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SECTION 01 11 13

SUMMARY OF WORK COVERED BY CONTRACT DOCUMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. The work to be done under this contract is for the construction of Mercado Park splash pad recirculation conversion located at 925 South D Street Mercado Park, in the City of Peris, CA 92570. The project consists of the installation of recirculation system from an existing pass throw splash pad. The general work includes the installation of City purchased recirculation equipment and all the required utilities, connections, and support structures required to convert the existing system to a recirculating fully contained re-circulation system per local health department and city requirements.

1.02 SCOPE OF WORK

Scope includes the following main items required to supply a complete and fully operational re-circulation system for an existing Splash pad including all additional minor support items and materials not specifically noted below.

A. Site Clearing and Site Demolition work includes, but not limited to.

1. Removal of existing trees and shrubs in the areas where new equipment and enclosures will be located.
2. Removal of existing hardscape to allow for utility runs to new equipment.
3. Minor removal and adjustment of existing cable fencing and a gate to allow for new fenced enclosure.

B. Utility, Drainage, and New Equipment installation work includes, but is not limited to:

1. Sewer and water extensions to new equipment.
2. New drainage lines to existing cobble creek.
3. New electrical runs from an existing panel to new equipment.
4. Installation and connection of “city furnished” splash pad recirculation equipment including any additional ancillary “contractor supplied” items for tie in from new equipment to existing plumbing and equipment per local code and health department requirements. This includes the installation of a large below grade sump tank that will be the Contractors responsibility to unload, stage and place as needed.

C. Site Improvement Work includes, but is not limited to:

1. Site excavation and soil export of spoils for tank and utility lines
2. New mow curbs for fenced equipment yard
3. Gravel utility yard
4. Adjusting existing enclosures for revised orientation (remove and reinstall 180* of current orientation)

5. Concrete paving including pads, walks, and repair of trenching paths with permeable paving to match original.

D. Fencing, Walls, Gates, but is not limited to:
   1. 6’ Tubular steel fencing
   2. 6’ Equipment access Gate

E. Electrical Work Includes, but is not limited to:
   1. New runs from existing panel- both underground and bridge/cross over mounted
   2. Equipment tie in with service disconnects, per local code

F. Irrigation Work Includes, but is not limited to:
   1. Revisions to existing valves due to construction activities causing removal and replacement
   2. Drip and Subsurface Irrigation installation
   3. Complete system check and verification of operational status
   4. Complete system maintenance, adjustment, review and adjustment of schedules

G. Planting Work Includes, but is not limited to:
   1. Soil preparation
   2. Soil amendment
   3. Furnish and Plant Shrubs
   4. Furnish and Plant Groundcover
   5. Furnish and Place Mulch
   6. Landscape Maintenance for 90 days

1.03 CONTRACT

A. The Project will be Governed by the contract entered by the Contractor and the Owner.

B. Responsibility for installation and completion of the work is upon designated Prime Contractor with whom the Owner enters into a Contract for the work herein.

1.04 LANDSCAPE ARCHITECTS SUPPLEMENTAL INSTRUCTIONS

A. Minor changes in the Work, not involving an adjustment in either the Contract Sum or Contract Time, as authorized by the General Provisions of the Contract, may be presented by the Landscape Architect using American Institute of Architects (AIA) Document G710 - Architect's Supplemental Instructions, or correspondence containing similar information.

B. Should the Landscape Architect's Supplemental Instructions result in disputed costs and time adjustments, such dispute shall be resolved in accordance with the provisions of the General Provisions of theContract.

1.05 REQUEST FOR PROPOSAL

A. Landscape Architect- or Owner-Initiated Requests for Proposal: Landscape Architect will prepare and issue a Request for Proposal through the Construction Manager or Owners Representative, which will include a detailed description of a proposed change, with supplementary or revised Drawings and Specifications as appropriate.

1. Such Request for Proposal may include an estimate of additions or deductions in Contract Time and Contract Sum for executing the change and may include stipulations regarding overtime work and the period of time the requested response from the Contractor shall be considered valid.
2. Contractor shall prepare and submit a response to the Request for Proposal within 5 days of the date of the Request for Proposal. Failure to respond within the required 5 days will result in no relief from project deadlines and or additional time and costs related to any future delays and shall solely be the Contractor's responsibility.
    a. Issuance of such a request by the Owner shall not indicated authorization for the Contractor to proceed with the proposed change.
    b. Changes will be approved only by an approved Construction Change Directive and Change Order per contract documents.
    c. Additional cost shall be based on supplied unit cost at time of bid and/or if needed shall be backed up by additional quotes from suppliers if currently under contract with the Owner.

Contractor-Initiated Request for Proposal: The Contractor may propose a change by submitting a request for a change to Construction Manager, with a copy to Landscape Architect, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and a full description of effects on the Contract Sum, Contract Time, related Work and work being performedunder separate contracts.

3. Requests for substitutions shall be included under this category, with procedures as specified inSection 01 60 00 - Product Requirements
4. After review of the request and with approval of Construction Manager or Owners Representative, the Contractor will prepare a Request for Proposal, as described above.
5. Issuance of such a request by Construction Manager shall not indicated authorization for the Contractor to proceed with the proposed change.
6. Changes will be approved only by a signed Construction Change Directive or Change Order.

1.06 CONTRACTORS RESPONSE TO REQUEST FOR PROPOSAL

A. Substantiating Data for Proposed Changes in Contract Sum and Contract Time: Contractor shall provide full information required for evaluation of proposed changes and to substantiate costs of changes in the Work.
    1. Document each quotation for a change in Contract Sum and Contract Time, with sufficient datato allow evaluation of the quotation.
    2. Upon request, provide additional data to support computations:
        a. Quantities of products, labor and equipment
        b. Taxes, insurance and bonds
        c. Overhead and profit
        d. Justification for change in Contract Time, if claimed.
        e. Credit for deletions from Contract, similarly documented.
B. Cost and Time Resolution: If amounts for changes in Contract Sum and Contract Time cannot be agreed upon by Owner and Contractor, amounts shall be resolved in accordance with provisions of the General Provisions of the Contract for resolution of disputes and the following:

1. Contractor shall keep accurate records of time, both labor and calendar days, and cost of materials and equipment for verification by Owners Representative.
2. Contractor shall prepare and submit an itemized account and supporting data after completion ofchanged Work, within the time limits indicated in the General Provisions of the Contract.
3. Contractor shall provide full information as required and requested, for Owner to evaluate andsubstantiate proposed costs and time for the change in the Work.
4. When Owner and Contractor determine mutually-acceptable amounts for changes in ContractSum and Contract Time, a Change Order shall be executed for these amounts.
5. Owner shall have the right to audit Contractor's invoices and bid quotations to substantiate costsfor Change Orders.

Construction Changes Based on Stipulated Sum or Time: Based on the Contractor's response to a request for Proposal or Construction Change Directive, Construction Manager and Architect will review the response.

6. Owner and Contractor shall negotiate a mutually acceptable adjustment in Contract Sum andContract Time, as appropriate, prior to performance of the changed Work.
7. A Change Order for the stipulated amounts shall be prepared based on the stipulated sum andchange in time.

C. Construction Changes Based on Unit Costs or Quantities: When the scope of a change in the Workcannot be accurately determined in advance, a Construction Change Directive shall be executed based on mutually-acceptable quantities and pre-determined unit prices. Actual costs shall be determined after completion of the Work and a Change Order for this amount shall be executed.

D. Construction Changes Based on Time and Material Costs: When the scope of a change in the Workcannot be accurately determined in advance, a Construction Change Directive shall be executed based upon an agreement that Owner will adjust the Contract Sum and the Contract Time based onactual costs and time expended by the Contractor in performance of the change.

1.07 CHANGE ORDERS

A. Change Order Preparation, General:

1. In response to each Request for Proposal or Construction Change Directive, Contractor shall submit information for review by Construction Manager and Landscape Architect, in order to confirm the scope of the proposed change and to determine the acceptable amounts, if any, for changes tobe made in the Contract Sum and Contract Time.
2. In accordance with General Provisions of the Contract, the Construction Manager and Landscape Architectwill review the Contractor's response to the Request for Proposal or Construction Change Directive, confirm the scope of the proposed change and determine with the Contractor the acceptable amounts, if any, for changes in the Contract Time and the Contract Sum.
3. When agreement is reached on changes, if any, in the Contract Time and the Contract Sum, the Contractor will prepare a Change Order using a form as directed by Owner, with supplementary documents as necessary to describe the change and the associated costs and schedule impacts.

a. The Contractor will prepare and six sets of Change Order documents, including drawings,specifications and other supporting documents.
b. Owner, Construction Manager and Contractor shall sign the Change Order indicatingacceptance and approval of the change.

1.08 CONSTRUCTION CHANGE DIRECTIVES

A. Construction Change Directives: In accordance with provisions of the General Provisions of the Contract, the Owner through the Construction Manager may direct the Contractor to proceed with achange in the Work prior to formal preparation, review, agreement and approval of a Change Order, inorder to not delay construction.

1. Owners Representative will prepare and issue a Construction Change Directive which, when signed by the Owner and the Landscape Architect, shall instruct the Contractor to proceed with a change inthe Work, for subsequent inclusion in a Change Order.
2. Construction Change Directives shall follow procedures specified above in Article titled "CHANGE ORDERS," except that Contractor shall immediately proceed with the change upon receipt of thesigned Change Directive.
3. Construction Change Directives shall be incorporated into subsequent Change Order prepared,reviewed and approved as specified in Article above titled "CHANGE ORDERS"
4. All Construction Change Directives shall be subject to modification according to subsequent review, if required, by Authority Having Jurisdiction (AHJ).
5. Should the Construction Change Directive result in disputed costs and time adjustments, such dispute shall be resolved in accordance with the provisions of the General Provisions of the Contract.

1.09 RECONCILIATION OF CHANGE ORDERS

A. Schedule of Values: Contractor shall promptly revise the Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjustment to the Contract Sum.

B. Schedules: Contractor shall promptly revise progress schedules to reflect changes in Contract Time,revising sub-schedules to adjust time for other items of Work as may be affected by the change. Contractor shall submit revised schedules at the next Application for Payment following approval and acceptance of the Change Order.

1.10 CONTRACTOR'S QUALIFICATIONS

A. Contractor shall have completed a minimum of 3 projects similar in scope and complexity or greater in the past 5 years as the Lead Contractor. Work as a Sub Contractor will not count as direct experience for the General Contractor. Many Landscape projects contain specialized features that require specific experience that may not carry over to traditional construction methods. If the bidder does not meet the experience requirements stated in this specification, the Owner may determine the bidder to be unqualified to perform the work under this contract.

B. Contractor shall have direct experience weighted equally to the bulk of work- for example a contractor with mostly masonry experience will not be considered specifically qualified for a project that has a majority of costs based on Planting and Irrigation.

1.11 CONSTRUCTION INTERFACING AND COORDINATION

A. Contractor shall be solely responsible for all Layout, scheduling, and sequencing of work. Contractor shall designate a Site Superintendent to be on site at all times as his representative and project expert. All sub-contractors shall follow chain of command and forward any issues through the Site Superintendent for coordination with the Owners Representative per the specifications herein.

B. The Site Superintendent shall be the person responsible for all coordination, control, sequencing, and layout verification for day-by-day operations Any issues requiring coordination with Design team, Owner, or other trades shall be his sole duty to resolve through the correct channels such as Requests for information or written clarification.

C. Any work done by the Contractor, or any sub-contractor of the Contractor, that is not coordinated and/or verified prior by the Site Superintendent shall be the Contractors sole Responsibility to correct if found to be incorrect, deficient, or not specifically meeting the requirements of the plans and specifications at a later time.

D. It is the Contractor sole responsibility to self-verify and supervise his/her subcontractor work. This includes, if requested providing survey, documentation, and verification of layout, grade/elevation and placement of work at no additional charge to the owner if variance from the Contract Documents is found.

E. Sub-Contractors shall not ask or request direction from the Owners Representative or Construction Manager directly as this will interrupt the Lead Contractors ability to manage their means and methods and voids the chain of command and proper documentation.

1.12 QUALITY ASSURANCE

A. Contractors' due diligence:

1. The Contractor shall take full responsibility for being the project expert in the Plans, Specifications, and Site conditions. Failure of the Contractor to fully review, adhere to, and follow the plans shall be their sole responsibility to reconcile.

2. Any project delays, cost increases, or performance failures by the Contractor due to not fully planning, accounting, purchasing, scheduling, and or properly requesting clarification prior to completion of the mobilization period prior shall be the Contractors sole responsibility. Relief will not be given due to the public bid process not allowing any other bidders special considerations beyond what is presented in the original Contract Documents.

B. Qualifications of Installers:

Throughout the progress of installation of the work of this Project, provide at least one person who shall be thoroughly familiar with the specified requirements, completely trained and experienced in the necessary skills, and who shall be present at the site and shall direct and take responsibility of all work performed under this Contract.

Use adequate number of skilled workers to ensure installation in strict accordance with the approved design and approved schedule.

Details provided on plans with notes. If notes conflict with book specification, manufactures' specification or installation instructions, the more stringent shall apply and shall be Bid per the contract documents.

1.13 WORK SEQUENCE

A. The Contractor shall be solely responsible for the coordination and control of all work to meet the Contract time period(working days) per contract documents.

B. Construct work in stages that allow for required access and installation that does not affect previous work.

C. Work that is completed by the Contractor that creates hardships or difficulties installing other work shall be the Contractors Sole Responsibility to rectify as part of their means and methods. At no time will additional time and costs be allowed or approved for work specifically done in an order that blocks, obstructs, or creates conflicts due to the Contractors chosen approach. It shall be understood that the Contractor planned and accepted the impacts of their own directed coordination and control.

D. Coordinate and update Progress Schedule and Coordinate fully with Owners Representative during construction.

E. The Contractor shall be responsible for coordinating with manufactures for, shipping, receiving, and storage of all required equipment and structures to meet the approved schedule. Failure to follow through, procure, and or purchase items to meet the schedule deadline will be the Contractors sole responsibility.

1.14 PERMITS, ADDITIONAL ENGINEERING, AND FEES

A. The Contractor shall obtain and pay for all permits, additional engineering, inspections, testing, soil tests and analysis, samples, and any notices, as required for the performance of the work.

1.15 CONTRACTOR'S USE OF THE SITE AND PREMISES

A. Contractor's Use of Site and Premises: Except as described below, during the construction period the Contractor shall have full use and responsibility of the premises for construction operations, includinguse of the site within Project Area.

1. Prior to commencing Work, Construction Manager and Contractor shall tour site together to examine and record existing conditions, including existing damage to paving, structures and other site improvements.
    a. Contractor shall produce video saved digitally of existing conditions and provide copy to Construction Manager. Video record shall be supplemented by written report describing all existing conditions, prepared by the Contractor and submitted for record prior to start of mobilization.
    b. Failure to document the site fully prior to start of work as listed above shall mean the Contractor has accepted and verified the site as having no damage, defects, or other issues needing documentation or repair.
    c. At Contract Closeout, any damage to paving, structures and other site improvements shall be restored by Contractor to condition equal to or better than conditions at commencement of work including total replacement if determined by Owners Representative.
    d. All cracking, subsidence, soiling, marring, breakage and other defects, other than normal weathering, shall be restored by Contractor at no change in Contract Time and Contract Sum.

B. Work Hours: Refer to General Provisions of the Contract. Work shall be performed during hours incompliance with applicable County/City noise abatement Ordinance.

C. Site Access and Egress: Contractor shall maintain driveways and access/egress routes clear at all times. Use of these areas for parking or storage of materials is prohibited. Contractor shall sequenceand schedule deliveries to minimize necessity for on-site storage of materials. Comply with requirements of public safety authorities having jurisdiction and requirements of airport operations.

1. Emergency access: Contractor shall provide pathways, drives, gates, directional signage and other provisions as required by public safety authorities having jurisdiction for emergency accessto Work area.

2. Emergency egress: Contractor shall maintain all pathways, drives, gates, and other means of egress during construction as required by public safety authorities having jurisdiction.

PART 2 - MATERIALS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 32 13
SCHEDULING AND PROCEDURES

PART 1 - GENERAL

1.01 GENERAL

A. The General Contractor shall prepare a Critical Path Method (CPM) schedule showing a detailed breakdown of the work activities, dates for start and completion of those activities, delivery of major components and lengths of time required to complete each activity. Contractor's Construction Schedule shall be developed using a scheduling software such as Microsoft Project or approved equal. Contractor to supply previous example prior to completion for approval by the Owners Representative as being sufficient and acceptable as a template.

1. The CPM schedule shall be reviewed and commented on by the Owners Representative. The contractor shall make all requested changes until a schedule is received that is acceptable to the Owners Representative.

B. After acceptance of Contractor's Construction Schedule by the Owners Representative, the Contractor shall be responsible for ensuring that it is adhered to, and for ascertaining that proper coordination and time schedules are maintained between various portions of the work.

C. The Owners Representative review and acceptance of Contractor's Construction Schedule is for conformance to the requirements of the Contract Documents only. Review and acceptance by the Owners Representative of Contractor's Construction Schedule does not relieve Contractor of his responsibility whatsoever for the accuracy or responsibility of Contractor's Construction Schedule, or of Contractor's ability to meet the interim milestone date(s) and the Contract Completion Date, nor does such review and acceptance expressly or implicitly warrant, acknowledge or admit the reasonableness of the logic, durations, manpower or equipment loading of Contractor's Construction Schedule.

D. The Contractor's Construction Schedule shall be updated monthly reflecting progress through the end of the month as agreed upon during the schedule meetings. Updates shall be submitted by the 5th workday of the following month. Invoices will not be processed for payment until the monthly progress updates of Contractor's Construction Schedule are submitted and accepted.

1.02 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. The Contractor's Construction Schedule shall cover the complete work effort, material and equipment purchases and deliveries required to execute the contract. This schedule, after approval by the Owners Representative, will become the official schedule. Contractor shall follow the approved schedule unless prior written approval to deviate from the approved schedule has been obtained from the Construction Manager.

B. The Construction Schedule shall identify all significant work tasks required in the performance of the Contract, and includes, but is not limited to, the following:

1. Mobilization.
2. Procurement, inspection, and delivery of major or critical materials and equipment.
3. Shop drawings and submittals.
4. Access to site.

5. Major phase completions based on approved Critical Path.
6. Milestones required in the Contract Documents or requested by the Owners Representative.
7. Major testing and inspection.
8. Punchlist and cleanup.
9. Plant Establishment and Plant Maintenance
10. Demobilization

C. Contractor's schedule shall contain sufficient activity detail to adequately manage the project, as well as to furnish viable back-up for monthly payment applications.

D. Contractor's schedule shall include activities for Shop drawings, Construction drawings and sample submittal dates, mock ups, Owners Representative review and dates for required for Owners Representative acceptances. Contractor should schedule two weeks for Owners Representative review of submittals.

E. Each sheet shall contain a revision box in the lower right-hand corner of the footer. The box will indicate the revision number and date of issue for the Baseline Schedule and all subsequent updates.

F. All activities except non-construction activities such as long lead procurement of materials, fabrication and delivery should have maximum Original Duration of 20 work days.

G. All activities are to be resource-loaded in man-hours, units and durations, including all materials purchased and equipment used, unless otherwise adjusted by the Owners Representative. Indirect charges including general and administrative expenses, overhead and profit should be spread over the activities. The total dollar amount of all activities in Contractor's Construction Schedule shall not exceed the total Contract amount, as may be revised by approved Change Orders/Modifications.

H. Contractor's Construction Schedule shall show activity numbers, early and late starts, early and late finishes, as well as total float for each activity.

I. Dummies and constraints should not be used to hold activities in place. Relationships between schedule activities (logic) should be used rather than constraints.

J. Critical path activities are to be differentiated from all other activities by displaying them in red.

K. All activities must have a brief description to convey scope of work and location where occurring (log records for description shall be used when requested by the Owners Representative for selected activities). Unusual abbreviations shall be not be used.

L. Major Contract Milestones: The Contractor's Construction Schedule shall indicate all Owners Representative imposed milestones required pursuant to the General Provisions in calendar days after Contract award. If additional interim milestones are required to meet any conditions affecting the Work that are included elsewhere in the Project specifications, these activities and their associated interim milestones shall be included as part of the Contractor's Construction Schedule and shall be stated in calendar days after Notice to Proceed.

M. The Float belongs to the Project and not the GC or its Subcontractors. The Owner will determine how the Float is to be used or allocated. No Float or gained time is permitted to be held in contingency by the GC or its Subcontractors.

1.03 CONTRACTOR SCHEDULE UPDATES AND REPORTING

A. The Construction Schedule shall be used by both the Contractor and the Owners Representative for:

1. Job planning and control.
2. Progress reporting and forecasting.
3. Basis for evaluating changes and claims.
4. Invoice support.
5. Interfacing with other contractors, subcontractors.

B. Activity codes shall designate area/location, subcontractor, and other third parties. Additional activity codes will be added at the request of the Construction Manager in order to allow filtering of activities consistent with Owners Representative or Client requests.

C. Provide supplemental sub-schedules if areas of the work require additional or more detailed coordination. Holiday schedules are required on critical weekends where coordination is required between Contractor and Owner activities.

D. Schedule Meetings will be held with the Owners Representative to discuss Contractor's Construction Schedule, as deemed necessary, usually on a bi-weekly basis, but not less frequently than monthly. The Schedule Meeting will generally be held as part of a regularly scheduled Progress Meeting.

E. Contractor shall submit a Two-Week Look Ahead Schedule. This schedule shall include one week of actual information and a two-week “look ahead” and shall be consistent with the sequence of activities contained in Contractor's Construction Schedule at a level of detail equal to or greater than that in Contractor's Construction Schedule. Contractor shall identify all activities requiring road closings, utility outages, etc. The Two-Week Look Ahead Schedule shall be updated weekly, submitted to the Owners Representative on a weekly basis, commencing with the approval of Contractor's Construction Schedule.

F. Contractor shall update the Construction Schedule once each calendar month. Revisions to the schedule shall be subject to approval by the Owners Representative. The activities shall be stated by percentage complete through the end of the month. This status shall be submitted to the Owners Representative for review by the end of the month. Contractor shall attend a Owners Representative Progress Payment Meeting to review with Contractor and subcontractor(s) the submitted progress. Upon approval of the final progress percentages, Contractor shall submit the status schedule by the fifth working day of the following month. Invoices shall also be based on the approved progress.

G. Activity delays and contract changes shall not automatically mean that an extension of the Contract Completion Date is warranted or due Contractor. A Contract Modification or delay may not affect existing critical activities or cause non-critical activities to become critical. A Contract Modification or delay may result in only absorbing a part of the available total float that may exist within an activity, thereby not causing any effect on any interim milestone date or the Contract Completion Date.

H. Total float is defined as the amount of time between the early start date and the late start date, or the early finish date and the late finish date, for each and every activity in the schedule. Extensions of time to interim milestone dates or the Contract Completion Date under the Contract will be granted only to the extent that the equitable time adjustments to the activity

or activities affected by the Contract Modification or delay exceeds the total float of the affected activity or subsequent paths and extends any interim milestone date or the Contract Completion Date.

I. Time Impact Analyses for Changes, Delays, and Time Extensions: When change orders are initiated, delays are experienced, or Contractor, in accordance with the provisions of the Contract, desires to revise the logic, Contractor shall submit to the Owners Representative a written Time Impact Analysis that shall include an analysis demonstrating how Contractor proposes to incorporate the change order, delay or Contractor request into the Critical Path schedule. The analysis shall demonstrate the time impact based on the date the change is given to Contractor, the status of construction at that point in time; and the event time computation of all affected activities. The event times used in the analysis shall be those included in the latest updated copy of Contractor's Construction Schedule or as adjusted by mutual agreement.

J. Recovery Schedule

1. If the Contractor fails to achieve the planned progress, as indicated in the approved, or updated Detailed CPM Construction Schedule and/or the Contractor's lack of progress delays the Critical Path and/or an intermediate contract milestone, the Contractor will submit to the Owners Representative, at no cost to the owner, a proposed Recovery Schedule for approval, indicating how the Contractor will recover the time.
2. If the Contractor fails to submit a Recovery Schedule and/or fails to cooperate with the recovery process, the Owners Representative can immediately order the Contractor to accelerate completion of the late activities by whatever means necessary, including additional personnel, equipment, overtime, double shifts without any additional cost to the Owner. The Owner / Owners Representative can withhold future progress payments until the Contractor's progress is in compliance with the contract schedule.

PART 2 - MATERIALS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 32 16
CONSTRUCTION PROGRESS SCHEDULE

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Scheduling format.

B. Submittals

C. Four-week work plan

D. Monthly progress status report.

E. Review, updates, and revisions.

F. Requests for time extensions.

1.02 DEFINITIONS

A. Baseline Schedule: The first schedule submitted by the Contractor and approved by the Owners Representative.

B. Progress Schedule: Subsequent schedules submitted by the Contractor and approved by the Owners Representative that modify the Baseline Schedule.

C. Contract Schedule: The Baseline Schedule and all subsequent Progress Schedules.

1.03 MEASUREMENT AND PAYMENT

A. Separate measurement or payment will not be made for work required under this Section. All costs in connection with the work specified herein will be considered to be included with the related item of work in the Bid Schedule of the Bid Form, or incidental to the Work.

1.04 GENERAL

A. Contract Schedules shall represent a practical plan to complete the Work within the Contract time(s) of completion scope items indicated in Section 01 11 13, Summary of the Work, and shall convey the Contractor's intent in the manner of prosecution and progress of the Work.

B. The Contractor as part of their in house organization shall have a designated Project Manager experienced and solely responsible for creating, submitting, and updating the overall schedule and updates. This team member must be available for all meetings and reviews of the schedule including updates, revisions, and the creation of a recovery schedule as needed.

C. The scheduling and execution of construction in accordance with the Contract Documents are the responsibility of the Contractor. The Contractor shall involve and coordinate all Subcontractors and material Suppliers in the development and updating of progress schedules.

D. The submittal of the Contract Schedule shall be understood to be the Contractor's representation that the Contract Schedule meets the requirements of the Contract Documents and that the Work will be executed in the sequence and duration indicated in the Contract Schedule.

E. The Contractors schedule shall be reviewed and approved as being viable and complete to the discretion of the Owners Representative- incomplete, oversimplified, or lacking of sound logic will be grounds for rejection, revision to meet the complexity and overall timeline of the Project.

1.05 SCHEDULING FORMAT

A. The Contract Schedule shall be computer produced in the Critical Path Method (CPM) format. The schedule shall be computer produced utilizing project scheduling software such as Primavera, Microsoft Project, SureTrak, or other equivalent software as approved by the Owners Representative and supplied by the Contractor.

B. The Progress Schedule shall be updated monthly and submitted and prior to the 5th working day of the month.

C. The Contract Schedule shall show Contract tasks, percent complete, progress bars, baseline schedules, milestones, start and finish dates, and other breakdowns as required by the Owners Representative. The Contract Schedule shall show clearly the sequence of activities and shall list specifically the following activities:

1. Interim milestone completion dates. Phasing and staging of the Work as specified shall be prominently identified.
2. Submittals and the Owners Representative review of submittals.
3. Owners Representative inspection of the Work, including Preliminary Final Inspection, Final Inspection, punch list(s), and Acceptance.
4. Acquisition of permits.
5. Any long lead time (over 60 days) orders for material and equipment.
6. Work to be performed by other contractors or agencies.

D. Descriptions of scheduled activities shall include sufficient detail to identify the work that is to be accomplished.

1. The Contract Schedule shall contain sufficient activities to clearly show the sequence and interdependencies of the Work. The schedule shall be prepared in such a way that an activity or group of activities will correspond directly with the bid item breakdown and/or the breakdown of lump sum bid items. The Engineer may request that additional activities be added.
2. Activity durations shall be expressed in whole days. Work that is to be performed by Subcontract shall be clearly defined.
3. Float suppression techniques, such as preferential sequencing (crew movement, equipment use, and form reuse), extended duration, imposed dates, scheduling of work not required for the Contract, and others, shall not be used to affect or limit float in the Contract Schedule. The use of constraint dates should be minimized, and must be approved by the Owners Representative.
4. Critical Path operations are those activities with a total float equal to or less than zero. Contract Schedules with negative total float may be found to be impractical by the Owners Representative.

E. A Contract Schedule showing that Work is completed in less than the completion time specified may be found to be impractical by the Owners Representative.

F. A Contract Schedule showing that Work that is completed in less than the completion time that is found to be practical by the Owners Representative, shall be considered to have Float. The Float shall be the time between the Scheduled Completion Date as indicated on the approved Contract Schedule and the Contract Completion Date, calculated by adding the completion time specified to the Notice to Proceed date.

G. Float shall not be for the exclusive benefit of either the Owner or the Contractor. Float shall be a resource available to both parties. Failure to meet the Scheduled Completion Date shall not mean delay, provided the Contract Completion Date is met. The Owner shall not be responsible for any damages, including the Contractor's extended overhead costs or early completion delay damages, related to the use of Float or failure to meet the Scheduled Completion Date.

H. Compensable delay, for which liquidated damages or extended overhead may be assessed, shall mean failure to meet the Contract Completion Date or any dates specified herein. Failure to meet the Scheduled Completion Date shall not entitle the Contractor to compensable delay, if the Contract Completion Date is met. The Owner shall not be responsible for any damages related to the use of Float or to a failure to meet an Early Completion Date, including Contractor's extended overhead costs or early completion delay damages.

I. The use of Negative Lag is not allowed. Positive Lag may be allowed subject to approval by the Owners Representative.

J. A schedule found to be impractical for the preceding reasons or any other reasons shall be revised by the Contractor and resubmitted.

1.06 SUBMITTALS

A. Refer to Section 01 33 00 - Submittal Procedures, for submittal requirements and procedures.

B. Schedules shall be submitted in time-scaled bar-chart (Gantt) format with logic lines shown on sheets no smaller than 22 inches wide by 34 inches long, nor larger than 34 inches wide by 44 inches long. A time-scaled logic network diagram may also be required by the Owners Representative. An activity report in a tabular form showing the following information shall be submitted with bar-chart: activity ID, description, duration, total float, early start, early finish, late start, late finish, predecessors, successors, constrains, percent complete, and remaining duration.

C. All schedule submittals shall include one reproducible and six full-size copies.

D. Schedule submittals will be reviewed by the Owners Representative, and shall be updated and revised by the Contractor as requested. Resubmittals shall conform to the same requirements as original submittals.

E. The Contractor shall prepare and submit all schedules and schedule analysis reports in electronic format PDF as well as hard copies.

F. All Contract Schedule submittals are subject to review and approval by the Owners Representative. The Engineer retains the right to withhold progress payments until the Contractor submits a Contract Schedule acceptable to the Owners Representative.

G. The Contractor shall submit the Baseline Schedule within 30 days after the date of the Notice to Proceed.

H. The first of each type of schedule and the first Monthly Progress Status Report submitted by the Contractor will be reviewed for format, as well as content. The Owners Representative may

request format changes. Once the format has been approved, all subsequent schedules and Progress Status Reports shall be submitted in the approved format.

1.07 TWO WEEK LOOK AHEAD

A. A schedule in calendar time-scaled bar chart format depicting the Contractor's intended work activities for the upcoming two week period including the past week(three total) shall be submitted on a weekly basis and shall be due on the first working day of each week. Each activity of one day or more in duration shall be indicated.

B. Any deviations, such as sequences of work, timing, and durations of activities from the approved Contract Schedule, shall be noted and explained in writing.

C. The Two week look ahead Work Plan shall be submitted on sheets not less than 8-1/2 inches by 11 inches, or as approved by the Owners Representative.

1.08 MONTHLY PROGRESS STATUS REPORT

A. The Monthly Progress Status Report shall be a narrative report that describes work activities accomplished in the reporting period, intended work activities for the upcoming reporting period, problems and actions intended by the Contractor to mitigate the problems, work that is being performed out of sequence with approved schedules, status of Change Orders, Notices of Potential Claims, status of submittals, and status of Contractor procurement items.

B. The Contractor shall submit the report format and obtain the Owners Representative approval of the format.

C. The Monthly Progress Status Report shall be submitted monthly on sheets no larger than 11 inches by 17 inches, nor any smaller than 8-1/2 inches by 11 inches.

1.09 REVIEW, UPDATES, AND REVISIONS

A. The Owners Representative will review and return the Contractor's schedule submittals with written comments according to the following schedule from the date of receipt.

B. Contract Schedule: 10 calendar days

C. Two week look ahead Work Plan: 5 calendar days

D. The Contractor shall make all corrections to the Contract Schedule requested by the Owners Representative. and resubmit the schedule for approval. If the Contractor does not agree with the Owners Representative comments, the Contractor shall provide written notice of disagreement within five days from the receipt of the Owners Representative comments. The Owners Representative comments on the Four-Week Work Plan for which the Contractor disagrees shall be resolved in a meeting held for that purpose, if necessary.

E. At least once each month, or as often as deemed necessary by the Owners Representative, the Contractor shall submit a Progress Schedule showing the progress of the Work to date and anticipated activities to be worked on, and the Monthly Progress Status Report as specified in Article

F. The submittal of the Progress Schedule update and Monthly Progress Status Report shall be at least five days prior to the submittal of a payment invoice. No invoice will be accepted nor payment made if there is not an approved current update in place.

G. If, according to the approved Contract Schedule, the Contractor is thirty or more days behind the Contract Completion Date or the completion date of any milestone indicated, considering

all approved time extensions, the Contractor shall submit a recovery schedule, showing a practical plan to complete the Work within the specified Contract completion time. The Owner may withhold progress payments until a revised schedule, acceptable to the Owners Representative and Owner, is submitted by the Contractor.

1.10 REQUESTS FOR TIME EXTENSIONS

A. If the Contractor requests an extension of time for the completion of an interim milestone date or Contract Completion Date, the Contractor shall furnish necessary justification for such extension so that the Owners Representative can determine whether or not the Contractor is entitled to an extension of time under the provisions of the Contract. Submission of proof based on revised activity logic, duration, and costs is obligatory to any approvals. The cost of such justification or subsequent schedule revisions shall be borne solely by the Contractor.

1. The schedule shall clearly display that the Contractor has used, in full, all the float time available for the work involved in its request.

2. The Owners Representative determination as to the total number of days of Contract extension will be based upon the current approved Progress Schedule for the time period in question, and all other relevant information. Actual delays in activities that, according to the schedule, do not affect the extended and predicted Contract completion dates as shown by the Critical Path, will not be the basis for a change to the Contract Completion Date.

3. After receipt of such justification and supporting evidence, the Owners Representative will review the facts and advise the Contractor in writing of the Owners decision. If the Owners Representative determines that the Contractor is entitled to an extension of time to an interim milestone, the Contract Completion Date will remain the same, unless the Engineer specifies another date. Any change to Contract milestones or to the Contract Completion Date will be made by Change Order.

B. As part of each request for extension, a fragnet showing all schedule logic revisions, duration changes, and cost changes for the work in question and its relationship to other activities on the current approved Progress Schedule for the time period in question shall be submitted.

1. If the Owners Representative has not yet made a full determination as to the amount of time extension to be granted and the parties are unable to agree as to the amount of extension to be reflected in the schedule, the Contractor shall reflect that amount of time extension in the Progress Schedule as may be determined to be appropriate by the Owners Representative for such interim purpose. It is understood and agreed that such interim determination by the Owners Representative for the purposes of this Article will not be binding upon either party for any other purpose, and that, after the Owners Representative has made a final determination as to any time extension, the Contractor shall revise the Progress Schedule in accordance with the final decision.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01 33 00

SUBMITTALS PROCEDURES

PART 1 - GENERAL

1.01 STANDARD SPECIFICATIONS

A. The Standard Specifications for Public Works Construction, "Greenbook", latest edition at time of Bid, is reference as if herein contained and the contractor shall keep a copy at the project site. These Specifications shall supersede conflicts with information given in the "Greenbook", unless otherwise determined by the Owner or their designated representative.

1.02 SCOPE

A. The Work of this Section shall consist of furnishing all labor, materials, equipment, appliances and services necessary for the execution and completion of all Submittals Work as shown on the Plans and as described in the Specifications including, but not necessarily limited to, the following:

1. Preparation of Submittals Schedule;
2. Submittals Planning;
3. Contractor's Construction Waste and Recycling Plan
4. Submittals Preparation, Distribution and Transmittal, to include all of the following:
   a. Product Data (Catalog Cuts);
   b. Materials Lists;
   c. Samples;
   d. Record Drawings;
   e. Turn-over Items;
5. Submittals Schedule updating and distribution

1.03 RELATED WORK

A.	Contractor's Construction Schedule	Section 01 32 13
B.	Shop Drawing Submittals	Section 01 33 23

1.04 SUBMITTALS AND PLANNING

A. Project success is based on the timely submission, review, approval, acquisition, and final installation of required items per Contract documents. The Contractor shall be moving forward immediately with all required submittals as soon as the Notice to Proceed is issued. The contractor is to have all submittals in process within 45 days of the NTP or before 25% of the total project timeline has expired.

Failure by the Contractor to self-plan and self-perform and complete the submittal process to meet the project timeline shall in no way be given any relief from project timelines, Liquidated Damages, penalties, maintenance and or additional time.

B. Processing Lead Time: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.

1. Allow two (2) weeks for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Owners Representative will promptly advise Contractor when a submittal being processed must be delayed for coordination.

2. If a resubmittal is necessary due to corrections or revisions, process the resubmittal in the same manner as the initial submittal.

3. Allow two (2) weeks for processing each resubmittal.

   No extension of Contract Time will be authorized because of failure to transmit submittals to the Owners Representative sufficiently in advance of the Work to provide the two-week processing time specified.

   Failure by the Contractor to self-plan and self-perform and complete the submittal process to meet the project timeline shall in no way be given any relief from project timelines, Liquidated Damages, penalties, maintenance and or additional time.

C. Coordination and Completeness:

1. Contractor shall coordinate preparation and processing of submittals with the performance of the related Work. Transmit each submittal allowing sufficient lead time to obtain appropriate reviews and approvals and to avoid delays in the related Work.

2. Coordinate the submittal date for each submittal with the lead time needed for fabrication, purchasing, testing, delivery, review of other related submittals, and related Work that require sequential processing/completion.

3. Coordinate the transmittal dates for each different type of submittal so processing will not be delayed. Ensure concurrent transmittal of submittals for related portions of the Work that need concurrent review to allow the Landscape Architect to verify that a coordinated work effort is being provided. Owner and Landscape Architect each reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

4. Contractor is responsible to verify completeness of all submittals. Incomplete submittals will be rejected.

1.05 SUBMITTALS SCHEDULE

A. Concurrently with the development of Contractor's Construction Schedule (and or per Special Provisions), prepare a complete "Submittals Schedule" for all submittals. Submit the Submittals Schedule together with the Construction Schedule at the Pre-Construction meeting.

1. Coordinate the Submittals Schedule with all subcontractors, with the schedule of values, with the Materials Lists and with the Construction Schedule.

2. Itemize items on the Submittals Schedule in the chronological sequence planned for submission; include all submittals required by the Contract Documents. Provide the following information:

   a. Scheduled date for the initial submittal for each item.

b. Related Specification Section number.
c. Submittal category (i.e. Product Data, Samples, Record Documents, Shop Drawing, etc.).
d. Name of subcontractor or supplier as applicable.
e. Description of the portion of the Work covered by the submittal.
f. Lead time for item and expected shipping duration.
g. Record successive date(s) of any resubmittal(s).
h. Record date of Owners Representatives approval of each submittal.

B. Submittals Schedule Updating: Update the Submittals Schedule after each meeting or activity where revisions have been recognized or made.

C. Distribution: Following receipt of review comments to the initial Submittals Schedule, on a monthly basis thereafter issue updated copies of the Submittals Schedule. Distribute copies to Owners Representative, all subcontractors, and all other parties required to comply with scheduled submittal dates. Keep an up to date copy of the Submittals Schedule posted in the Construction Office. Parties may be deleted from the distribution upon completion of all portion(s) of the Work assigned to such parties and such parties are no longer involved in construction activities.

1.06 SUBMITTALS PREPARATION AND TRANSMITTAL

A. Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

1. Provide a space approximately 4" x 5" on the label or beside the title block on Shop Drawings to record Contractor's review and approval markings and the action taken.
2. Include the following information on the label for processing and recording action taken.
   a. Project name.
   b. Date.
   c. Name and address of Landscape Architect.
   d. Name and address of Contractor.
   e. Name and address of subcontractor (as applicable).
   f. Name and address of supplier.
   g. Name of manufacturer.
   h. Number and title of related Specification Section.
   i. Drawing number and detail references, as appropriate.

B. Transmittal: Package six copies of each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to the Owners Representative using a transmittal form. Submittals received from sources other than General Contractor may be returned without action. If a submittal is rejected, submit six copies of the resubmittal.

1. When transmitting submittals, record relevant information and requests for data on the transmittal form. Include a Contractor's certification that information submitted complies with the Contract Document requirements as a part of each submittal. If the submittal is not in full accordance with the Contract Documents, record specific deviations from the Contract Document requirements, including minor variations and limitations, either on the transmittal form or on a separate attached sheet that is referenced on the form.

2. Transmittal Form: Use AIA Document G 810, or Owner approved equal.
3. Current lead time of all submittal items as of the NTP.

1.07 SUBMITTALS PROCESSING AND DISTRIBUTION

A. Processing: Upon receipt of the submittals, the Owners Representative will retain one copy and forward five to the appropriate Designer (Landscape Architect/Engineer) who will retain one, and will return four copies marked with action taken.

1. Except for submittals for record information or similar purposes, where action and return are required or requested the appropriate Designer (Owner, Landscape Architect, or Engineer) will review each submittal, mark to indicate action taken, and return promptly.
2. Verification of the submittals compliance with characteristics specified in the Contract Documents is Contractor's responsibility.
3. Action Stamp: The appropriate Designer (either Owner, the Landscape Architect, or the Engineer) will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:
    a. "No Exception Taken": When submittals are marked "No Exception Taken," that part of the Work covered by the submittal may proceed.
    b. "Make Corrections Noted": When submittals are marked "Make Corrections Noted," that part of the Work covered by the submittal may proceed provided it complies with the notations and corrections marked on the submittal as well as the requirements of the Contract Documents.
    c. Returned for Resubmittal: Submittals may be returned for resubmittal for various reasons. When a submittal is marked either "Submit Specified Item," "Rejected," or "Revise and Resubmit," Contractor shall not proceed with any part of the Work covered by the submittal, including purchasing, fabrication, delivery, or any other associated activity. Instead, the submittal shall either be revised to comply with the Contract Documents and resubmitted, or a new submittal shall be prepared in accordance with the notations and submitted; resubmit without delay.
    d. Other Action: Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will be returned, marked "Action Not Required".
    e. Contractor shall repeat the submittal process as specified above for all submittals as necessary to obtain an action mark that will allow the Work to proceed.

B. Distribution: Upon receipt of marked copies of the submittals from the appropriate Designer, the Owners Representative will forward four copies of the marked submittal to the Prime Contractor for further distribution to the Subcontractor(s) and/or Supplier(s).

1. Do not proceed with the Work until an appropriately marked copy of the applicable submittal has been received from Owners Representative and is in the installer's possession.
2. Do not permit use of unmarked copies of submittals in connection with construction.
3. Contractor shall not permit submittals marked "Rejected, "Submit Specified Item", or "Revise and Resubmit" to be used at the Project site, or elsewhere where Work is in progress

1.08 PRODUCT DATA ("CATALOG CUTS")

A. Submittal: Assemble Product Data submittals into a single submittal package for each construction trade or system (e.g. Plumbing, Electrical Lighting, Concrete, HVAC, etc.). Submittals shall consist of a minimum of 6 copies. Product Data submittals shall include all available printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings."

1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to delete inapplicable information. Product Data submittals, as a minimum, shall include the following information:
   a. Manufacturer's printed recommendations.
   b. Compliance with recognized trade association standards.
   c. Compliance with recognized testing agency standards.
   d. Application of testing agency labels and seals.
   e. Notation of dimensions verified by field measurement.
   f. Notation of coordination requirements.
2. Do not submit Product Data until Contractor has confirmed the product's compliance with requirements of the Contract Documents.
3. Products shall be submitted as called for by the plans and bid documents, substitutions or Contractors deemed "Equals" shall not be allowed unless requested and approved via a Bid Addendum for all bidders benefit prior to close of Bidding.

1.09 SAMPLES

A. General: Submit full-size, fully fabricated Samples cured and finished as specified, in the quantity specified in the respective Technical Specification section, and physically identical with the material or product proposed. Where quantities are not specified in the Technical Specification, submit a minimum of three samples, one will be returned marked with the action taken. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture and pattern.

1. Mount, display, or package Samples in the manner specified to facilitate review of qualities indicated. Prepare Samples Submittals to match the Landscape Architect's Sample when available. Include the following:
   a. Generic description of the Sample.
   b. Sample source.
   c. Product name or name of manufacturer.
   d. Certification of compliance with the specified standards.
   e. Availability and delivery time.
2. Submit Samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed. Where variation in color, pattern, texture or other characteristics are inherent in the material or product

represented, submit multiple units (not less than 3), that show approximate limits of the variations.

3. Preliminary submittals: Where Samples are for selection of color, pattern, texture or similar characteristics from a range of standard choices, submit a full set of choices for the material or product. Preliminary submittals will be reviewed and returned with the appropriate Designer's mark indicating selection and other action.

4. Maintain appropriately marked sets of Samples, as returned or approved by the Owners Representative, at the Project site for quality comparisons throughout the course of construction.

B. Distribution of Samples: If additional sets of samples are needed for distribution to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work, Contractor shall submit samples in sufficient quantities for such distribution. Do not distribute unmarked copies of sample to others involved in the Work.

1.10 MATERIALS LISTS

A. Submittal Requirements: Submitting a catalog number and manufacturer's name as a materials list stating that the items will be furnished to meet the Specifications will not be acceptable. Contractor shall submit a complete materials list for approval by the Owners Representative prior to performing any Work. Catalog data and full descriptive literature must be submitted whenever the use of items different than those specified is requested. Notarized certificate must be submitted by plastic pipe and fitting manufacturer indicating that material complies with the Project Specifications, unless material has been previously approved and used on other projects by Owners Representative.

Material list shall be submitted in a format similar to the following:

Item	Description	Manufacturer	Model No.
1.	Pressure Supply Line	Lasco	Sch. 40
2.	Lawn Head	Rainbird	2400
3.	etc. …		

1.11 "RECORD" PRINTS

A. Progress: Contractor to record daily progress accurately on one set of approved prints, it shall quantify and date how much of a specific task or item was installed/completed. An example would be highlighting or distinguishing on the plans how many linear feet of main line was installed on a particular day. This must be done daily, and the Contractor shall a submit a current PDF of the plans to the Owners Representative at the end of each week documenting the progress.

B. Changes: Contractor to record accurately on one set of approved prints all changes in the Work constituting departures from the original Contract Plans. For example, changes in installed locations of pressure and non-pressure irrigation line locations.

C. Legibility and Approval: The progress, changes and dimensions shall be recorded in a legible and workmanlike manner to the satisfaction of Owners Representative. Prior to final inspection of the Work, submit completed "record" prints to the Owners Representative for approval.

D. Reference Points: Contractor to dimension from two permanent points of reference (buildings, monuments, sidewalks, curbs, pavement, etc.). Data to be shown on "record" prints shall be recorded day-to-day as the project is being installed.

E. As-built Items: Show locations and depths of the following types of underground items:

1. Point(s) of connection for irrigation, domestic water, gas, sewer, electric and similar underground utilities.
2. Routing of underground conduits, irrigation pressure lines and utility lines (dimension maximum 100 feet on center along routing).
3. All types of valves in various piping systems, including gate valves, quick coupler and remote control valves.
4. Routing of irrigation control wires.
5. Related equipment (as may be directed).

F. Maintain record prints on site at all times

PART 2 - **MATERIALS** (n/a)

PART 3 - **EXECUTION** (n/a)

END OF SECTION

SECTION 01 33 23

SHOP DRAWINGS, DEFERRED SUBMITTALS, PRODUCT DATA AND SAMPLES

PART 1 - GENERAL

1.01 SUMMARY

A. Submit shop drawings, deferred submittals, product data and samples required by Contract Documents.

1. Make submittals promptly and in such sequence as to cause no delay in the work or per specific section.

2. Shop drawings, approved deferred submittals and product data submittals shall be transmitted to Landscape Architect in electronic (PDF) format. See Article 1.12 Electronic Submittal Procedures for additional information.

B. Shop drawing review by the Landscape Architect is only for General conformance with the design concept of the Project and general compliance with the information given in the Contract Documents. Any action shown is subject to the requirements of Drawings and Specifications. Contractor is responsible for quantities and dimensions which shall be confirmed and correlated at the job site, fabrication processes and techniques of construction, coordination of his/her work with that of all other trades and the satisfactory performance of his/her work.

1.02 RELATED SECTIONS

A.	Submittals Procedures	Section 01 33 00
B.	Quality Controls	Section 01 45 00
C.	Field Engineering	Section 01 71 23

1.03 CONTRACTOR RESPONSIBILITY

A. Review and approve Shop Drawings, Product Data and Samples prior to submission.

B. Determine and verify accuracy of:

1. Dimensions and field measurements.

2. Quantities required.

3. Field construction criteria.

4. Catalog numbers and similar data.

5. Conformance with specifications and local authorities and jurisdictions.

6. Coordinate each submittal with requirements of the Contract Documents.

C. Notify Landscape Architect, in writing, at time of submission, of any deviation in the submittals from requirements of the Contract Documents, identifying such deviation clearly on the submittals. See submission requirements.

D. Begin no fabrication or work which requires submittals until return of submittal from Owners Representative without objection.

E. The use of the terms Architect, Surveyor, or Landscape Architect shall imply and require that the person be currently licensed by State Authorities where the Project is located to perform the duties ascribed to that profession.

1. Certification by a Licensed (licensed by the State where the project is located) Architect, Professional Engineer, Geotechnical Engineer, Land Surveyor or Landscape Architect.
    a. When required by any Specification Section that materials, items or systems to be furnished, provided or installed are to be designed and/or certified by a professional, the certification of the required responsible professional shall be affixed to the layouts, design, calculations, drawings and data (shop drawings and product data) when submitted for review.
    b. Such certified submittals are also subject to the review and acceptance by the Building (permit/code) Official.

1.04 SHOP DRAWINGS

A. Contractor shall all submit shop drawings no later than 30 working days after the official Notice to Proceed.

B. Present drawings in a clear and thorough manner.

1. Plans and details shall be identified by reference to the projects sheet, detail, schedule and items shown on drawings or the submittals will be rejected.
    a. Provide layout plans and erection details as well as piece drawings.
2. Scale drawings to clearly indicate in detail the product or assembly. Provide the following:
    a. Sufficient detail in the drawings to show fabrication, installation, anchorage and interface of the work of this Section with the work of adjacent trades.
    b. Material list of items proposed to be provided under this Section.
    c. Manufacturer's specifications and other data necessary to prove compliance with the specified requirements.

C. Shop drawings shall be submitted electronically to the Owners Representative per the Electronic Submittal Procedures outlined in Article 1.12 of this section.

D. Electronic files will be made available to the contractor for their convenience in use of project layout and developing shop drawings per Section 01 71 23.

1.05 DEFERRED SUBMITTALS

A. Contractor to submit all deferred submittals no later than 30 working days after the official Notice to Proceed to the jurisdiction responsible for approval and permit application.

B. Any manufacture or supplier delays(backlog) must be clearly documented in writing prior to the expiration of the 30-working day period showing due diligence by Contractor.

C. Present deferred submittals in a clear and thorough manner.

1. Plans and details shall be identified by reference to the projects sheet, detail, schedule and items shown on drawings or the submittals will be rejected.
    a. Provide Approved layout plans and erection details as well as piece drawings and any required engineering. Layout shall tie to overall plans for simple field verification/ point of beginning.

2. Scale drawings to clearly indicate in detail the product or assembly. Provide the following:
    a. Sufficient detail in the drawings to show fabrication, installation, anchorage and interface of the work of this Section with the work of adjacent trades.
    b. Capture all installation locations and applications where it may vary or have different dimensions or layout.
    c. Material list of items proposed to be provided under this Section.
    d. Manufacturer's specifications and other data necessary to prove compliance with the specified requirements.

D. Approved Deferred submittals shall be submitted electronically to the Owners Representative per the Electronic Submittal Procedures outlined in Article 1.12 of this section.

1.06 PRODUCT DATA

A. Preparation:
    1. Clearly mark each copy to identify pertinent products.
    2. Show performance characteristics and capacities, dimensions and clearances required, mounting or installation requirements, wiring or piping diagrams and controls and other data necessary to prove compliance with Project documents.

B. Manufacturer's Standard Schematic Drawings and Diagrams:
    1. Modify drawings and diagrams to delete information, which is not applicable to this work, and supplement drawings and diagrams as required to provide complete information applicable to the work, including how site grading may affect installation per the Civil Engineers plans and the Construction plans.

C. Product Data submittals shall be transmitted electronically to the Owners Representative per the Electronic Submittal Procedures outline in Article 1.13 of this Section.

1.07 SAMPLES

A. Submitted samples shall be sufficient size to clearly illustrate:
    1. Functional Characteristics of the product, with integral related parts and attachment devices.
    2. Submit three samples of each color, texture, size, etc., as applicable for each material requiring a sample.
    3. Landscape Architect shall retain one sample.

B. If a mock-up sample is required, it shall be an areas of 3' - 0" x 3' - 0" of each material, finish or color. The Landscape Architect may allow mock-ups to become part of the permanent construction if they do not affect the aesthetics or future use of the building or item. Unapproved mock-ups or obsolete mockups will be torn down or otherwise removed immediately.
    1. Approved mock-ups shall be retained as a construction standard reference until no longer required by the Landscape Architect or Owners Representative, at which time they will be removed and disposed of by the Contractor.

1.08 SUBMISSION REQUIREMENTS

A. Submittals Shall Contain the Following Requirements:

1. Date of submission and dates of previous submissions.
2. Project title and number.
3. Contract identification.
4. Names and Contractor, supplier, and manufacturer.
5. Fabrication lead time including shipping and transit.
6. Identification of product, with the specification's section number.
7. Dimensions and quantities of product or material.
8. Field dimensions clearly identified as such.
9. Relation to adjacent or critical features of the work or materials.
10. Applicable standards such as ASTM, ANSI, or Federal Specifications.
11. Identification of deviations from contract documents.
12. Identification of revisions on resubmittals.
13. A 4" x 4" blank space for Landscape Architect's stamps.
14. Contractor's stamp, initialed or signed, shall certify verification of the above requirements, verification of the Contractor's responsibilities and coordination of the information with requirements of the work and of the contract documents. This certification is required before Architect reviews any submittals.
    a. Submission of any shop drawings, product data or samples, whether stamped and signed or not, shall meat the above requirements and the 1.02 Contractor Responsibilities have been complied with by the Contractor.

B. Samples: Submit new samples as required for initial submittal.

C. Submission marked "Rejected" or "revise and Resubmit" or "Submit Specified Item" shall be so revised and resubmitted as originally required.

1.09 LANDSCAPE ARCHITECT'S STAMP DEFINITION

A. Shop Drawings, Product Data and Samples will be reviewed with reasonable promptness and stamped indicating the appropriate action required by the Contractor as follows:

1. "No Exception Taken" means that fabrication, manufacture, or construction may proceed providing submittal complies with Contract Documents.
2. "Make Corrections Noted" means that fabrication, manufacture, or construction may proceed providing submittal complies with Landscape Architect's notation and Contract Documents. If, for any reason, notations cannot be complied with, resubmit as described for submittal stamped "Reject".
3. "Revise and Resubmit" means submittal information is incomplete or ambiguous and therefore clarification or additional information is required to ascertain compliance with the Contract Documents, and that fabrication, manufacture or construction shall not proceed. Provide additional data required by the contract documents and resubmit.

4. "Reject" means that submittal does not comply with Contract Documents and that fabrication, manufacture, or construction shall not proceed. Re-submit in accordance with requirements of Contract Documents.
5. "Submit Specified Item" means that submittal does not comply with project requirements as submitted and shall not be used on the project. Revise or make a new selection and resubmit compliant item shop drawings, product data, or samples in accordance with requirements of contract documents.

1.10 RESUBMISSION REQUIREMENTS

A. Shop drawings and product data: Make corrections and changes in the submittal as required by the Landscape Architect and resubmit in same quantities and format until approved.

B. Samples: Submit new samples as required for initial submittal.

C. Submission marked 'Rejected' or 'Revise and Resubmit' or 'Submit Specified Item' shall be so revised and resubmitted as originally required.

1.11 SUBSTITUTIONS

A. All material, equipment and processes to be substituted for those specified or shown in the contract documents must be approved by the Architect in writing prior to submittal of shop drawings for the item or work being installed or performed. Substitutions shown on shop drawings approved by the Architect without prior written approval does not constitute approval of a substituted item.

B. Request for substitution shall be in accordance with Section 01 25 00, Substitution Procedures.

1.12 ELECTRONIC SUBMITTAL PROCEDURES

A. Summary:

1. Shop drawing and product data submittals shall be transmitted to Landscape Architect and or the Owners Representative in electronic (PDF) format.
2. The intent of electronic submittals is to expedite the construction process by reducing paperwork, improving information flow, and decreasing turnaround time.
3. The electronic submittal process is not intended for color samples, color charts, or physical material samples.

PART 2 – MATERIALS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 56 23

TEMPORARY CONSTRUCTION FENCING

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. Contractor to secure and protect the site and all work with temporary Chain link fencing.

1.02 SCOPE OF WORK

A. Install a 6' tall (min.) temporary construction fence prior to beginning any site work, at the limit of work per the construction/project plans to secure site.

B. Fencing to include green privacy screening covering the entire structure, Contractor to mitigate for wind issues and secure with hog rings per screen manufactures recommendations.

C. Include all required support bracing and gates for construction access.

D. The purpose of the fence is to secure the site and make safe for the general public.

E. Contractor responsible for supplying locks and may be required to add additional locking devices for public safety and or City departments as needed.

1.03 Submittals

A. Contractor to supply a simple plan designating entry points and layout for approval by the Owners Representative prior to installation.

PART 2 - PRODUCTS

2.01

A. The fence shall be chain link (new or used), free of openings or breaks in the fabric, with fence posts at 10' O/C maximum.

B. Contractor to add additional supports and or bracing as required per site conditions.

C. The fence shall be maintained in place throughout the construction phase period through to the end of the ninety (90) day (minimum)landscape maintenance period. Install “No Trespassing” signs minimum 50' o.c. The temporary fence shall be removed prior to final inspection/project acceptance at the end of the maintenance period as directed by the Owners Representative.

Part 3 – EXECUTION

3.01

A. Contractor to verify all utility locations prior to start of installation, and shall be responsible for any damages due to their work.

B. Fencing to be installed per industry standards and shall be secure and free standing.

END OF SECTION

SECTION 01 56 39

TREE PROTECTION

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. This item shall consist of furnishing all labor, materials, tools and equipment required to protect those trees designated to remain on the site. Protection of designated trees shall include directing construction work activity away from the protected tree zones. Section includes the all aspects of required protection, trimming, pruning and care of trees that interfere with, or are affected by, execution of the Work, whether temporary or new construction.

1.02 RELATED WORK

A. Section – 30 90 00 Planting

1.03 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Tree Preservation Plan (Tree Protection Plan) as designed and developed by a Certified Arborist.

1. Shall include site inventory of trees with identification of trees, location, and images of current status/health.
2. Tree /root protection zones based on canopy or Arborist recommendation.
3. Any required maintenance, including frequency and product recommendations if required by Arborist.
4. Site inspection schedule- minimum monthly inspections required

C. Tree Pruning Schedule: Written schedule detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.

D. Qualification Data: For tree service firm and arborist, current ISA certification required.

E. Contractor to keep and update a log of all maintenance activities including required inspections with images and shall submit updated copies with monthly project schedule updates.

F. Provide final log of work performed including any damage that occurred during construction and subsequent repairs.

G. Certification: From arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly pruned and repaired when damaged.

1.04 QUALITY ASSURANCE

A. Tree Service Qualifications: An experienced tree service firm that has successfully completed tree protection and trimming work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site on a as needed basis during execution of the Work.

B. Arborist qualifications: An arborist currently certified by the International Society of Arboriculture.

C. Tree Pruning Standards: Comply with ANSI A300 (Part 1), "Trees, Shrubs, and other Woody Plant Maintenance—Standard Practices (Pruning)."

D. Pre-installation Conference: Before starting tree protection and trimming, meet with representatives of authorities having jurisdiction, Owner, Landscape Architect, consultants, and other concerned entities to review tree protection and trimming procedures and responsibilities.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Materials for tree/vegetation protection barriers shall conform to the following requirements:

1. Mesh Construction Fencing by ULINE or Approved Equal (orange or green color)
2. Cedar Posts (minimum length 6.0 feet)
3. #14- gauge steel wire

B. Temporary Signs: White or yellow weatherproof material, 8-inch by 40 inch minimum, with 3-inch black letter: text – "Tree Protection Area – Do Not Enter".

PART 3 - EXECUTION

3.01 EXAMINATION

A. Temporary Fencing: Install temporary fencing around the tree protection zones designated on the plans or where directed by the Arborist to protect remaining vegetation from construction damage. Maintain temporary fence and remove when construction is complete per the Owners Representative prior to the Plant Establishment period.

B. Temporary Signs: Install temporary signs 60 feet apart, or two per protected tree, whichever is greater, on posts of temporary fencing. Maintain temporary signs and remove when construction is complete.

C. Tree Trunk Protection: The Contractor shall provide 2 inches by 8 inches by 8-ft. boards, banded continuously around each trunk to prevent scarring of trees as called for on the plans or designated by the Certified Arborist. For multi-stem trees, saplings, and shrubs to be protected within the area of construction, temporary fencing may be used for trunk protection.

The Contractor shall repair or replace any and all damaged plant material determined by the Owners Representative to any existing or newly installed plant material at its own expense. Unnecessary damage to ground cover or turf shall be repaired or replaced as specified for restoration of similar areas within the plans, or as directed by the Owners Representative, and shall be at the Contractor's expense.

D. Root Zone Protection: During the entire construction period all reasonable efforts shall be made to protect from damage those trees and their root system designated to remain. Around the trees to be protected, the Contractor shall avoid excessive excavation or compaction and damage during the removal of trees and shrubs designated to be removed. All plant material

designated to be saved, or outside of the limits of construction, shall be protected during subsequent construction work. Work under these items will include construction and maintenance of temporary fencing to protect the root zones of existing trees and other plantings, construction and maintenance of tree trunk protection.

A protection barrier or temporary fence of at least (4 feet) in height shall be installed around each tree to be protected and preserved. The tree protection shall be installed prior to the actual construction start and maintained for the duration of the project.

Within this protection zone, construction materials shall not be stored, equipment operated and/or temporary storage buildings or work trailers placed.

The protection barrier shall be constructed of orange snow fencing securely fastened to fence posts spaced a maximum of (5 feet) on center. Posts are (6 feet) in length with (2 feet) set into the ground and (4 feet) extending above ground. The fencing shall be attached to the post with a minimum of four (4) nylon-locking ties evenly placed at each post.

E. Dimensions of the protection barrier are as follows:

1. Trees located in open areas:
    a. Shall be to the extents of the drip line or farther if required by the Arborist due to special species considerations or local environmental conditions.
2. Trees located in Tree Pits:
    a. Where trees are located within Tree Pits, the fencing should be installed at a minimum distance of the inside dimension of the Tree Pit opening with one stake at each corner of the opening.
3. Trees Located in Parkways or Boulevards:
    a. Small Trees (<9" D.B.H.): Minimum 1.5m (5 feet) from face of tree along the parkway length. In the dimension bordered by the public sidewalk or curb, the fencing shall be the width of the parkway with a maximum offset of (1 foot) from back of curb or edge of sidewalk. In no case shall the closure be less than (2 feet) from the centerline of the tree. (Example: 6" Tree in a 6' parkway as measured from back of curb to sidewalk. The dimension of the protection fencing would be (4' x 10') with tree in the center). Note: Larger grass parkways (>12') may allow for a ten-foot by ten foot (10' x 10').
    b. Medium (10"to 15" D.B.H.): Minimum of ten (10) feet from face of tree along the parkway length. In the dimension bordered by the public sidewalk or curb, the fencing shall be the width of the grass parkway with a maximum offset of one (1) foot from back of curb or edge of sidewalk. In no case shall the closure be less than two (2) feet from the centerline of the tree.
    c. Large (>15" D.B.H.): Minimum of fifteen (15) feet from face of tree along the parkway length. In the dimension bordered by the public sidewalk or curb, the fencing shall be the width of the grass parkway with a maximum offset of one (1) foot from back of curb or edge of sidewalk. In no case shall the closure be less than two (2) feet from the centerline of the tree.

    The Contractor shall be responsible to protect all trees from damage at the construction site. It shall be the responsibility of the Contractor to restore all damaged parkways to their original condition. Any trees damaged as a result of construction activity as determined by the Certified Arborist shall be repaired, removed and/or

replaced at the Contractor's expense. The Contractor as specified in the Municipal Code shall pay liquidated damages in the amount of the appraised value of the tree(s). At a minimum, any tree greater than 4" D.B.H. that is permanently damaged due to the construction project and not originally marked for removal shall be replaced with a new tree as identified by the Owner and shall have a minimum of 4" caliper. Any damaged tree smaller than 4" caliper measured 6" above the ground shall be replaced in kind, inch for inch.

F. Materials shall be disposed of in accordance with specifications.

G. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

H. Do not store construction materials, debris, or excavated material inside tree protection zones. Do not permit vehicles or foot traffic within tree protection zones; prevent soil compaction over root systems.

I. Do not allow fires under or adjacent to remaining trees or other plants.

3.02 EXCAVATION

A. Install shoring or other protective support systems to minimize shoring or benching of excavations.

B. Do not excavate within tree protection zones, unless otherwise indicated.

C. Where excavation for new construction is required within drip line of trees, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks and comb soil to expose roots.

1. Relocate roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and relocate them without breaking. If encountered immediately adjacent to location of new construction and relocation is not practical; cut roots approximately 3 inches back from new construction.

2. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect

3. Do not allow heavy equipment in tree protection areas. All excavation work is to be performed by hand.

D. Root Pruning: Do not cut main lateral roots; cut only smaller roots that interfere with installation of utilities or construction. Cut roots with sharp pruning instruments; do not break or chop.

E. When excavating, place excavated soil on opposite side of trench from tree.

3.03 ROOT PRUNING

A. Root pruning shall take place only where the roots of existing trees have been damaged by the Contractor during construction of the Project, as directed by the Certified Arborist.

B. If construction is to occur within the root zone of existing plant material, root pruning and special plant care including fertilizing and watering will be required, as directed by the Certified Arborist and hereinafter specified. Prior to root pruning, remove all weeds growing in existing tree mulch

rings. Root pruning using an approved mechanical root pruning saw shall be performed prior to digging where noted on the plans, or directed by the Certified Arborist. Air Spading excavation consisting of hand and/or pneumatic excavation may be required if indicated on plans or as directed by Certified Arborist. Whenever roots of plant material to remain are exposed during construction, the damaged root ends are to be removed by cutting them off cleanly.

C. Initial watering shall be performed on all trees, which are designated for root pruning. Water trees immediately by thoroughly saturating root balls and provide a horticultural watering bag, such as a Gator Bag or equivalent, filled with water to keep root balls thoroughly saturated during first three weeks following root pruning. Thereafter refill bags as required, according to weather conditions, to keep root balls in a moist condition during growing seasons, through the duration of the Project. Test root balls for optimal moisture once a week using a soil auger.

D. Contractor shall be responsible for location of all utilities prior to installation of trees. Notification of the local Utilities Alert Network is required for all planting sites.

E. All pruning shall be overseen by a professional arborist (someone whose principal occupation is the care and maintenance of trees). All pruning shall be done according to the National Arborist Association's Pruning Standards for Shade Trees Class 11 - Standard Pruning Specifications.

F. Any damage to the root zone, as determined by the Certified Arborist, will be compensated by pruning an equivalent amount of the top vegetative growth of the material within 1 week following root damage, fertilization and supplemental watering.

G. Fertilize damaged trees with fertilizer that promotes root growth. Fertilizer nutrients shall be applied within 48 hours after root damage occurs. Fertilizer nutrients shall be applied within 48 hours after root damage occurs. A fertilizer with a 1: 1: 1 ratio shall be applied at the rate of .5 pounds of nutrients per 1000 square feet.

H. Application shall be accomplished by placing dry fertilizer in holes in the soil. The holes shall be 8 inches to 12 inches deep and spaced 24 inches apart in an area beginning 30 inches from the base of the plant. Holes can be punched with a punch bar, dug with a spade, drilled with an auger or any other method approved by the Certified Arborist.

I. Approximately 0.02 pounds (10 grams) of fertilizer nutrients shall be placed in each hole 250 holes per 1000 square feet. Fertilizer Nutrients shall not be measured for payment but considered incidental to root pruning. If the Certified Arborist determines that the whole method of fertilizer placement is not practical or desirable, an approved method of uniform surface application will be allowed. Neither separate measurement nor payment will be made for fertilization, but will be considered incidental to the cost of tree protection.

J. Supplemental water shall be applied within 48 hours of any root damage. The water shall be applied at the rate of 7 quarts per square yard of surface area within the root zone of plant material having sustained damage to the root zone. Root zone shall be calculated as the areas, which extend nine feet beyond the limits of the crown’s branches. Subsequent weekly watering shall be applied if deemed necessary by the Certified Arborist. Neither separate measurement nor payment will be made for supplemental watering but will be considered incidental to the cost of tree protection.

K. The Contractor shall repair or replace any and all damage determined by the Certified Arborist to any existing or newly installed plant material at its own expense. Unnecessary damage to ground cover or turf shall be repaired or replaced as specified for restoration of similar areas

within the plans, or as directed by the Certified Arborist, and shall be at the Contractor's expense.

L. Materials shall be disposed of in accordance with specifications.

3.04 REGRADING

A. Do not fill within tree protection zones, unless otherwise indicated.

B. Where filling for new construction is required within drip line of trees, perform work by hand to minimize damage to root systems

1. Where existing grade is below elevation of finish grade, fill with topsoil. Place topsoil by hand in a single uncompacted layer and hand grade to required finish elevations.

3.05 TREE PRUNING

A. Prune trees to remain that are affected by temporary and permanent construction.

B. Pruning Standards: Prune trees according to ANSI A300 (Part 1).

C. Cut branches with sharp pruning instruments; do not break or chop.

1. Clean all pruning instruments with antimicrobial solution between performing work on separate trees to avoid the potential spread of pathogens.

D. Chip removed tree branches and uses as organic mulch or dispose of off-site as directed by Owners Representative.

3.06 TREE REPAIR AND REPLACEMENT

A. Promptly repair trees damaged by construction operations within 24 hours. Treat damaged trunks, limbs, and roots according to arborist's written instructions.

B. Remove and replace dead and damaged trees that arborist determines to be incapable of restoring to a normal growth pattern.

1. Provide new trees of a species selected by Landscape Architect.

2. Replacement trees to be of same size as original or as deemed acceptable by Landscape Architect. Tree replacement shall:

a. Comply with all local requirements for like planting or as detailed per plans.

b. Warranty and Maintenance Period: One year.

C. Aerate surface soil, compacted during construction, 10 feet beyond drip line. Drill 2-inch diameter holes a minimum of 12 inches deep at 24 inches o.c. Backfill holes with an equal mix of augured soil and sand.

END OF SECTION

SECTION 01 58 13

TEMPORARY PROJECT SIGNAGE

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Project identification/ information signs.

1.02 RELATED REQUIREMENTS

A. The Standard Specifications for Public Works Construction, "Greenbook", latest edition, is reference as if herein contained and the contractor shall keep a copy at the project site. These Specifications shall supersede conflicts with information given in the "Greenbook", unless otherwise determined by the Owner or their designated representative.

1.03 QUALITY ASSURANCE

A. Design sign and structure to withstand a minimum 90 miles/hr. wind velocity.

B. Sign Manufacturer to have experience in manufacturing signage with references on similar projects.

C. Finishes, Vinyl: Adequate to withstand weathering, fading, and chipping for duration of construction.

1.04 SUBMITTALS

A. See Section 01 33 00 - Submittal procedures.

B. Shop Drawing: Show content, layout, lettering, color, foundation, structure, sizes and grades of members.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Signs.

1. Contractor to submit supplier for approval by Landscape Architect or Owners Representative.

2.02 SIGN MATERIALS

A. Structure and Framing: New, wood, structurally adequate.

B. Rough Hardware: Rough hardware shall be hot-dip galvanized steel.

C. Sign Surfaces: Exterior grade plywood with medium density overlay, minimum 3/4 inch thick, full size sheet size to minimize joints.

D. Vinyl: Exterior quality; sign background of color as selected.

E. Lettering: Vinyl or digitally printed, colors as selected.

2.03 PROJECT IDENTIFICATION SIGN

A. One vinyl graphic sign, 64 sq ft area, bottom 4 feet above ground.

B. Graphic Design, Colors, Style of Lettering: Designated by Landscape Architect and or Owners Representative.

2.04 PROJECT INFORMATION SIGNS

A. Vinyl informational signs of same colors and lettering as Project Identification sign, or standard products; size lettering to provide legibility at 100-foot distance.

B. Provide at field office, and directional signs to direct traffic into and within site. Relocate as Work progress requires.

C. Restrictions: Contractor shall not display signs other than Project Identification Sign and Project Informational Signs specified above without written approval of Owners Representative.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install project identification sign within 14 days after date fixed by Notice to Proceed.

B. Erect at designated location.

C. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.

D. Contractor shall provide backing or additional support as required to span across framing members and provide even, smooth surface without waves or buckles.

E. Install sign surface plumb and level. Anchor securely.

F. Exposed surfaces of sign, supports, and framing to be treated lumber.

3.02 MAINTENANCE

A. Maintain signs and supports clean, repair deterioration and damage.

3.03 REMOVAL

A. Remove signs, framing, supports, and foundations at completion of Project and restore the area.

END OF SECTION

SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes requirements and procedures for ensuring optimal diversion of construction and demolition (C&D) waste materials generated by the Work from landfill disposal within the limits of the Construction Schedule and Contract Sum.

1. California State law (Public Resources Code sections 40000 et seq.) requires that projects develop source reduction, re-use, recycling, and composting programs to divert 75% of all solid waste from landfill disposal by 2020. Construction waste materials generated by the Work are targeted to achieve and maintain these diversion rates.
2. The Work of this Contract requires that a minimum of 75% by weight of the construction and demolition materials generated in the Work is diverted from landfill disposal through a combination of re-use and recycling activities.
3. For LEED® projects, requirements for submittal of LEED documentation in compliance with the Materials and Resources category, Construction and Demolition Waste Management credit.
4. Requirements for submittal of Contractor's Construction Waste and Recycling Plan prior to the commencement of the Work.

1.03 DEFINITIONS

A. Class III Landfill: A landfill that accepts non-hazardous resources such as household, commercial, and industrial waste, resulting from construction, remodeling, repair, and demolition operations. A Class III landfill must have a solid waste facilities permit from CalRecycle and is regulated by the Enforcement Agency (EA).

B. Construction and Demolition Debris: Building materials and solid waste resulting from construction, remodeling, repair, cleanup, or demolition operations that are not hazardous as defined in California Code of Regulations, Title 22, and Section 66261.3 et seq. This term includes, but is not limited to, asphalt concrete, Portland cement concrete, brick, lumber, gypsum wallboard, cardboard and other associated packaging, roofing material, ceramic tile, carpeting, plastic pipe, and steel. The debris may be commingled with rock, soil, tree stumps, land development projects.

C. C&D Recycling Center. A facility that receives only C&D material that has been separated for reuse prior to receipt, in which the residual (disposed) amount of waste in the material is less than 10% of the amount separated for reuse by weight.

D. Disposal. Final deposition of construction and demolition or inert debris into land, including stockpiling onto land of construction and demolition debris that has not been sorted for further

processing or resale, if such stockpiling is for a period of time greater than 30 days; and construction and demolition debris that has been sorted for further processing or resale, if such stockpiling is for a period of time greater than one year, or stockpiling onto land of inert debris that is for a period of time greater than one year.

E. Enforcement Agency. Enforcement agency as defined [i.e. in Public Resources Code 40130].

F. Inert Disposal Facility or Inert Waste Landfill: A disposal facility that accepts only inert waste such as soil and rock, fully cured asphalt paving, uncontaminated concrete (including fiberglass or steel reinforcing rods embedded in the concrete), brick, glass, and ceramics, for land disposal.

G. Mixed Debris: Loads that include commingled recyclable and non-recyclable materials generated at the construction site.

H. Mixed Debris Recycling Facility: A processing facility that accepts loads of commingled construction and demolition debris for the purpose of recovering re-usable and recyclable materials and disposing the non-recyclable residual materials.

I. Recycling: The process of sorting, cleansing, treating and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.

J. Reuse. The use, in the same or similar form as it was produced, of a material which might otherwise be discarded.

K. Separated for Reuse. Materials, including commingled recyclables, that have been separated or kept separate from the solid waste stream for the purpose of additional sorting or processing those materials for reuse or recycling in order to return them to the economic mainstream in the form of raw material for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace, and includes materials that have been "source separated."

L. Solid Waste: All putrescible and non-putrescible solid, semisolid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, dewatered, treated, or chemically fixed sewage sludge which is not hazardous waste, manure, vegetable or animal solid and semisolid wastes, and other discarded solid and semisolid wastes. "Solid waste" does not include hazardous waste, radioactive waste, or medical waste as defined or regulated by State law.

M. Source-Separated: Materials, including commingled recyclables, that have been separated or kept separate from the solid waste stream at the point of generation for the purpose of additional sorting or processing of those materials for reuse or recycling in order to return them to the economic mainstream in the form of raw materials for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace.

N. Waste Hauler: A company that possesses a valid permit from the local waste management authority to collect and transport solid wastes from individuals or businesses for the purpose of recycling or disposal in the locality.

1.04 SUBMITTALS

A. Contractor's Construction Waste and Recycling Plan

1. Review Contract Documents and estimate the types and quantities of materials under the Work that are anticipated to be feasible for on-site processing, source separation for re-use or recycling. Indicate the procedures that will be implemented in this program to effect jobsite source separation, such as, identifying a convenient location where dumpsters would be located, putting signage to identify materials to be placed in dumpsters, etc.
2. Prior to commencing the Work, submit Contractor's Construction Waste and Recycling Plan. The Plan must include, but is not limited to the following:
    a. Contractor's name and project identification information;
    b. Procedures to be used;
    c. Materials to be re-used and recycled;
    d. Estimated quantities of materials;
    e. Names and locations of re-use and recycling facilities/sites;
    f. Tonnage calculations that demonstrate that Contractor will re-use and recycle a minimum 65% by weight of the construction waste materials generated in the Work.
3. Contractor's Construction Waste and Recycling Plan must be approved by the Owners Representative prior to the start of Work.
4. Contractor's Construction Waste and Recycling Plan will not otherwise relieve the Contractor of responsibility for adequate and continuing control of pollutants and other environmental protection measures.

B. Contractor's Reuse, Recycling, and Disposal Report
1. Submit Contractor's Reuse, Recycling, and Disposal Report with each monthly schedule update. Failure to submit the report and its supporting documentation will cause a delay in the approval of the progress schedule. If applicable, include manifests, weight tickets, receipts, and invoices specifically identifying the Project for re-used and recycled materials:
    a. Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick).
    b. Salvaging building materials or salvage items at an off-site salvage or reuse center (i.e. lighting, fixtures).
    c. Recycling source separated materials on site (i.e. crushing asphalt/ concrete for base course, or grinding for mulch).
    d. Recycling source separated material at an offsite recycling center (i.e. scrap metal or green materials).
    e. Use of material as Alternative Daily Cover (ADC) at landfills.
    f. Delivery of soils or mixed inert material to an inert landfill for disposal (inert fill).
    g. Disposal at a landfill or transfer station (where no recycling takes place).
    h. Other (describe).
2. Contractor's Reuse, Recycling, and Disposal Report must quantify all materials generated in the Work, disposed in [Class III] landfills, or diverted from disposal through recycling. Indicate zero (0) if there is no quantity to report for a type of material.
3. Contractor to develop or use a standard form that reports:

a. The disposal or recycling either in tons or in cubic yards: if scales are available at disposal or recycling facility, report in tons; otherwise, report in cubic yards. Report in units for salvage items when no tonnage or cubic yard measurement is feasible.

b. The locations to which materials are delivered for reuse, salvage, recycling, accepted as daily cover, inert backfill, or disposal in landfills or transfer stations.

c. Provide legible copies of weigh tickets, receipts, or invoices that specifically identify the project generating the material. Said documents must be from recyclers and/or disposal site operators that can legally accept the materials for the purpose of re-use, recycling, or disposal.

4. Indicate project title, project number, progress payment number, name of the company completing the Contractor's Report and compiling backup documentation, the printed name, signature, and daytime phone number of the person completing the form, the beginning and ending dates of the period covered on the Contractor's Report, and the date that the Contractor's Report is completed.

C. For LEED Projects, complete the LEED Construction and Demolition Waste Management Calculator in format provided under the most current version of the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) program. Include a signed cover letter with calculation summary on company letterhead.

1. Certify that the project has completed a waste management plan and diverted construction, demolition, and land clearing waste to uses other than landfill.

2. Provide quantities of diverted materials and means of diversion in accordance with the results table in the LEED Construction and Demolition Waste Management Calculator.

3. Indicate how and where waste was diverted.

4. Indicate quantities of waste diverted in tons [or cubic yards].

5. Letter will also include: Total quantity of diverted waste, total quantity of waste, and the percentage of waste diverted.

6. Include name, organization, and role in project. Provide signature and date completed.

7. Include legible copies of weigh tickets, receipts, or invoices that specifically identify the project generating the material. Said documents must be from recyclers and/or disposal site operators that can legally accept the materials for the purpose of re-use, recycling, or disposal.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.01 SALVAGE, RE-USE, RECYCLING AND PROCEDURES

A. Identify re-use, salvage, and recycling facilities.

B. Develop and implement procedures to re-use, salvage, and recycle new construction and excavation materials, based on the Contract Documents, the Contractor's Construction Waste and Recycling Plan, estimated quantities of available materials, and availability of recycling

facilities. Procedures may include on-site recycling, source separated recycling, and/or mixed debris recycling efforts.

1. Identify materials that are feasible for salvage, determine requirements for site storage, and transportation of materials to a salvage facility.
2. Source separate new construction, excavation and demolition materials including, but not limited to the following types:
    a. Asphalt.
    b. Concrete, concrete block, slump stone (decorative concrete block), and rocks.
    c. Drywall.
    d. Green materials (i.e. tree trimmings and land clearing debris).
    e. Metal (ferrous and non-ferrous).
    f. Miscellaneous construction debris.
    g. Paper or cardboard.
    h. Red clay brick.
    i. Reuse or salvage materials
    j. Soils.
    k. Wire and cable.
    l. Wood.
    m. Other (describe)
3. Miscellaneous Construction Debris: Develop and implement a program to transport loads of mixed (commingled) new construction materials that cannot be feasibly source separated to a mixed materials recycling facility.

3.02 DISPOSAL OPERATIONS AND WASTE HAULING

A. Legally transport and dispose of materials that cannot be delivered to a source separated or mixed recycling facility to a transfer station or disposal facility that can legally accept the materials for the purpose of disposal.

B. Use a permitted waste hauler or Contractor's trucking services and personnel. To confirm valid permitted status of waste haulers, contact the local solid waste authority.

C. Become familiar with the conditions for acceptance of new construction, excavation and demolition materials at recycling facilities, and prior to delivering materials.

D. Deliver to facilities that can legally accept new construction, excavation and demolition materials for purpose of re-use, recycling, composting, or disposal.

E. Do not burn, bury or otherwise dispose of solid waste on the project job-site.

3.03 RE-USE AND DONATION OPTIONS

A. Implement a re-use program to the greatest extent feasible. Options may include:

1. California Materials Exchange (CAL-MAX) is a free program sponsored by CalRecycle and is designed to help connect businesses, organizations, manufacturers, schools, and individuals with the most effective online resources for exchanging materials. Go to http://www.calrecycle.ca.gov/CalMAX/. Public Surplus is a government agency surplus

auction system used by many universities. Go to https://www.publicsurplus.com for more information.

3.04 REVENUE

A. Revenues or other savings obtained from recycled, re-used, or salvaged materials shall accrue to Contractor unless otherwise noted in the Contract Documents.

END OF SECTION

SECTION 02 41 00
DEMOLITION

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes the following:

B. Demolition and removal of existing man-made and natural elements as indicated on drawings and as required to accomplish new construction work indicated on drawings.

1.02 RELATED SECTIONS

A. Section 01 11 00– Summary of Work

1.03 DEFINITIONS

A. Protect in Place

1. Noted or called out Items or features per plan shall not be disturbed, moved, or otherwise damaged in any way that changes their original found condition. It is the Contractor's responsibility as the Site Expert to notify and report any items that are similar or require field verification of status based on the plans. Failure to request inspection and direction prior to demolition of items shall result in the total responsibility for damages or required corrective/replacement measures to be that of the Contractor. The Contractor shall mark all items for removal prior to and request inspection by Owners Representative to verify items and limits of demolition.

   All landscape plantings such as trees, shrubs, and ground cover shall be continually cared and maintained if noted as being protected in place. This includes suppling irrigation, maintenance, fertilizer, and protection from other construction activities as needed. Any decline will be deemed as damaged and will require full replacement at the cost of the Contractor.

2. Grade Around
   a. Grade Around directs the contractor to adjust as needed to blend grading per plan with the existing item. For existing features, Contractor shall adjust grading to create a natural transition from shown grades to existing feature. If site characteristics are found to be inconsistent with plans, Contractor to notify Landscape Architect immediately for clarification and direction prior to grading.

3. Avoid
   a. Contractor shall avoid all interaction with described item. This shall be treated as an exclusion zone.

B. For sites with natural features, such as stones or boulders intended to be part of final design (if not present disregard)

1. Remove: Remove and legally dispose of items as noted per the Demolition plan. Naturally occurring boulders may be found during excavation that may not be listed and shall be added to existing Boulder Contingency areas as approved by the Landscape Architect or Owners Representative.

2. Relocate: Boulders indicated as preferred or to be relocated shall be documented and recorded as such. Remove, clean, and relocate or place Boulders to protect against damage as indicated per plans.
3. Existing to Remain: Protect construction or features indicated to remain against damage and soiling during demolition.

1.04 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, relocated, reinstalled, or otherwise indicated to remain the Owner's property, demolished materials shall become the Contractor's property and shall be removed from the site with further legal disposition/disposal at the Contractor's cost.

1.05 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections, for information only, unless otherwise indicated.

B. Proposed dust-control measures.

C. Proposed noise-control measures.

D. Inventory of items to be removed and salvaged.

E. Photographs or videotape, sufficiently detailed, of existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by demolition operations.

1. Failure to properly document site pre-construction condition shall cause the final decision of damage to be that solely of the Owners Representative Opinion.

F. Record drawings at Project closeout according to Division 1 Section "Contract Closeout."

1. Identify and accurately locate capped utilities and other subsurface structural, electrical, or mechanical conditions.

G. Landfill records indicating receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes if disposal of hazardous materials is required.

1.06 QUALITY ASSURANCE

A. Demolition Firm Qualifications: Engage an experienced firm that has successfully completed selective demolition work similar to that indicated for this project with a 5 years minimum experience.

B. Regulatory Requirements: Comply with governing EPA notification regulations before starting selective demolition involving hazardous materials if found.

C. Pre-demolition Conference: Conduct conference at Project site to verify items and limits of demolition- Contractor to have all items clearly marked including extents of saw cuts, or disturbance limits.

1.07 PROJECT CONDITIONS

A. Owner assumes no responsibility for actual condition of the surroundings to be demolished.

1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

B. Contaminated Materials: Contaminated materials may be present on the site. Contractor to contact City for further information on the presence of contaminated materials. Examine any City documentation to become aware of locations where contaminated materials may be present. Refer to specification sections specific to contaminated materials for additional requirements.

C. Storage or sale of removed items or materials on-site will not be permitted

PART 2 - EXECUTION

2.01 EXAMINATION

A. Contractor shall pot hole and locate all known or identified utilities to verify depths and location prior to the start of construction if not done by others previous to project start at no cost to the Owner.

B. Verify that utilities have been disconnected and capped if present as required.

C. Survey existing conditions and correlate with requirements as indicated to determine extent of demolition/site clearing required.

D. Inventory and record the condition of items to be removed and items to be reinstalled and or salvaged.

E. When unanticipated mechanical, electrical, or structural elements that conflict with the intended function or design are encountered, investigate and measure the nature and extent of the conflict. Promptly submit a written report to the Owners Representative.

F. Survey the condition of the site to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of the structure/site features or adjacent structures/site features during demolition.

G. Perform daily surveys as the Work progresses to detect hazards resulting from demolition activities.

2.02 UTILITY SERVICES

A. Maintain existing utilities indicated to remain in service and protect them against damage during demolition operations.

B. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services serving the site to be demolished. Contractor to coordinate and pay for all fees associated with utility shut off.

1. Arrange to shut off indicated utilities with utility companies.

2. Where utility services are required to be removed, relocated, or abandoned, provide bypass connections to maintain continuity of service to other parts of the site before proceeding with demolition.

3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal the remaining portion of pipe or conduit after bypassing.

C. Utility Requirements: Refer to local utilities for shutting off, disconnecting, removing, and sealing or capping utility services. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing to the Owners Representative.

2.03 PREPARATION

A. Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with demolition operations as required.

B. Conduct demolition operations and remove debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

1. Provide alternate routes around closed or obstructed traffic ways as specified.

C. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around demolition area.

1. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
2. Protect existing site improvements, appurtenances, and landscaping to remain if present.
3. Provide temporary weather protection, during interval between demolition and removal of existing construction, on exterior surfaces and new construction to ensure that no water leakage or damage occurs to structure or interior areas.
4. Cover and protect furniture, furnishings, and equipment that have not been removed if present.

D. Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent movement, settlement, or collapse of adjacent site features as required as part of Contractors Bid.

2.04 POLLUTION CONTROLS

A. Use water mist, temporary enclosures, and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental protection regulations.

1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

B. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

C. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing before start of demolition.

2.05 DEMOLITION

A. Contractor to demolish and remove existing construction or site features as shown on the drawings and to the extent required for the installation of all new work. Use methods required to complete Work within limitations of governing regulations and as follows:

1. Proceed with demolition systematically, from higher to lower level.
2. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire- suppression devices during flame-cutting operations.

3. Maintain adequate ventilation when using cutting torches.
4. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
5. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
6. Dispose of demolished items and materials promptly. On-site storage or sale of removed items is prohibited.

B. Break up and all remove concrete as required to access under-slab plumbing, electrical work, or general removal.
   1. Contractor to bid all concrete removal to include rebar removal consistent with current structural requirements including all separation and disposal as part of bid. If none is found, or quantities are limited – Contractor shall be required to submit a credit to the Owner.

2.06 PATCHING AND REPAIRS

A. Contractor to notify Owners Representative of all damage at time of incident that will require repairs.

B. Damage will be documented and repaired at a time when the sequence is appropriate for the overall project, for example hardscape damage will be repaired after all demolition is complete- during the installation of other hardscapes operations

C. If damage causes an immediate disruption to the safety, access, or use of adjoining areas or site it shall be corrected before any further work is continued.

D. Patching and repairs will be to the satisfaction of the Owners Representative, if a section of flatwork is damaged, it shall be removed to the next control joint or expansion joint for a total replacement.

E. If the Contractor is not skilled or experienced in the type of repair work required the Owner may at the Contractors expense hire a specialist to do the work and charge to cost directly to the Contractor or deduct it from future payments.

2.07 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Promptly dispose of demolished materials on a daily basis. Do not allow demolished materials to accumulate on-site or stock pile for longer than 24 hours.

B. Contractor to separate all materials that can be recycled, and divert them from landfills to appropriate facilities for proper recycling.
   1. Contractor to report quantities and weigh tickets to Owners Representative.

C. Burning: Burning of demolished materials is prohibited.

D. Disposal: Contractor is responsible for all transport of demolished materials and the cost, fees, and permits required for legal disposal as part of the Contractors Bid.

END OF SECTION

SECTION 31 23 35

LANDSCAPE UTILITY TRENCHING AND BACKFILLING

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. Provide all labor, materials, tools, transportation, equipment and incidentals necessary to perform the work as indicated on the Plans and as herein specified.

1.02 DESCRIPTION

A. The work of this section consists of trenching and backfilling for the construction and installation of pipelines, conduit, and other buried support or encasement incidentals. All trenching will be open cut, unless previously approved by the Owners Representative.

1.03 DEFINITION

A. Materials used in backfill are defined as follows:

SIEVE SIZE	PRECENT PASSING
½ inch	100
No. 4	50-80
No. 40	10-25
No. 200	5 (maximum)

1.04 REFERENCES

A. The Standard Specifications for Public Works Construction, "Greenbook", latest edition, is reference as if herein contained and the contractor shall keep a copy at the project site. These Specifications shall supersede conflicts with information given in the "Greenbook", unless otherwise determined by the Owner or their designated representative.

B. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2014.

C. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)); 2012.

D. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2011.

E. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth); 2005.

F. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth); 2005.

1.05 QUALITY ASSURANCE:

A. All compaction testing and gradation analysis will be arranged and paid for by the Contractor. Contractor shall collect, and submit required samples of bedding, fill, and backfill materials for testing.

B. Contractor shall submit certifications/test results to the Owners Representative after completion of test.

C. Compaction of fill and backfill materials in accordance with the requirements of Section 707 of the Standard Specifications.

D. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used.

E. Compaction Density Test Reports.

1.06 PROJECT CONDITIONS

A. Arrange construction sequences to provide the shortest practical time that the trenches will be open to avoid hazard to the public, and to minimize the possibility of trench collapse.

1.07 EXCAVATION CLASSIFICATION

A. Regardless of the nature of material excavated, all excavation will be considered unclassified.

PART 2 - PRODUCTS

2.01 GENERAL

A. All backfill material shall be approved before use and be free of cinders, ashes, large hard clods, organic debris, or other deleterious items. Trench excavation materials may be used as approved.

2.02 MATERIALS FOR BACKFILLING

A. Furnish required backfill materials listed under the appropriate types of utility line in Section 703 of the Standard Specifications.

PART 3 - EXECUTION

3.01 TRENCH EXCAVATION

A. Trenching Guidelines: Excavate the trench to the approximate level of the top of the utility line to be installed, using adequate trench width and side slopes to safely accommodate worker access. Continue excavating for the utility line, to a width not greater than is shown on the appropriate trench detail.

1. Unstable Trench Bottom: Secure approval of depth of over-excavation and stabilization method. For wet trench construction, use approved method of dewatering through diversion, damming and pumping, well points, or subsoil drain systems. Dispose of removed fluidized materials as approved. Use backfill material to build a suitable foundation to within 6 inches of finished utility grade, prior to bedding with the specified material. Compact layers until unstable conditions are under control.

3.02 SHORING AND SHEETING

A. Construct and maintain all shoring, sheeting, and slope lay-back necessary to protect the excavation, as needed for the safety of the employees and as required by applicable State and Federal laws.

3.03 BACKFILLING

A. Compaction: Use vibratory compactors for sands and gravels (noncohesive soils). Use mechanical tampers for sand and gravel containing a significant portion of fine-grained material, such as silt and clay (cohesive soils). Hand tamp around pipe or cable to protect the lines until adequate cushion is attained. Puddling or water flooding for consolidation of backfill or compaction by wheel rolling with construction equipment will not be permitted.

B. Bedding: compact the specified material to 95 percent of maximum density to the finished utility grade.

C. Utility Installation: Shape the trench bottom to ensure uniform contact with the full length of the installed line and remove any sharp-edged materials that might damage the line. Compaction shall be maintained beneath the line.

D. Hand trim excavations. Remove loose matter.

E. Remove large stones and other hard matter that could damage piping or impede consistent backfilling or compaction.

F. Remove excavated material that is unsuitable for re-use from site.

G.

H. Backfill: Fill by hand placement around the utility to just over half depth, and compact in a manner to ensure against lateral or vertical displacement. Place backfill to 12 inches above the utility line by hand placement in not more than 6-inch layers. Compact each layer to 95 percent of maximum density.

   1. Backfill: Place and compact the specified material as follows:

I. Pedestrian Areas: Fill and compact in 8-inch maximum layers to 90 percent of maximum density.

J. Clean-Up: Prior to final inspection and acceptance, remove all rubbish and excess material for disposal as approved, and leave area in a neat, satisfactory condition.

K. Contractor responsible to remove all spoils as a result of trenching activities after final backfill and compaction requirements have been met.

END OF SECTION

SECTION 32 13 13
CONCRETE PAVING

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. Provide all labor, materials, tools, transportation, equipment and incidentals necessary to perform the work as indicated on the Plans and as herein specified.

1.02 SCOPE OF WORK

A. Provide all cast-in- place concrete flatwork, complete in place, as indicated on the Plans, specified herein, and needed for a complete and proper installation

1.03 RELATED WORK

A. 31 23 13 Sub Grade

1.04 REFERENCES

A. The Standard Specifications for Public Works Construction, "Greenbook", latest edition, is reference as if herein contained and the contractor shall keep a copy at the project site. These Specifications shall supersede conflicts with information given in the "Greenbook", unless otherwise determined by the Owner or their designated representative.

1.05 SUBMITTALS

A. Comply with pertinent provisions of Section 01 33 00

B. Submit all mix designs with applicable, curing methods and compounds, admixtures, color additive as noted per Plans or any requested alternatives or equal replacements for prior approval by the Owners Representative.

C. Submit color additive manufacturer's color chart & sample chip set if colored concrete is indicated per Plans; indicate color additive number and required dosage rate.

D. For all concrete, a signed copy of batch plants certificate stating the quantity of material, amount of water, admixtures, departure time and date shall accompany each load of materials as certified by a weighmaster shall be submitted to the Owners Representative.

E. Samples for Concrete Color Selection if called for by the plans: Color additive manufacturer's color chart or sample chip set; indicate color additive number and required dosage rate. Submittals are for general verification of color and may vary somewhat from concrete finished in field according to Specifications.

F. Samples for Verification of Concrete Color if called for by the plans: Sample chips of specified colors indicating color additive numbers and required dosage rates. Submittals are for general verification of color and may vary somewhat from concrete finished in field according to Specifications.

G. Aggregate samples for special aggregate blends/finishes if called for by the plans.

1.06 QUALITY ASSURANCE

A. Codes and Standards: Comply with the provisions of the following codes, specifications and standards, except where more stringent requirements are shown, specified, or required.

1. ACI 301 “Specifications for Structural Concrete for Building”
2. ACI 304 “Guide for Measuring, Mixing, Transporting and Placing Concrete”
3. ACI 316 “Recommendations for Construction of Concrete Pavements &* Concrete Bases”
4. ACI 318 “Building Code Requirements for Reinforced Concrete”
5. ACI 347 “Recommended practices for Concrete Formwork”
6. ASTM C 979 “Standard Specification for Pigments in Integrally Colored Concrete”
7. ASTM C 1315 “Standard Specifications for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete”
8. Concrete Reinforcing Steel Institute, “Manual of Standard Practice”
9. Uniform Building Code (UBC) Latest Edition

B. Qualification of Installers:

1. Throughout the progress of installation of the work of this section, provide at least one Journeyman level Supervisor who shall be thoroughly familiar with the specified requirements, completely trained and experienced in the necessary skills, and who will be present at the site and shall direct all work performed under this section.

C. Workforce:

1. Ensure proper staffing levels of required laborers to complete the installation in strict accordance with the Plans and these Specifications.

1.07 MOCK-UPS

A. Provide a (3’x3’) formed sample per each finish and or color required by plans for approval by the Owners Representative prior to start of forming.

B. Approved Mock-ups will be the standard of quality by which future paving samples will be judged.

C. Mock-ups to remain on-site and be protected during the course of construction, as a means to compare work in progress. If Mock-ups are damaged or removed, Contractor shall repair, replace and have them re-approved by the Owners Representative.

1.08 PRE-INSTALLATION MEETINGS

A. Review all layout, forms and reinforcement with the Owners Representative for final approval prior to placing concrete.

1.09 COORDINATION

A. Contractor to notify responsible and or impacted trades of the scheduled concrete pour to allow time for the correct environmental conditions, work access, and complete finishing during working hours.

PART 2 - PRODUCTS

2.01 FORM MATERIALS

A. Flatwork: 1" Exterior Masonite Siding for all Tangents. 7/16" Exterior Masonite Siding for all radii (Curves) or approved equal. Create true arc to tangent connections as per layout plan.

B. Vertical and Custom Work: Exterior grade Standard Douglas Fir (Or Equal Approved Plywood), minimum three ply, one smooth side sufficiently thick to sustain loads, or steel forms.

C. Do not use any material that creates a rough form finish, including materials with knots, splits or other defects.

D. All forms to be clean and prepped for creating smooth continuous edges, damaged, rough, or forms with previous concrete attached shall not be allowed.

E. Form Oil:

1. Non staining, paraffin- based oil having a specific gravity of between 0.8 and 0.9

F. Design of Formwork: Design and layout of formwork is the Contractors responsibility based on experience, site conditions, and current industry standards.

2.02 REINFORCING MATERIALS

A. Reinforcement shall be installed per Plans and Details

B. Deformed Reinforcing Bars: ASTM A-615, Grade 60 unless otherwise indicated

C. Welded Wire Fabric: ASTM A-185

2.03 CONCRETE MATERIALS

A. Concrete Shall have a minimum compressive strength at 28 days of 2,500 PSI unless otherwise indicated greater per the Plans.

B. Portland Cement Shall be Type I or Type II, low alkali, and shall conform to ASTM C-150

C. Concrete aggregate shall conform to ASTM C33. All aggregate shall be well graded and selected from a source that has a proven history of non-reactivity. Maximum aggregate size shall be 3/4 inch.

D. Fine aggregate shall consist of washed natural sand having hard, strong and durable particles and which does not contain more than 2% by weight of clay, loam, shale, alkali, organic matter or other deleterious substances.

E. Coarse aggregate shall consist of clean, hard, fine grained, sound crushed rock or gravel, which does not contain more than 5% by weight of flat, chip-like, thin, elongated, friable or laminated pieces. Any piece having a major dimension in excess of two and one-half (2 1/2) times the average thickness and which will adversely affect the strength of the concrete shall not be used.

F. Integral color if called for by the plans shall be

G. Water shall be Potable clean and free from deleterious amounts of acids, alkalis, and organic materials

2.04 PROPORTIONS AND MIXING

A. The concrete shall be composed of cement, sand, and coarse aggregate in the proportions as determined by the testing laboratory. Cost of any testing and mix design shall be borne by the Contractor.

B. Slump: Adjust quantity of water so concrete at time of placing does not exceed 4" of slump when tested according to ASTM C-143. Use the minimum water necessary for workability required by the area being cast.

2.05 INTEGRAL CONCRETE COLOR FINISH ADDITIVES (If called for by plans)

A. Concrete Color Additives: Provide products manufactured by Davis Colors, 7101 Muirkirk Road, Beltsville, MD 20705; ASD. Tel: (800)800-6856 or (301) 210-3400. Fax: (301) 210-4967; or 3700 E. Olympic Boulevard, Los Angeles, CA 90023; ASD. Tel: (800) 800-6856 or (323) 269-7311. Fax: (323) 269-1053; Web Site:www.daviscolors.com

B. Concrete Colors: Match colors selected by Landscape Architect from color additive manufacturer's color lines.

C. Colored Concrete Additive: Made with pure, concentrated mineral pigments especially processed for mixing into concrete and complying with ASTM C 979.

D. Admixtures: Do not use calcium chloride admixtures.

E. Concrete Mix: Mix color additives in accordance with manufacturer's instructions, until color additives are uniformly dispersed through-out mixture and disintegrating bags, if used, have dis-integrated.

2.06 EXPOSED AGGREGATE FINISH MATERIALS (If called for by plans)

A. Surface Retarder: Water based top-surface retarder designed to retard the setting (hydration) of the upper layer of cement paste, producing an exposed-aggregate appearance of the concrete surface. Surface retarder shall be Grace TopCast 15/ Yellow or approved equal.

B. Aggregate: This project will require a multi-step aggregate seeding process to achieve the intended aesthetic effect. Aggregates to be surface seeded include the following:

1. "Birdseye Brown" Pebbles – 1/4" size.

   Available from Decorative Stone Solutions (800) 699-1878 or approved equal.

   Surface Application Rate: 200 lbs. per 100 SF

C. Curing/Sealing Compound (Exposed Aggregate areas ONLY): Wet-Look Penetrating Surface Sealer by Seal Krete (800) 323-7357 or approved equal. Application Rate: 1 gallon per 150 SF.

2.07 EXPANSION JOINTS

A. Provide expansion joints at 50' O.C. maximum, equally spaced unless otherwise shown in the Plans.

B. Joint Filler: Use non- extruding, compressible and resilient, closed cell joint filler of neoprene foam conforming to ASTM D-1753, Type RE-42. Joint fillers that contain or have been treated with oil, grease or bituminous materials are prohibited. Test joint fillers for compatibility with proposed sealant.

1. Acceptable joint filler: Neoprene Sponge Rubber joint filler by Burke Company, or other approved equal

2. Joint Sealant: ASTM C-920, Grade NS, Class 25, Type M; Multi- Component chemical curing, non-staining, non- bleeding, capable of continuous water immersion, non-sagging type; color to be selected. Product to be Sika-Flex 01C SL or approved equal.

C. Preformed Expansion Joint Strips: Seal tight Expansion Joint with Snap Cap, by WR Meadows Inc. or approved 1/2" wide vinyl joint strip with removable cap.

D. Contractor to provide expansion joints around installed site features as needed to limit cracking and control expansion/ contraction of other installed materials.

E. Provide control joints per at 10' O.C. maximum, equally spaced unless otherwise shown on the Plans.

1. Control joints shall be tooled and shall have a depth of 25% of the Concretes thickness unless.

PART 3 - EXECUTION

3.01 FORMS

A. Design, erect, support, brace and maintain formwork to support vertical and lateral loads that might be applied until such loads can be supported by concrete structure. Construct formwork so concrete paving is the correct size, form, alignment, elevation and position. Comply with ACI 347

B. Forms shall extend 1-1/2" below finish grade for all flatwork

C. Curves shall be true to layout without any deforming, bulges or deflections to the curve due to a lack of support or improper forms.

D. No flatwork shall be installed at any width under 12" wide to protect against weak connections and cracking. For example, where any curves if present are adjoining or terminating into other flatwork the end of the curve shall be formed to be part of the larger adjoining piece rather than the end or sliver of a portion next to it/adjacent.

E. Design and fabricate formwork to be readily removable without impact, shock or damage to cast-in-place concrete surfaces and adjacent materials.

F. Provide openings in formwork to accommodate work of other trades, accurately place and securely support any items to be embedded into the concrete.

G. Set and build into the work anchorage devices and other embedded items required for other work that is attached to, or supported by cast-in-place concrete. Use setting, diagrams, templates and instructions provided by others for locating and setting. It is the Contractors responsibility to coordinate all trades, schedules, and delivery of items to allow for installation at the time of placing the concrete.

H. Contractor to coordinate with all trades that will require sleeves under flatwork such as but not limited to electrical, plumbing, communications, landscape and irrigation.

3.02 PLACING CONCRETE

A. Preplacement Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast-in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten wood forms immediately before placing concrete.

B. Coordinate the installation of joint materials with the placement of any required forms and reinforcing steel.

C. The location of all stoppages shall be approved by the Owners Representative if not made at a designated expansion joint or edge per Plan.

D. Install concrete and cement finish work true to lines, dimensions, levels, and finish with smooth unblemished surfaces per finishes specified on Plans.

E. Responsibility for the proper placing, compacting and finishing is the sole responsibility of the Contractor.

F. Comply with ACI 304, placing concrete in a continuous operation within planned joints or sections. Do not begin placement until work of other trades affecting concrete is completed.

G. Protect concrete from physical damage or reduced strength due to weather extremes during mixing, placement and curing.

1. In cold weather (40 degrees and below) comply with ACI 306
2. In hot weather (80 degrees and above) comply with ACI 305
3. Use water reducing set retarding admixtures in such quantities as recommended by manufacturer to assure concrete remains workable.

3.03 CONCRETE FINISH (Medium Broom Finish)

A. Compact, tamp and screed concrete as specified to bring 3/8" of mortar to surface, wood float to straight edges and screeds, and apply finishes. Do not use steel or plastic floats of any kind for initial floating operations. Unless otherwise specified, do not apply finishes until surface water disappears and surface is sufficiently hardened. Remove any bleed water and laitance as it appears.

B. Use a steel power trowel for continuous areas over 8' wide.

1. Leave finish essentially free of trowel marks, uniform in texture and appearance.
2. Finish shall be true to grade and plane to maximum allowable tolerance or less.

C. No wetting of concrete surfaces during placement operations shall be permitted. Further, no concrete finishing operation shall be permitted while there is water on the surface of flatwork.

D. Finishes that are exposed and subject to foot traffic shall receive a broom finish perpendicular to travel with a texture of plus or minus three- sixty fourth (+/- 3/64) inch or as designated on the Plans.

E. All edges adjoining landscape areas shall have a troweled radius of ¾"

F. All flatwork shall drain positively away from buildings, whether indicated on the drawings or not.

1. Any condition which may result in water standing or flowing adjacent to buildings or structures shall be brought to the attention of the Owners Representative before placing concrete.
2. Plane Surface Tolerance: Exterior – Class AX, 3/16in. with no ponding.

3.04 EXPOSED AGGREGATE FINISH (If called for by plans)

A. Finish slab surface per manufacturer's recommendations for exposed aggregate finish(es) indicated.

B. Immediately after substrate surface has been leveled and wood floated, before bleed water has appeared, add the selected Pebbles at the application rate indicated in Part 2.06 evenly while there is sufficient moisture in the slab to saturate the pebble layer. Troweling must be started early enough to complete all operations without use of additional water on the surface.

C. Distribute the granules in three separate shake coats. Use one-third (1/3) of the required quantity of granules for the first application. Apply second application slightly after the first application is floated. Do not throw the granules or broadcast them with a shovel. Use an evenly distributed hand broadcast.

D. Lightly trowel granules into surface after each shake coat. After the second shake coat of granules have been troweled once, sprinkle the third coat over the surface. The surface must be uniformly coated. Use a steel trowel to leave grains at surface covered with a thin film of cement paste.

E. The final finish may be lightly troweled to produce a smooth surface free from defects or blemishes. Finish troweling shall be delayed until surface has set sufficiently to avoid burying the granules, but must be accomplished before finish has hardened.

F. General: Follow all manufacturer's recommendations and written instructions when applying surface retarder.

G. Mixing: Mix surface retarder thoroughly prior to each use.

H. Application:

1. Begin application while slab is still wet, after the evaporation of all bleed water from the surface.
2. Apply surface retarder using low pressure sprayer to produce an even, continuous coating
   a. Follow manufacturer's recommended coverage rate; do not under-apply
3. Comply with manufacturer's recommendations regarding rain protection until material is dry.
4. Removal:
   a. Begin removing retarded cement matrix after dwell time recommended by manufacturer, adjusted for field conditions. Unless field conditions substantially differ from those under which acceptable mockup was produced, begin removal after same time period as was used for mockup.
   b. Remove cement matrix with 25-degree nozzle power washer.
      1) Stiff bristle broom or mechanical scrubber may be used as a supplementary means of removal.
      2) Take care not to mechanically remove more material than intended by using overly aggressive methods.
      3) Landscape Architect or Owners Representative shall be in attendance & observe all removal operations.
5. Sealing (Exposed Aggregate only):
   a. Sealer: Apply two (2) coats of surface sealer to slab after curing/sealing compound has dried.
   b. Clean surface of dirt, dust, and debris prior to application.
   c. Coverage:

1) First Coat: 200 – 300 sq. ft. per gallon.
2) Second Coat: 400 – 600 sq. ft. per gallon

3.05 CURING

A. Curing Methods: Performing curing of concrete by moist curing, by moisture retaining cover curing, by liquid curing compound, and or by combination thereof, as herein specified or as approved by the Owners Representative.

B. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

C. If moist curing:

1. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Keep continuously moist for not less than 7 days,

2. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 301 procedure. Avoid rapid drying at end of the final curing period.

D. Curing Compound: ASTM C-309, non-staining, all resin type, white pigmented, compatible with any color admixture if called for.

1. Acceptable Product: Burke Aqua Resin Cure or equal.

2. Apply compound to form a continuous, uniform, coherent film that will not check, crack, or peel as directed by Manufactures instructions.

3. Contractor to remove all cure agent from concrete surface with power washing equipment and soft brush not causing abrasion to finish work surface per manufactures recommendation.

3.06 REMOVAL of FORMS

A. Remove forms in accordance with ACI 347-68

3.07 RE-USE of FORMS

A. Clean and repair surfaces to be reused in the work after each application. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable. Apply new form coating compound material to concrete surfaces as specified for new formwork.

3.08 PROTECTION OF WORK

A. The Contractor bears the sole responsibility to protect all work in place from vandalism, damage and or weather, if forecasted to occur during placing or curing period. Any damage that occurs will be repaired or replaced per the direction of the Owners Representative at no cost to the Owner in compliance with these specifications herein.

3.09 DEFECTS

A. All surface defects including, cracking, honeycomb and voids shall be repaired and patched so that finish matches local accepted area in color and texture to the satisfaction of the Owners Representative. Permission to patch any defective area shall not be a waiver of the right of the Owner to require complete removal of defective work if patching does not restore quality and appearance of work.

B. If surface repairs are not acceptable, the Contractor shall cut, remove and replace the entire area to nearest existing control joints.

C. Concrete work not found formed as indicated, not true to intended alignment, not plumb, level, or true to intended grades, embedded with foreign material or debris, and or not fully conforming to the provisions of these specifications shall be deemed defective and shall be removed from the job site as directed by the Owners Representative. Replacement concrete shall comply with all specification requirements, with all costs, additional time, inspection fees being the sole responsibility of the Contractor.

3.10 FIELD QUALITY CONTROL

A. Inspections will be provided as necessary by the Owners Representative. Call for inspection 48 hrs. in advance.

B. The contractor shall call for required inspections for the following tasks

1. Sub grade/ layout prior to forming
2. All completed formwork prior to pouring
3. After final curing

3.11 CLEAN UP

A. Contractor is responsible to remove all surplus construction materials, debris, overpour and trash throughout installation. Voids from form work shall be filled and compacted to surrounding levels, any sleeving that was installed shall be marked with stake and flagging.

END OF SECTION

SECTION 32 31 16

METAL FENCES AND GATES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Ornamental welded steel fence system.

1.2 RELATED SECTIONS

A. Section 03 31 00 – Footings and Foundations.

B. Section 05 50 00 – Metal Fabrications

1.3 REFERENCES

A. American Society for Testing and Materials International (ASTM).
1. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
2. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus.
3. ASTM D523 - Standard Test Method for Specular Gloss.
4. ASTM D714 - Standard Test Method for Evaluating Degree of Blistering of Paints.
5. ASTM D822 - Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.
6. ASTM D1654 - Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.
7. ASTM D2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
8. ASTM D2794 - Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
9. ASTM D3359 - Standard Test Methods for Measuring Adhesion by Tape Test.
10. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
11. ASTM F1908 - Standard Guide for Fences for Residential Outdoor Swimming Pools, Hot Tubs, and Spas.
12. ASTM F2049 - Standard Safety Performance Specification for Fences/Barriers for Public, Commercial, and Multi-Family Residential Use Outdoor Play Areas.
13. ASTM F2408 - Standard Specification for Ornamental Fences Employing

Galvanized Steel Tubular Pickets.

B. American Welding Society (AWS): AWS D1.1 - Structural Welding Code - Steel

C. U.S. Consumer Product Safety Commission (CPSC). 2008. Public playground safety handbook. Bethesda, MD: CPSC. http://www.spcs.gov/cpscpub/pubs/325.pdf

1.4 SUBMITTALS

A. Submit under provisions of Section 01 33 00 – Submittals Procedures.

B. Manufacturer's printed product information indicating material compliance and specified options are to be submitted prior to installation. Submit manufacturer's product data sheets on each product to be used.

C. Submit under provisions of Section 01 33 23 – Shop Drawings.

D. Shop drawings shall include plans, elevations, sections, details, and attachments to other work. Drawings must be submitted for approval and be approved prior to installation.

E. Design data which verifies compliance with design loads specified in Performance Requirements Article. Design data shall be signed and sealed by the qualified professional engineer responsible for their preparation.

F. Submit samples for initial color selection. Submit samples of each specified finish.

1.5 QUALITY ASSURANCE

A. Manufacturing company with engineering and fabrication of custom fencing and gate systems for a minimum of 10 years.

B. Installation company with experienced in manufacturer's products for a minimum of 5 years. The Contractor shall provide trained laborers with prior experience in the type of construction involved as well as experience installing the materials and techniques specified.

C. Obtain each fence system and gates through one source from a single manufacturer.

D. Provide samples of full-size special design features such as finials, caps, rings, leaf's, decorative vining, etc. if called for by the Plans.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Upon delivery to the jobsite, inspect all materials for damage that might have occurred during shipment.

B. Handle and store materials in manufacturer's packaging until materials are ready to be installed. Store materials in such a way as to prevent damage and theft.

1.7 PROJECT CONDITIONS

A. Verify actual locations of walls and other construction contiguous with fencing and gates by field measurements before fabrication and indicate measurements on shop drawings. Provide allowance for trimming and fitting onsite.

1.8 COORDINATION AND SCHEDULING

A. Coordinate installation of anchorages for fencing and gates. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors that are to be embedded in concrete or masonry. Deliver such items to the Project Site in time for installation.

B. Schedule installation so wall attachments are made only to completed walls. Do not support systems temporarily by any means that do not satisfy structural performance requirements.

1.9 WARRANTY

A. Manufacturer's Warranty: Provide manufacturer's standard 20 year limited warranty, from the date of purchase, against defects in materials and workmanship including protection against cracking, peeling, blistering, and corrosion (rusting).

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. FenceWorks 951-788-5620

2. Valley Cities Fence 951-735-1145

3. Country Estate Fence 800-289-0999

4. Or Approved Equal demonstrating similar experience and capability

2.2 SITE FENCING AND GATES

A. Ornamental Welded Steel Fence:
   1. Basis of Design: per Plans and Details
      a. Fence Panels:
         1) Height: As indicated on the Drawings.
      b. Materials:
         1) Posts shall be cold-rolled steel formed and welded tubing with a Grade A minimum tensile strength of 45,000 psi (310 MPa) conforming to ASTM A653, have a G60 zinc coating, 0.60 oz./ft2 (0.18 kg/m2) in accordance with ASTM A653, and have a

powder-coated factory finish.

c. Components: The following are to be used as the minimum base only if not called out on the Plans.
   1) Rails: 1-1/2 inch (38 mm) square, 16 gauge.
   2) Pickets: 3/4 inch (19 mm) square, 19 gauge.
   3) Posts: 2-1/2 inch (63.5 mm) square, 16 gauge.
   4) Posts: 3 inch (76 mm) square, 14 gauge.

d. Gates: Provide manufacturer's standard gates and hardware unless called out specifically on the plans.

e. Fabrication:
   1) Fence Panels: Fabricated in standard length of 90-1/2 inches unless called out specifically on the plans. Comply with requirements indicated for materials, thickness, design and details of construction.
   2) Welded connections shall comply with AWS standards for recommended practice in shop welding.
   3) Components shall be accurately cut and drilled to receive hardware, fasteners, and accessories.
   4) Fence panel shall be capable of meeting structural test load capabilities for a commercial fence system referenced in table 2 of ASTM 2409.
   5) Fence panel shall be capable of meeting coating performance requirements in table 3 of ASTM 2409.

2. Finish:
   a. Materials are coated with the Fortress Guard process including galvanization, zinc phosphate, and architectural grade powder coat.
   b. Metal parts shall be assembled and finished individually prior to shipment.
   c. Galvanized steel fence components shall be cleaned with a non-petroleum solvent followed by the application of a sealing zinc phosphate coating.
   d. Immediately after sealing, a powder finish coating is applied by the electrostatic spray process. This consists of a thermosetting carboxyl polyester resin top coat with a minimum dry film thickness of 50 microns.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions under which the work is to be installed, and notify the Contractor in writing, with a copy to the Owner and the Architect, of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Stake layout showing locations of gates and posts per submitted shop drawings.

B. Owners Representative shall verify location of fence line, gates, and openings.

C. Contact applicable authorities and take necessary precautions prior to beginning any excavation work.

3.3 INSTALLATION

A. Install fences in accordance with manufacturer's written instructions and in accordance with authorities having jurisdiction. Installation shall conform to the specifications referenced elsewhere in this Section and as indicated on the Drawings.

B. Refer to Division 3 for concrete specification. Recommend minimum 28 day compressive strength of 3,000 psi (20 MPa). Crown concrete at top to shed water.

C. On-center post spacing per manufacturer's drawings.

D. For non-level installations the on-center post spacing must be measured along the grade. Ensure that fence sections are parallel to grade within 1/4 inch (6mm) in 12 feet (3658 mm).

E. Install brackets onto fence section and posts as indicated in manufacturer's printed instructions for specific fence style. Attach fence sections to brackets with approved fasteners and techniques.

F. Install gate in accordance with manufacturer's printed instructions and approved signoff drawings. Do not mount gate from wall of a structure. Provide gate post on both sides of a gate. For double drive gate installation, provide concrete center drop to foundation depth and drop rod retainers at center. Lubricate to ensure smooth operation and verify proper latch operation.

3.4 CLEANING

A. Remove cutting and drilling chips that are attached to the fencing, post, brackets, or additions to prevent corrosion.

B. Repair scratches and other installation-incurred damage using manufacturers recommended paint. Use paint of the appropriate color with a zinc additive to prevent rust from forming.

C. Clean up debris and unused material, and remove from site.

3.5 PROTECTION

A. Protect finishes from damage during construction period with temporary protective coverings approved by manufacturer. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in field to shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION

SECTION 32 84 00

PLANTING IRRIGATION

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. Provide all labor, materials, tools, transportation, equipment and incidentals necessary to perform the work as indicated on the Irrigation Plans and as herein specified.

1.02 SCOPE OF WORK

A. Irrigation materials and equipment.

B. Installation standards.

C. System location and layout.

D. Excavation and backfill.

E. Installation of pipe, equipment, and appurtenances.

F. Water flow meters.

G. Field quality control – Coverage Tests.

H. Plant establishment period.

I. Clean up.

1.03 RELATED SECTIONS

A. Related work specified elsewhere:

1. 01 33 23 - Shop Drawings, Product Data, and Samples
2. 32 90 00 – Planting

1.04 REFERENCES

A. The Standard Specifications for Public Works Construction, “Greenbook”, latest edition at the time of Bid, is reference as if herein contained and the contractor shall keep a copy at the project site. These Specifications shall supersede conflicts with information given in the “Greenbook”, unless otherwise determined by the Owner or their designated representative.

B. American Society for Testing and Materials (ASTM):

1. ASTM A53	Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
2. ASTM D1557	Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2700 kN-m/m3))
3. ASTM D1784	Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
4. ASTM D1785	Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120

5. ASTM D2241 Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR-Series)

6. ASTM D2464 Specification for Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80

7. ASTM D2466 Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40

8. ASTM D2564 Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems

C. California Code of Regulations, Title 24:

1. Part 3 California Electrical Code

D. Underwriters Laboratories Inc. (UL):

1. UL 651 Schedule 40 and 80 Rigid PVC Conduit.

1.05 VERIFICATION OF DIMENSIONS

A. Dimensions are approximate, before proceeding with any work, Contractor shall verify all dimension and shall immediately inform the L.A. and owner of any discrepancies between the drawings and/or specifications and actual field conditions. No work shall be done in any area where there is such a discrepancy until approval has been given by L.A. and owner. Any work done without notification and prior approval will be the sole responsibility of the Contractor to remedy as required by L.A. and Owner.

1.06 SUBMITTALS

A. Existing Static water pressure/ Water service size verification:

Static water pressure on site shall be recorded with an accurate liquid filled gauge capable of measuring 0-200 PSI (Winters PFQ806LF or equal). Measurements shall be taken as early as possible per available source and at a time no other distribution devices are actively running. Contractor to document readings in writing on Contractors form that list time & date, reading in PSI, location, and type of gauge used in addition to date stamped photographs of readings. Contractor to document all points of service including both potable and recycled. Final results shall be submitted to the Owners representative prior to purchase of equipment.

B. Materials List:

1. Complete material list shall be submitted prior to performing any work. Catalog data and full descriptive literature must be submitted whenever the use of the item is different than those specified is requested. Notarized certificate must be submitted by plastic pipe and fitting manufacturer indicating that material complies with specifications, unless material has been previously approved.

2. Material list shall be submitted using the following format (double spaced between each item):

Item	Description	Manufacturer	Model
1.	Pressure Pipe	Lasco	Sch. 40
2.	Lawn Head	Rainbird	1804-SAM-PRS
Etc.	Etc.	Etc.	Etc.

C. Record Drawings:

1. Record accurately on one set of contract drawings all changes in the work constituting departures from the original contract drawings daily including noting when work was done.
2. The changes and dimensions shall be recorded in a legible and workmanlike manner to the satisfaction of the Owners Representative. Prior to final inspection of work, submit record drawings to Owners Representative for approval.
3. Dimensions shall be from two permanent points of reference (buildings, monuments, sidewalks, curbs, pavement, etc.). Data to be shown on record drawing shall be recorded day to day as the project is being installed. All lettering on drawings shall be minimum 1/8 inch in size.
4. Show locations and depths of the following items:
    a. Point of connection.
    b. Routing of sprinkler pressure lines (dimension maximum 100 feet along routing)
    c. Gate valves/ Isolation valves.
    d. Sprinkler control valves.
    e. Quick coupling valves.
    f. Routing of control wires.
    g. Related equipment (as may be directed).
5. Maintain record drawings on-site at all times. Upon completion of work, transfer all as-built information and dimensions to clean blackline prints for reproduction.

D. Operation and Maintenance Manual: Operation and Maintenance Data, for submittal requirements. As a minimum, provide operation and maintenance instructions for the following items:

1. Electric Remote-Control Valves (including master control valves);
2. Satellite Irrigation Controllers;
3. Water Flow Meters; and
4. Irrigation Controller Software.

1.07 QUALITY ASSURANCE

A. The landscape irrigation system shall consist of a completely automatic, electrically-controlled bubbler, drip, and spray-irrigation system. The system shall be installed to provide complete coverage with minimum maintenance. The irrigation system shall be installed to prevent overspray onto walks and structures.

B. The irrigation system shall avoid conflicts with plant materials, lighting standards, sign posts, architectural features, above and below ground utilities, and drainage system. Contractor responsible for coordination with other trades to verify acceptable locations to avoid conflicts.

C. Irrigation piping layout is schematic, showing location of pipes and fittings close to landscape areas is not always possible graphically. All equipment shall be located inside the landscape areas.

D. Plant establishment period is specified in Section 32 93 00 – Plants.

1.08 SEQUENCING AND SCHEDULING

A. Contractor to coordinate layout and installation of irrigation sleeves, conduits, and piping under paved areas and other features prior to their construction.

B. Coordinate installation of irrigation system with excavation of planting beds and backfilling of planting beds with topsoil. Refer to Section 32 90 00, Planting, for requirements. Typically, the irrigation system shall be installed after planting beds have been excavated and backfilled with topsoil.

C. The irrigation system shall be installed and tested prior to installation of plant material. Coordinate layout and installation of irrigation system with location and installation of plant material to assure that there will be complete and uniform irrigation coverage of planting as indicated.

D. Tree locations shall be staked in the field prior to installation of irrigation pipe and heads. Refer to the plant list on the Contract Drawings for plant setbacks and spacing requirements.

1.09 EXISTING UTILITIES

A. Existing utilities and conditions: Prior to cutting into the soil, locate all cables, conduits, sewer lines, septic systems, and other utilities commonly encountered underground and take proper precautions not to damage or disturb such improvements. If a conflict exists between such obstacles and the proposed work, promptly notify the L.A. and Owner who will give direction. Proceed in the same manner if a rock layer or any other conditions encountered underground make changes advisable.

1. Where investigation of subsurface conditions has been made by a qualified body in areas in which local materials may be obtained, the Contractor may request the use of such information but will be solely responsible for its verification and accuracy

2. It is the Contractors sole responsibility to verify any located or demarked utilities via pot holing or other method prior to start of excavation. Failure to do so will result in all damages being the sole responsibility of the Contractor.

1.10 INSPECTIONS

A. Inspections will be required for:

1. Pressure test of irrigation main line.

2. Coverage test.

3. Final inspection/start of maintenance. Final inspection shall be performed by the Owners Representative and Landscape Architect or certified water auditor.

4. Manufacture certification, for warranty, verification of installation per manufacture requirements.

5. Final acceptance.

B. Inspection Requests:

1. Contractor shall notify the Owners Representative and Landscape Architect in advance for requesting all inspections as follows:

   Pressure supply line installation and testing - 36 hours (1- 2 working days)

   System layout - 36 hours (1- 2 working days)

Coverage Tests - 36 hours (1- 2 working days)

Final Inspection - 48 hours (2 working days)

2. When inspections have been conducted by other approved personnel, the Contractor shall show evidence in writing of when and by whom these inspections were made including a signature of the referenced Inspector.
3. No inspection will commence without "record" prints. In the event the Contractor calls for an inspection without up to date "record" prints, without completing previously noted corrections, or without preparing the system for inspection, the inspection will be canceled and the Contractor back charged for the direct costs of all Owners Representative time and consultant time lost.

C. Closing in Uninspected Work:
1. Do not allow or cause any of the work of this section to be covered up or enclosed until it has been inspected, tested, and approved by the Owners Representative.
2. Any additional inspections required due to the Contractors actions, such as failing to have work inspected or covering it prior will- result in additional inspections charged by the current hourly rate of the Landscape Architect or Certified Irrigation designer/Auditor including travel time and expenses.

D. Coverage Test/ Adjustments:
1. When the sprinkler system is completed, Contractor shall perform a coverage test in the presence of the Owners Representative and the Landscape Architect to determine if the water coverage for planting areas is complete and adequate. This test shall be accomplished before any planting.
2. Any adjustment required for proper coverage shall be the Contractors Responsibility, and shall include field adjustments and additions as needed to head layout as directed by the Landscape Architect. All additional cost associated with final system tunning and adjustments shall be the Contractors Responsibility.

E. Hydrostatic Tests:
1. All pressure lines shall be tested under a hydrostatic pressure of 150 psi for a period of not less than two hours or per local governing regulation- whichever is greater.
2. All hydrostatic tests shall be made in the presence of the Owners Representative. No pressure line shall be backfilled until it has been inspected, tested, and approved in writing.

F. Contractor shall furnish necessary force pump and all other test equipment.

1.11 TURNOVER ITEMS

A. Controller Charts:
1. Record drawings must be approved by Owners representative before charts are prepared.
2. Provide one controller chart for each automatic controller. Chart shall show the area covered by controller.
3. The chart is to be a reduced copy of the actual "record" drawing. In the event the controller sequence is not legible when the drawing is reduced, it shall be enlarged to a readable size.

4. Chart shall be a blackline print with a different color used to show the area of coverage for each station.
5. When completed and approved, the chart shall be hermetically sealed between two pieces of plastic, each piece being a minimum 20 mils in thickness.

B. Operation and Maintenance Manuals:

1. Two individually bound copies of operation and maintenance manuals shall be delivered to the Owners Representative 10 calendar days prior to final inspection. The manuals shall describe the material installed.
2. Each complete, bound manual shall include the following information:
   a. Index sheet stating Contractor's address and telephone number, duration of guarantee period, list of equipment including names and addresses of local manufacturer representatives.
   b. Complete operating and maintenance instructions for all equipment.
   c. Spare parts lists and related manufacturer information for all equipment.

C. Equipment:

1. Supply as part of this contract the following items:
   a. 4 additional sprinkler heads of each type and spray pattern shown.
   b. Two (2) wrenches for disassembly and adjustment of each type of sprinkler head involved.
   c. 10 additional drip emitters of each type and flow rate shown.
   d. 25’ of each type of drip tubing used per plan, and 6 of each fittings used.
   e. Two keys for each automatic controller.

D. Contractor to verify with the Owners Representative what type of padlocks and keys are required for enclosures that can be padlocked. Each locking mechanism must have 4 copies of the correct key for turnover to the Owners Representative. Depending on actual enclosures per plan this includes locks for gates, any needed chains/cables, and other security instruments for the protection of Irrigation equipment.

1.12 GUARANTEE

A. General:

The entire sprinkler system, including all work done under this contract, shall be guaranteed against all defects and fault of material and workmanship for a period of one (1) year following the filing of the Notice of Completion. All materials used shall carry a manufacturer's guarantee of one (1) year.

Should any problem with the irrigation system be discovered within the guarantee period, it shall be corrected by the Contractor at no additional expense to the Owner within ten (10) calendar days of receipt of written notice from the Owners Representative. When the nature of the repairs as determined by the Owners Representative constitute an emergency (e.g. broken pressure line) the Owner may proceed to make repairs at the Contractor's expense. Any and all damages to existing improvement resulting either from faulty materials or workmanship, or from the necessary repairs to correct same, shall be repaired to the satisfaction of the Owners Representative by the Contractor, all at no additional cost to the Owner.

B. Form of Guarantee: Guarantee shall be submitted on Contractors own letterhead as follows:

FORM OF:

GUARANTEE FOR SPRINKLER IRRIGATION SYSTEM

We hereby guarantee that the complete irrigation system we have furnished and installed is free from defects in materials and workmanship, and the work has been completed in accordance with the drawings and specifications. We agree to repair or replace any defects in materials or workmanship which may develop during the period of one year from date of filing of the Notice of Completion and also to repair or replace any damage resulting from the repairing or replacing of such defects at no additional cost to the Owner. This shall include all defects and failures in workmanship and the results of such issues such as trench settling, erosion as caused by failures or defects, and including plant replacement. We shall make such repairs or replacements within 10 calendar days following written notification by the Owners Representative. In the event of our failure to make such repairs or replacements within the time specified after receipt of written notice from the Owners Representative, we authorize the Owner to proceed to have said repairs or replacements made at our expense and we will pay the costs and charges therefore upon demand.

PROJECT: _____

LOCATION: _____

SIGNED: _____

ADDRESS: _____

_____

PHONE: _____

PART 2 - PRODUCTS

2.01 GENERAL

A. Materials and or equipment installed or furnished shall be new and in pristine condition. Materials that have faded, are dirty, or have been improperly stored will be rejected and shall be removed from the site and replaced at no expense to the Owner.

B. All materials shall be stored per manufactures recommendation and protected from, weather, construction activities, and vandalism/theft.

2.02 PIPE

A. Pressure supply line from point of connection through backflow prevention unit shall be Type ‘K’ brass or copper pipe.

B. Pressure supply lines 2-1/2 inches in diameter and up to 6 inches in diameter downstream of backflow prevention unit shall be Class 315 solvent weld PVC.

C. Pressure supply lines 2 inches in diameter and smaller downstream of the backflow prevention unit shall be Schedule 40 solvent weld PVC.

D. Non-pressure lines shall be Schedule 40 solvent weld PVC.

2.03 COPPER PIPE AND FITTINGS

A. Copper pipe shall be Type 'K', hard tempered ASTM B 88 and fittings shall be wrought solder joint type in accordance with ANSI B16.22.

B. Joints shall be soldered with silver solder, conforming to ASTM B206.

2.04 BRASS PIPE AND FITTINGS

A. Brass pipe shall be 85 percent red brass, ANSI, Schedule 40 screwed pipe.

B. Fittings shall be medium brass, screwed 125-pound class.

2.05 GALVANIZED STEEL PIPE AND FITTINGS

A. All galvanized steel pipe shall be Schedule 40, threaded, coupled, and hot-dipped galvanized, and shall comply with the requirements of ASTM A 120-66 or ASTM A 53-67.

B. All fittings for galvanized steel pipe shall be 150-pound rated galvanized malleable iron, banded pattern.

C. Pipe sizes indicated on the drawings are nominal inside diameter, unless otherwise noted.

2.06 CONDUIT

A. Conduit: Provide rigid non-metallic conduit conforming to UL Standard No. 651 for rigid non-metallic conduit, such as Schedule 40 PVC conduit, unless otherwise indicated.

2.07 PLASTIC PIPE AND FITTINGS

A. All plastic pipe shall bear the following markings: manufacturer's name, nominal pipe size, schedule or class, type of material, pressure rating in psi, NSF seal of approval, and the date of extrusion.

B. All plastic pipe shall be extruded of an improved PVC virgin pipe compound.

C. Rubber gasket PVC pipe, couplings, and fittings shall conform to ASTM D 1784 Type I, Grade I, 2,000-psi design stress. Couplings, rubber gaskets, and fittings shall be as approved by the pipe manufacturer.

D. Ring-type rubber gasket couplings shall permit a 5 degree deflection of the pipe at each coupling (2-1/2 degree each side) without exfiltration or infiltration, cracking or breaking.

E. All fittings shall be standard weight Schedule 40 and shall be injection molded of an improved PVC fitting compound. Threaded plastic fittings shall be injection molded. All tees and ells shall be side gated.

F. When connection is plastic to metal, male adapters shall be used. The male adapter shall be hand tightened, plus one turn with a strap wrench. Joint compound shall be nonhardening sealing compound compatible with plastics. Compound must not lubricate the joint.

G. All threaded nipples shall be standard weight Schedule 80 with molded threads.

H. All solvent cementing of plastic pipe and fittings shall be a two-step process, using primer and solvent cement applied per the manufacturer's recommendations. Cement shall be of a fluid consistency, not gel-like or ropy.

I. Solvent cementing shall be neat and demonstrate quality workmanship- Primer and Glue shall not be used in excess or applied in a way to affect the portions of the pipe that are not part of the actual connected joint. Any joints with excessive runs/drips, trails, or globing of Glue and or Primer shall be cut out in whole and replaced at cost by the Contractor until an acceptable professional product is completed and accepted by the Owners Representative.

2.08 BACKFLOW PREVENTION UNITS

A. The backflow prevention unit shall be as indicated on the drawings.

2.09 BACKFLOW PREVENTION ENCLOSURE

A. The backflow prevention device enclosure shall be as indicated on the drawings or approved equal. Install one for each backflow device.

2.10 BOOSTER PUMP

A. The Pump unit shall be as indicated on the drawings if required.

2.11 VALVES

A. Gate and Ball Valves:

1. Ball valves 2 inches or smaller shall have screwed joints and brass bodies.
2. All gate valves larger than 3 inches in diameter shall have 2-inch-square operating units and have an arrow cast in the metal indicating the direction of opening. Valves shall have iron body and be bronze mounted.
3. All gate valves larger than 2 inches and up to 3 inches in diameter shall conform to (1) or (2) above.
4. All gate valves shall have a minimum working pressure of not less than 150 psi and shall conform to AWWA standards.

B. Quick Coupling Valves:

1. Body of valves shall be brass with a wall thickness guaranteed to withstand normal working pressure of 150 psi without leakage. Valves shall have 3/4-inch female threads opening at base, with two-piece body. Construct valves to be operated only with a coupler, designed for that purpose. Coupler is inserted into valve and a positive, watertight connection shall be made between coupler and valve. Hinge cover shall be brass with a yellow rubber-like vinyl cover bonded to it.

C. Remote Control Valves:

1. Valves shall be spring-loaded, self-cleaning, packless diaphragm activated, of a normally closed type.

2.12 VALVE BOXES

A. Valve boxes shall be fabricated from a durable, weather-resistant plastic material resistant to sunlight and chemical action of soils.

B. The valve box cover shall be secured with a hidden latch mechanism or bolts.

C. The cover and box shall be capable of sustaining a load of 1,500 pounds.

D. Valve box extensions shall be by the same manufacturer as the valve box.

E. Gate valve boxes shall be round plastic boxes with bolt-down covers marked "GV," heat branded in 2" high characters; AMETEK or approved equal.

F. Remote control valve boxes shall be rectangular plastic boxes with bolt-down covers marked "RCV"; and with the valve identification number heat branded in 2" high characters; AMETEK or approved equal.

G. Colors of boxes shall be green unless otherwise called out by the plans.

H. Valve boxes shall be sized to fit all equipment with ample room for operation and any required maintenance tasks, Contractor to adjust as needed per field conditions and final assembly of components at no additional cost.

2.13 AUTOMATIC CONTROLLER

A. Automatic controller shall be as called for on the plans.

2.14 ELECTRICAL

A. All electrical equipment shall be NEMA Type 3, waterproofed for exterior installation.

B. All electrical work shall conform to local codes and ordinances.

2.15 WIRING

A. Remote control wire shall be direct-burial AWG-UF type, sized according to manufacturer's specifications per the drawings, and in no case smaller than 14 gauge.

B. Connections shall be either Spears Dri Splice or 3M DBR/Y Direct burial type connectors per the details.

C. Common wires shall be white in color. (Where two or more controllers are used, the common wires shall be white with a different color stripe for each controller.) Control wires shall be black (where two or more controllers are used, the control wires shall be a different color for each controller.) These colors shall be noted on as-built plans located on controller door.

2.16 SPRINKLERS

A. Sprinklers shall be as called for on the plans.

2.17 FERTIGATION

A. If called for on the plans shall be provided by Eco-Fert fertigation. Contractor shall coordinate installation and programming with Eco-Fert. Eco-Fert System Number EFSS-FP1. Coordinate Installation with Eco-Fert (949) 766-5800 and include all conduits and electrical service for installation. Fertigation system shall include, but not be limited to the following components as a minimum:

- Walchem Pump
- Signet 9900
- Schedule 80 4" fittings
- Extension Boxes
- GF 2536
- Saddle
- Stainless Steel Cabinet/Pedestal
- Tank
- 4 pin connectors
- 5 pin connectors
- Madison Horz float
- Valve Boxes
- Fan.

PART 3 - EXECUTION

3.01 GENERAL

A. Water Supply:

1. Connections to or for the installation of the water supply shall be at the locations shown on the drawings. Any changes caused by actual site conditions shall be made at no additional cost to the Owner.

B. Electrical Service:

1. Contractor shall make and supply all electrical connections including conduit, wiring, and support breakers/switches to supply the irrigation controller, booster pump, and fertigation system in addition to any required ancillary equipment.

C. Layout:

1. Layout irrigation system prior to excavation and make minor adjustments required due to differences between site and diagrammatic drawings/plans. All equipment to be located within planter areas. It is the Contractors responsibility to notify the Landscape Architect of any items of concern prior to start of installation. Any changes in layout or design by the

Contractor not disclosed and approved prior by the Landscape Architect are made at the Contractors sole liability.

D. Diagrammatic Intent:

1. The drawings are purposely diagrammatic, due to scale it is impossible to show all items in their actual location on the plan. The size and location of equipment and fixtures are drawn to scale where possible to show overall system makeup and design. Provide offsets in piping and changes in equipment locations as necessary to conform with structures, hardscape, and to avoid obstructions or conflicts with other work. Contractor shall not willfully install any equipment that would be out of place, cause issue/ interference with other work, or appear to be out of location per industry standards. All equipment shall be located in landscape areas unless specifically approved by the Owners Representative prior to installation for any non-conforming circumstances.

E. Modifications:

1. Provide modifications to the irrigation system to avoid blockage of sprinkler irrigation patterns, to prevent overspray and excessive runoff onto walkway and parking areas, and to provide full irrigation coverage to the planted areas. Such modifications also include adjusting locations and adding heads as required to spray around trees, light poles, sign posts, other objects that obstruct spray pattern, and any other adjustments required due to field conditions unknow at the time of design. All cost's associated with Modifications are the Contractors sole responsibility as they shall be considered part of the bid.

F. Grades:

1. Before starting work, carefully check all grades to determine that the site is properly graded and work may safely proceed, keeping within the specified material depths with respect to finish grade.

G. Inspections:

1. Prior to all work of this section, carefully inspect the current work of all other trades and verify that all such work is complete to the point where this installation may properly commence. Any installation prior to the completion of other trades that requires work to be adjusted or redone is the sole responsibility of the contractor.
2. Verify existing grades are correct and that proper coverage per the details and final equipment locations and heights are correct. Any work installed that is found to be incorrectly installed per the details that requires adjustment to equipment or pipe relocation is the sole responsibility of the Contractor.
3. Verify that irrigation system may be installed in strict accordance with all pertinent codes and regulations, the original design, the referenced standards, and the manufacturer's recommendations.

H. Discrepancies:

1. In the event of discrepancy, notify the Owners Representative and the Landscape Architect prior to starting work.
2. Do not proceed with installation in areas of discrepancy until all discrepancies have been resolved and approval of solution has been granted in writing.
3. Failure of the Contractor to accurately lay out or knowingly install the system in a way that creates design inadequacies without prior acknowledgement to the Owners

Representative will be the direct responsibility of the Contractor to remedy without any additional costs or impact to the Owner.

I. Field Measurements:

1. Contractor shall be responsible to make all necessary measurements in the field to ensure precise fit of items in accordance with the original design. Contractor shall coordinate the installation of all irrigation materials with all other trades, including the proper location of required sleeves, and support items that may involve other trades.

3.02 INSTALLATION STANDARDS

A. The landscape irrigation system shall be installed in accordance with applicable requirements of the California Plumbing Code and California Electrical Code, and the requirements of the jurisdictional water company or utility district.

B. Manufactured materials and equipment shall be installed in accordance with the respective manufacturer's instructions for the location and conditions.

3.03 TRENCHING

A. Dig trenches and support pipe continuously on bottom of ditch. Lay pipe to an even grade. Trenching excavation shall follow layout indicated on drawings to the depths below finished grade and as noted. Where lines occur under paved area, these dimensions shall be considered below subgrade.

B. Contractor responsible for all trenching activities which shall be in accordance with current safety and OSHA requirements.

C. Provide minimum cover of 24 inches, maximum 30 inches on pressure supply lines 3 inches and larger.

D. Provide minimum cover of 18 inches, maximum 24 inches on pressure supply lines 2-1/2 inches and smaller.

E. Provide minimum cover of 4” for subsurface drip lines, or as recommended by the subsurface drip line manufacture.

F. Provide minimum cover of 18 inches, maximum 24 inches for control wires.

G. Provide minimum cover of 12 inches, maximum 16 inches for non-pressure lines.

H. Provide minimum cover of 24 inches, maximum 30 inches for all pipe sleeved under paving.

I. Provide minimum cover of 36 inches in infiltration areas (6” minimum backfill cover over pipe beneath gravel layer).

J. When two pipes are to be placed in the same trench, maintain a six-inch space between pipes as a minimum. No pipe shall be installed directly over or next to another.

K. For pressurized lines, snake as needed in the trench to allow for minor expansion and contraction depending on the type of pipe used. Follow manufactures recommendations.

L. Where it is necessary to excavate adjacent to existing trees, the Contractor shall avoid injury to trees and tree roots. Excavation in areas where 2-inch and larger roots occur shall be done by hand. All roots 2 inches and larger in diameter shall be tunneled under and shall be heavily wrapped with wet burlap to prevent scarring or drying. Where trenching machine is run close to trees having roots smaller than 2 inches in diameter, the wall of the trench adjacent to the

tree shall be hand trimmed, making a clean cut through the roots. Roots 1 inch and larger in diameter shall be painted with two coats of Tree Seal or approved equal. Trenches adjacent to trees shall be closed within 24 hours. Any damage to tree root structure and resulting decline will be the sole responsibility of the Contractor.

M. After trenches have been excavated, pipe shall be installed, tested, and inspected, and the trench shall be backfilled without undue delay.

3.04 PIPING

A. Piping under existing pavement may be installed by jacking, boring, or hydraulic driving. No hydraulic driving is permitted under asphaltic concrete pavement.

B. Cutting or breaking of existing pavement is not permitted.

C. Carefully inspect all pipe and fittings before installation, removing dirt, scale, and burrs and reaming; install pipe with all markings up for visual inspection and verification.

D. Exercise care in handling, loading, unloading, and storing plastic pipe and fittings; store plastic pipe and fittings under cover until ready to install; transport plastic pipe on a vehicle with a bed long enough to allow the pipe to lay flat, avoid undue bending and any concentrated external load.

E. Remove all dented, crushed, scratched, and damaged pipe sections.

F. Contractor shall install concrete thrust blocking at all changes of direction and terminal points of pressure pipe per plans.

G. All lines shall have a minimum clearance of 6 inches from each other and 12 inches from lines of other trades.

H. Parallel lines shall not be installed directly over one another.

I. In solvent welding/ cementing, use only the specified primer and solvent cement and make all joints in strict accordance with the manufacturer's recommended methods; allow solvent welds at least 15 minutes setup time before moving or handling and 24 hours curing time before filling.

J. Solvent welding/cementing shall be neat and demonstrate quality workmanship- Primer and Glue shall not be used in excess or applied in a way to affect the portions of the pipe that are not part of the actual connected joint. Any joints with excessive runs/drips, trails, or globing of Glue and or Primer shall be cut out in whole and replaced at cost by the Contractor until an acceptable professional product is completed and accepted by the Owners Representative

K. 360-degree applicators shall be used to apply primer and solvent on sizes - 2 inches and larger.

L. Center load all plastic pipe prior to pressure testing.

M. All threaded plastic-to-plastic connections shall be assembled using Teflon tape.

N. For plastic-to-metal connections, work the metal connections first. Use a nonhardening pipe dope on all threaded plastic-to-metal connections, except where noted otherwise.

O. Snake all piping to allow for expansion and contraction due to environmental conditions.

3.05 ASSEMBLIES

A. Install all assemblies specified herein according to the respective detail drawings or specifications, using best standard practice.

B. Install backflow assemblies at locations approved in the field and at height required by local codes.

C. Valves shall be installed in Landscape areas whenever possible per Owners Representative standards.

D. Each valve box shall be installed on a foundation of gravel backfill; 3 cubic feet minimum. Place boxes on common bricks bedded in backfill per details. Valve boxes shall be installed with their tops ½" inch above the surface of surrounding finish grade in lawn areas and 2" inch above the surface of surrounding finish grade in shrub areas or per details.

E. Valve box risers or extensions shall be installed as needed per field conditions at no additional cost, they shall be by the same manufacture as the installed box.

F. Areas with burying rodents will require metal fabric or wire mesh installed under boxes prior to gravel and shall be placed at all other possible entry points to protect the equipment from damage. All cost associated with wire fabric installation shall be the responsibility of the contractor.

3.06 BACKFILLING

A. Before pipeline trenches are backfilled, the irrigation system shall be pressure tested and the location of irrigation heads modified as required to obtain complete and uniform coverage of each plant's root ball. Refer to field quality control requirements specified herein.

B. Initial backfill on all lines shall be of fine granular material with no foreign matter larger than 2 inch in size. Reference section 217-1.1 of the "Greenbook" for further requirements of bedding material. All protruding rocks or other material capable of damaging pipe will shall be removed from trench walls or bottom prior to placement of pipes or conduits.

C. Compaction of backfill in landscaped areas shall be not less than that of surrounding ground as determined by ASTM D1557.

D. Backfill shall be tamped in 4-inch lifts under the pipe and uniformly on both sides for the full width of the trench and the full length of the pipe. Materials shall be sufficiently damp to permit thorough compaction, free of voids. Backfill shall be compacted to dry density equal to adjacent undisturbed soil and shall conform to adjacent grades.

E. Flooding in lieu of tamping is not allowed without specific prior approval.

F. Under no circumstances shall truck wheels be used to compact soil.

G. Provide washed sand backfill a minimum of 6 inches over and under all piping under paved areas.

3.07 CONTROLLER

A. The exact location of the controller shall be approved by the Owners Representative before installation. The electrical service shall be coordinated to this location by the Contractor.

B. Fertigation controller will be located next to fertigation unit per plan if included. Maintenance access shall be provided.

C. Pump starter shall be connected to controller pump starter relay switch.

D. The irrigation system shall be programmed to operate during the periods of minimal use of the design area, and for maximum efficiency.

E. Testing/Certifications Requirements:

1. All manufacturer requirements for certification and or warranty release of the system in addition to electrical code requirements are the Contractors responsibility to meet and supply proof in the form of documentation of inspection and compliance.

3.08 WIRING

A. Wiring shall occupy the same trench and shall be installed along the same route as the pressure supply lines and shall be located below the supply lines wherever possible.

B. Where more than one wire is placed in a trench, the wiring shall be taped together at intervals of 10 feet.

C. All connections shall be of an approved type and shall occur in a valve box. Provide an 18-inch service loop at each connection.

D. An expansion loop of 12 inches shall be provided at each wire connection and/or directional turn, and one of 24 inches shall be provided at each remote-control valve.

E. A continuous run of wire shall be used between a controller and each remote-control valve. Under no circumstances shall splices be used without prior approval.

3.09 FLUSHING THE SYSTEM

A. Prior to installation of sprinkler heads, the valves shall be opened and a full head of water used to flush out the lines and risers.

B. Sprinkler heads shall be installed after flushing the system has been completed.

3.10 SPRINKLER HEADS

A. Sprinkler heads shall be installed as designated on the drawings and per Owners Representative standards.

B. Spacing of heads shall not exceed maximum indicated on the drawings.

3.11 ADJUSTING THE SYSTEM

A. Contractor shall adjust valves, align heads, and verify coverage of each system prior to coverage test.

B. If it is determined by the Owners Representative that additional adjustments, heads or nozzle changes/ additions will be required to provide proper coverage, all necessary changes or adjustments shall be made prior to acceptance and any planting. (See 3.01 section E)

C. The entire system shall be operating properly before any planting operations commence.

3.12 PLANT ESTABLISHMENT

A. Contractor to continually check and adjust the system for proper run times, coverage, and function throughout the Plant Establishment Period listed in Section 32 93 00 – Plants.

3.13 COMPLETION CLEANING

A. Upon completion of the work, Contractor shall smooth all ground surfaces; remove excess materials, rubbish, debris, etc.; sweep adjacent streets, curbs, gutters, walkways, and trails; and

remove construction equipment from the premises. Contractor is responsible for removing and cleaning any tracking, tire marking, or other visible signs of damage to existing facilities.

END OF SECTION

SECTION 32 90 00

PLANTING

PART 1 – GENERAL

1.01 SCOPE

A. The work required is indicated on the drawings and includes, but is not necessarily limited to: soil preparation; fine grading, finish grading; planting trees; guying and staking trees; planting shrubs and ground cover; soil erosion control; maintenance; plant establishment period; guarantees; and replacement.

1.02 RELATED SECTIONS

A. Related work specified elsewhere:

1. 32 84 00 Planting Irrigation
2. 32 90 05 Planting Maintenance

1.03 GUARANTEE

A. All trees installed under the contract shall be guaranteed against any and all poor, inadequate or inferior materials and/or workmanship for a period of one (1) year.

B. All plant material 15 gallon or larger shall be guaranteed against any and all poor, inadequate or inferior materials and/or workmanship for a period of one (1) year.

C. During the guarantee period, any material found to be dead, missing, or in poor condition shall be replaced by the Contractor within seven (7) days of written notification. The Owners Representative/ Landscape Architect shall be the sole judge as to the condition of the material.

D. Replacement shall be made in accordance with these specifications and the plans.

E. Material and labor involved in replacing plant material shall be provided by the Contractor at noadditional cost to the Owner.

1.04 REFERENCES

A. The Standard Specifications for Public Works Construction, "Greenbook", latest edition, is reference as if herein contained and the contractor shall keep a copy at the project site. These Specifications shall supersede conflicts with information given in the "Greenbook", unless otherwise determined by the Owner or their designated representative.

1.05 QUANTITIES AND TYPES

A. Plant materials shall be furnished in the quantities and/or spacing as shown and noted for each location, and shall be the species, kinds, sizes, etc. as symbolized and/or described in the "PlantMaterials Legend", as indicated by the drawings. The L.A has provided this list and/or counts only as a convenience to the Owner and Contractor and assumes now responsibility for its accuracy. As part of his/her bid the Contractor

shall be solely responsible for accuratelyidentifying the counts and species as shown on the plans by symbols.

1.06 VERIFICATION OF DIMENSIONS

A. Dimensions are approximate, before proceeding with any work, Contractor shall verify all dimension and shall immediately inform the L.A. and owner of any discrepancies between the drawings and/or specifications and actual field conditions. Minor adjustments to planting locations for interference with infrastructure or other site features shall be included in the bid by the contractor. No work shall be done in any area where there is such a discrepancy until approval has been given by L.A. and owner. Any work done without notification and prior approval will be the sole responsibility of the Contractor to remedy as required by L.A. and Owner.

1.07 INSPECTIONS

A. Inspections will be required to observe and verify the work. The Contractor shall contact the Owners Representative at least 48 hours (2 working days) in advance of an anticipated inspection. An inspection will be required at each of the steps listed below:

1. Upon completion of fine grading, and prior to commencement of soil preparation, foracceptance of fine grading work and taking of soils samples.
2. Inspection of completed finish grading work per this section following soil amendment work.
3. Percolation test of selected planting locations.
4. On site delivery of plant material.
5. When trees and shrubs are spotted for planting, but before planting holes are excavated.
6. When planting and all other indicated or specified work has been completed.
7. During application of pre-emergent chemical.
8. At start of plant establishment and maintenance period.
9. At the end of the plant establishment period, concurrent with final acceptance of the project for maintenance by the Owner. <u>This acceptance for maintenance will be confirmed in writing by the Landscape Architect or Owners Representative.</u>

1.08 SOILS TEST

A. Agronomic soil analysis shall be required with interpretation and recommendations (include texture, organic matter, estimated nitrogen release, Phosphorus (P 1, P 2), potassium, magnesium, calcium, soil pH, hydrogen, cation exchange capacity, percent base saturation, soluble salts, excess lime rate, sodium and boron at the acceptance

of fine grading. Total amount of tests required shall be as stated per the per plans or at a minimum of 1 test per 25,000 sq. ft. whichever is greater. The tests shall be individual to identify any irregularities in soil types on site and amend them as necessary per plant or area needs. Creating a single composite mix of all samples is not allowed. The final approved recommendation shall take precedence over the minimums listed herein or elsewhere in the plans. Recommendations shall be based on the plants listed per the planting plans specifically. The recommendations shall call for any needed special requirements for the listed trees, shrubs, ground covers, turf, and or any other special specie requirements. Any additional costs due to recommendations of the soil test shall be the responsibility of the Contractor who has reviewed the site during bidding and made their own observations and tests as needed to make an accurate bid based on the site conditions and their experience as a professional contractor. See plans for amount and locations of tests required based on project size. All costs for testing shall be the responsibility of the Contractor and included in their bid as well as the proper scheduling allowing for analysis and reporting lead times.

1.09 SUBMITTALS

A. Contractor to submit date stamped photos documenting current appearance of each plant listedin the plant legend. Photos shall clearly document size and condition from the nursery, including height, spread, and size of caliper noted for trees for approval by Landscape Architect.

B. In addition to photos the Contractor shall supply documentation of the required quantities available from the supplier at the time of submittal, it is the Contractors responsibility to procure all plant material ahead of delivery once the submittal is approved. Any additional

cost as a result of scheduling or order of operations for holding, growing, and caring for plant material shall be included In the Contractors bid.

C. Contractor to submit written recommendations from a Certified Pest Control Advisor for allherbicides and pesticides to be used on site for approval by Landscape Architect.

D. Contractor to submit samples of Mulch or other listed ground cover material per plan in a1-gallon zip-lock type plastic bag for approval by Landscape Architect.

E. The following written certifications and or delivery tickets are required to be submitted to theLandscape Architect within 10 working days upon delivery of the respective materials to the job site:

1. Total Quantity of commercial fertilizers by type
2. Total Quantity of soil amendments and conditioners by type
3. Total Quantity of mulch
4. Total Quantity of iron sulphate
5. Also, all items per section 32 92 00 (turf seeding or sod)

Failure to supply proof of delivery to the site of the required products shall cause a

delay in scheduled billings being approved until the documentation is approved in full.

F. All bagged products (fertilizers, etc.) shall stay on the site in a neat and orderly manner until thefinal approval by the Landscape Architect.

1.10 SUBSTITUTIONS

A. Substitutions for any indicated plant material shall be permitted only if the provided substituted materials are approved in advance at the start of work, and if found to be acceptable by the L.A. with no additional costs to the owner. The L.A. has final authority on the approval of substitutions based on their opinion of overall impact to plant palette and the substitutions previous performance. No substitutions shall be allowed based on failures of the Contractor tolocate and reserve plant quantities at the time of award. For any additional required inspections, nursery visits, or staff time spent verifying additional plant material after the original approval will be the responsibility of the Contractor and charged at the Landscape Architects current rates at time of Design Award.

1.11 WARRANTY

A. General:

The Contractor shall guarantee all plant material against all defects and fault of material and workmanship/installation for the entire combined period of the plant establishment/maintenance periods. The Contractor shall guarantee all trees and plant material 15 gallon and larger for a period of one year from completion of plant establishment. Any trees that fail or are found to be in decline will be replaced by the Contractorat no cost to the owner. The final decision on the health and status of the material will be the sole discretion of the Landscape Architect and or the City's Representative.

Should any problem with the planting installation be discovered within the guarantee period, itshall be corrected by the Contractor at no additional expense to the Owner within ten (10) calendar days of receipt of written notice from the Owners Representative. When the nature of the repairs as determined by the Owners Representative constitute an emergency (I.E. Tree failures, Etc.) the Owner may proceed to make repairs at the Contractor's expense. Any and alldamages to existing improvement resulting either from faulty materials or workmanship, or from the necessary repairs to correct same, shall be repaired to the satisfaction of the Owners Representative by the Contractor, all at no additional cost to the Owner.

PART 2 - MATERIALS

2.01 FERTILIZER, SOIL AMENDMENTS AND CONDITIONERS

Samples of soils amendments and plants shall be submitted for inspection and stored on the site until furnishing of materials is completed. Photographs may be used for Plant Material if they include the following: date of image, person or object for scale, nursery name and contact info, multiple views of any items 24" or larger. Delivery may begin upon approval of samples and completed grow and kill period, or as directed by the Owner's

Representative. Substitutions in any material will not be permitted unless presented during bidding and specifically approved in writing by the Owner's Representative in the form of an official bid addendum.

A. Soil and Soil Amendments:

1. Fertilizer and amendments for soil conditioning and maintenance shall bear the manufacturer's guaranteed analysis and shall be as recommended in the required soils laboratory report.
2. Fertilizer tablets if called for shall be Gro-Power 7 gram 20-10-5, to be applied per Manufacturer's Specifications.
3. Myco tabs if called for shall be TRI-C 1.68 gram Myco Tabs(Mycorrhizal + NPK) to be applied per Manufacturer's Specifications.
4. Myco Paks if called for shall be TRI-C 4 gram Myco Paks to be applied per Manufacturer's Specifications.
5. Premium Humate if called for shall be TRI-C premium humate applied per manufacturer's specification for soil preparation via Rototilling.
6. Revival Plus if called for shall be TRI-C Myco Revival plus and installed in conjunction with TRI-C humate per manufacturer's specifications.
7. Organic amendments if called for shall be nitrolized redwood sawdust (.5% actual nitrogen), or Fir Bark 1% nitrogen). It shall be fine textured, having minimum 80% passing #8 screen and minimum 95% passing #4 mesh screen. Salinity shall be no higher than 3.5 milliohms per centimeter at 25 Centigrade as measured by saturation Pine shall not be used as an organic amendment.

B. Application Rates

Application rates when called for shall be at a minimum as listed below - Note: Soil analysis may adjust listed rates and shall take precedence.

1. Fertilizer tablets- Apply 7 grams Gro-Power tablets at the following rates per plant by size:

Shrubs:	Trees:
· 1 gal. shrub – 2 tablets	24" box tree – 14 tablets
· 5 gal. shrub – 6 tablets	36" box tree – 18 tablets
· 15 gal. & 24" box shrubs – 12 tablets	60" box tree – 32 tablets

Ground Cover:

Apply one 7 gram Gro-Power tablet per rooted ground cover cutting. Refer to Manufacturer's Specification for installation procedure.

2. Myco tabs shall be used at the following rates per plant by size:

· 1 gal - 2 tabs	48" box – 34 tabs
· 5 gal - 8 tabs	60" box – 40 tabs
· 15 gal – 16 tabs	72" box – 46 tabs
· 24" box – 22 tabs	84" box – 52 tabs
· 36" box – 28 tabs	96" box – 60 tabs

3. Myco Pak shall be used at the following rates per plant by size:

· 1 gal – 1 pak	24" box – 12 paks
· 5 gal – 3 paks	36" box – 18 paks

· 15 gal – 8 paks 48” box – 22 paks

4. Premium humate shall be incorporated at 50lbs. per 100 square feet
5. Myco Revival Plus shall be topically applied per manufacture and watered in accordance with the manufacturer's instructions

A. Inorganic Conditioners:

Inorganic conditioners shall be agricultural grade gypsum, soil sulfur and iron sulphate. Iron sulphate shall be ferric sulphate or ferrous sulphate in pelleted or granular form containing notless than 18.5% iron, expressed as metallic iron, and shall be registered as an agricultural mineral with the State Department of Agriculture in compliance with Article 2 "Fertilizing Materials", Section 1030 of the Agriculture Code.

B. PLANTS

All plants shall be true to name, and one of each bundle or lot shall be tagged with the name and size of plants in accordance with the standards of practice recommended by American Standard for Nursery Stock ANSI Z60.1-2014. The root condition of plants furnished in containers shall be determined by removal of earth from the roots of not less than two plants nor more than 2% of the total number of plants of each species or variety except when container-grown plants are from several different sources: in which case, the roots of not less than two plants of each species or variety from each source shall be checked by the Owners Representative / Landscape Architect at his option. The selection of plants to be checked will be made by the Owners Representative / Landscape Architect. All plants rendered unsuitable for planting shall be considered as samples, and replacements shall be provided at no additional cost. In case the sample plants are found to be defective, the entire lot or lots of plants represented by the defective samples will be rejected.

C. All trees and shrubs supplied by Contractor shall be of the specified standard height and diameter set by the American Standard for Nursery Stock. The height of the trees shall be measured from the root crown to the last division of the terminal leader and the diameter shallbe measured six (6) inches above the crown roots. The trees shall stand erect without support.

D. No plants or trees shall be accepted with compromised root systems, including girdling, root bound, and or recently up planted from smaller container stock.

E. Container stock shall have grown in the container for at least 6 months, but not over two years.

F. Do not prune any plants prior to delivery without specific prior approval.

G. Material that has been trimmed, damaged, or does not meet the standard approved via photographs will be rejected.

H. All cost associated with returning and replacing rejected material shall be the Contractors soleresponsibility.

I. Substitutions shall not be permitted unless the contractor can prove in writing that no specimens can be located within 100 miles of the project. A minimum of 5 notices

from suppliers stating the plant is not available are a required.

J. At all times plants shall come from Nursery stock grown in similar conditions and climate zones as associated with the project.

2.02 BACKFILL MATERIAL

A. Topsoil shall be free from noxious weed seed and shall be of a loam characteristic, fertile and friable.

B. Wood shavings shall be leached nitrogen fortified and shall be free of foreign matter.

C. Native plantings shall use native soil only for backfill.

D. Soil used for backfill of planting pits for bidding purposes shall be enriched using the following blend per cubic yard (agronomic soil test recommendations shall take precedence where theseminimum amounts are exceeded):

60% site soil or approved import

40% wood shavings

17 lbs. soil condition/fertilizer (Gro-Power Plus)

1 lb. iron sulphate

E. All soil backfill shall be bulk mixed, not individually mixed at each plant pit.

2.03 STAKES AND TIES

A. Tree stakes shall be 3" dia. x 10-foot-long straight-grained copper naphthenate treated lodgepole pine unless called for differently per the plans. Stakes shall be free from knots, checks, splits, or disfigurement.

B. Tree ties shall be "Cinch-Tie Tree Support" supplied by V.I.T. Co., Escondido, California, (760) 480-6702. For 5- 15-gallon trees, Model CT24; for 24"- 36" box trees, Model CT32. Total amount of ties per tree shall be as called for by the Details.

C. Multi-stem trees and 48" box trees and larger shall require underground tree guying/earth anchors system that include strapping of the root ball and soil anchors. Duckbill Root Ball anchor sized per manufactures recommendations or approved substitution shall be required.

PART 3 - EXECUTION

3.01 LANDSCAPE GRADING

A. The Contractor shall complete Fine grading as required by adding soil, removing surplus soil, removing rocks and debris over 1 inch in diameter within the top 2" of soil in flat and slopeareas, and removing rocks over 2" in diameter within the top 6" of soil in areas with slopes lessthan 3:1. Bring all areas to be landscaped to fine grade. All areas shall slope to drain. Flow lines shall be established to drain inlets, existing road curbs, sidewalks, and or other drainage conveyance structures as shown on the grading plans. Contractor shall notify Owners Representative/ Landscape Architect of

any areas that appear to have drainage issues prior to soil preparation for complete mitigation and or correction.

B. The Contractor shall key/cut and remove all soil for mulch, ground cover, turf interfaces with hardscape per the details.

3.02 WEED CONTROL MEASURES

A. Upon completion and acceptance of all fine grading work and prior to soil preparation, the Contractor shall perform weed control (Grow/Kill) measures as follows:

1. Irrigate all areas designated to be planted for a minimum of 10 minutes per setting, two settings per day for 14 days continuously to germinate existing seed bank.
    a) In instances of point source or drip irrigation it is the Contractors responsibility to completely irrigate all planting areas which may require additional or supplemental irrigation above the designed system per plans. This may include adding above ground temporary irrigation, watering from water trucks/tanks, and or hand watering and shall be included in the Contractors bid.
2. Apply a contact non selective herbicide per the written recommendations of a Certified Pest Control Advisor specific to the site- allow 7 days or sufficient time to pass to allow a complete kill of all weeds germinated.
3. Remove all weeds present including any viable root systems and above ground vegetation, this includes all weeds within the limit of work- not only planting areas.
4. Repeat step one for only 7 days and then follow steps 2-3 as above until weed cover is lessthan 1%.
5. Contractor shall call for inspection and verification of the completion of the Grow Kill Period prior to planting.
6. Contractor to indicate on master schedule total grow kill period as part of submittals.
7. If the Contractor wants to phase the grow kill operation, the Contractor will be responsiblefor providing plans documenting treatments including start and stop dates, in addition to reporting and requesting inspections for verification.
8. Any failure by the Contractor to continually irrigate or miss herbicide or clean up windowsas listed above would require the process starting over from step one.
9. Contractor is responsible for the purchase and erection of all signs and barriers required to prevent intrusion into treated areas in addition to all required forms of public notice as required by local governing boards and or manufacture requirements for the safe and responsible use of products.
10. No material or method applied shall affect the success or ability of hydroseeded or planted material to germinate/thrive.

3.03 SOIL PREPARATION

A. All fine grading and mounding and all weed control measures shall be documented, completed, and approved prior to any soil preparation.

B. This work shall not commence until the agronomic soils tests have been completed. Should 30 calendar days elapse between completion of soil preparation and commencement of planting, all areas shall be prepared again.

C. In planting areas with gradients less than 3:1, a layer of soil amendments shall be spread and rototilled into the soil to a minimum depth of 6 inches, or as required by the soils report, so that the soils shall be loose, friable, and free from all rocks, sticks, and other objects undesirable to planting.

D. The following soil amendments shall be used for estimating purposes and added per 1,000 square feet to all planting areas with gradients less than 3:1 (agronomic soil test recommendations shall take precedence where these minimum amounts are exceeded). Contractor shall be responsible for any additional cost due to Soil report recommendations and shall have inspected and understood the current soil conditions at time of Bid.(Note: the following is for typical ornamental planting installation- they will not apply to Native plantings, see Soil Management report for further information if included in plans)

1. 3 cubic yards organic amendment
2. 200 pounds soil conditioner/fertilizer (Gro-Power Plus)
3. 25 pounds gypsum

All landscape areas shall be re-fine graded to "dress out", maintain, and/or reestablish grades and flow lines as approved prior to amending the soil. Fine grades will be inspected upon completion. Contractor shall not proceed with planting work until fine grades have been inspected and accepted by the Landscape Architect.

E. Moisture Content - The soils shall not be worked when the moisture content is so great that excessive compaction will occur; and not when it is so dry that dust will form in the air or that clods will not break easy. Water shall be applied, as necessary, to provide ideal moisture content for tilling, planting, and required dust control.

F. Note: Special soil preparation areas such as drainage basins or areas with different agronomic requirements shall be per plan and or notes/details.

3.04 FINISH GRADING

A. After completion of all soil preparation work the Contractor shall finish grade all planting areas filling as needed or removing surplus dirt, removing rocks and debris over 1 inch in diameter, and floating to a smooth uniform grade. All areas shall slope to drain. Flow lines shall be established to inlets, road curbs and/or a sidewalk as shown on the plans and as directed.

3.05 PLANTING

A. Prior to planting the Contractor shall dig test planting holes for percolation tests. Per direction of the Landscape Architect, locations shall be selected to address all soil types and situations on site, such as examples for slope, exposure, soil type,etc. Holes

will be dug to the depth per planting details and filled to 25% capacity with water. Test start time will be documented and checked every half hour until fully infiltrated to ensure proper drainage. Any areas found to not infiltrate per the recommended time frame for the selected material will require additional drains and specialized planting techniques per the details for Trees and Shrubs in Wet Soils, which require deeper pits, additional gravel sumps, and drain pipes. The Contractor shall include the cost of these additional items per the site conditions at the time of bidding and if not installed shall refund a credit.

B. Trees and Shrubs: Plant holes shall be dug to size as indicated in the drawings. Before trees and shrubs are set in the holes, all holes shall be pre-watered as follows:

   All planting holes shall be filled to the brim with water and allowed to drain before any planting is done. If any holes fail to drain then they will be added to the holes for wet soils treatment as stated in item “A” above.

C. Soil surrounding planting pit shall be in a friable condition and moist to a depth of 8".

D. Backfill using specified soil mix per the details to within 8" of finish grade. At this depth, place the fertilizer tablets or Mycro packs/ tans per details. Complete backfillingto finish grade.

E. Plants and Trees shall be planted at such a depth that the crown roots bear the same relative position to finish grade as they did to the soils where they were grown. At no time shall the soil level be raised around the crown. If the soil level per grower’s container is higher than base of the trunk flare the Contractor shall remove excess soil per ISA standards and BMP’s. Backfill after planting shall be compacted carefully into place without injuring the roots of the tree or breaking up the ball of earth surrounding the roots.

F. Contractor shall create and mound soil as required for water basins per the details including adding slope guards, stones for root cover/ soil moisture protection on southwestern exposures, trunk protection, and additional straw wattles when required.

G. All excess soil spoils and excavated debris shall be removed from the site by the Contractor.

3.06 GROUND COVER AND VINE PLANTING

A. Soil preparation and fine grading shall be completed prior to ground cover planting.

B. Add Soil Amendments and conditioners to ground cover areas per Section 3.03, part D of the above planting specifications.

C. All rooted ground cover and bare dirt areas are to be treated with a pre-emergent chemical (subject to approval by the Landscape Architect prior to application as recommended by a CPA). Chemicals are to be applied by a DPR Qualified or Certified applicator. This treatment shall be applied at the following times during the contract: a) before planting, b) at beginning of plant establishment period, and c) at the end of plant establishment period. The Owners Representative / LandscapeArchitect shall be given a minimum of 48 hours (2 working days) notice prior to each application. No chemicals shall be applied other than in the presence of the inspector.

D. Ground cover shall be planted below all shrubs and trees to within 12" of the shrub main stem unless otherwise noted on the plans.

E. Ground cover and vines shall be planted in moist soil and spaced as indicated on the plans.

F. Each plant shall be planted with its proportionate amount of flat soil to minimize root disturbance. Soil moisture shall be such that the soil does not crumble when removing plants.

G. Following planting, ground cover and vine areas shall be re-finished graded to restore smooth finish gradeand to ensure proper surface drainage. All excess soil spoils and excavated debris shall be

removed from the site by the Contractor.

H. A 3-inch layer of mulch per plans shall be spread over the planted areas. Watering shall begin immediately following mulching.

I. When necessary to prevent plant damage from pedestrian traffic during the initial growing stage, the Contractor shall erect temporary protective fencing to be removed at the end of theplant establishment period.

J. Vines shall be tied to walls, fences, etc., in the manner prescribed on the plans and details. At a minimum the contractor shall provide attached fasteners and guying for vines requiring support. Temporary staking shall be removed at the beginning of the plant establishment period.

3.07 TREE STAKING

A. Stake trees as per planting details. No metal wire shall circle any part of any tree.

B. All nursery stake shall be removed at the time of planting.

C. Contractor to adjust staking as needed for locations in high wind areas, including adding morerestraints and stakes per the plans and current ISA guidelines at no additional cost.

3.08 WATERING

A. It shall be the Contractor's responsibility to maintain a balanced watering program to ensure proper growth until final acceptance of the work.

B. Immediately after planting, apply water to each tree, shrub or vine. Apply water using a gentle spray pattern via a water wand in the planting hole until the material about the roots is completely saturated from the bottom of the hole to the top of the ground.

C. Apply water in sufficient quantities and as often as seasonal conditions require to keep the planted areas moist at all times, well below the root system of plants.

D. Contractor shall be responsible for monitoring all planting areas and adjusting irrigation as needed for severe weather conditions such as high wind or high heat waves including working weekends and holidays as part of their Bid based on project timelines and schedules per seasonal requirements .

E. For turf or hydroseed installation using Eco Mat or other subsurface irrigation the contractor will be responsible for any head adjustments or hand watering required to germinate the seeds againstany hardscape buffer areas (typically 24”) at no additional

cost.

F. Irrigation:

1. Contractor shall properly and completely maintain the irrigation system. Contractor to program controller per watering schedule on irrigation plans and adjust in the field as necessary. Overhead irrigation areas to have a maximum run time of 15 minutes per cycle with additional cycles as needed. At no time will run off or erosion be allowed.

3.09 Mulching

A. Contractor to apply a 3" minimum mulch layer to all planting areas unless specified as other ground cover treatment by the plans.

B. Contractor to keep mulch from plant trunks as follows:

1. Shrubs shall have 3" of clearance from trunks/main stems to mulch
2. Trees shall have 6" of clearance from crown/ base of the flare to mulch

C. Contractor to overhead water entire mulched area to help settle and lock material together and start the process of nutrients moving into the below soil.

3.10 PLANT PROTECTION

A. The Contractor is responsible for all aspects of protection of the installed landscape from loss or damage through the Plant Establishment and Maintenance periods until the final acceptance via written notice. This shall include any additional materials or protection methodologies such as but not limited to ground wire cages, shields, trunk covers, shading, herbivore protection above/below via product use or trapping and or removal, application of deterrents, and Pest and insect control.

3.11 PRUNING

A. All shrubs and trees shall be pinch pruned as necessary to encourage new growth and to eliminate rank sucker growth. Old flowers, and dead foliage and damaged limbs shall be removed. No major pruning shall be done without the approval of the Landscape Architect. Any damage to shrubs and trees that drastically changes structure and or appearance shall require the Contractor to replace in kind with an approved replacement at no additional cost per the direction of the Landscape Architect.

3.10 MAINTENANCE

A. All areas landscaped by Contractor under this contract shall be maintained by said Contractor for a minimum plant establishment period of not less than ninety (90) days or as called for by the Contract documents from the date of written acceptance of initial installation and substantial completion per the requirements of the plans, specifications, and contract documents.

3.11 START OF PLANT ESTABLISHMENT

A. Criteria for start of plant establishment period:

1. The plant establishment period shall not start until all elements of the project that impact the landscape are completed in accordance with the contract documents. Projects will not be segmented into phases or have portions separated for multiple Plant Establishment programs.
2. Permanent Water and Power for the irrigation system shall be established.
3. Fully automatic irrigation including acceptance of installation and as-builts/controller charts.
4. Written acceptance of the Owners Representative must be obtained prior to the start of the plant establishment period.
5. If project maintenance fails to continuously meet standards required, the plant establishment period "day count" will be suspended and will not recommence untilContractor has corrected all deficiencies.
6. The 90-day establishment period is the minimum required and will be extended as neededat no additional cost to remedy issues with failure to service/meet the requirements and bring the project into compliance.

3.12 LANDSCAPE MAINTENANCE (PLANT ESTABLISHMENT)

A. Refer to section 32 90 05 Landscape Maintenance

3.13 CLEAN UP

A. Upon completion of the work, the Contractor shall smooth all ground surfaces; remove excess materials, rubbish, debris, etc.; sweep adjacent streets, curbs, gutters, walkways, and trails; andremove construction equipment from the premises.

B. This shall include power washing all hardscape, site structures, site furnishings to return them to a state ofclean and unsoiled. If the finish has been soiled past the ability to be washed off the Contractor shall be responsible to returning it to a new finish state, including repainting, refinishing, and in extreme cases replacing in whole.

END OF SECTION

SECTION 32 90 05

LANDSCAPE MAINTENANCE

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Furnishing and implementing a complete landscape maintenance program to maintain all planting areas from time of Accepted plant installation through the (90) ninety-day Plant Establishment Period and accepted Final Completion. Contractor shall note the (90) ninety-day period is the minimum for plant establishment and that failures of plant performance/establishment and or Contractor failures to properly meet all requirements shall extend the period as deemed necessary by the Owner's Representative.

1.02 SCOPE OF WORK

A. Furnish all supervision, labor, materials, equipment and transportation required to maintain the landscape in a thriving condition as it establishes and take root, as specified herein.

1. Care of all lawn and ground cover areas if present, including watering, cutting, edging, trimming, fertilizing and pest control within all ground cover areas as directed herein.
2. Care of all shrubs, trees, and groundcover areas, including watering, cultivation, pruning, fertilization, debris removal, and pest control including but not limited to:
    a. All cultivation and soil aeration as necessary to maintain optimum conditions for plant growth.
    b. Fertilization of all plant material on a regular schedule, including soil testing as necessary to determine requirements and application methods with reference to the project soil analysis.
    c. All pruning, re-staking, tightening or adjustment of guy wires or straps and trimming of plant material that is required in landscape areas to promote growth and proper structure.
    d. Control and/or prevention of diseases, insect and or rodent infestation using methods and techniques approved by State Licensing Agency.
3. Supplemental watering of plant material on a regular basis through use of automatic irrigation systems and/or hand watering as needed, while consistently monitoring and adjusting water needs to maintain optimum conditions for plant growth per each species/ hydrozones requirements.
4. Maintenance of irrigation systems, including adjustment of heads and valves and regular controller program updating, cleaning of filters, and fertilizer injection systems if included per plans.
5. General maintenance of the site and associated amenities including removal of litter and debris, cleaning of site features, graffiti removal, and reapplication of any anti-graffiti coatings as required.
6. Replacement of plantings, or other materials, that, in the Owner's Representatives opinion, require replacement due to failure, decline or the Contractor's neglect in care or maintenance at no cost to owner.

7. Protection of Property and Landscape During Inclement Weather: During periods of inclement weather, Contractor shall provide supervisory inspections of the project during regular hours to prevent of minimize possible damage from storms or weather events. Contractor shall report any storm damage to Owner's Representative.
8. Protection of Existing Facilities and Structures: Contractor shall exercise due care in protecting from damage all existing facilities, structures, and utilities both above and below grade from maintenance activities- any damage from equipment or personnel shall be repaired or replaced immediately to the original condition of a new installation.
9. Project Inspection: Contractor will meet with Owners Representative per approved schedule to verify compliance with specifications. Following each meeting, Contractor will submit written reports noting problems cited during inspections and any actions taken.
10. Work Schedule: A monthly schedule shall be prepared and submitted to the Owner prior to the beginning of each month. Schedules shall indicate times, days of the week and type of work to be performed including man power for approval.

B. Section also includes notification of Recreation & Park Department prior to completion of the Plant Maintenance Period.

1.03 RELATED WORK

A. Section 32 84 00 – Planting Irrigation

B. Section 32 90 00 – Planting

1.04 REFERENCE STANDARDS

A. Plant Material Standards: "American Standard for Nursery Stock", 1981 Edition, American Association of Nurserymen.

B. Staking and Guying Procedures: "Staking Landscape Trees", University of California Extension Publication #2576.

C. Pruning Procedures: "Pruning Landscape Trees", University of California Extension Publication #2574.

1.05 WORK FORCE

A. Supervision: Contractor shall furnish competent supervisors, to be present on the job site at all times during which work is being performed. Supervisors must possess adequate technical background, preferably with formal education in ornamental horticulture. Supervisors must be English speaking and preferably bilingual (in Spanish).

B. General Personnel: In addition to Supervisors, Contractor shall supply sufficient working personnel capable of promptly accomplishing, on schedule, all work required under this contract during regular hours.

C. All such personnel shall be physically able to perform their assigned work. The Contractor and his employees shall conduct themselves in a proper and efficient manner at all times and shall cause the least possible annoyance to the public. They shall be fully clothed in suitable attire. The Owner may require the Contractor to remove from the work site any employee(s) deemed careless, incompetent, or otherwise objectionable, whose continued employment on the job is considered to be contrary to the best interest of the Owner. All personnel shall be U.S. citizens or legal residents.

1.06 WARRANTY

A. Refer to Section 32 90 00 – Planting.

1.07 SCHEDULE

A. Submit a proposed maintenance work schedule to the Owner's Representative in writing for review at least 10 days prior to commencement of maintenance work. All maintenance work shall be done at times approved by the Owner's Representative so as not to conflict with the operation of the project.

B. Project site must be visited twice weekly for the first (30) days and once weekly as a minimum thereafter until the end on establishment.

C. For Projects with extended maintenance periods over 90 days see below for a reference of general required activities.

Frequency Per Month:

Operation	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
Site Check	4	4	4	4	4	4	4	4	4	4	4	4
Debris Removal	2	2	3	3	4	4	4	4	3	3	2	2
Pruning	0	1	0	0	0	0	0	0	0	1	0	0
Weed Control	0	2	3	3	4	4	4	4	3	2	2	0
Clean + Sweep	2	2	3	3	4	4	4	4	4	4	2	2
Irrigation Adjustment	1	1	1	1	2	2	2	2	2	1	1	1

1.08 TECHNICAL SPECIFICATIONS

A. Turf-Mow-Edge

1. Mowing
   a. All turf areas shall be mowed once per week at a minimum- additional mowing's per week may be directed dependent on turf and season.
   b. Work shall be performed on the same day each week. Initial week schedule and any changes must be approved by the Owner prior to implementation.
   c. Mowing's missed due to inclement weather or ground conditions from such weather shall be rescheduled and completed within 3 work days on weekly schedule and within 7 days on bi-weekly schedule.

d. Cutting heights shall be adjusted according to the type of grass in accordance with the following:

TURF TYPE	TIME OF YEAR	CUT HEIGHT
Bluegrass and Fescue	June through September	3”
Bluegrass and Fescue	September through May	2”
St. Augustine	Year-Round	2-1/4"
Bermuda	Year-Round	3/4"
Buffalo Grass	Year-Round	1-1/2”

e. All warm season grasses to include Bermuda, Buffalo and St. Augustine shall be mowed with a power-driven reel type mower. Bluegrass and Fescue may be mowed with either power-driven reel type or rotary type mowers. All equipment shall be adjusted to the proper cutting heights and shall be adequately sharpened.

f. All visible grass clippings shall be collected and removed from the site prior to the completion of that day's mowing operations or the end of the day, whichever occurs first.

g. All trash, leaves, paper and other debris shall be removed and disposed of off-site prior to mowing.

h. All walkways, roadways, trails or other areas dirtied by mowing operations shall be cleaned and all debris disposed of off-site prior to the completion of that day's mowing operations or the end of the day, whichever occurs first.

2. Edging
   a. All turf grass borders shall be neatly and uniformly edged or trimmed concurrent with every mowing with bladed tools- no string trimmers will be allowed for edging.
3. Turf Maintenance
   a. All turf areas shall be irrigated as required to maintain adequate growth and appearance.
   b. Contractor shall monitor the requirements of the plant material, soil conditions, seasonal temperature variations, wind conditions and rainfall and shall recommend appropriate changes in duration of watering cycles. No actual changes will be implemented without prior approval of the Owner.
   c. Special areas of consideration:
      1) Special irrigation zones may exist such as, sub irrigation zones for turf adjacent to hardscape. In some situations, for example in hydroseeded applications, the Contractor shall hand water as required for initial germination and establishment as part of the installation and establishment period if deemed necessary. This will be included with the contract price and no additional cost or charges will be allowed.
4. Weed Control
   a. A regular program of approved chemical application shall be used to control weed growth, supplemented by hand removal or noxious weeds or grasses as necessary.

5. Fertilization
    a. All turf areas shall be fertilized in accordance with soils report, specific turf requirements and or recommendations when granular fertilization is used; if no soils report exists, the following criteria shall prevail.

TURF	FORMULA	RATE	CYCLE
Bluegrass	16-6-8 w/trace elements	1 lb. actual nitrogen/ 1,000 S.F.	45 days
Bermuda	Ammonia Nitrate 33.5-0-0 16-6-8 w/trace elements	1 lb. actual nitrogen/ 1,000 S.F.	45 days
Fescue	16-6-8 w/trace elements	1 lb. actual nitrogen/ 1,000 S.F.	45 days
St. Augustine	Ammonia Nitrate 33.5-0-0	1 lb. actual nitrogen/ 1,000 S.F.	45 days
Buffalo grass	Manufacture approved crab grass preventer	Per manufacturer	45 days

B. Fallen Vegetation and Debris Removal
    1. The contractor shall police the entire project area including all paved areas, planters, lawn areas, sidewalks (including common area sidewalks) and trash enclosures and collect fallen leaves, branches and limbs regardless of length or diameter, dead vegetation, paper, trash, cigarette butts, garbage, rocks, and any and all other debris to prevent unsightly and inordinate accumulations during normal maintenance working hours. Sidewalks shall be swept or washed as necessary to keep free of trash and graffiti. Collected items shall be promptly removed and taken to a legal disposal site.

C. Removal of Dead Animals
    1. Removal and legal disposal of animal carcasses are considered a normal maintenance task for the duration of the maintenance period. Dead carcasses shall be legally removed immediately when discovered by the contractor.

D. Erosion Control
    1. The contractor is responsible for daily visual inspection of slopes and immediately reporting areas experiencing erosion to the landscape architect and/or owner's representative on the same day noticed. If the contractor fails to notify the landscape architect and/or owner's representative of areas experiencing erosion on the same day noticed, then the contractor assumes full responsibility for any erosion control measures and/or repairs as directed by the landscape architect and/or owner's representative at no additional cost to the owner.
    2. Upon notification and agreement of the applicable erosion control measure by the landscape architect, the owner and the contractor, the contractor is responsible for immediately repairing and correcting any progressive rilling that may occur.
    3. Erosion control measures may include but not be limited to:

a. Filling
b. Raking
c. Redirecting runoff
d. Properly programming irrigation operations
e. Replanting
f. Providing additional erosion control materials such as:
    1) Jute matting
    2) Filter Fabric
    3) Hay bales
    4) Hay rolls
    5) Silt fencing
    6) Sand Bags
    7) And/or other erosion control items as required to maintain healthy plant material and stable slopes.

E. Additional erosion control measures required due to irrigation operations programmed by the contractor that did not take into account cycle and soak functions of the controller will be installed and/or repaired as directed by the landscape architect and/or owner's representative at no additional cost to the owner.

F. Mulch replenishment

1. Contractor to replenish mulch levels as required to match installation levels with the same type as listed in the documents

1.09 PROTECTION

A. Maintain all planting areas from time of plant installation, through the Plant Establishment Period and final acceptance, in accordance with Standard Specifications.

B. Maintain weed levels to less than 5% of total area with a final goal of less than 3% at completion of the establishment period.

C. Maintenance also includes temporary fences, barriers, and signs as required for protection.

D. The Contractor shall treat or replace any plant that becomes damaged, fall in decline or be injured, as directed by the Owner’s Representative at no additional cost to the Owner.

1.10 FERTILIZATION

A. Groundcover and all planting shall be fertilized in accordance with soils report recommendations when granular fertilization is used; if no soils report exists, the following criteria shall prevail: apply certified organic compost mulch at the rate of 3 cu yards per 1000 square feet 30 days after installation. Repeat application every 60 days if maintenance period is longer than 90 days. Organic Compost shall be Custom Amendment Mix (WCP 33) by Earthworks Soil Amendments, Inc., 951-782-0260.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.01 FIELD QUALITY CONTROL

A. Perform Site Observations: For the purpose of establishing the 90-day Maintenance Period and observing completion of the work of this Section through final acceptance. A minimum of (6) six separate field visits, occurring chronologically as follows:

1. Observation for Maintenance at Commencement
2. 15-day Progress Maintenance Observation
3. 30-day Progress Maintenance Observation
4. 60-day Coordinate Site Meeting with Client's Site Maintenance Staff
5. 60-day Progress Maintenance Observation
6. 90-day Observation for Final Acceptance

B. Observation for Plant Establishment Period Commencement: Request observation and acceptance by Owner's Representative after all plant material is installed and after all irrigation work and other work of this Section is completed. Plant Establishment Period shall begin upon acceptance of final planting and review by the Owner's Representative. The Period shall continue for a minimum of 90-calendar days until Final Acceptance.

C. At any time, deficiencies are found such as underperforming plants or a lack of maintenance, the Owner's Representative will notify the Contractor immediately that the 90-day period has been suspended until such time as the deficiencies are fully corrected.

D. The Contractor has 3 days to respond to any notices of deficiencies and make appropriate corrections including plant replacements.

3.02 PROGRESS MAINTENANCE OBSERVATION

A. General: Notify the Owner's Representative 72 hours prior to a required scheduled Progress Maintenance Observation. All items determined to be deficient during the previous observation shall be completed prior to the meeting. FAILURE TO DO SO MAY RESULT IN AN EXTENSION OF THE PLANT ESTABLISHMENT and MAINTENANCE PERIOD. In addition, prior to first Progress Maintenance observation, furnish the Owner's Representative with the following information:

1. An "As-Built" irrigation plan, as specified.
2. All supplier invoices for the nursery stock, commercial fertilizers, soil amendments, mulches and herbicides as shown and specified and as installed.
3. Maintenance schedule for fertilization, irrigation, and for all planting areas.

B. Failure to provide the above submittals may result in the re-scheduling of the Progress Maintenance Observations and extend the Maintenance Period.

C. Notify the Owner's Representative in writing, prior to any of the Progress Maintenance Observations of any conditions, which may impede proper plant establishment and or growth.

D. Final Maintenance Observation: Notify the Owner's Representative at least 7 days before the expiration of the Plant Establishment Period for Final Maintenance Observation. Prior to this observation, all items determined to be deficient during the Progress Maintenance Observations shall be completed and signed-off by the Owner's Representative.

3.03 FINAL COMPLETION

A. General: Work under this Section will be accepted by the Owner's Representative upon satisfactory completion of all work of this Section, Section 32 90 00 Planting, and Section 32 84 00 Planting Irrigation, including 90-Day Plant Establishment Period, exclusive of replacement of plant material under the terms of the Warranty.

B. Termination of Observation: During any Observations, any landscape item previously identified as deficient in the Progress Maintenance Observations and determined by the Owner's Representative to be still deficient, shall automatically terminate the Final Completion and result in the extension of the Plant Establishment Period an additional 30 days. Additional costs associated with subsequent Observations that are a result of the Contractor's failure to correct deficient items shall be paid by the Contractor. There shall be no conditional final completion agreement for any work.

3.04 NOTIFICATION TO OWNER FOR TRANSFER OF MAINTENANCE

A. At least one month prior to the end of the 90-Day "Plant Establishment Period," the Contractor shall notify the Owner's Representative to coordinate a meeting between the Recreation & Park Department staff and the Contractor to ensure a smooth transition for turn-over of plant maintenance.

END OF SECTION