compaction to assure a uniform distribution of water content. It shall be the responsibility of the Grading Contractor to attain the proper moisture content during compaction. No fill shall
be placed during the rain or when saturation will hinder proper compaction. Jetting or flooding of the fill will not be permitted.

3.6 TOLERANCES

A. The surface of the completed fill shall be finished true to line and grade and shall present a smooth, compacted, and unyielding surface. Depressions shall be filled and compacted and loose material shall be removed. The finished building pads shall not vary from a true horizontal plane by more than plus or minus 0.05 foot at any point. This true plane shall be not more than an average of 0.05 foot higher or lower than the elevation indicated on the plans.

B. Elevations for subgrade in streets and parking areas shall not vary from the plans by more than plus or minus 0.05 foot at any point.

C. At the completion of the grading, the Owner reserves the right to retain the services of a Registered Civil Engineer or Licensed Land Surveyor to verify that the elevations are within the tolerances specified herein.

3.7 ADJUSTMENT OF EXISTING UTILITY STRUCTURES

A. Adjust tops of existing manholes, vaults, pull boxes, valve boxes, cleanouts, to conform with new finish grades.

B. Tops of existing structures shall be adjusted to set flush with finished grades and shall conform with slope angles where possible.

C. Lids, covers, etc., shall be put into operable condition equal to the original installation.

3.8 TREATMENT AFTER COMPLETION OF GRADING

After grading is completed and the Geotechnical Engineer has finished his observation of the work, no further excavation or filling shall be done except with the approval of and under the observation of the Geotechnical Engineer. It shall be the responsibility of the Contractor to prevent erosion of freshly graded areas during construction and until such time as permanent drainage measures have been installed.

END OF SECTION 02300
SECTION 02315 TRENCHING AND BACKFILLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Refer to the General Conditions, Supplementary Conditions, and Division 1 General Requirements.

1.2 WORK INCLUDED
   A. Excavate trenches for utilities and storm sewers.
   B. Bedding and fill over utilities and storm sewers to subgrade elevations.

1.3 RELATED WORK
   Section 02300 - EARTH MOVING
   Section 02315 - TRENCHING AND BACKFILLING
   Section 02786 - ASPHALTIC CONCRETE PAVING AND BASE MATERIAL

1.4 REFERENCES
   A. ASTM D1557.

1.5 PROTECTION
   A. Trenching and shoring plan must be submitted for trenches over 5’ deep and a permit from the State Division of Industrial Safety will be necessary. Comply with OSHA trenching/excavation requirements and permits.
   B. Protect excavations by shoring, bracing, sheet piling, underpinning, or other methods required to prevent cave-in or loose soil from falling into excavation.
   C. Notify Geotechnical Engineer of unexpected subsurface conditions and discontinue work in affected area until notification to resume work.
   D. Control water in excavations as specified in Section 312000 of these Specifications.
   E. Grade top perimeter of excavation to prevent surface water run-off into excavation.
   F. All footings located adjacent to utility trenches shall have their bearing surface below an imaginary 1 to 1 (H:V) plane projected from the bottom edge of the footing downward.
PART 2 - PRODUCTS

2.1 SELECT BEDDING AND BACKFILL MATERIALS

A. Bedding: Coarse sands and gravels with maximum particle size of 1.5 inches.

B. The remaining trench backfill material shall be on-site or imported materials meeting the requirements for "general fill" or "select fill" specified in Section 312000.

PART 3 - EXECUTION

3.1 INSPECTION

A. Verify that stockpiled materials to be reused are acceptable.

B. Verify that areas to be backfilled are free of debris or water.

C. Contractor shall submit samples of proposed backfill materials for testing and approval. Submit samples to the Geotechnical Engineer at least one week prior to intended placement.

3.2 PREPARATION

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

B. When necessary, compact subgrade surfaces to density requirements for backfill material.

3.3 EXCAVATION

A. Cut trenches sufficiently wide to enable installation of utilities and allow inspection.

B. Hand trim excavation and leave free of loose matter.

C. Excavate subsoil required for underground pipe.

D. Remove lumpy subsoil, boulders and rocks not meeting the gradation requirements for general fill defined in Section 312000 of these Specifications.

E. Fill over-excavated areas under pipe-bearing surfaces with materials meeting the requirements for general fill as defined in Section 312000 of these Specifications.

F. If excess excavated material from trenches is suitable for embankment construction, incorporate it into embankments. Dispose of unsuitable earth material off-site.

G. Correct unauthorized excavation as directed by the Geotechnical Engineer.
3.4 BACKFILLING

A. Support pipe during placement and compaction of bedding.

B. Backfill trenches to the contours and elevations on the Drawings. Do not backfill over wet or spongy subgrade surfaces. Maintain ground water levels at least 2 feet below base of trench until bedding and backfilling have been completed.

C. Place and compact trench bedding and backfill material in uniform, horizontal layers not exceeding eight (8) inches in uncompacted thickness.

D. Placement and compaction of trench backfill shall be performed only during the presence of the Geotechnical Engineer or, if absent, only with his approval. All utility trenches shall be backfilled with compacted structural fill. If on-site soil is used (and approved by the Geotechnical Engineer), the material shall be placed in lifts not exceeding 8 inches in uncompacted thickness by mechanical means only. Due to the varying soil conditions, compaction requirements should be set forth based on the Compaction Recommendations in the Geotechnical Report prepared by Ninyo & Moore. Water jetting to attain the minimum required degree of compaction will not be allowed. Trench cut-off plugs shall be of impermeable material.

E. Where granular backfill is used in trenches and/or the perimeter of the building footprint, a cut-off plug 2 feet wide of impermeable material shall be placed where trenches enter the pavement areas.

Leave stockpile areas completely free of excess fill materials at completion of contract.

END OF SECTION 02315
SECTION 02752 SITEWORK CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Refer to the General Conditions, Supplementary Conditions, and Division 1 General Requirements.

1.2 SUMMARY
A. Extent of portland cement concrete site work as shown on Drawings.
B. Prepared subbase as specified in "Earthwork" section.
C. Concrete and related materials are specified in Caltrans Standard Specifications, Sections 51 and 90.

1.3 SUBMITTALS
A. Provide samples, manufacturer's product data, test reports, and materials' certifications as required in referenced sections for concrete and joint fillers and sealers.

1.4 QUALITY ASSURANCE
A. Codes and Standards: Comply with the applicable provisions of the City of Burlingame Standard Specifications.
B. Pre-Construction Meeting: Arrange meeting with the Owner prior to start of site concrete work to discuss materials and methods of construction. Notify Owner at least 7 days prior to meeting.

1.5 JOB CONDITIONS
A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.
   1. Coordinate with requirements for "Temporary Facilities" specified in Division 1.
   2. The project site is a public park proximate to K-5 school. Please observe the school schedule to be cognizant of drop-off and pick-up times to provide pedestrian access.
PART 2 - PRODUCTS

2.1 MATERIALS

A. Forms: Steel, wood or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects.

1. Use flexible spring steel forms or laminated boards to form radius bends are required.

B. Coat forms with a nonstaining form release agent that will not discolor or deface surface of concrete.

C. Reinforcing Bars: Deformed steel bars, ASTM A 615, Grade 60.

D. Joint Dowel Bars: Plain steel bars, ASTM A 615, Grade 60. Cut bars true to length with ends square and free of burrs.

E. Concrete Materials: Comply with requirements of applicable Caltrans Section 90 for concrete materials, admixtures, bonding materials, curing materials, and others as required.

F. Liquid-Membrane Forming and Sealing Curing Compound: Comply with ASTM C 309, Type I, Class A unless other type acceptable to Owner. Moisture loss no more than 0.055 gr./sq. cm. when applied at 200 sq. ft./gal.

2.2 CONCRETE MIX, DESIGN, AND TESTING

A. Comply with requirements of applicable Caltrans Section 90 for concrete mix design, sampling and testing, and quality control and as herein specified.

B. Design mix to produce normal-weight concrete consisting of portland cement, aggregate, water reducing or high-range water-reducing admixture (superplasticizer), air-entraining admixture, and water to produce the following properties:

1. Compressive Strength: Class A concrete, developing 3000 psi, minimum at 28 days, un-less otherwise indicated.

2. Slump Limit: 8 inches minimum for concrete containing high-range water-reducing ad-mixture (superplasticizer); 3 inches for other concrete.

3. Air Content: 5 to 8 percent.
PART 3 - EXECUTION

3.1 SURFACE PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

B. Proof-roll prepared subbase surface to check for unstable areas and need for additional compaction. Do not begin paving work until such conditions have been corrected and are ready to receive paving.

3.2 FORM CONSTRUCTION

A. Set forms to required grades and lines, braced and secured. Install forms to allow continuous progress of work and so that forms can remain in place at least 24 hours after concrete placement.

B. Check completed formwork for grade and alignment to following tolerances:
   1. Top of forms not more than 1/8 inch in 10 feet.
   2. Vertical face on longitudinal axis, not more than 1/4 inch in 10 feet.

C. Clean forms after each use and coat with form release agent as required to ensure separation from concrete without damage.

3.3 REINFORCEMENT

A. Locate, place, and support reinforcement as indicated.

3.4 CONCRETE PLACEMENT

A. General: Comply with requirements of Section 90 for mixing and placing concrete, and as herein specified.

B. Do not place concrete until subbase and forms have been checked for line and grade. Moisten subbase if required to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

C. Place concrete by methods that prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand-spreading and consolidation. Consolidate with care to prevent dislocation of reinforcing, dowels, and joint devices.

D. Use bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
E. Deposit and spread concrete in a continuous operation between transverse joints as far as possible. If interrupted for more than 1/2 hour, place a construction joint.

F. Curbs and Gutters: Automatic machine may be used for curb and gutter placement at Contractor's option. If machine placement is to be used, submit revised mix design and laboratory test results that meet or exceed minimums specified. Machine placement must produce curbs and gutters to required cross-section, lines, grades, finish, and jointing as specified for formed concrete. If results are not acceptable, remove and replace with formed concrete as specified.

3.5 JOINTS

A. General: Construct expansion, weakened-plane (contraction), and construction joints true to line with face perpendicular to surface of concrete. Construct transverse joints at right angles to the centerline, unless otherwise indicated.

B. When joining existing structures, place transverse joints to align with previously placed joints, unless otherwise indicated.

C. Weakened-Plane (Contraction) Joints: Provide weakened-plane (contraction) joints, sectioning concrete into areas as shown on drawings. Construct weakened-plane joints for a depth equal to at least 1/4 concrete thickness, as follows:

   1. Tooled Joints: Form weakened-plane joints in fresh concrete by grooving top portion with a recommended cutting tool and finishing edges with a jointer.

   2. Sawed Joints: Form weakened-plane joints with powered saws equipped with shatter-proof abrasive or diamond-rimmed blades. Cut joints into hardened concrete as soon as surface will not be torn, abraded, or otherwise damaged by cutting action.

D. Construction Joints: Place construction joints at end of placements and at locations where placement operations are stopped for more than 1/2 hour, except where such placements terminate at expansion joints.

   1. Construct joints as shown or, if not shown, use standard meal keyway-section forms.

   2. Where load transfer-slip dowel devices are used, install so that one end of each dowel bar is free to move.

E. Expansion Joints: Provide premolded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks, and other fixed objects, unless otherwise indicated.
F. Extend joint fillers full width and depth of joint, not less than 1/2 inch or more than 1 inch below finished surface where joint sealer is indicated. If no joint sealer, place top of joint filler flush with finished concrete surface.

G. Furnish joint fillers in one-piece lengths for full width being placed wherever possible. Where more than one length is required, lace or clip joint filler sections together.

H. Protect top edge of joint filler during concrete placement with a metal cap or other temporary material. Remove protection after concrete has been placed on both sides of joint.

3.6 CONCRETE FINISHING

A. After striking-off and consolidating concrete, smooth surface by screeding and floating. Use had methods only where mechanical floating is not possible. Adjust floating to compact surface and produce uniform texture.

B. After floating, test surface for trueness with a 10-ft. straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous smooth finish.

C. Work edges of slabs, gutters, back top edge of curb, and formed joints with an edging tool, and round to 1/2-inch radius, unless otherwise indicated. Eliminate tool marks on concrete surface.

D. After completion of floating and when excess moisture or surface sheen has disappeared, complete troweling and finish surface as follows:

1. Broom finish by drawing a fine-hair broom across concrete surface perpendicular to line of traffic. Repeat operation if required to provide a fine line texture acceptable to Owner.
   a. On inclined slab surfaces, provide a coarse, non-slip finish by scoring surface with a stiff-bristled broom, perpendicular to line of traffic.

2. Burlap finish by dragging a seamless strip of damp burlap across concrete, perpendicular to line of traffic. Repeat operation to provide a gritty texture acceptable to Owner.

E. Do not remove forms for 24 hours after concrete has been placed. After form removal, clean ends of joints and point-up any minor honeycombed areas. Remove and replace areas or sections with major defects, as directed by Owner.
3.7 CURING

A. Protect and cure finished concrete paving in compliance with applicable requirements of Cal-trans Section 51. Use membrane-forming curing and sealing compound or approved moist-curing methods.

3.8 REPAIRS AND PROTECTION

A. Repair or replace broken or defective concrete, as directed by Owner.

B. Drill test cores where directed by Owner when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete bonded to pavement with epoxy adhesive.

C. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.

D. Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just before final inspection.

END OF SECTION 02752
SECTION 02761 PAVEMENT MARKING AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Refer to the General Conditions, Supplementary Conditions, and Division 1 General Requirements

1.2 DESCRIPTION

A. Work Included: All labor, materials, tools, equipment, transportation and temporary construction of any nature necessary for a complete operational installation of all pavement markings and accessories work shown on the Drawings and specified herein.

B. Related Work Specified Elsewhere:

1. Section 02786: Asphaltic Concrete Paving and Base Material

1.3 REFERENCES

A. California Department of Transportation (CDT):


2. Standard Specifications: Sections 82, 85, 90, 91, 94, and 95.


1.4 PROJECT CONDITIONS

A. Specifications, standards, tests and recommended methods cited in the above referenced specifications shall determine quantity and quality of materials and methods un-less specifically designated otherwise.

B. Reference to makers, brands, models, etc. is to establish type and quality desired; substitution of equals will be permitted upon approval by the Owner.
PART 2 - PRODUCTS

2.1 TRAFFIC PAINT

A. Traffic paint shall conform to or exceed the standards set forth by the State of California Materials and Research Department. Common brands are: Kelly Moore No. 2130, Crown Products, DeSoto and Bauer.

B. All paint shall be thoroughly mixed prior to placing in painting equipment.

2.2 THERMOPLASTIC MATERIAL

A. Thermoplastic material and glass beads shall conform to the requirements of CDT Standard Specifications Section 84-2.01 to 84-2.03.

2.3 REFLECTORIZED MARKERS AND POSTS

A. Reflectorized metal markers, metal marker posts and mounting hardware shall be of the size, type and description noted on the Drawings and shall conform to the applicable requirements of Section 82 of the CDT Standard Specifications.

2.4 WHEELSTOPS

A. Wheel stops shall be precast concrete, shop-fabricated 3'-0" long, where shown on the drawings.

PART 3 - TRAFFIC PAINT AND GLASS BEADS

A. Types of Traffic Paint

1. White:
   a. Solid 4" line: edge lines, parking stalls.

2. Blue:
   a. Solid 4" line: accessible parking stalls.
   b. Blue curb: accessible parking stalls.
   c. Pavement Markings: international symbol of accessibility.

3. Red:
   a. Red curb: no parking lanes for fire access.

B. Rates of Application

1. All new surfaces shall have the traffic paint applied in two applications. The first or priming coat of paint is the wearing surface and the rates of application are shown in Table 1.
2. Restriping where indicated on the drawings, shall coincide with the original painting and shall be applied in one application at the rates indicated in Table 1.

3. All surfaces to be painted shall be clean and dry prior to painting. Ample time shall be allowed between the asphalt pavement seal coat and the initial painting application. Usually the drying time of the seal coat is approximately three to four (3-4) days, depending upon weather conditions. There shall be a minimum drying time between paint applications of approximately 20 minutes.

4. Glass beads shall be placed on all traffic stripes and pavement markings except for the first or priming coat on new asphalt surfaces. Rates of application are shown in Table 1. All glass beads shall be applied directly to the wet traffic paint with a method that provides uniform distribution.

5. Table 1 - Rates of Application:

SOLID STRIPE (4" WIDE)

new surface (1st coat)  12-14 gallons per mile
1 gallon per 125-150 SF of line

2nd coat or restriping  16-18 gallons per mile
1 gallon per 100-110 SF of line

glass beads with 2nd coat  approx. 110 lbs/mi.
6 lbs/gallon of paint

PAVEMENT MARKINGS

New surface (1st coat):  1 gallon per 100 SF of area
2nd coat or restriping:  1 gallon per 100 SF of area
Glass beads with 2nd coat:  6 lbs/gallon paint

6. The Contractor shall provide sufficient evidence to the Owner that the quantity of paint specified has been applied to the job. Such evidence can be invoice tickets made out to the specific job, counting empty paint cans, or a method acceptable to the Owner.

Nterra Group, Civil Engineer
7. Striping shall not be applied at temperatures below 40 degrees F or if pavement surfaces are wet.

8. The alignment of all striping shall be accurately laid out. Lines which do not conform to the alignment as set forth in the Drawings, or which have a wavy appearance, shall be removed and replaced by the Contractor at his expense.

3.2 REMOVAL OF STRIPES

A. All stripes and pavement markings not in conformance with the proposed striping plan shall be removed by sandblasting. Painting-out black paint will not be allowed unless specifically indicated on the Drawings. In slurry seal and asphalt concrete overlay areas, painted stripes and markings need not be removed prior to sealing or overlay operations; all thermoplastic material and raised pavement markers shall be removed prior to slurry seal or overlay application.

B. After removal of paint, apply fog seal coat of SS-Ih emulsified asphalt per Section 94 of the CDT Standard Specifications to all asphalt surfaces affected by the removal operations. The fog seal coat must be given ample time to dry prior to the initial painting application.

END OF SECTION 02761
SECTION 02786  ASPHALTIC CONCRETE PAVING & BASE MATERIAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Refer to the General Conditions, Supplementary Conditions, and Division 1 General Requirements.

1.2 WORK INCLUDED
   A. Prepare sub-grade to receive base course.
   B. Place stabilizing base courses, work and compact.
   C. Prime base course, place asphalt pavement, apply seal coat.

1.3 RELATED WORK
   Section 02300 - EARTH MOVING
   Section 02315 - TRENCHING AND BACKFILLING
   Section 02752 - SITEWORK CONCRETE

1.4 REFERENCES
   A. American Society for Testing and Materials (ASTM)
      1. A15
      2. C150
      3. D1557
      4. D1682

   B. Caltrans:
      1. Standard Specifications:
         Section 26    Section 84
         Section 37    Section 90
         Section 39    Section 91
2. California Test Method No. 399A.
3. California Maintenance Manual, Chapter XVII.

1.5 SUBMITTALS

A. The Owner shall be provided with 2 copies of material certificates signed by the material producer and the Contractor, certifying that each material item complies with, or exceeds specified requirements.

B. The Contractor shall furnish the Owner a certified weight or load slip for each load of material used in the construction of the asphaltic concrete pavement.

1.6 TESTING AND INSPECTION

A. Testing and inspection of asphaltic pavement mix and testing of the in-place, stabilizing base course and asphaltic pavement will be performed by an independent Testing Laboratory. Testing and inspection will be performed in a manner to minimize disruption to work.

B. Allow agents of the Testing Laboratory access to the mixing plant for verification of weights or proportions, character of materials used and determination of temperatures used in the preparation of asphaltic concrete mix.

C. When and if required, the Testing Laboratory will perform laboratory tests on proposed asphalt pavement mixes to determine conformity with requirements.

D. The Testing Laboratory will perform one series of compaction tests for the stabilizing base course and for asphalt pavement. Payment for costs of additional testing required due to improper performance of Work will be borne by the Contractor.

E. When the stabilizing base course or a portion thereof has been placed and compacted in accordance with requirements, notify the Testing Laboratory to perform density tests. Do not place asphalt pavement until results have been verified and base course installation approved.

F. If compaction tests indicate that the stabilizing base course or asphalt paving do not meet Specifications, remove defective work, replace and retest at Contractor's expense.
1.7 PROJECT CONDITIONS

A. Asphaltic Concrete Paving: Asphaltic concrete surfaces shall be constructed only when ambient temperature is above 40º and when base is dry.

1. Standard Specifications:
   
   | Section 26 | Section 84 |
   | Section 37 | Section 90 |
   | Section 39 | Section 91 |
   | Section 51 | Section 92 |
   | Section 52 | Section 93 |
   | Section 73 | Section 94 |

2. California Test Method No. 399A,

3. California Maintenance Manual, Chapter XVII.


PART 2 - PRODUCTS

2.1 MATERIALS

A. Where Class 2 Aggregate Base (R=78) is indicated on the Plans, aggregate base shall conform to Class 2 aggregate base 1-1/2" maximum size, as specified in Section 26 of the Caltrans Standard Specifications.

B. Asphaltic Concrete Paving:

1. Paving asphalt to be mixed with aggregate shall be steam-refined asphalt, AR-4000, conforming to Section 92 of the Caltrans Standard Specifications.

2. Aggregate shall be Type B aggregate as specified in Section 39 of the Caltrans Standard Specifications.

3. Maximum aggregate size shall be as follows: The aggregate for the surface course shall conform to the grading for "1/2" inch Maximum, Medium"; "Contract Compliance" column as shown in Section 39 of Caltrans Standard Specifications.

   Where the structural section calls for 3" or greater AC total thickness, the surface course shall be 1-1/2" inches thick.

   Where the structural section calls for 2-1/2 or less inches AC total thickness, the surface course and the base course may be combined into one lift. The gradation of the aggregate shall conform to the gradation for surface course.
4. Liquid asphalt for prime coat shall be Grade SC-70 in conformance with Section 93 of the Caltrans Standard Specifications.

5. Asphaltic emulsion for paint binder and fog seal coat shall be emulsified asphalt, Type SS-1h, conforming to Section 94 of the Caltrans Standard Specifications.

PART 3 - EXECUTION

3.1 PREPARATION

A. The top 12 inches of subgrade shall be scarified and compacted to 95% relative compaction.

B. Aggregate base shall be compacted to 95 percent as determined by ASTM D1557. Comply with Sections 26-1.04B and 26-1.05 of the Caltrans Standard Specifications. Redwood Header is required wherever asphalt is set adjacent to or through unpaved areas.

3.2 ASPHALTIC CONCRETE PAVING

A. General:

1. Asphaltic concrete shall be proportioned, mixed, placed, spread and compacted in conformance with Section 39 of Caltrans Standard Specifications.

2. Before placing asphaltic concrete on an untreated base, a liquid asphalt prime coat shall be applied to the base course in conformance with Section 39 of Caltrans Standard Specifications. Prime coat shall be applied at the rate of 0.25 gallons per square yard.

3. Before placing asphaltic concrete, an asphaltic emulsion tack coat (paint binder) shall be applied to all vertical surfaces of existing pavement, curbs, gutters, construction joints and all existing pavement to be surfaced, in conformance with Section 39 of Caltrans Standard Specifications.

4. Spreading and compacting asphaltic concrete shall be performed in accordance with Section 39 of the Caltrans Standard Specifications.

5. Fog seal shall be applied to all finished surface of asphaltic concrete pavement in accordance with Section 37 Caltrans Standard Specifications, at a rate of 0.05 gallons per square yard.

6. After the fog seal has been applied, ample time shall be allowed for drying before traffic is allowed on the pavement or paint striping is applied.

3.3 PAVEMENT MARKING: As specified in Section 02761
3.4 FIELD QUALITY CONTROL

A. Aggregate Base: The surface of finished aggregate base shall vary by no more than an average of 0.05 feet above or below the grade shown on the drawings.

B. Asphaltic Concrete Paving:

1. The finished asphalt pavement, where not controlled by adjacent structures or features, shall not vary more than 0.05 feet above or below the planned grade; it shall be uniform and free of sharp breaks.

2. The cross section of the finished pavement shall be free of ridges and valleys and shall not vary more than 0.03 feet above or below the theoretical section at any point on the cross section.

3. The specified thickness of the finished pavement shall be the minimum acceptable.

4. Conforms shall form a smooth, pond-free transition between existing and new pavement.

3.5 FRAMES, COVERS, GRATES AND VALVE BOXES

A. Frames, covers, grates and valve boxes of existing manholes, inlets, or other facilities shall be adjusted to grade in conformance with Section 15 of the Caltrans Standard Specifications.

B. All structures located in the pavement area shall not be constructed to final grade until the adjacent pavement or surfacing has been compacted.

3.6 CLEANUP

A. Surplus material remaining upon completion of fog sealing operations shall become the property of the Contractor and be removed from the Work site and disposed of in a lawful manner.

B. All sealed surfaces shall be left in a clean, neat, and workman like condition, and all construction waste, rubbish, and debris shall be removed from the Work site and disposed of in a lawful manner.

END OF SECTION 02786
PART 1 - GENERAL

1.1 SCOPE

A. Work in this section includes installation of a complete automatic irrigation system, including excavation for points of connection, trenching, piping, equipment, electrical components, maintenance of the system, and incidentals related thereto.

B. Related work specified elsewhere:

1. Landscape Soil Preparation - Section 02920
2. Planting – Section 02950

1.2 QUALITY CONTROL

A. Standards: Unless otherwise shown or specified, all materials and methods shall conform to the appropriate current sections of the State of California Department of Transportation Standard Specifications (DTSS) as they reasonably apply to this work except for measurement and payment requirements.

B. Reviews: Contractor shall specifically request the following reviews prior to progressing with the work:

1. Layout of system
2. Points-of-connection excavation
3. Trenching and pipe assembly
4. Coverage adjustment of all heads, valve box installation
5. Operation of system

PART 2 - PRODUCTS

2.1 MATERIALS

A. Quality: All materials shall be new and the best quality available unless otherwise specified. All materials shall be clearly marked by manufacturer on all material, containers or certificates of contents for inspection.
B. Plastic Pipe and Fittings: All pipe unless otherwise noted shall be polyvinyl chloride schedule 40 (CS207-60), all solvent weld fittings, if used, shall be Schedule 40, or Schedule 80 as called for on details. Solvent for piping shall be as recommended by manufacturer. All pipe shall be clearly labeled with manufacturer type and specification numbers.

C. Control Wire: Type UF, 600 v. insulation, minimum size #14, copper, common ground white, U.L. approved for irrigation control use; splices shall be “Scotch-Lok” seal pack or equal with wire-nuts enclosed in resin-filled envelopes.

D. Valve Boxes: precast concrete or plastic of type and size indicated. Free of all cracks, chips or structural defects. Boxes subject to vehicular traffic shall be concrete and have heavy-duty steel covers.

E. Irrigation equipment: Refer to drawings. Any desired substitutions require submittals in duplicate for specific written approval.

F. Thread Sealant: Permatex Thread Sealant, part #14H, white in color.

PART 3 - EXECUTION

3.1 GRADING: Contractor shall be responsible for installing all irrigation features to their finished grade and at depths indicated. All rough grading shall be completed before trenching commences.

3.2 LAYOUT AND TRENCHING: All features of the irrigation system shall be staked and pipe alignments marked prior to trenching for review by the Owner's Representative.

3.3 BACKFILLING: Do not cover joints until system has been reviewed by the Owner's Representative. Backfill with damaging rocks and debris shall not be permitted. Compact all backfill and eliminate settlement. Previously prepared soil is to be replaced as the top six inches of backfill.

3.4 FABRICATION: Snake pipe from side to side when trench exceeds thirty feet in length. All manifolds shall be neat, orderly and constructed for ease in maintenance operations. Construct manifolds to allow valve boxes to be parallel to each other and to adjacent walls, walks, curbs and buildings. Cuts and joints shall be free of burrs, smooth and minimum in quantity. All pipe above finish grade shall be galvanized unless noted otherwise.

3.5 PIPELINES: All pipelines shown parallel on the drawing may be installed in a common trench. Where pipelines are shown parallel or adjacent to shrub or groundcover areas, they shall be installed in these areas. Where shown parallel or adjacent to lawn areas versus pavement, they shall be installed in the lawn area. All changes in depth of pipe shall be accomplished using 45-degree fittings.
3.6 TESTING: Test all lines before backfilling for malfunctions. Test mains under 120 psi for at least three hours.

3.7 CONTROL WIRE: Install control wire in pipe trenches wherever practical. Tape to underside of pipe every ten feet. All splices shall be epoxy-coated. All wire shall be installed below or level with the bottom of adjacent pipes. All wiring above finish grade shall be enclosed in steel conduit. Splices shall be installed in junction boxes.

3.8 ADJUSTMENTS: Adjust all heads for arc, radius, riser height, and distribution for uniform and optimum coverage. Such adjustments shall include nozzle changes without additional cost to the City.

3.9 FINISH GRADE: Unless otherwise noted, all heads shall be set at finish grade and on double or triple swing joints as called for on drawings. The top of all valve boxes shall be flush with finish grade.

3.10 CONTROLLER: Contractor shall clearly label and sequence stations for ease in maintenance operations. Station valves to operate as they are located around the site. Fasten controller and wire conduits securely to wall with conduit clamps and screws. Contractor shall complete all forms and labels shipped with and/or attached to the controller; attach his own name, address and phone number to the controller via a permanent label; and shall properly execute and file with the City the controller and valve guarantees.

3.11 RECORD DRAWING: Contractor shall regularly update a print of the system and any changes made to the system throughout the project. Features below ground shall be indicated with at least two measurements from surface features such as walks, building or sprinkler heads. All changes shall be recorded on this plan before trenches are backfilled. The record drawing shall be completed and submitted to the City’s Representative before final payment shall be made for work installed.

PART 4 - MEASUREMENT AND PAYMENT

4.1 All work under this Section shall be included in the lump sum bid price for irrigation under "Parking Lot Renovation" bid item, and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for performing all the work involved as indicated on the drawings and Project Manual.

END OF SECTION 02810
PART 1 - GENERAL

1.1 SCOPE

A. Furnish and install all landscape soil preparation as shown and specified including, but not necessarily limited to, the following: import topsoil placement, organic amendment and fertilizer placement, and finish grading.

B. Related work specified elsewhere:

1. Irrigation – Section 02810
2. Planting - Section 02950
3. Landscape Maintenance – Section 02970

1.2 QUALITY CONTROL

A. Reviews: Contractor shall specifically request at least two days in advance the following reviews prior to progressing with the work:

1. Completion of rough grading
2. Verification of amendment incorporation depths
3. Finish grade

B. Certification: Written certificates stating quantity, type, and composition, weight and origin for all amendments and chemicals shall be delivered to the City's Representative before the material is used on the site.

C. Native Topsoil Analysis: A composite native topsoil sample was submitted for analysis by Waypoint Analytical, San Jose, CA (408) 727-0330. The soil preparation recommendations from this report have been incorporated into this specification.

D. Amendment Testing: Contractor shall provide a one-quart sample of each proposed amendment to a certified, independent soils testing laboratory for their testing for conformance to this specification. No material shall be delivered to the site until the City’s Representative approves the materials. Testing costs shall be paid by the Contractor.
PART 2 - PRODUCTS

2.1 MATERIALS

A. Import Topsoil for all Planting Areas: Shall be a homogeneous mineral soil classified as sandy loam, sandy clay loam, or loam. Particle size data shall be based upon standard USDA methodology. Of the material falling in the course sand category, a maximum of (15%) shall fall in the course sand range (.05 - 2.0 mm). Gravel content (greater than 2.0mm) shall be less than (15%). Import topsoil shall not contain more silt and clay than the on-site native soil. The sum of silt plus clay shall be not more than (20%), the soil shall be non-saline as determined on the saturation extract. Salinity shall not exceed (3.0 Ds/m) @ 25 degrees C, boron shall not exceed (1.0 ppm) and the sodium absorption ratio (SAR) shall not exceed (6.0). Soil reaction as determined on a saturated paste shall fall between (5.5 and 7.5) without high lime content. The soil shall be free of organic herbicides, or other growth restricting chemicals. Contamination may be tested by greenhouse trials using rye grass and radish as test crops using the proposed import soil as substrate. These trials require four to five weeks for completion.

B. Organic Fertilizers:

Blood Meal (12-0-0)
Feather Meal (12-0-0) (organic) or approved equal
Steamed Bone Meal (3-15-0) (organic) or approved equal
Potassium Sulfate (0-0-50)
Gypsum (Calcium Sulfate)

These organic fertilizers are available from: Target Specialty Products, San Jose, or approved equal. http://www.target-specialty.com

C. Organic Amendment: Shall be (nitrogen-treated redwood sawdust) or (fir bark) conforming to:

Physical Properties: (95%-100%) passing, sieve size (6.35mm) (1/4"), (80%-100%) passing, sieve size (2.38mm) (No. 8, 8 mesh) and (0%-30%) passing, sieve size (500 micron) (No. 35, 32 mesh).

Chemical Properties: Nitrogen Content (dry weight basis) - (0.4-0.6%) iron content - minimum (0.08%) dilute acid soluble Fe on dry weight basis, soluble salts - maximum (3.5 millimhos/centimeter @ 25 degrees C.) as determined by saturation extract method; ash - (0-6.0%).
PART 3 - EXECUTION

3.1 LIMITS AND GRADES

A. Prior to commencing soil preparation operations, Contractor shall request a review by the City's Representative to verify specified limits and grades of work completed to date and soil preparation work to commence. Contractor shall complete the rough grading as necessary to round the top and toe of all slopes, providing naturalized contouring to integrate newly graded areas with the natural topography. Finish grading under this section shall be completed in accordance with the grades indicated on the landscape drawings.

3.2 STRIPPING AND STOCKPILING OF EXISTING TOPSOIL

A. Not applicable.

3.3 IMPORT TOPSOIL PLACEMENT

A. After all planting areas have been excavated, they shall be ripped to a depth of (seven inches). Next, a (three-inch) layer of import topsoil shall be uniformly distributed over these areas and thoroughly incorporated into the top (six inches) of subsoil by ripping, scraping, or tilling to mix the subsoil with the topsoil into a homogeneous mixture. The remaining layer of topsoil shall then be uniformly distributed in the planting areas and compacted in place to 85% compaction. The total depth of topsoil to be distributed shall be as indicated on the drawings.

3.4 ORGANIC AMENDMENT AND FERTILIZER INCORPORATION

A. For Mass Planting: Materials determined from the soils test shall be uniformly distributed throughout all irrigated planting areas and incorporated to a homogeneously blended soil depth of (six inches). For bidding purposes, assume per 1000 square feet:

- Six-inch layer of import topsoil (where indicated on the drawings).
- 4 cubic yards Nitrogen Stabilized Organic Amendment.
- 6 pounds Blood Meal (12-0-0)
- 14 pounds Feather Meal (12-0-0)
- 7 pounds Steamed Bone Meal (3-15-0)
- 15 pounds Potassium Sulfate (0-0-50)
- 70 pounds Gypsum (Calcium Sulfate)
3.5 PLANT PITS

A. Plant pits shall have their sides and bottoms loosened or otherwise broken to prevent glazed or compacted surfaces, and shall be as shown on the planting detail.

3.6 BACKFILL

A. Only un-amended soil shall be used beneath the root ball; cultivate bottom of plant pit to improve porosity. Backfill around the top 12-inches of the sides of root ball shall be the soil taken from adjacent prepared areas blended with the following amendments and fertilizers:

<table>
<thead>
<tr>
<th>Amount per Cubic Yard of Backfill Organic</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 parts</td>
</tr>
<tr>
<td>1 part</td>
</tr>
</tbody>
</table>

Uniformly blended with:

- 1/3 pound Blood Meal (12-0-0)
- 3/4 pound Feather Meal (12-0-0)
- 1/3 pound Steamed Bone Meal (3-15-0)
- 3/4 pound Potassium Sulfate (0-0-50)
- 3 3/4 pounds Gypsum (Calcium Sulfate)

3.7 FINISH GRADING

A. Contractor shall finish grade all irrigated planting areas unless otherwise noted, and shall remove all rocks and clods over one cubic inch to a depth of 4 inches. All areas shall be smooth and uniformly graded. All erosion damage during the construction period shall be repaired by the Contractor.

B. Unless otherwise noted, all soil finish grades shall be one inch below finish grade of walks, pavements and curbs.

PART 4 - MEASUREMENT AND PAYMENT

4.1 All work under this Section shall be included in the lump sum bid price for landscape soil preparation under “Parking Lot Renovation” bid item, and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for performing all the work involved as indicated on the drawings and Project Manual.

END OF SECTION 02920
SECTION 02950 PLANTING

PART 1 - GENERAL

1.1 SCOPE

A. Furnish and install all container plantings, including trees, shrubs, vines and groundcover, staking, and related work thereto.

B. Coordinate and provide all services as required to contract grow plant material indicated on the drawings.

C. Related work specified elsewhere:
   1. Irrigation - Section 02810
   2. Landscape Soil Preparation - Section 02920
   3. Landscape Maintenance - Section 02970

1.2 QUALITY CONTROL

A. Reviews: The Contractor shall specifically request the following reviews prior to progressing with the work:
   1. Plant material approval
   2. Plant layout
   3. Finish grade
   4. Substantial completion
   5. Final completion

B. Submittals/Plant Material: Within five days after award of contract, Contractor shall submit notice to the Landscape Architect certifying the quantity and species of plant material ordered, the nursery supplying the material and any plant material unavailable at the time, and proposed schedule for growing same to be approved by the City’s Representative.

C. Contract Growing: Contractor is advised that plant material specified is not subject to substitutions and that contractor shall contract grow or otherwise provide plant material as noted. If portions of plant material are unavailable, all other operations are to be completed within the time schedules outlined with a later single phase to be scheduled for completion several months later, with no change in contract amounts or payments.
PART 2 - PRODUCTS

2.1 MATERIALS

A. Nomenclature and Labels: Plant botanical names shall conform to “Standardized Plant Names,” second edition, and secondly, “A Checklist of Woody Ornamental Plants of California,” Manual 32, University of California. All plants of each clone, species, and cultivar shall be delivered to the site labeled with their full botanical names. Every plant species shall be labeled with no less than one label for every ten plants of a species.

B. Quality: Minimum quality of all plant material shall conform to prevailing published specifications of the California Association of Nurserymen and the American Association of Nurserymen unless otherwise indicated. Additional specifications shall be indicated on the drawings.

C. Quantities: the quantities shown on the plant list and in labels are for the City’s Representative use and are not to be construed as the complete and accurate limits of the contract. Contractor shall furnish and install all plants shown schematically on the drawings. Any unlabeled plants shall be considered as the smaller size shown for that type on the drawings.

D. Root Systems: All container-grown stock shall be grown in its container for at least six months prior to its planting. Contractor shall allow one percent of the quantity of plants for removal and inspection. Any plant material, within one year following the final acceptance of the project, determined by the City’s Representative to be defective, restricted, declining or otherwise deficient due to abnormal root growth, shall be replaced by Contractor, to the equal condition of adjacent plants, at the time of replacement.

F. Trees: All trees shall have straight trunks of uniform taper, larger at the bottom. Trunks shall be free of damaged bark, with all minor abrasions and cuts showing healing tissue. Sucker basal growth and sucker lateral growth shall be removed and treated to eliminate re-sprouting. Normal lower side branching shall remain. Trees unable to stand upright without support shall be rejected.

G. Health: Foliage roots and stems of all plants shall be of vigorous health and normal habit of growth for its species. All plants shall be free of all diseases, insect stages, burns, or disfiguring characteristics.

H. Untrue Species: All plant material, within two years following the final acceptance of the project, determined by the City’s Representative to be untrue to the species, clone, and/or variety specified, shall be replaced by the Contractor, to the equal condition of adjacent plants at the time of replacement.
I. Chemicals: Shall be applied only as recommended by a pest control operator licensed by the State of California. The following chemicals are examples of brand names which must be verified by the pest control operator for each specific application:

Pre-emergent herbicide: Treflan or equal
anti-desiccant: “Wilt-Pruf, formula NCF”

PART 3 - EXECUTION

3.1 GENERAL

A. Plant Material Approvals: Before planting operations commence, all plant material shall be reviewed by the City’s Representative. Defective plants installed without such review shall be removed from the site upon request by the City’s Representative and an acceptable plant substituted in its place.

B. Layout: Only those plants to be planted in any single day shall be laid out. Locations of all plants shall be reviewed prior to planting. Plants installed without this review shall be transplanted as directed by the City’s Representative.

C. Protection of Plants: Contractor shall maintain all plant material in a healthy growing condition prior to and during planting operations. Contractor shall be responsible for vandalism, theft and damage to plant material until the commencement of the maintenance period.

D. Pruning: Contractor shall do no pruning without the specific approval of the City’s Representative. Plants pruned without approval shall be replaced by the Contractor, if required.

E. Basins: Construct basins as necessary to water plants. Remove basins from all plants under a permanent irrigation system prior to final inspection and finish grade the planting area. Basins for plants to be hand-watered shall remain in place. Basin bottoms shall drain to berm away from plant stem.

F. Staking: All trees shall be staked as drawn with stakes driven securely into existing soil aligned with the trunk and perpendicular to the direction of the prevailing winds. A minimum of two figure eight wire and rubber tree ties required per stake.

G. Plant Pits, Backfill and Finish Grading: See Section 02920 – Landscape Soil Preparation for materials and installation requirements.
H. Cleanup: After completion of all operations, Contractor shall remove all trash, excess soil and other debris. All walks and pavement shall be swept and washed clean, leaving the entire area in a neat, orderly condition.

I. Chemicals: Contractor shall verify compatibility, dosage and other application procedures with a licensed pest control operator and with the manufacturer and shall pre-test any and all chemicals at the site to verify total compatibility with proposed plantings and shall be responsible for any damages arising from the inappropriate use.

Herbicide: Treat all groundcover and lawn areas 20 days after planting as required to obtain weed control.

Anti-desiccant: Apply one or more application of anti-desiccant to plants immediately after arrival to the site and thereafter as required to minimize wind damage to plants.

PART 4 - MEASUREMENT AND PAYMENT

4.1 All work under this Section shall be included in the lump sum bid price for planting under “Parking Lot Renovation” bid item, and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for performing all the work involved as indicated on the drawings and Project Manual.

END OF SECTION 02950
SECTION 02970 LANDSCAPE MAINTENANCE

PART 1 - GENERAL

1.1 SCOPE

A. Work in this section includes the growing and maintenance operations necessary to establish the shrubs, ground cover, vines, and other plantings; to provide pest and disease control; and to maintain the irrigation system and related construction elements.

B. Related work specified elsewhere:

1. Irrigation - Section 02810
2. Planting - Section 02950
3. Landscape Soil Preparation - Section 02920

PART 2 - PRODUCTS

2.1 MATERIALS

A. Fertilizer: Used during the course of the maintenance period shall be:
   - Blood Meal: 6 pounds per 1,000 square feet
   - Feather Meal: 14 pounds per 1,000 square feet

B. Water: During the course of construction and maintenance period shall be paid for by the City.

C. Pre-emergent Herbicide: Treflan or approved equal

PART 3 - EXECUTION

3.1 TIME LIMITS: The maintenance period shall commence from the date of substantial completion of planting as defined in paragraph 3.6 below, and extend for a ninety (90) calendar day period thereafter, or until the acceptance of Final Completion.

3.2 FERTILIZER APPLICATION: Fertilizer(s) shall be applied per Waypoint Analytical's recommendations. Initial application shall be ninety (90) calendar days after planting.
3.3 HERBICIDE APPLICATION: Herbicide shall not be used until all plant material has been planted a minimum of 20-days. All planting areas shall be kept weed-free without herbicide use during this time period.

3.4 IRRIGATION SYSTEM: The Contractor shall be responsible for maintaining the irrigation system fully operational with regular system checks for proper head to head coverage, potential main or lateral leaks, damaged heads or clogged nozzles. The controller shall be programmed in accordance with the irrigation schedules indicated on the drawings. Any system break-downs that cannot immediately be repaired shall be reported to the City’s Representative.

3.5 BASIC REQUIREMENTS: All planting areas shall be kept weed-free at all times during the maintenance period. All pest and disease control shall be the Contractor’s responsibility. All planting areas shall be kept at optimum moisture for plant growth. Settlement of soil and plants and soil erosion shall be repaired and areas replanted as required. Dying or deficient plants shall be replaced as soon as they become apparent.

3.6 CITY’S RESPONSIBILITY: Work installed under this contract that is damaged or stolen prior to Substantial Completion shall be repaired or replaced by the Contractor without cost to the City. After substantial completion and through the maintenance period, these damages and similar factors such as graffiti or other defacement shall be the City’s responsibility to repair or replace and shall not be a part of this contract. No planting shall be guaranteed beyond the maintenance period, except as to conformance to specified species and variety, and except as to conditions specified under “Root Systems” of Landscape Planting, Section 02950.

3.7 SUBSTANTIAL COMPLETION: Shall be deemed as the time all major plantings, including sod and groundcover, are installed, and when all other work is satisfactorily completed (with the exception of minor items to be completed as noted upon a checklist compiled by the City’s Representative). Maintenance period shall not commence until work is deemed substantially complete by the City’s Representative.

3.8 FINAL COMPLETION: Contractor shall request a final project review in writing at least five (5) business days in advance of the proposed date. Failure to request this notice shall be automatically extend the Final Completion date. The maintenance period shall continue until Final Project Completion as approved by the City’s Representative.
PART 4 - MEASUREMENT AND PAYMENT

4.1 All work under this Section shall be included in the lump sum bid price for landscape maintenance under “Parking Lot Renovation” bid item, and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for performing all the work involved as indicated on the drawings and Project Manual.

END OF SECTION 02970