PROJECT SPECIFICATIONS
Bid Submittal
August 16, 2019

PREPARED BY:

VERDE DESIGN
Project No. 1801800
### Technical Specifications

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SECTION 01 11 00

SUMMARY OF WORK

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, subcontractors, 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
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.
SECTION 01 33 00

SUBMITTALS

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 manufacturer’s for the same item. If multiple products or manufacturer’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
SECTION 01 42 00

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.

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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
SECTION 01 50 00

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
SECTION 01 62 00

PRODUCT OPTIONS AND SUBSTITUTIONS

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
License Category: ________________________ License Number: ________________________

Firm: _______________________________ Phone No.: _______________________________

Address: ___________________________ Fax No.: _________________________________

Telephone: __________________________

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 – Asphalting 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.
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, guaranties, 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: _________________________________
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
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
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. Bleachers
2. Bases/plates/pitching rubbers/home base
3. Benches
4. Bat and Helmet Rack

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, subcontractor 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**

<table>
<thead>
<tr>
<th>Description</th>
<th>Manufacturer</th>
<th>SKU #</th>
<th>Finish/Color</th>
<th>Distributor/Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Single Anchor 1&quot; All Steel Anchor Qty: 8</td>
<td>Bolco</td>
<td>301-105-109</td>
<td>Steel</td>
<td>Beacon Athletics <a href="http://www.Beaconathletics.com">www.Beaconathletics.com</a></td>
</tr>
<tr>
<td>D. Home Plate Wood Filled Home Plate Qty: 7</td>
<td>MacGregor</td>
<td>BBHPSAFE</td>
<td>White/wood</td>
<td>BSN Sports <a href="http://www.BSNSports.com">www.BSNSports.com</a></td>
</tr>
</tbody>
</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 32 13 13 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.

END OF SECTION
SECTION 26 05 10

GENERAL ELECTRICAL REQUIREMENTS

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

A. The work of this Section consists of providing all required labor, supervision, materials and equipment to satisfactorily complete all electrical installations that are shown on the Drawings, included in these specifications, or otherwise needed for a complete and fully operating facility.

B. Furnish and install all required in-place equipment, conduits, conductors, cables and any miscellaneous materials for the satisfactory interconnection and operation of all associated electrical systems.

1.02 RELATED WORK

A. This Section provides the basic Electrical Requirements which supplement the General Requirements of Division 1 and apply to all Sections of Division 26.

1.03 SUBMITTALS

A. As specified in Division 1. Submit to the Architect shop drawings, manufacturer's data and certificates for equipment, materials and finish, and pertinent details for each system specified. Information to be submitted includes manufacturer's descriptive literature of cataloged products, equipment, drawings, diagrams, performance and characteristic curves as applicable, test data and catalog cuts. Obtain written approval before procurement, fabrication, or delivery of the items to the job site. Partial submittals are not acceptable and will be returned without review. Furnish manufacturer's name, trade name, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and paragraph reference, applicable Federal, Industry and Technical Society Publication References, and years of satisfactory service of each item required to establish contact compliance. Photographs of existing installations and data submitted in lieu of catalog data are not acceptable and will be returned without approval.

B. Organize submittals for equipment and items related to each specification section together as a package.

C. Proposed substitutions of products will not be reviewed or approved prior to awarding of the Contract.

D. Substitutions shall be proven to the Architect or Engineer to be equal or superior to the specified product. Architect's decision is final. The Contractor shall pay all costs incurred by the Architect and Engineer in reviewing and processing any proposed substitutions whether or not a proposed substitution is accepted.

E. If a proposed substitution is rejected, the contractor shall furnish the specified product at no increase in contract price.

F. If a proposed substitution is accepted, the contractor shall be completely responsible for all dimensional changes, electrical changes, or changes to other work which is a result of the substitution. The accepted substitution shall be made at no additional cost to the owner or design consultants.

1.04 QUALITY ASSURANCE
A. Codes: All electrical equipment and materials, including installation and testing, shall conform to the latest editions following applicable codes:

2. Occupational Safety and Health Act (OSHA) standards.
3. All applicable local codes, rules and regulations.
4. Electrical Contractor shall possess a C-10 license and all other licenses as may be required. Licenses shall be in effect at start of this contract and be maintained throughout the duration of this contract.

B. Variances: In instances where two or more codes are at variance, the most restrictive requirement shall apply.

C. Standards: Equipment shall conform to applicable standards of American National Standards Institute (ANSI), Electronics Industries Association (EIA), Institute of Electrical and Electronics Engineers (IEEE), and National Electrical Manufacturers Association (NEMA).

D. Underwriter Laboratories (UL) listing is required for all equipment and materials where such listing is offered by the Underwriters Laboratories. Provide service entrance labels for all equipment required by the NEC to have such labels.

E. The electrical contractor shall guarantee all work and materials installed under this contract for a period of one (1) year from date of acceptance by owner.

F. All work and materials covered by this specification shall be subject to inspection at any and all times by representatives of the owner. Work shall not be closed in or covered before inspection and approval by the owner or his representative. Any material found not conforming with these specifications shall, within 3 days after being notified by the owner, be removed from premises; if said material has been installed, entire expense of removing and replacing same, including any cutting and patching that may be necessary, shall be borne by the contractor.

1.05 DRAWINGS

A. Drawings: The electrical Drawings shall govern the general layout of the completed construction.

1. Locations of equipment, panels, pullboxes, conduits, stub-ups, ground connections are approximate unless dimensioned; verify locations with the Architect prior to installation.

2. Review the Drawings and Specification Divisions of other trades and perform the electrical work that will be required for those installations.

3. Should there be a need to deviate from the Electrical Drawings and Specifications, submit written details and reasons for all changes to the Architect for approval.

4. The general arrangement and location of existing conduits, piping, apparatus, etc., is approximate. The drawings and specifications are for the assistance and guidance of the contractor, exact locations, distances and elevations are governed by actual field conditions. Accuracy of data given herein and on the drawings is not guaranteed. Minor changes may be necessary to accommodate work. The contractor is responsible for verifying existing conditions. Should it be necessary to deviate from the design due to interference with existing conditions or work in progress, claims for additional compensation shall be limited to those for work required by unforeseen conditions as determined by the Architect.
5. All drawings and divisions of these specifications shall be considered as whole. This contractor shall report any apparent discrepancies to the Architect prior to submitting bids.

6. The contractor shall be held responsible to have examined the site and compared it with the specifications and plans and to have satisfied himself as to the conditions under which the work is to be performed. He shall be held responsible for knowledge of all existing conditions whether or not accurately described. No subsequent allowance shall be made for any extra expense due to failure to make such examination.

1.06 CLOSEOUT SUBMITTALS

A. Manuals: Furnish manuals for equipment where manuals are specified in the equipment specifications or are specified in Division 1.

1.07 COORDINATION

A. Coordinate the electrical work with the other trades, code authorities, utilities and the Architect.

B. Provide and install all trenching, backfilling, conduit, pull boxes, splice boxes, etc. for all Utility Company services to the locations indicated on the Drawings. All materials and construction shall be in accordance with the requirements for all the Utility Companies. Prior to performing any work, the Electrical Contractor shall coordinate with the various Utility Companies to verify that all such work and materials shown on the Drawings are of sufficient sizes and correctly located to provide services on the site. The Electrical Contractor shall verify with all the Utility Companies that additional contractor furnished and installed work is not required. If additional work, materials, or changes are required by any of the Utility Companies, the Electrical Contractor shall advise the Architect of such changes and no further work shall then be performed until instructed to do so by the Architect.

C. Utility Company charges shall be paid by the Owner.

D. Contractor shall pay all inspection and other applicable fees and procure all permits necessary for the completion of this work.

E. Where connections must be made to existing installations, properly schedule all the required work, including the power shutdown periods.

F. When two trades join together in an area, make certain that no electrical work is omitted.

1.08 JOB CONDITIONS

A. Operations: Perform all work in compliance with Division 1

1. Keep the number and duration of power shutdown periods to a minimum.

2. Show all proposed shutdowns and their expected duration on the construction schedule. Schedule and carry out shutdowns so as to cause the least disruption to operation of the Owner’s facilities.

3. Carry out shutdown only after the schedule has been approved, in writing, by the owner. Submit power interruption schedule 15 days prior to date of interruption.

B. Construction Power: Unless otherwise noted in Division 1 of these specifications, contractor shall make all arrangements and provide all necessary facilities for temporary construction power from the owner’s on site source. Energy costs shall be paid for by the Owner.
C. Storage: Provide adequate storage for all equipment and materials which will become part of the completed facility so that it is protected from weather, dust, water, or construction operations.

1.09 DAMAGED PRODUCTS

A. Notify the Architect in writing in the event that any equipment or material is damaged. Obtain approval from the Architect before making repairs to damaged products.

1.10 LOCATIONS

A. General: Use equipment, materials and wiring methods suitable for the types of locations in which they are located.

B. Dry Locations: All those indoor areas which do not fall within the definition below for Wet Locations and which are not otherwise designated on the Drawings.

C. Wet Locations: All locations exposed to the weather, whether under a roof or not, unless otherwise designated on the Drawings.

1.11 SAFETY AND INDEMNITY

A. The Contractor is solely and completely responsible for conditions of the job site including safety of all persons and property during performance of the work. This requirement will apply continually and not be limited to normal working hours. The contractor shall provide and maintain throughout the work site proper safeguards including, but not limited to, enclosures, barriers, warning signs, lights, etc. to prevent accidental injury to people or damage to property.

B. No act, service, drawing review or construction review by the Owner, the Engineer or their Consultants is intended to include reviews of the adequacy of the Contractors safety measures in or near the construction site.

C. The Contractor performing work under this Division of the Specifications shall hold harmless, indemnify, and defend the Owner, the Engineer, their consultants, and each of their officers, agents and employees from any and all liability claims, losses, or damage arising out of or alleged to arise from bodily injury, sickness, or death of a person or persons and for all damages arising out of injury to or destruction of property arising directly or indirectly out of or in connection with the performance of the work under this Division of the Specifications, and from the Contractor's negligence in the performance of the work described in the construction contract documents, but not including liability that may be due to the sole negligence of the Owner, the Engineer, their Consultants or their officers, agents and employees.

D. The project work area does not contain asbestos materials. However, if a work area is encountered that does contain asbestos materials, the contractor is advised to coordinate with the owner and it's asbestos abatement consultant all measures necessary to provide installation of conduit, and hangers. All asbestos containing materials related work shall conform to the directions given by the owner. Nothing herein shall be construed to create a liability for American Consulting Engineers regarding asbestos abatement measures.

1.12 ACCESS PANELS AND DOORS

A. The Contractor shall install access panels as required where floors, walls or ceilings must be penetrated for access to electrical, control, fire alarm or other specified electrical devices. The minimum size panel shall be 14" x 14" in usable opening. Where access by a service person is required, minimum usable opening shall be 18" x 24".

B. All access doors installed lower than 7'-0" above finished floor and exposed to public access shall have keyed locks.
C. Where specific information or details relating to access panels differ from these specifications, shown on drawings and or details or on other Divisions of work, these requirements shall supersede these specifications.

D. Approved Manufacturers: Subject to compliance with requirements under Architectural Specifications, Milcor, Karp, Nystrom or Cesco.

1. Milcor Style K (plaster)
2. Milcor Style DW (gypsum board)
3. Milcor Style M (masonry)

PART 2 PRODUCTS

2.01 STANDARD OF QUALITY

A. Products that are specified by manufacturer, trade name or catalog number establish a standard of quality and do not prohibit the use of equal products of other manufacturers provided they are approved by the Architect prior to installation.

B. Material and Equipment: Provide materials and equipment that are new and are current products of manufacturers regularly engaged in the production of such products. The standard products shall have been in satisfactory commercial or industrial use for two years prior to bid opening. The two-year period includes use of equipment and materials of similar size under similar circumstances. For uniformity, only one manufacturer will be accepted for each type of product.

C. Service Support: Submit a certified list of qualified permanent service organizations including their addresses and qualification for support of the equipment. These service organizations shall be convenient to the equipment installation and able to render service to the equipment on a regular and emergency basis during the warranty period of the contract.

D. Manufacturer’s Recommendations: Where installation procedures are required to be in accordance with manufacturer’s recommendations, furnish printed copies of the recommendations prior to installation. Installation of the item shall not proceed until recommendations are received. Failure to furnish recommendation shall be cause for rejection of the equipment or material.

2.02 NAMEPLATES

A. For each piece of electrical equipment, provide a manufacturer’s nameplate showing his name, location, the pertinent ratings, the model designation, and shop order number.

B. Identify each piece of equipment and related controls with a rigid laminated engraved plastic nameplate. Unless otherwise noted, nameplates shall be melamine plastic 0.125 inch thick, white with black center core. Surface shall be matte finish. Corners shall be square. Accurately align lettering and engrave into the core. Minimum size of nameplates shall be 0.5 by 2.5 inches unless otherwise noted. Where not otherwise specified, lettering shall be a minimum of 0.25 inch high normal block style. Engrave nameplates with the inscriptions indicated on the Drawings and, if not so indicated, with the equipment name. Securely fasten nameplates in place using two stainless steel or brass screws.

C. Contractor to provide rigid laminated engraved plastic nameplate for all signal terminal cabinets, fire alarm terminal cans, electrical disconnect switches (fused or non-fused) and data/voice cabinets. Provide and secure as noted above.
2.03 FASTENERS

A. Fasteners for securing equipment to walls, floors and the like shall be either hot-dip galvanized after fabrication or stainless steel.

2.04 FINISH REQUIREMENTS

A. Equipment: Refer to each electrical equipment section of these Specifications for painting requirements of equipment enclosures. Repair any final paint finish which has been damaged or is otherwise unsatisfactory, to the satisfaction of the Architect.

B. Wiring System: In finished areas, paint all exposed conduits, boxes and fittings to match the color of the surface to which they are affixed.

PART 3 EXECUTION

3.01 WORKMANSHIP

A. Ensure that all equipment and materials fit properly in their installation.

B. Perform any required work to correct improperly fit installation at no additional expense to the owner.

C. All electrical equipment and materials shall be installed in a neat and workmanship manner in accordance with the NECA Standard of Installation Manual and Workmanship of the entire job shall be first class in every respect.

3.02 EQUIPMENT INSTALLATIONS

A. Provide the required inserts, bolts and anchors, and securely attach all equipment and materials to their supports.

B. Do all the cutting and patching necessary for the proper installation of work and repair any damage done.

C. Earthquake restraints: all electrical equipment, including conduits over 2 inches in diameter, shall be braced or anchored to resist a horizontal force acting in any direction as per Title 24, part 2, table 16a-o, part 3.

D. Structural work: All core drilling, bolt anchor insertion, or cutting of existing structural concrete shall be approved by a California registered structural consulting engineer prior to the execution of any construction. At all floor slabs and structural concrete walls to be drilled, cut or bolt anchors inserted, the contractor shall find and mark all reinforcing in both faces located by means of x-ray, pach-ometer, or prof-ometer. Submit sketch showing location of rebar and proposed cuts, cores, or bolt anchor locations for approval.

3.03 FIELD TESTS

A. Test shall be in accordance with Acceptance testing specifications issued by the National Electrical Testing Association (NETA).

B. Perform equipment field tests and adjustments. Properly calibrate, adjust and operationally check all circuits and components, and demonstrate as ready for service. Make additional calibration and adjustments if it is determined later that the initial adjustments are not satisfactory for proper performance. Perform equipment field test for equipment where equipment field tests are specified in the equipment Specifications. Give sufficient notice to the Architect prior to any test so that the tests may witnessed.
C. Provide instruments, other equipment and material required for the tests. These shall be of the type designed for the type of tests to be performed. Test instrument shall be calibrated by a recognized testing laboratory within three months prior to performing tests.

D. Operational Tests: Operationally test all circuits to demonstrate that the circuits and equipment have been properly installed and adjusted and are ready for full-time service. Demonstrate the proper functioning of circuits in all modes of operation, including alarm conditions.

E. Re-testing will be required for all unsatisfactory tests after the equipment or system has been repaired. Re-test all related equipment and systems if required by the Architect. Repair and re-test equipment and systems which have been satisfactorily tested but later fail, until satisfactory performance is obtained.

F. Maintain records of each test and submit five copies to the Architect when testing is complete. All tests shall be witnessed by the Architect. These records shall include:

1. Name of equipment tested.
2. Date of report.
3. Date of test.
4. Description of test setup.
5. Identification and rating of test equipment.
6. Test results and data.
7. Name of person performing test.
8. Owner or Architect’s initials.

G. Items requiring testing shall be as noted in the additional electrical sections of these specifications.

3.04 CLEANING EQUIPMENT

A. Thoroughly clean all soiled surfaces of installed equipment and materials.

3.05 PAINTING OF EQUIPMENT

A. Factory Applied: Electrical equipment shall have factory applied painting system which shall, as a minimum, meet the requirements of NEMA ICS 6 corrosion-resistance test and the additional requirements specified in the technical section.

B. Field Applied: Paint electrical equipment as required to match finish of adjacent surfaces.

3.06 RECORDS

A. Maintain one copy of the contract Drawing Sheets on the site of the work for recording the "as built" condition. After completion of the work, the Contractor shall carefully mark the work as actually constructed, revising, deleting and adding to the Drawing Sheets as required. The following requirements shall be complied with:

1. Cable Size and Type: Provide the size and type of each cable installed on project.
2. Substructure: Where the location of all underground conduits, pull boxes, stub ups and etc. where are found to different than shown, carefully mark the correct location on the Drawings. Work shall be dimensioned from existing improvements.

3. Size of all conduit runs.

4. Routes of concealed conduit runs and conduit runs below grade.

5. Homerun points of all branch circuit.

6. Location of all switchgear, panels, MCC, lighting control panels, pullcans, etc.

7. Changes made as a result of all approved change orders, addendums, or field authorized revisions.

8. As Built: At the completion of the Work the Contractor shall review, certify, correct and turn over the marked up Drawings to the Architect for his use in preparing “as built” plans.

9. As Built drawings for fire alarm, data, telephone, CATV/Video, intercom and clock shall also be recorded. Upon completion “As-built” documentation showing actual devices locations and devices identification as installed and labeled, including fire alarm, data, telephone, CATV/Video and int/clock wiring layout. “As-built” shall include, for example, fire alarm equipment location showing all monitor modules and end of line resistor locations. The contractor shall provide one set drawings documents and the other set in electronic CAD file representing actual as-builts. CAD files shall be AutoCAD 14 format. Obtaining CAD files from the Architect/District shall be charged with $150/sheet.

10. As built Drawings shall be delivered to the Architect within ten (10) days of completion of construction.

3.07 CLEAN UP

A. Upon completion of electrical work, remove all surplus materials, rubbish, and debris that accumulated during the construction work. Leave the entire area neat, clean, and acceptable to the Architect.

3.08 MECHANICAL AND PLUMBING ELECTRICAL WORK

A. The requirements for electrical power and/or devices for all mechanical and plumbing equipment supplied and/or installed under this Contract shall be coordinated and verified with the following:

1. Mechanical and Plumbing Drawings.

2. Mechanical and Plumbing sections of these Specifications.

3. Manufacturers of the Mechanical and Plumbing equipment supplied.

B. The coordination and verification shall include the voltage, ampacity, phase, location and type of disconnect, control, and connection required. Any changes that are required as a result of this coordination and verification shall be a part of this Contract.

C. The Electrical Contractor shall furnish and install the following for all mechanical and plumbing equipment:

1. Line voltage conduit and wiring.
2. Disconnect switches.


D. Automatic line voltage controls and magnetic starters unless otherwise noted, shall be furnished by the Mechanical and/or Plumbing Contractor and installed and connected by the Electrical Contractor. All line voltage control wiring installed by the Electrical Contractor shall be done per directions from the Mechanical and/or Plumbing Contractor.

E. All low voltage control wiring for Mechanical and Plumbing equipment shall be installed in conduit. Furnishing, installation and connection of all low voltage conduits, boxes, wiring and controls shall be by the Mechanical and/or Plumbing Contractor.

F. Manual motor starters, where required, shall have toggle type operators with pilot light and melting alloy type overload relays, SQUARE D COMPANY, Class 2510, Type FG-1P (surface) or Type FS-1P (flush) or ITE, WESTINGHOUSE or GENERAL ELECTRIC equal.

3.09 ACCESS DOORS

A. The Electrical Contractor shall furnish and install access doors wherever required whether shown or not for easy maintenance of electrical systems: As an example, fire alarm devices, controls, junction boxes, etc. Access doors shall provide for complete access to equipment for both removal and replacement of equipment.

END OF SECTION
SECTION 26 05 19

LOW VOLTAGE WIRE AND CABLE

PART 1 GENERAL

1.01 DESCRIPTION OF WORK:
A. The work of this Section consists of providing all wire and cable rated 600 volts or less, including splices and terminations, as shown on the Drawings and as described herein.

1.02 RELATED WORK:
A. See the following Specification Section for work related to the work in this Section:
   1. Section 26 05 33 - Conduits, Raceways and Fittings.
   2. Section 26 05 34 - Junction and Pull Boxes.

1.03 SUBMITTALS:
A. In accordance with Division 1.
B. Submit complete material list with the manufacturer's specifications and published descriptive literature for all materials proposed for use.

1.04 QUALITY ASSURANCE
A. Field tests shall be performed as specified in paragraph 3.04 of this Section.

PART 2 PRODUCTS

2.01 CONDUCTORS:
A. Conductors shall be copper, type THHN/THWN/MTW oil and gasoline resistant, 600 volt rated insulation. Minimum power and control wire size shall be No. 12 AWG unless otherwise noted.
B. Conductors shall be stranded except that sizes #10 and smaller for receptacle circuits shall be solid and of the sizes indicated.
C. Minimum power and control wire size shall be No. 12 AWG unless otherwise noted.
D. All conductors used on this Project shall be of the same type and conductor material.

2.02 CABLES:
A. All individual conductors shall be copper with type THHN/THWN, 600 volt rated insulation.
B. Insulation Marking - All insulated conductors shall be identified with printing colored to contrast with the insulation color.
C. Color Coding - As specified in paragraph 3.03.
D. Special Wiring - Where special wiring is proposed by an equipment manufacturer, submit the special wiring requirements to the Owner's Representative and, if approved, provide same. Special wire shall be the type required by the equipment manufacturer.
E. Other Wiring - Wire or cable not specifically shown on the Drawings or specified, but required, shall be of the type and size required for the application and as approved by the Owner’s Representative.

F. Manufacturer - Acceptable manufacturers including Cablec, Southwire, or equal.

2.03 TERMINATIONS:

A. Manufacturer - Terminals as manufactured by T&B, Burndy or equal.

B. Cable Termination for Copper - Crimp style two hole NEMA spade terminals designed and rated for copper cable.

C. Wire Terminations - Crimp on ring-tongue terminals, insulated sleeve, of proper size for the wire used.

D. End Seals - Heat shrink plastic caps of proper size for the wire on which used.

2.04 TAPE:

A. Tape used for terminations and cable marking shall be compatible with the insulation and jacket of the cable and shall be of plastic material.

PART 3 EXECUTION

3.01 CABLE INSTALLATION:

A. Clean Raceways - Clean all raceways prior to installation of cables as specified in Section 26 05 33 - Conduits Raceway and Fittings.

B. Cable Pulling - Exercise care in pulling wires and cables into conduit or wireways so as to avoid kinking, putting undue stress on the cables or otherwise abrading them. No grease will be permitted in pulling cables. Only soapstone, talc, or UL listed pulling compound will be permitted. The raceway construction shall be complete and protected from the weather before cable is pulled into it. Swab conduits before installing cables and exercise care in pulling, to avoid damage to conductors.

C. Bending Radius - Cable bending radius shall be per applicable code. Install feeder cables in one continuous length.

D. Equipment Grounding Conductors - Provide an equipment grounding conductor, whether or not it is shown on the Drawings, in all conduits or all raceways.

E. Panelboard Wiring - In panels, bundle incoming wire and cables which are No. 6 AWG and smaller, lace at intervals not greater than 6 inches, neatly spread into trees and connect to their respective terminals. Allow sufficient slack in cables for alterations in terminal connections. Perform lacing with plastic cable ties or linen lacing twine. Where plastic panel wiring duct is provided for cable runs, lacing is not necessary when the cable is properly installed in the duct.

F. Provide #10awg conductors for all 20 amp 120v branch circuits over 100 feet.

3.02 CABLE TERMINATIONS AND SPLICES:

A. Splices - UL Listed wirenuts.

B. Terminations - Shall comply with the following:

1. Make up and form cable and orient terminals to minimize cable strain and stress on device being terminated on.
2. Burnish oxide from conductor prior to inserting in oxide breaking compound filled terminal.

3.03 CIRCUIT AND CONDUCTOR IDENTIFICATION:

A. Color Coding - Provide color coding for all circuit conductors. Insulation color shall be white for neutrals and green for grounding conductors. Ungrounded conductor colors shall be as follows:

<table>
<thead>
<tr>
<th>VOLTAGE</th>
<th>208/120V</th>
<th>480/277V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase A</td>
<td>Black</td>
<td>Brown</td>
</tr>
<tr>
<td>Phase B</td>
<td>Red</td>
<td>Orange</td>
</tr>
<tr>
<td>Phase C</td>
<td>Blue</td>
<td>Yellow</td>
</tr>
<tr>
<td>Neutral</td>
<td>White</td>
<td>Grey</td>
</tr>
<tr>
<td>Ground</td>
<td>Green</td>
<td>Green</td>
</tr>
</tbody>
</table>

B. Color coding shall be in the conductor insulation for all conductors #10 AWG and smaller; for larger conductors, color shall be either in the insulation or in colored plastic tape applied at every location where the conductor is readily accessible.

C. Circuit Identification - All underground distribution and service circuits shall be provided with plastic identification tags in each secondary box and at each termination. Tags shall identify the source transformer of the circuit and the building number(s) serviced by the circuit.

3.04 FIELD TESTS:

A. All systems shall test free from short circuits and grounds, shall be free from mechanical and electrical defects, and shall show an insulation resistance between phase conductors and ground of not less than the requirements of the CEC. All circuits shall be tested for proper neutral connections.

END OF SECTION
SECTION 26 05 33

CONDUITS, RACEWAYS, AND FITTINGS

PART 1   GENERAL

1.01 DESCRIPTION OF WORK
   A. The work of this section consists of furnishing and installing conduits, raceways and fittings as shown on the Drawings and as described herein.

1.02 RELATED WORK
   A. See the following specification sections for work related to the work in this section:
      1. Section 26 05 35 - Underground Ducts.
      2. Section 26 05 19 - Low Voltage Wire and Cable.
      3. Section 26 05 34 - Junction and Pull Boxes.

1.03 SUBMITTALS
   A. As specified in Division 1.
      1. Catalog Data: Provide manufacturer’s descriptive literature.
      2. Single Submittal: A single complete submittal is required for all products covered by this Section.

PART 2   PRODUCTS

2.01 CONDUITS, RACEWAYS
   A. Electrical Metallic Tubing (EMT) shall be hot-dip galvanized after fabrication. Couplings shall be compression or setscrew type.
   B. Flexible Conduit: Flexible metal conduit shall be galvanized steel.
   C. Galvanized Rigid Steel Conduit (GRS) shall be hot-dip galvanized after fabrication. Couplings shall be threaded type.
   D. Rigid Non-metallic Conduit: Rigid non-metallic conduit shall be PVC Schedule 40 (PVC-40 or NEMA Type EPC-40) conduit approved for underground use and for use with 90°C wires.
   E. The use of “MC Cable shall not be permitted without written approval.

2.02 CONDUIT SUPPORTS
   A. Supports for individual conduits shall be galvanized malleable iron one-hole type with conduit back spacer.
   B. Supports for multiple conduits shall be hot-dipped galvanized Unistrut or Superstrut channels, or approved equal. All associated hardware shall be hot-dip galvanized.
   C. Supports for EMT conduits shall be galvanized pressed steel single hole straps.
   D. Clamp fasteners shall be by wedge anchors. Shot in anchors shall not be allowed.

2.03 FITTINGS
A. Provide threaded-type couplings and connectors for rigid steel conduits. Provide compression (watertight) steel type (die-cast zinc or malleable iron type fittings not allowed), or setscrew type for EMT. Provide threaded couplings and Meyers hubs for rigid steel conduit exposed to weather.

B. Fittings for flexible conduit shall be Appleton, Chicago, IL, Type ST, O-Z Gedney Series 4Q by General Signal Corp., Terryville, CT, T & B 5300 series, or approved equal.

C. Fittings for use with rigid steel shall be galvanized steel or galvanized cast ferrous metal; access fittings shall have gasketed cast covers and be Crouse Hinds Condulets, Syracuse, NY, Appleton Unilets, Chicago, IL, or approved equal. Provide threaded-type couplings and connectors; setscrew type and compression-type are not acceptable.

D. Fittings for use with rigid non-metallic conduit shall be PVC and have solvent-weld-type conduit connections.

E. Union couplings for conduits shall be the Erickson type and shall be Appleton, Chicago, IL, Type EC, O-Z Gedney 3-piece Series 4 by General Signal Corp., Terryville, CT, or approved equal. Threadless coupling shall not be used.

F. Bushings
1. Bushings shall be the insulated type.
2. Bushings for rigid steel shall be insulated grounding type, O-Z Gedney Type HBLG, Appleton Type GIB, or approved equal.

G. Conduit Sealants
1. Fire Retardant Types: Fire stop material shall be reusable, non-toxic, asbestos-free, expanding, putty type material with a 3-hour rating in accordance with UL Classification 35L4 or as specified on the Drawings.

PART 3 EXECUTION

3.01 CONDUITS, RACEWAY AND FITTING INSTALLATION
A. For exposed, exterior conduit runs provide rigid metal (GRS).

B. For conduit runs underground, in concrete or masonry block walls and under concrete slabs, install minimum ¾” size nonmetallic (PVC) with PVC elbows. Where conduits transition from underground or under slab to above grade install wrapped rigid metal (GRS) elbows and risers.

C. For conduit runs concealed in steel or wood framed walls or in ceiling spaces or exposed in interior spaces above six feet over the finished floor, install EMT.

D. Flexible metal conduit shall be used only for the connection of recessed lighting fixtures and motor connections unless otherwise noted on the Drawings. Liquid-tight steel flexible conduit shall be used for motor connections.

E. The minimum size raceway shall be 3/4-inch unless indicated otherwise on the Drawings.

F. Installation shall comply with the CEC.

G. From pull point to pull point, the sum of the angles of all of the bends and offset shall not exceed 270 degrees.

H. Conduit Supports: Properly support all conduits as required by the NEC. Run all conduits concealed except where otherwise shown on the drawings.
1. Exposed Conduits: Support exposed conduits within three feet of any equipment or device and at intervals not exceeding NEC requirements; wherever possible, group conduits together and support on common supports. Support exposed conduits fastened to the surface of the concrete structure by one-hole clamps, or with channels. Use conduit spacers with one-hole clamps.
a. Conduits attached to walls or columns shall be as unobtrusive as possible and shall avoid windows. Run all exposed conduits parallel or at right angles to building lines.

b. Group exposed conduits together. Arrange such conduits uniformly and neatly.

2. Support all conduits within three feet of any junction box, coupling, bind or fixture.

3. Support conduit risers in shafts with Unistrut Superstrut, or approved equal, channels and straps.

I. Moisture Seals: Provide in accordance with NEC paragraphs 230-8 and 300-5(g).

J. Where PVC conduit transitions from underground to above grade, provide rigid steel 90’s with risers. Rigid steel shall be half-lap wrapped with 20-mil tape and extend minimum 12” above grade.

K. Provide a nylon pull cord in each empty raceway.

L. Provide galvanized rigid steel factory fittings for galvanized rigid steel conduit.

M. Slope all underground raceways to provide drainage; for example, slope conduit from equipment located inside a building to the pull box or manhole located outside the building.

N. Conduits shall be blown out and swabbed prior to pulling wires.

END OF SECTION
PART 1       GENERAL

1.01 DESCRIPTION OF WORK

A. The work of this section consists of furnishing and installing raceways, raceway spacers and encasing material with necessary excavation for underground ducts.

B. Encasement - Encasement shall be sand for all other raceways.

C. Where required - All raceways, where run underground in and excavation shall be installed in compliance with the requirements of this Section. Conduits run underground without encasement shall be as indicated in the Drawings.

1.02 RELATED WORK

A. See the following specification sections for work related to the work of this section.
   1. 26 05 33 Conduit Raceway and Fittings

1.03 STANDARDS AND CODES

A. Work and material shall be in compliance with and according to the requirements of the latest revision of the following standards and codes.

B. National Fire Protection Association (NFPA), National Electrical Code (NEC) - Latest Revision:
   1. Underground Installations NEC - Article 300
   2. Rigid Nonmetallic Conduit NEC - Article 347

C. California Electrical Code (CEC).


1.04 SUBMITTALS

A. As specified in Division 1 and Section 26 05 10.

B. Catalog Data: Provide manufacturer’s descriptive literature.

C. Single Submittal: A single complete submittal is required for all products covered by this Section.

PART 2       PRODUCTS

2.01 RACEWAYS

A. As specified in Section 26 05 33 Conduits, Raceways and Fittings.

2.02 SPACERS

A. Molded plastic as furnished by the raceway manufacturer, to cradle and position the raceways in the excavation for placing the encasement.
B. Shape to accurately fit the raceway, provide the correct raceway spacing, to interlock in place and stack.

PART 3  EXECUTION

3.01 RACEWAYS

A. Install raceways in spacers. Spacers installed at intervals of five feet and within one inch each side of all bends and joints.

B. Solvent weld connections.

END OF SECTION
PART 1  GENERAL

1.01 DESCRIPTION OF WORK

A. The work of this section consists of providing all labor, supervision, tools, materials, and performing all work necessary to furnish and install pre-cast concrete vaults, and pull boxes with necessary excavation.

1.02 RELATED WORK

A. See the following specification sections for work related to the work of this section.
   1. 02200 Excavation and Backfill.
   2. 03010 Formwork.
   3. 03020 Reinforcing Steel.
   4. 03040 Portland Cement Concrete.
   5. 26 05 43 Underground Ducts.

1.03 STANDARDS AND CODES

A. Work and material shall be in compliance with and according to the requirements of the latest revision of the following standards and codes.
   2. California Electrical Code (CEC).
      a. A 185 - Welded Steel Wire Fabric for Concrete Reinforcement.
      b. A 615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement.
      c. C 33 - Concrete Aggregates.
      d. C 478 - Pre-cast Reinforced Concrete Vault Sections, Specification for.

1.04 SUBMITTALS

1. As specified in Division 1 and Section 26 05 10.
   a. Catalog Data: Provide manufacturer’s descriptive literature.
   b. Single Submittal: A single complete submittal is required for all products covered by this Section.

PART 2  PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. General Requirements:

   1. Concrete vaults and pull boxes for electrical power, controls and other communication circuits shall consist of pre-cast reinforced concrete boxes, extensions’ bases, and covers as specified herein and as indicated on the Drawings. Pre-cast units shall be the product of a manufacturer regularly engaged in the manufacture of pre-cast vaults and pull boxes. Acceptable manufacturers are Christy, Utility Vault, Brooks, Associated Concrete or equal.

B. Construction:
1. Pre-cast concrete vaults and pull boxes for electrical power distribution and communication circuits with associated risers and tops shall conform to ASTM C478 and ACI 318. Vaults and pull boxes shall be the type noted on the Drawings and shall be constructed in accordance with the applicable details as shown. Tops, walls and bottoms shall consist of reinforced concrete. Walls and bottom shall be of monolithic concrete construction. Duct entrances and windows shall be located near the corners of structures to facilitate cable racking. Provide all necessary lugs, rabbets, and brackets. Set pulling-in irons and other built-in items in place prior to pouring concrete. A pulling-in iron shall be installed in the wall opposite each duct entrance. All steel other than "rebar" shall be hot dipped galvanized after fabrication.

C. Cable Racks:
   1. Vaults shall be provided with galvanized cable racks, including rack arms and insulators, and shall be adequate to accommodate the indicated cables; porcelain insulators shall be provided for electrical vaults only.

D. Covers:
   1. The word "ELECTRICAL" shall be cast in the top face of all electrical power vault and cable boxes.
   2. The words "FIRE ALARM" shall be cast in the top face of all fire alarm vault and cable boxes.
   3. The word "SIGNAL" shall be cast in the top face of all telecom, intercom, CATV, data, EMS, security and/or clock vault and cable boxes.

E. Sumps:
   1. Where indicated on the drawings, drain sumps shall be provided.

F. Concrete:
   1. Aggregates used in the concrete mix, either coarse or fine, excluding light weight aggregates, shall conform to ASTM C 33. Aggregates shall be properly graded and free of deleterious substances to produce a homogeneous concrete mix when blended with cement.

G. Cement:
   1. The cement shall be Type II low alkali Portland cement and shall meet the requirement of ASTM C 150.

H. Compressive Strength:
   1. Sufficient cement content shall be used per batch to produce a minimum compressive strength of 3,000 psi at 28 days.

I. Reinforcing Steel:
   1. Welded wire mesh for street lighting boxes shall conform to ASTM A 185.
   2. Reinforcing bars for primary and secondary electrical vaults and pull boxed, and communication vaults and pull boxes shall be intermediate grade billet steel conforming to ASTM A 615.

J. Ladders:
   1. Ladders for vaults shall be sized as required, stationary galvanized steel.

PART 3 EXECUTION

3.01 INSTALLATION
A. Pre-cast vaults and pull boxes shall be installed approximately where indicated on the Drawings. The exact location of each vault or pull box shall be determined after careful consideration has been given to the location of other utilities, grading, and paving. All vaults, cable boxes and secondary pull boxes shall be installed with a minimum of 6-inch thick crushed rock or sand bedding.

B. Paved areas:
   1. Vaults and pull boxes located in areas to be paved shall be installed such that the top of the cover shall be flush with the finished surface of the paving.

C. Unpaved Areas:
   1. In unpaved areas, the top of vaults and pull box covers shall be approximately 2 inches above finished grade.

D. Joint Seals:
   1. Section joints of pre-cast vaults and pull boxes shall be sealed with compound as recommended by the manufacturer.

E. Trenching, Backfilling, and Compaction:
   1. Trenching, backfilling and compaction shall be as specified in Section 02200 - Excavation and Backfill.

F. Grounding:
   1. Ground rods and associated copper ground loop shall be installed in all vaults. Ground loop shall be properly connected to the cable shielding, at each cable joint or splice by means of a minimum number 4 AWG or equivalent braided tinned copper wire. Ground rods shall be protected with a double wrapping of pressure-sensitive plastic tape for a distance of two inches above and six inches below concrete penetrations. Ground wires shall be neatly and firmly attached to vault cable support racks.

END OF SECTION
PART 1  GENERAL

1.01 DESCRIPTION OF WORK
   A. The work of this section consists of:
      1. Furnishing, installing, and connecting all duplex receptacles complete with wall plates and/or covers, as shown on the Drawings.
      2. Furnishing, installing and connecting all single pole and three-way switches complete with wall plates and or handle operators, as shown on the Drawings.

1.02 RELATED WORK
   A. See the following specification sections for work related to the work of this section:
      1. Section 26 05 33 - Conduits, Raceways and Fittings.
      2. Section 26 05 19 - Low Voltage Wire and Cable.
      3. Section 26 05 34 - Junction and Pull Boxes.

1.03 SUBMITTALS: As specified in Division 1.
   A. Submit manufacturers published descriptive literature properly marked to identify the items to be supplied.
   B. A single complete submittal is required for all products covered by this Section.

PART 2  PRODUCTS

2.01 RECEPTACLES
   A. General - Receptacles shall be heavy duty, high abuse, grounding type.
   B. Duplex Receptacles
      1. Receptacles shall be specification grade, rated 20 ampere, two-pole, 3-wire, 120 volt, NEMA 5-20 configuration, self-grounding with screw terminals. Color shall be ivory or as selected by the Architect.
      2. Devices shall have a nylon composition face, back and side wired.
      3. Manufacturer: Leviton #5362 Series, Hubbell #5362-I Series.
   C. GFCI Receptacles
      1. Device shall be Smart Lock with lockout action, rated 20 ampere, 2-pole, 3-wire, 120 volt, conforming to NEMA 5-20 configuration. Face shall be nylon composition. Unit shall have an LED type green indicator light, test and reset push buttons. Color shall be ivory unless otherwise noted.
      2. GFCI component shall meet UL 2003 Class A standards with a tripping time of 1/40 second at 5 milliamperes current unbalance. Operating range shall extend from -31°F to 158°F. Unit shall have transient voltage protection and shall have a diagnostic indication for miswiring.
      3. Manufacturer: Leviton #8898-I Series.
   D. GFCI Blank Face Devices
1. Device shall be Smart Lock with lockout action, rated 20 ampere, 2-pole, 3-wire, 120 volt, blank face, dead front. Face shall be nylon composition. Unit shall have a test and reset push buttons. Color shall be ivory unless otherwise noted.

2. GFCI component shall meet UL 2003 Class A standards with a tripping time of 1/40 second at 5 milliamperes current unbalance. Operating range shall extend from -31°F to 158°F. Unit shall have transient voltage protection and shall have a diagnostic indication for miswiring.

3. Manufacturer: Leviton #8590-I Series.

E. Surge Suppression Receptacles

1. Device shall be rated 20 ampere, 2-pole, 3-wire, 120 volt. Face shall be nylon composition. Unit shall have an LED type "Power-on" indication light and damage-alert audible alarm. Color shall be ivory unless otherwise noted.

2. Surge suppression protection shall be listed to UL standard 1449 and shall instantly absorb a transient surge of 6,000 volts minimum. A minimum of four (4) Metal Oxide Varistors shall be utilized to absorb transients.

3. Manufacturer: Leviton #8380-I Series, Hubbell #HBL8362S Series.

2.02 SWITCHES

A. Switches shall be rated 20 amperes to 120/277 volts ac. Units shall be flush mounted, self-grounding, quiet operating toggle devices. Handle color shall be ivory or as selected by the Architect.

1. Manufacturer: Leviton #1221-2I Series, Hubbell #HBL1221 Series.

B. Timed switches: Shall be as designed by Paragon Electric Company # ET2000f, Watt Stopper TS-100 or Leviton # 6215M rated for the voltage specified on drawings. Time out shall be adjustable from 5 minutes up to 12 hours. Unit shall be provided with warning alarm.

C. Motion Sensor shall be dual technology as designed by Watt Stopper DT series. Use protective wire covers in restrooms, multi-use, cafeteria, etc.

2.03 PLATES

A. General - Plates shall be of the style and color to match the wiring devices, and of the required number of gangs. Plates shall conform to NEMA WD 1, UL 514 and FS W-P-455A. Plates on finished walls shall be non-metallic or stainless steel. Plates on unfinished walls and on fittings shall be of zinc plated steel or case metal and shall have rounded corners and beveled edges.

B. Non-Metallic: Plates shall be plain with beveled edges and shall be nylon or reinforced fiberglass.

C. Stainless Steel: Plates shall be .040 inches thick with beveled edges and shall be manufactured from No. 430 alloy having a brushed or satin finish.

D. Cast Metal: Plates shall be cast or malleable iron covers with gaskets so as to be moisture resistant or weatherproof.

E. Blank Plates: Cover plates for future telephone outlets shall match adjacent device wall plates in appearance and construction.

PART 3    EXECUTION

3.01 INSTALLATION OF WIRING DEVICES

A. Interior Locations: In finished walls, install each device in a flush mounted box with washers as required to bring the device mounting strap level with the surface of the finished wall. On unfinished walls, surface mount boxes level and plumb.
B. Mounting Heights: Measure locations of wall outlets from the finished floor to the center of the outlet box. Adjust boxes so that the front edge of the box shall not be farther back from the finished wall plane than 1/4-inch. Adjust boxes so that they do not project beyond the finished wall. Height above finished floor to center of device unless otherwise noted on Drawings shall be as follows:
   1. Receptacles 18 Inches above finished floor
   2. Toggle Switches 48 Inches above finished floor

C. Receptacles
   1. Ground each receptacle using a grounding conductor, not a yoke or screw contact.
   2. Install receptacles with connections spliced to the branch circuit wiring in such a way that removal of the receptacle will not disrupt neutral continuity and branch circuit power will not be lost to other receptacles in the same circuit.

3.02 INSTALLATION OF WALL PLATES
   A. General - Plates shall match the style of the device and shall be plumb within 1/16-inch of the vertical or horizontal.
   B. Interior Locations, Finished Walls: Install non-metallic plates so that all four edges are in continuous contact with the finished wall surfaces. Plaster filling will not be permitted. Do not use oversized plates or sectional plates.
   C. Interior Locations, Unfinished Walls: Install stainless steel or cast metal cover plates.
   D. Exterior Locations: Install cast metal plates with gaskets on wiring devices in such a manner as to provide a rain tight weatherproof installation. Cover type shall match box type.
   E. Future Locations: Install blanking cover plates on all unused outlets.
   F. All receptacles shall be labeled with panel and circuit number. Contractor shall provide 3/8" clear label tape on each wall plate with ¼" black machine lettering.

3.03 TESTS
   A. Receptacles
      1. After installation of receptacles, energize circuits and test each receptacle to detect lack of ground continuity, reversed polarity, and open neutral condition.

END OF SECTION
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>%</th>
<th>Chemical</th>
</tr>
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<tbody>
<tr>
<td>14%</td>
<td>nitrogen</td>
</tr>
<tr>
<td>4%</td>
<td>phosphoric acid</td>
</tr>
<tr>
<td>9%</td>
<td>potash</td>
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</tbody>
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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.
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
SECTION 31 20 00

EARTHWORK

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 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 31 13 00 - 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 90% 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 90% 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. The Contractor shall mark out all construction areas in white, non-permanent paint and contact Underground Service Alert (U.S.A.) (800-642-2444) to locate all known utilities a minimum 48 working hours prior to any excavation.
   3. Should an existing crossing utility present an obstruction, the proposed line shall be adjusted as acceptable to the Owner’s Representative to clear the existing utility.

3.02 TRENCH EXCAVATION

A. General:
   1. 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. 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-compacted in the layers and to the density specified for the particular area.

E. Open Trench:
1. No trench shall be left in an open unprotected 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 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 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.

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
PORTLAND CEMENT CONCRETE

PART 1  GENERAL

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 Doweling

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:
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 attached to studding or joists 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
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.
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<tr>
<td>75-μm</td>
<td>89</td>
<td>11</td>
</tr>
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</table>

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

C. Decomposed granite: California Gold Track Fines
   1. Binder from "PHP Organic Aggregate Binder material is to be delivered preblended, and to be mixed with gold pathway fines at 12lbs per ton.
   4. All of the above is available from: TMT Enterprise, Inc., San Jose, 19666 Oakland Road, 95131, 408.432.9040.

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.
3.06 DECOMPOSED GRANITE

A. Install base course as specified per Section 31 20 00 – Base Courses.
B. Spread evenly and compact in 2 inch lifts in designated areas.
C. Water lightly and compact with roller.
D. Spread additional material, roll and compact to establish even finished grade at specified elevation.

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.

END OF SECTION
SECTION 32 31 13

CHAIN LINK FENCING & GATES

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

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. Color selections for finishes of “vinyl coated” and/or “powder coated” fencing systems.
   2. 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 be painted to match with PVC touch-up paint in vinyl or powder coated systems.

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:

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<th>Outside Diameter (OD) in inches</th>
<th>Type I Steel</th>
<th>Type II Steel</th>
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<td>8</td>
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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. Batting cage roof: Per plans.
8. For fencing with vinyl coated fabric, posts and railings to be painted with two applications of exterior grade paint. Color shall match vinyl color.

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: Concrete for footings shall be Class B minimum. Refer to Section 32 13 13 Portland Cement Concrete for additional information. OR 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.
11. For fencing with vinyl coated fabric, fittings and accessories shall be painted with two applications of exterior grade paint. Color shall match vinyl color.

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.

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 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.

END OF SECTION
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

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".

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 - "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 Carson 1419-12 with 1419-T locking lid for 1" and 1-1/2" valves and 1730-12 with 1730-T locking lid for valves 2" and larger. 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 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.

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 six (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 or 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

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 Nurseriesmen, 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 the guaranteed chemical analysis.
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.

Or

A. Topsoil shall be clean on-site material that has been previously stripped from the top 4 inches of grade after initial 2 inch stripping of organics. 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.
   4. 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.
   5. 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
   6. Liquid All organic Kelp Product/bio-stimulant,
      Approved product -EF Solu-Kelp 1-1-0 or Pre-Bid Approved Equal
      Quantities Baseball Field 2.5 gallons/acre
   7. Liquid 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
    Quantities: Baseball Field - Pen Max or equal
    .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

1. 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 3/4” 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 laid
      7. Sod shall not be allowed to dry out as it is being laid 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 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.
   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. 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.
3. Dry spreader for spreading bagged fertilizer material (can be sling type or drop type-1000 lbs. or larger).
4. Boom sprayer for spraying liquid fertilizers-14-20ft. Boom and 150 gallons plus capacity.
5. Top dresser with a minimum of 4 yards capacity.
6. 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.
7. Six to ten-foot reel mower with blades kept sharpened for mowing all turf areas 3 times per week during the establishment period.
8. 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 0.5 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 0.5 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 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 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:

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Pipe Stiffness</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 inch (100 mm)</td>
<td>50 psi (340 kPa)</td>
</tr>
<tr>
<td>6 inch (150 mm)</td>
<td>50 psi (340 kPa)</td>
</tr>
<tr>
<td>8 inch (200 mm)</td>
<td>50 psi (340 kPa)</td>
</tr>
<tr>
<td>10 inch (250 mm)</td>
<td>50 psi (340 kPa)</td>
</tr>
<tr>
<td>12 inch (300 mm)</td>
<td>50 psi (340 kPa)</td>
</tr>
<tr>
<td>15 inch (375 mm)</td>
<td>42 psi (290 kPa)</td>
</tr>
</tbody>
</table>

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 hardscape 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 1005 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>Classification</th>
<th>Sieve Number</th>
<th>Allowable Range % Retained on Sieve</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Standard</td>
<td>10</td>
<td>&gt;2.00</td>
</tr>
<tr>
<td>Sieve Mesh</td>
<td>18</td>
<td>1.00 – 2.00</td>
</tr>
<tr>
<td>1/2 inch (12.5 mm)</td>
<td>95% passing</td>
<td></td>
</tr>
<tr>
<td>1/4 inch (6.3 mm)</td>
<td>20 – 45% pass</td>
<td></td>
</tr>
<tr>
<td>10 mesh (2.0 mm)</td>
<td>No more than 10% passing</td>
<td></td>
</tr>
<tr>
<td>18 mesh (1.0 mm)</td>
<td>No more than 5% passing</td>
<td></td>
</tr>
</tbody>
</table>

Material available through Harbor Sand & Gravel, Redwood City, or TMT Enterprises, San Jose.

C. Sand for all perforated drain pipes 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 SECTIONP