CITY OF
ROSEVILLE
CALIFORNIA

Parks, Recreation & Libraries Department

Section 4:
TECHNICAL SPECIFICATIONS

TABLE OF CONTENTS

Consultants to add new sections and/or edit existing sections as needed to reflect specific project needs. New sections shall be formatted to match those included in these standards.

APPENDICES

Consultant to add or delete sections/appendices as they apply to specific project needs. Items noted to be provided by the City shall be identified on a project by project basis.

SECTION 00 31 46
PERMITS

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.

B. The requirements set forth in the Supplemental Conditions shall be in addition to the standards provided herein.

C. The intent of this Section is to furnish bidders with the known list of required permits for the Work under the Contract Documents. Bidders should note the list is not necessarily complete and additional requirements may exist or arise.

1.02 Permits

A. The Contractor shall obtain copies of the following permits from the Project Manager. Copies of these shall be obtained prior to start of work and shall be kept on the jobsite.

1. State Water Resources Control Board General Permit for Discharges of Storm Water Associated with Construction Activity.
2. City of Roseville Department of Development Services, Improvement Plan Permit for all Work related to this project.
3. City of Roseville Department of Development Services, Building Permit for all structural items associated with this project, including, but not limited to, lighting, backstops, restrooms, shade structures, drinking fountain (plumbing code), and miscellaneous electrical.
4. California Department of Fish & Game, Section 1601 Streambed Alteration Agreement: Owner has applied for and obtained the Section 1601 Agreements to allow work within streambeds and banks. A copy of the permit is included in the Appendix of the Project Manual.
5. City of Roseville Planning Department, Tree Permit: Owner has applied for and obtained a tree permit to allow removal or encroachment under Heritage Oaks.

B. Contractor shall comply with the conditions of these permits, and will be solely responsible for all costs associated with meeting permit conditions unless specifically specified otherwise in these Contract Documents.

PART 2 - PRODUCTS

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PART 3 - EXECUTION

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END OF SECTION

SECTION 01 10 00
SUMMARY OF WORK

PART 1 - GENERAL

1.01 General

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.
B. The requirements set forth in the Special Conditions shall be in addition to the standards provided herein.

1.02 Project Description

A. Project Name and address:
Sample Project Name
123 Main Street Roseville
B. Project description/scope of work:
The scope of this project includes …
C. The Contractor, prior to submission of his bid, shall visit the site and become familiar with the physical site conditions, the plans and specifications. All existing site conditions, apparent in a detailed, on-site inspection, shall be a part of the project. Submission of a bid shall represent the Contractor's acknowledgment of the existing site conditions and its effect on the implementation of the contract documents.

1.03 Engineering

A. Field Engineering, as a part of this contract, shall include:
1. Layout of the work and establishment of lines and grades.
2. Said work to be performed by a California Registered Civil Engineer or a California licensed Land Surveyor.
3. When discrepancies between the drawings and actual site conditions are discovered, notify the Inspector for instruction on how to proceed.
4. All work shall:
a) Establish indicated layout in relation to the property survey and existing reference points.
b) Establish and preserve permanent reference points during the course of construction.
c) Set locations and elevations of all site elements as required for proper completion of the work.

1.04 Permits, Fees and Notices

A. The Contractor and/or his assigned Subcontractors shall obtain any and all required permits (beyond those provided by the City's Project Manager) from all governing authorities, including other City Departments, prior to start of construction.

1.05 Construction Plans

A. Any discrepancies or omissions found in the Contract Documents shall be reported to the City's project manager immediately. The City's project manager will clarify discrepancies or omissions, in writing, within a reasonable time.

B. In resolving inconsistencies among two or more sections of the Contract Documents, precedence shall be given in the following order:

1. Notice to Contractors
2. Special Provisions
3. City of Roseville Parks Construction Standards
4. City of Roseville Design and Construction Standards
5. Drawings

Addenda shall take precedence over all sections referenced therein. Figure dimensions on Drawings shall take precedence over scale dimensions. Detailed Drawings shall take precedence over general Drawings.

1.06 Definitions

A. The term "accepted" where used within, shall mean accepted in writing by the City of Roseville's Project Manager.

B. The term "Inspector", where noted, shall mean the project representative, appointed by the City of Roseville, who will oversee the project on a day-to-day basis.

C. The term "Project Manager", where noted, shall mean the project representative appointed by the Parks Department.

D. The term "Consultant", where noted, shall mean the prime Consultant listed on the cover sheet of these Specifications.

E. The term "accepted equal", where used herein, shall mean the equal in the opinion of the Project Manager, in consultation with the Consultant, when necessary, and as accepted in writing by the Project Manager.

F. The term "Project Owner", where used herein, shall mean the landowner or developer.

G. The term "provide", where used herein, shall mean furnish and install complete.

H. The term "as selected", where used herein, shall mean as selected by the Consultant and as accepted by the Project Manager.

I. The term “substantially complete”, where used herein, shall mean the state of which the project can be used in the manner of which it is intended with the exception of minor items as determined by the Project Manager.
J. See Section 1 of the General Conditions for additional definitions and terms.

1.07 Standards

A. Numerous standards are referenced in these contract documents. The referenced standards shall be the current edition as of the date of these contract documents. Also, see Section 4 - 1.02 of the General Conditions.
B. The codes adopted by the City, County, State and federal agencies shall govern minimum requirements for this project. Where codes conflict with these Specifications, the more stringent shall apply, and such conflicts shall be brought to the attention of the Project Manager. Caltrans Standards shall be applied where specifically referenced. In the absence of specific reference requirements in the contract documents, the applicable codes shall govern.
C. In addition to the standards noted in individual sections of these Specifications, standards of the following organizations shall be noted by initials only.
    1. ANSI: American National Standards Institute.
    2. ASTM: American Society for Testing and Materials.

1.08 Submittals

A. All submittals shall be submitted at one time within ten (10) working days from issuance of Notice to Proceed. The review time for submittals shall be as noted in Section 2 - 1.04 of the Special Conditions. Items returned for re- submittal shall be returned to the City within two weeks
B. The Contractor shall include a cover sheet indicating the following (A sample is provided in Section 5: Forms):
    1. Drawing sheet or specification section reference (by section, paragraph and sub-paragraph numbers);
    2. Item description;
    3. Indication whether this item is “as specified” or “proposed substitution” and
    4. A space for itemized response summary, e.g. “reviewed” or “resubmit”.
C. Contractor shall provide submittals electronically in PDF file format and physical product samples as required in specifications. It shall be the Contractor’s responsibility to ensure the summary sheet is included in the submittal package. Incomplete submittal packages (i.e., the lack of a summary sheet or lack an appropriate product sample) will not be reviewed.
D. Proposed substitution requests must include a comparison between the originally specified item and the proposed substitute. The burden of proof of compliance for proposed substitutions with project requirements rests with the Contractor. Coordination of the installation of accepted substitutions, including

incidental changes/modifications to accommodate proposed products shall be at no additional cost to the Owner.

E. Where required in specified Section of these Specifications, submittals shall include proof of order of site furnishings, play equipment or other materials within two weeks (ten working days) of receipt of the returned, approved submittal. Submittals of orders shall be made at one time. Exceptions will be considered, with justification.

1.09 Tests

A. In addition to Section 4 - 1.03 of the General Conditions, testing and inspections may be performed by a private testing laboratory. The testing laboratory, provided by the City, shall be under the direction of a California registered civil engineer. All work shall conform to requirements set forth by ASTM B329, and shall be acceptable to the City.

B. Copies of the laboratory reports/results of each test or inspection shall be provided to the Project Manager, Inspector and Contractor.

1.10 Temporary Facilities

A. Sanitary provisions shall be the responsibility of the Contractor. Existing restroom facilities shall be not utilized by the Contractor, his Sub-contractors, or employees thereof, unless specifically accepted by the Project Manager. Provide chemical toilets or water closets and urinals connected to the sewer in a location accepted by the Project Manager.

B. Barricades shall be the responsibility of the Contractor and shall be erected as necessary to protect the property, the construction and the public from hazards due to construction.

C. Signs, other than those identified in these Specifications, shall be prohibited. Notices, required by law, shall be posted and maintained.

1.11 Utilities

A. All utility fees, including, but not limited to, connection fees, installation fees, meters, monthly service fees and cost of utilities used during the course of construction and establishment are considered a direct cost and are the responsibility of the Contractor until project acceptance by City Council.

1.12 Dust/Noise Control Requirements

A. Dust and other air pollution nuisances on or adjacent to the site shall be abated, per Section 2 - 1.15 of the General Conditions. Dirt shall not be allowed to accumulate on streets or sidewalks nor be washed into sewer.

B. Noise from construction operations shall be kept to a minimum. Allowable hours of operations shall be from 7 a.m. to 7 p.m. Monday through Friday. Work on

weekends and holidays must be approved by the project manager. Work on weekends and holidays shall not begin before 8 a.m. and must be completed by 8 p.m.

1.13 Tree Replacement Schedule

A. Trees damaged or removed without prior approval shall be replaced at an inch per inch basis on-site, except otherwise accepted. New stock shall follow the table provided:

Plant Size	Inch Value
3 Five Gallon Stock	One Inch
1 Fifteen Gallon Stock	One Inch
1 24” Box Stock	Two Inches
1 36” Box Stock	Three Inches

1.14 Inspection of Construction

A. In addition to the routine inspections performed by the Parks Inspector, portions of work may be inspected by the other city departments. Notify the Parks Inspector and Project Manager a minimum of 48 hours prior to date of inspection.

B. The Parks Inspector shall be the main line of communication between the site superintendent, the project manager and other City department inspectors. Changes in scope of work or standards shall be approved by the project manager.

C. Refer to the parks inspection record. This shall be issued at the Pre-Construction meeting and shall be utilized by the Contractor throughout the course of construction. A completed “hard card” shall be submitted to the Project Manager along with required turn in items (See 1.19 this Section) upon final acceptance of the project. The Notice of Completion shall not be filed until all record documents have been received and accepted.

1.15 Adverse Impacts to Site Conditions Due to Construction

A. Impacts that affect the site conditions to the detriment of the park or streetscape impacts that affect the site conditions to the detriment of the park or streetscape construction or long term viability of the site shall be mitigated by the contractor prior to acceptance of the project. Such impacts shall include, but are not limited to:

1. Soil compaction in non-structural areas;
2. Diesel or gas fuel leaks/spillage;
3. Buried concrete or other construction debris;
4. Hazardous material contamination;
5. Lime treatment in planting areas;
6. and more.

1.16 Pre-final (Punch List) Review

A. Notify, in writing, to the Parks Construction Inspector, that the work is substantially complete. Substantially complete is defined as “the state of work where it may be used in a suitable and intended manner with exception of minor corrections”. Partial acceptances will not be granted. Items to be reviewed as a part of substantial completion include:
   1. All construction items
   2. Installation of all site furnishings, including lights and signs
   3. All planting, including mulch installation and weed control of planted areas.
      a) For sodded turf, upon sod installation
      b) For seeded turf, upon second mowing as described in Section 329000, Part 3.11.

   4. The irrigation system is fully functioning as designed and as confirmed by the landscape irrigation audit.

B. Within five workings days of receipt of notification, the Parks Construction Inspector will confirm substantial completion. The Parks Construction Inspector will schedule the punch list walk (pre-final review) within five working days after the project has been determined as substantially complete. A formal punch list will be developed at the punch list walk. The Parks Construction Inspector will provide a copy of the formal punch list to the Contractor within five working days of punch list walk. Performance of the punch list walk does not automatically trigger the start of establishment.
   1. If at any point during this review it becomes apparent the Contractor has not properly prepared for the site review, the inspection shall immediately be terminated and re-scheduled at such a time as the site has been readied for a review. Any costs for the re-scheduling of the review shall be the responsibility of the Contractor. Lack of site preparation could delay start of the establishment period.

C. Concurrent to the pre-final review, the City will make a formal request for all required turn-in items to be submitted to the City. All turn-in items shall be submitted in their entirety to the City’s Park Construction Inspector. Partial turn-in packages will be rejected.

D. Once all turn-in items have been confirmed to be complete and accurate, the establishment period may be considered to begin. The City shall have sole discretion in determining the appropriateness of the commencement of the establishment period and shall notify the developer/contractor in writing of the start and end dates. Portions of the project will not be accepted for establishment prior to the substantial completion of the entire project.

1.17 Establishment Period

A. The duration of the establishment period shall be:
   1. For seeded turf in parks: Ninety (90) calendar days, minimum, and until the Notice of Completion (NOC) for City-built parks has been approved by the City Council, or the deed transferring property ownership, has been recorded at the County for Developer-built parks.
   2. For sodded turf in parks: Forty-five (45) calendar days commencing between March 1st and October 31st and sixty (60) calendar days commencing between November 1st and February 28th, and until the Notice of Completion (NOC) for City-built parks has been approved by the City Council, or the deed transferring property ownership, has been recorded at the County for Developer-built parks.
   3. For streetscapes: Thirty (30) calendar days, minimum, and until final acceptance of all related street improvements subject to approval of a Notice of Completion by the City Council. The inclusion of large box trees (36" box and greater) may require an extended establishment period of ninety (90) calendar days, as noted on plans.

B. Active maintenance is required throughout the entire establishment period. Active maintenance is defined as:
   1. All areas within the project site shall be protected against damage including vandalism, erosion, trespass, rodents and other acts. Immediately repair all damaged areas.
   2. All walkways and paved areas shall be kept clean and all debris within planting and turf areas shall be immediately removed.
   3. Automatic irrigation controller shall be fully utilized and irrigation system monitored and adjusted as described in Section 32 84 00 4.03.
   4. All plant and turf maintenance as described in Section 32 90 00 3.11

C. Prior to the start of the final thirty (30) days of establishment:
   1. All punch list items shall be completed.
   2. All certifications and testing shall be completed.
   3. All plantings and turf shall be thriving and in a healthy condition.
   4. The lack of active maintenance prior to the final thirty (30) days may constitute a delay in the start of the final thirty (30) days of the establishment period.

1.18 Final Review

A. One (1) week prior to the end of the establishment period, a final on-site review shall be conducted to review project readiness for final turn-over. All punch list items must be satisfactorily addressed prior to the final review.

B. The project shall be prepared and cleaned per Section 2 - 1.12 of the General Conditions; the turf shall be mowed; and the irrigation heads shall be adjusted appropriately one day prior to the scheduled final review.
C. Acceptance of the project shall be considered “field accepted” and a recommendation will be forwarded to the City Council for “final acceptance” per Section 7 - 1.01 of the General Conditions.
D. An unaccepted project shall extend the establishment period until such time as the unaccepted portions of the project have been reviewed and field accepted by the Inspector and Project Manager.
E. Turn over for City maintenance shall occur only after:
    1. The specified duration of the establishment period has been successfully completed.
    2. If required, the deed transferring property ownership, has been recorded at the County.
    3. A Notice of Completion (NOC) for city-built parks and for streetscapes has been approved by the City Council.
F. Contractor shall provide a written guarantee covering all improvements associated with this project. See 1.19 – Warranties and Guarantees.

1.19 Record Documents

A. Record documents or as-built plans shall be maintained on-site and updated routinely as specified in Section 2 - 1.13 of the General Conditions. Record documents shall include **all items under the contracted scope of work**.
B. Record documents shall be submitted:
    1. two sets 11 x 17 laminated reductions of the irrigation plan illustrating with colors the individual controller stations; and
    2. Electronically submit PDF scanned images (in color) of the verified/initialed as-built drawings.
    3. For City of Roseville CIP projects, SWPPP binder.

1.20 Warranties and Guarantees

A. Warranties are required under various Sections of these Specifications. Prior to final acceptance, the Contractor shall combine all warranties into a single electronically submitted PDF, . All warranties shall be clearly labeled and the number of years highlighted. Also, see Sections 7 - 1.10 and 7 - 1.11 of the General Conditions.
    1. Warranties for equipment shall be submitted in the manufacturer’s standard form and shall be countersigned by the subcontractor or supplier and the Contractor.

2. All other warranties shall be provided in the following format, written on subcontractor's or supplier's letterhead, signed by the subcontractor or supplier and countersigned by the Contractor:

WARRANTY FOR _____ YEARS

"We hereby warrant that the ***product*** which we have installed at ***project name*** has been done in accordance with the contract documents, and that the work, as installed will fulfill the warranty requirements included in the Specifications.

We agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced by so doing, that may prove to be defective in its workmanship or material within the warranty period stated above commencing from the date of final acceptance of the above named project by the City of Roseville's City Council, without additional expense to the City, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of failure to comply with the above conditions within thirty (30) days of notification by the City, we collectively or separately do hereby authorize the City to proceed with the repairs or replacement of such defects at our expense. Payment of said costs and charges will be forwarded to the City upon demand.

Signed: _____ _____
Subcontractor or Supplier Date

Countersigned:_____ _____
Contractor Date

B. Guarantees shall be a minimum of one (1) year for all plant material, including trees and shrubs. The guarantee shall state that plant materials (trees & shrubs) to be free of all defects or disease and all plants are in a healthy and thriving condition at the completion of the contract. Deciduous plant material shall be warranted beyond the time of contract completion until such time as growth becomes evident.

PART 2 - PRODUCTS

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PART 3 - EXECUTION

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END OF SECTION

SECTION 01 57 23
STORM WATER POLLUTION CONTROL

PART 1 - GENERAL

1.01 General

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.
B. The requirements set forth in the Special Conditions shall be in addition to the standards provided herein.

1.02 References

A. State Water Resources Control Board Order No. WQ 2022-0057 DWQ National Pollutant Discharge Elimination System General Permit No. CAS0000002, for Storm Water Discharges Associated with Construction and Land Disturbance Activities.
B. CASQA California Stormwater BMP Handbook – Construction, October 2024.

1.03 Definitions

A. NOI: Notice of Intent
B. NOT: Notice of Termination
C. QSP: Qualified SWPPP Practitioner
D. QSD: Qualified SWPPP Developer
E. SWPPP: Storm Water Pollution Prevention Plan
F. SWRCB: State Water Resources Control Board
G. NPDES: National Pollutant Discharge Elimination System
H. WDID: Waste Discharger Identification number
I. BMP: Best Management Practices

PART 2 - PRODUCTS

Intentionally left blank.

PART 3 - EXECUTION

3.01 SWPPP

A. Comply with State Water Resources Control Board Order No. WQ 2022-0057-DWQ National Pollutant Discharge Elimination System General Permit No. CAS000002, for Storm Water Discharges Associated with Construction and Land Disturbance Activities.

B. A SWPPP has been developed for this project. The SWPPP is a dynamic document and will change as conditions (weather or construction phases) warrant.
C. Implementation of the SWPPP is the responsibility of the Contractor and a part of this project. Costs associated with implementation and maintenance of the BMPs per the SWPPP shall be included in the lump sum base bid.
D. Major changes to the SWPPP shall be reviewed by the City's QSD prior to implementation. Cost associated with the major changes will be paid for using the unit cost listed in the Additions or Deletions Sheet of the Proposal
E. The City's QSD/QSP will perform weekly inspections of the jobsite. Implementation of and minor changes to the SWPPP as directed by the City's QSP shall be incidental to the Work. Contractor shall start all inspection corrective actions within 72 hours of observation, and complete as soon as possible.
F. All BMPs installed will be inspected by the City's QSD/QSP for compliance with the SWPPP and BMP Fact Sheets. BMPs that are not in compliance shall be brought into compliance by the Contractor at no cost to the City.
G. An electronic copy of the SWPPP will be provided to the contractor. The contractor shall keep a binder on-site for inspection reports, and will make the inspection binder available upon request.
H. The SWPPP shall be readily available throughout the course of construction and until the NOT has been accepted by SWRCB. The SWPPP shall be made available upon request by a representative of the Regional Water Quality Control Board, State Water Resources Control Board, United States Environmental Protection Agency, or City' storm water staff.
I. At the end of the establishment period, the Contractor shall submit copies of all inspection reports and sampling and analysis results to the City's Project Manager.

3.02 Schedule

A. Contractor shall develop a Water Pollution Control Schedule that describes the timing of grading or other work activities that could affect water pollution. The schedule shall be updated by the Contractor to reflect changes in the Contractor's operations that would affect the necessary implementation of water pollution control practices. The typical sequence of work shall be adjusted by the Contractor based on weather conditions and forecasted rain events. The schedule is considered an appropriate and applicable BMP.

3.03 Penalties and fines

A. Contractor is responsible for all penalties and fines assessed to or levied on the project related to the implementation of the SWPPP.

B. In an effort to maintain compliance with the General Permit, the Contractor may be asked to make changes to the BMPs. If the Contractor is unable to perform these services in a timely manner the City reserves the right to address any areas of concern and deduct the cost from the contract.

3.04 BMP's

A. Construction BMP's shall be installed per the Erosion / Sediment Control Plan and project SWPPP, and in accordance with the CASQA California Stormwater BMP Handbook. Use of alternative BMP's will be reviewed and accepted at the discretion of the City's QSD.

3.05 Cleaning

A. Thoroughly clean all areas where work has occurred. Remove from the site excess material, debris and rubbish.
B. Take all precautions to protect completed work. Immediately repair or replace all damaged areas due to tire ruts, erosion, compaction failure, etc. Keep all erosion control measures intact.

Delete this article if winter suspension is not required

3.06 Winter Construction Suspension

A. Contractor shall include a winter construction suspension as part of the construction schedule. The counting of working days will be suspended during the winter suspension period. It is at the City's sole and complete discretion to determine the start and end dates of the winter construction suspension. The City will notify the Contractor 10 working days before the start of the winter construction suspension. The City will notify the Contractor 10 working days before the end of the winter construction suspension. The Contractor shall begin work within 15 calendar days after receiving the notice of the end of the winter construction suspension.
B. Contractor shall include an allowance of *($15,000)* for the winter construction suspension per the bid documents. Costs associated with preparing the site for the winter construction suspension and costs associated with corrective actions required during the winter construction suspension will be paid for using the allowance on a Time & Materials Basis according to the allowable mark-ups in the project's General Conditions, or per an approved lump sum or unit price quote. Costs to implement and maintain the BMPs per the Erosion and Sediment Control Plan are excluded from the winter suspension allowance and shall be included in the lump sum base bid.
C. Prior to the winter construction suspension, stabilize all exposed soils at the direction of the City's QSD/QSP. In addition, all adjacent drainage inlets shall be protected and perimeter control shall be installed and in good repair.

D. Traffic on the construction site shall be kept to minimum. All traffic entering or exiting the site must use the stabilized construction entrance.
E. Where there are areas of concentrated runoff flows, Contractor shall protect the soil from erosion.
F. Per the Construction General Permit Requirements, inspections by the City's QSD/QSP will continue into and through the winter suspension period. Inspections will occur before, during, and after each Qualifying Precipitation Event (0.5" or more precipitation forecast in a 24 hour period) and at least once per week. Contractor shall start all inspection corrective actions within 72 hours of observation, and complete as soon as possible.
G.
H. The City's QSD/QSP will be sampling discharges that occur during regular working hours during a Qualifying Precipitation Event (QPE) to ensure compliance with runoff standards for pH and turbidity. If the water sampling indicates compliance issues, Contractor shall make repairs or adjustments to BMPs immediately, and respond to any such requests within 24 hours.

END OF SECTION

SECTION 03 30 00
SITE CONCRETE

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.
B. The requirements set forth in the Supplemental Conditions shall be in addition to the standards provided herein.
C. The standards set forth in the City of Roseville Design and Construction Standards and the City of Roseville Parks Construction Standards, latest editions, shall be in addition to the standards provided herein.

1.02 Description

A. Furnish all labor, materials and equipment for the complete installation of all concrete work, flatwork and poured-in-place as shown in the Plans and as specified herein.

1.03 References

A. Caltrans Standard Specifications, latest edition.
B. California Building Code (CBC) and California Administrative Code (Title 24), latest editions.

1.04 Quality Assurance

A. For all flatwork, the Contractor shall pour a six-foot by six-foot (6’ x 6’) sample of each type of finish specified for review and acceptance by the Project Manager prior to pouring any concrete. The accepted samples shall remain on-site and intact until all concrete work has been completed. The quality of the concrete work shall be measured by the accepted samples.
B. During the course of construction, a qualified testing laboratory shall obtain samples as determined by the Inspector and conforming to federal and state codes and standards. Such costs shall be paid for by the City. Re-tests and removal of below acceptable strength concrete shall be borne by the Contractor. The Contractor shall cooperate with the testing during the course of obtaining such samples.
C. Variances in surface grades of more than 1/8”, as measured by a straight edge ten feet (10‟) long, shall be corrected to the satisfaction of the Inspector. Remove all areas where standing water occurs, including any surface irregularities.

1.05 Handling and Storage

A. Comply with ASTM C-94, “Specifications for Ready Mix Concrete” for the batch, mix and transport of concrete.
B. Mix and deliver only the amount that will be poured immediately.

1.06 Record Drawings

A. The Contractor shall keep an accurate record of the as-built conditions of the site concrete. These records shall be updated daily and kept at the construction site. At any time, the Inspector may examine the conditions of the “as-builts” to ensure compliance of the above.

PART 2 - PRODUCTS

2.01 Concrete

A. Concrete for play area curbs, sidewalks, and accessible ramps shall conform to the provisions of Section 90-2 “Minor Concrete” of the Caltrans Standard Specifications. Cementitious material shall be „Type II Modified” and shall contain no less than 505 pounds of cementitious material per cubic yard. Aggregate shall be not greater than one-inch or smaller than 3/8-inch. Submit concrete analysis for review and acceptance prior to placement of concrete.

2.02 Fiber Reinforcement

A. Fibers for concrete shall conform to ASTM C1116 Type III and manufactured specifically for the secondary reinforcement of concrete. Fiber length to be 0.50” or 0.75”. Acceptable products include Fibermesh 150, as manufactured by Sika USA, or accepted equal.

2.03 Expansion Joint Material

A. Fiber expansion joint shall conform to ASTM-1751 and shall be a non-extruding resilient filler. Filler shall have preserve attributes and high quality bituminous materials.
B. Apply Sikaflex elastomeric sealant, or accepted equal, over all expansion joints.

2.04 Concrete Forms

A. All forms shall be new at the start of the project.. Minimum size lumber shall be 2 x 6.
B. Radius bends shall be formed by spring steel forms or laminated boards, as required.
C. Plywood shall be 5/8”, Class I, exterior grade as outlined in APA “Guide to Plywood Grades”. Omit mill oiling treatment.

2.05 Coloring Agents

A. (Insert amount and color)
B. All colored concrete admixtures shall be integral.

PART 3 - EXECUTION

3.01 Poured-In-Place Concrete

A. Concrete for hardscape or flatwork shall be placed on subgrade compacted per geotechnical engineer recommendations.. Prior to placement of concrete, a soils compaction test must be performed by an accepted soils testing professional on a representative number of locations along the flatwork area. The City or project owner shall provide the initial test. The results of these tests must be available and meet acceptable levels prior to pouring. Re-tests and re-work of any area, as directed by the soils professional, shall be the responsibility of the Contractor.
B. Construct forms to conform to the shapes, dimensions and details shown on the Plans. All forms shall be true to lines, plumb, level and square.
C. Forms shall not leak, spread, shift or settle when concrete is placed.
D. All forms shall carry dead and live loads and shall not deflect more than 1/8” between supports after placement of concrete.
E. All forms shall be thoroughly soaked a minimum of twelve (12) hours prior to pouring of concrete. Forms shall be treated per manufacturer’s recommendations.
F. Reuse of forms may be allowed at the discretion of the Inspector. Reused forms shall be cleaned and free of defects that would affect the final concrete finish.
G. Concrete footings shall be formed only when excavations slump or cave in. Over-excavate the trench or footing diameter to accommodate the forms’ installation and removal. Apply water to moisten soil. Do not allow water to create mud or ponding.

3.02 Fiber Reinforcement

A. Install per manufacturer’s instructions. Apply at the batch plant prior to delivery. Thoroughly mix fiber material to avoid “clumping”.

3.03 Expansion Joints

A. Expansion joints shall be placed where vertical elements meet horizontal paving unless otherwise noted on the Plans. This shall include vertical expansion joints on play area curb walls, buildings, shade structures, walls and/or planters. The corners of the paving shall be tooled at the expansion joints. Trim exposed fibers which protrude above or beyond the finish surface of paving or the finish surface of the wall.

3.04 Control Joints for Concrete Sidewalks

A. Control joints shall be per Parks Standard Details with deep, straight and finished with rounded edges. Control joints shall be placed (on-center) a distance equal to the width of the concrete walkway, unless otherwise shown on the Plans. For example a ten-foot wide walkway shall have control joints placed ten feet on center. Control joints shall not dead-end into an adjacent panel, and shall not create acute angles that are prone to break off.

3.05 Sawcutting of control joints shall begin as soon as the concrete surface has hardened sufficiently to resist raveling. Admixtures

A. (Insert, if used)

3.06 Coloring Agent

A. (Insert, if used)

3.07 Placement of Concrete

A. Do not pour concrete in weather below 40 degrees F. or when temperatures are predicted to fall below freezing within 24 hours, except with prior authorization.
B. Concrete shall be transit mixed according to ASTM C-94. Discharge ready-mixed concrete from transport vehicle while the concrete is still plastic and before stiffening occurs.
.
C. Concrete shall be deposited up to the finished height of the forms and up to the adjacent joint. No partial pours will be allowed. Excess material shall be dumped on-site and later removed by the Contractor.
D. Thoroughly consolidate the concrete by manually spading and tamping concrete into all corners of the forms and by utilizing a high-speed mechanical vibrator. Retain a standby vibrator on-site during the course of concrete work. When utilizing the vibrator, take precautions to avoid impact on the forms.
E. After obtaining uniform consolidation, screen tamper all flatwork surfaces, screed and bull float to ensure that large aggregates are pushed below the surface. When it is practical to work on the surface, wood float, steel trowel paving to a uniform surface.
F. Concrete elements shall not exceed the following tolerances:
    1. Linear: 1/8”
    2. Slab deviation: 1/8” in 10’

3.08 Finishes

A. Finishes shall be as shown on the Plans and shall be consistent in quality throughout the project. No visible cracks or discoloration will be accepted.

Finishes on vertical surfaces shall be consistent throughout. Vertical expansion joints are spaced as identified on the plans and are smooth with the finish surfaces. All edges for flatwork and vertical surfaces shall be eased at a consistent radius.

B. Upon completion of float finishing, provide the final finish as follows:
   1. Medium Broom Finish: shall be accomplished by pulling a stiff bristle broom across a floated surface. The direction of the broom shall be perpendicular to the path of travel, unless otherwise shown on the Plans.
   2. Acid Washed Finish: shall be accomplished after the slab has cured and no sooner than two (2) weeks after the concrete had been placed. Remove the cement film from the surface of the aggregate by an acid wash. Delaying the acid wash additional time is permissible. The slab shall be saturated with water, brushed free of standing water and washed with 5% to 10% solution muriatic acid. Several flushings with clear water should follow until the surface matches the accepted sample panel.
   3. Rock Salt Finish: shall be accomplished by (Insert, if used).
   4. Medium Sandblast Finish: shall be accomplished by (Insert, if used)
   5. Other (Insert, if used)

3.09 Removal of Forms

A. Form removal timing to be based on the concrete set strength and environmental conditions unless specifically called out on the drawings.

B. Remove all bolts, nails, ties, wires, etc. a minimum of one inch (1”) below the surface of the concrete. Remove imprints, irregularities or other such defects and patch as directed by the Inspector.

3.10 Curing and Protection

A. Allow adequate time for the concrete to cure. Contractor to take necessary steps to minimize evaporation and maximize the process of hydration.
B. Protect all concrete from damage during the curing period. Shoulddamage occur, Contractor shall take immediate action to repair damage or replace damaged concrete to the satisfaction of the City.

3.11 Clean-Up

A. During the course of this work, the area shall be kept clear and free of debris as realistically as possible. Upon completion of concrete work, completely remove from the site all used forms, hardware, spillage, rejected work and other materials.
B. Remove from site furnishing posts all concrete “slobber”. Re-touch posts as necessary for a clean finish.

END OF SECTION

SECTION 04 20 00
UNIT MASONRY (GENERAL)

PART 1 - GENERAL

1.01 Conditions

A. The general provisions of the Contract, including General and Supplementary Conditions and General Requirements apply to the work specified in this section.

1.02 Scope of Work

A. Provide all labor, materials, and equipment required to complete the unit masonry work as indicated on the Drawings and/or specified herein.
B. Work includes, but not limited to the following:
   1. Concrete masonry units.
   2. Face brick units.
   3. Pre-cast Elements.
   4. Installation of all required reinforcements, fasteners, anchors and accessories.
   5. Cleaning of unit masonry.
C. Related work specified in other sections:
   1. Section 03 30 00: Concrete

1.03 Quality Assurance

A. Material and installation standards: Comply with recommendations of the Brick Institute of America (BIA) standards; National Concrete Masonry Association standards; and ASTM standards.
B. Verify all measurements indicated on Drawings by taking field measurements; proper fit and attachment of all units is required.
C. Accurately fit, cut, and securely mortar together all units to produce a plumb, level and rigid installation.
D. All work and materials shall comply with Uniform National Building Codes (latest edition), and all other applicable codes and ordinances that govern the work of this Section.

1.04 Qualification of Installers

A. Installers shall be trained and experienced in the skills required and shall be completely familiar with the materials and their installation. Qualified installers shall be present at all times during the progress of work.

1.05 Coordination

A. Coordinate with all other trades whose work relates to unit masonry installation for placing all required reinforcements, fasteners, anchors, accessories, etc.

1.06 Submittals

A. Submit for Landscape Architect's written approval two (2) representative samples of each unit specified.
B. Submit manufacturer's certificate that units meet or exceed material specifications.

PART 2 - PRODUCTS

2.01 Concrete Masonry Units

A. ASTM C-90, concrete masonry hollow units, wire cut. Standard and bond beam units. Size and color as indicated on the Drawings. Color shall be standard grey.

2.02 Stone Veneer

A. As shown on Drawings.

2.03 Precast Concrete Molding and Baseboard

A. As shown on Drawings.

2.04 Masonry Mortar

A. ASTM C-270, Type M, consisting of one (1) part cement and three (3) parts sand with quarter (1/4) part lime.
B. LATICRETE 3701 grout and Mortar Admix
C. Mortar compressive strength at 28 days shall be 3000 PSI

2.05 Grout

A. Grout mix ratio by volumes: one part Portland Cement (ASTM C-150, Type 1); two parts minimum to three parts maximum damp loose sand, two (2) parts coarse aggregate (ASTM C-404).
B. LATICRETE 3701 Grout and Mortar Admix.
C. Grout compressive strength at 28 days shall be 3000 PSI.

2.06 Unit Masonry Reinforcement

A. Horizontal Joint Reinforcement: Truss type, hot-dipped galvanized zinc coated steel construction; 3/16 inch side rods with No. 9 cross ties.
B. Horizontal and vertical rebar reinforcements: ASTM A-615, Grade 40, size as indicated on the Drawings.

2.07 Concrete

A. As per Section 03 30 00: Concrete

PART 3 - EXECUTION

3.01 General

A. Supply anchor devices as indicated on the Drawings and as required to install materials as specified in other sections of work.
B. Cut units where required with a power saw or order units pre-cut from manufacturer.
C. Construct walls and other masonry construction to the full thickness indicated on the Drawings, using unit sizes as indicated.
D. Establish lines, levels, and coursing. Protect from disturbances.

3.02 Coursing

A. Install units straight and plumb with all courses true to line and level.
B. Install units in pattern as indicated on the Drawings.
C. Maintain unit courses to uniform width. Make vertical and horizontal joints equal and of uniform thickness.

3.03 Placing and Bonding

A. Lay units in full bed of mortar properly jointed with other work.
B. Install full mortar coverage of vertical and horizontal face of joints. Maintain uniform joint width of 3/8” – 1/2”, depending on nominal unit sizes. Cut joints flush and tool slightly concave.
C. Fully bond intersections and external and internal corners.
D. Do not shift or tap units after mortar has taken initial set. Where adjustment must be made remove mortar and replace.
E. Remove excess mortar.
F. Fill concrete masonry hollows solid with grout t or as indicated on the Drawings. Fill structural brick block unithollows solid with grout where reinforcement occurs or as indicated on the Drawings.
G. Wall caps shall be epoxied and anchored in place.

3.04 Reinforcement

A. Horizontal joint reinforcement: Place masonry joint reinforcement sixteen (16) inches on center or as indicated on the Drawings.
B. Place joint reinforcement continuous and lap reinforcement according to the recommendations of the Manual of Standard Practice of the Concrete Reinforcing Steel Institute.
C. Horizontal and vertical rebar reinforcement: Install with bond and beam spacing and rebar spacing as indicted on Drawings.
D. Place and consolidate grout fill without disturbing reinforcing. Cells containing reinforcement shall be grouted solid.

3.05 Curing and Protection

A. Provide thorough curing of joints and grout pours.
B. Protect newly laid masonry from exposure to precipitation, excessive drying, freezing, soiling, backfill and other harmful elements.

3.06 Waterproofing & Graffiti Seal

A. All walls below grade shall be waterproofed on the backside extending from the foundation to the brick cap.
B. Install in conformance with manufacturer's specifications.
C. Apply 2 clear coats of graffiti sealant on exposed exterior and interior surfaces. Submit proposed sealant type and conform to manufacturer specifications.

3.07 Cleaning

A. Brush off excess mortar as work progresses. Dry-brush masonry at end of each day's work.
B. Clean masonry with cleaners and methods as recommended by the manufacturer of the masonry units.
C. Rinse walls by washing off cleaning solution, dirt and mortar using clean, pressurized water.
D. Repair damage to adjacent materials that occurs during cleaning operation at no additional cost to the Owner.

END OF SECTION

SECTION 05 12 00
STRUCTURAL AND MISCELLANEOUS STEEL (GENERAL)

PART 1 - GENERAL

1.01 Conditions

A. The general provisions of the Contract, including General and Special Provisions apply to the work specified in this Section.

1.02 Scope of Work

A. Furnish all labor, materials, and equipment as required to fabricate and install all structural and miscellaneous steel work as indicated on Drawings and specified herein.
B. Although such work or materials are not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a secure and complete installation.
C. Provide shop drawings for all work.
D. Completely coordinate with work of all other trades.

1.03 References (Latest Edition)

A. AISC: Standard Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings by the American Institute of Steel Construction (AISC).
B. AISC – Code of Standard Practice – Manual of Steel Construction – Allowable Stress Design (ASD).
C. AISC – Code of Standard Practice of Steel Buildings and Bridges.
D. ASTM A36 – Structural Steel.
E. ASTM A-53: Black and Hot Dipped Zinc – Coated Welded and Seamless Steel Pipe.
F. ASTM A-120: Black and Hot Dipped Zinc – Coated Welded and Seamless Steel Pipe.
G. ASTM A307 – Carbon Steel Externally Threaded Standard Fasteners.
H. ASTM A500 – Cold Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.
I. ASTM A501 – Hot Formed Welded and Seamless Carbon Steel Structural Tubing.
J. AWS A2.4 – Symbols of Welding, Brazing, and Nondestructive Examination.
K. AWS D1.1 – Structural Welding Code.
L. SSPC (Steel Structures Painting Council) – Painting Manual.

M. California Building Code (CBC), latest edition.

1.04 Regulatory Requirements

A. Safety Requirements: Work shall comply with all Federal, State and municipal regulations regarding safety, including the requirements of the following:
   1. William-Steiger Occupational Safety & Health Act of 1970
   2. State of California, California Administrative Code, Title 8 Industrial Relations, Chapter 4, Subchapter 4, “Construction Safety Orders” and other State and local agencies having jurisdiction.
B. California Building Code (CBC), latest edition.

1.05 Submittals

A. Shop Drawings: General
   1. Before any structural steel is fabricated or delivered to jobsite, submit Shop Drawings in accordance with the General Conditions of these specifications.
   2. Shop Drawings shall clearly show all pieces with all pertinent dimensions, data, layout, sizes and weights, connections, and all controlled dimensions and elevations. Drawings shall clearly distinguish between shop and field bolts and welds. Errors in dimensions shown on shop drawings shall be responsibility of Contractor.
   3. Show details, including cuts, copes, connections, holes, threaded fasteners, and welds in accordance with AWS.
   4. Indicate which structural units, members or brackets require field cuts or welds due to construction techniques.
   5. Indicated metal fabricator’s method for radius form bents of pipe or tubing.
   6. All shop and field welds shall be indicated by AWS Welding Symbols.
      a) Indicate size, length and type of each weld.
      b) Special Inspection required by CBC and Building Department.
B. Welding:
   1. Certification of Welder’s Qualifications.
   2. Welding Procedure: Submit descriptive data to illustrate welding procedures to be performed.

1.06 Quality Assurance

A. Fabricated structural steel members in accordance with AISC Code of Standard Practice.
B. Perform Work in accordance with AISC Section 10.
C. Perform Work in accordance California Building Code (CBC), latest edition.
D. All welding procedures, welders, welding operation, and tackers shall be qualified in accordance with AWS Standard Code D1.1.
E. Maintain one copy of each document on site.

F. Fabricator: Company specializing in performing the work of this section.
G. Erector: Company specializing in performing the work of this section.
H. All construction shall conform to applicable building codes, project specifications and applicable regulations. Where the provisions of applicable codes, material manufacturer's requirements, and project specifications conflict, the more stringent provision shall govern.
I. Certification: Furnish, before fabrication, a mill certified report (in duplicate) of the tests for ach heat of steel or iron from which the material is to be fabricated, containing the results of chemical and physical tests required by the ASTM specifications for the materials.
J. Qualify welding processes and welding operators in accordance with AWS "Standard Qualifications Procedure". Provide certification that welders to be employed in work have satisfactorily passed AWS qualification test within the previous twelve (12) months. If recertification of welders is required, retesting will be Contractor's responsibility.
K. Work shall comply with the Drawings, Specifications and accepted Shop Drawings in every aspect. All errors of fabrication and connections, defective materials, fasteners, and workmanship shall be replaced at the expense of the Contractor.

1.07 Delivery, Storage and Handling

A. Deliver anchor bolts and anchorage devices which are to be embedded in cast-in-place concrete or masonry in ample time so as not to delay that Work.
B. Store materials to permit easy access for inspection and identifications. Keep steel members off the ground using pallets, platforms, or other supports. Protect steel members and packaged materials from corrosion and deterioration. Remove any damaged items from the site and replace at no cost to the Owner.
C. Use all means necessary to protect structural steel before, during and after installation.

1.08 Coordination

A. Coordinate and furnish all required anchorages, templates, and patterns, setting drawings, and installation directions for all built-in items. Supervise the proper location and the installation of all built-in items. Deliver all items required to be embedded in concrete, masonry or built into other material to their respective Contractor. Provide holes and connections for Work of others Contractors.

1.09 Field Measurements

A. Take field measurements prior to preparation of Shop Drawings and metal fabrication. Proper fit and attachments of all items is required; allow for trimming and fitting when taking field measurements before metal fabrication.

1.10 Shop Assembly

A. Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

PART 2 - PRODUCTS

2.01 General

A. Use materials of size and thickness indicated or, if not indicated, as required to produce strength and durability in finished product for use intended.
B. Metal surfaces used for fabrications of miscellaneous metal items which will be exposed to view shall be smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.
C. All other materials not specifically described, but required for a complete and proper installation, shall be new, free from rust, best quality of their respective kind, and subject to the approval of the Project Inspector.

2.02 Steel Plates, Shapes and Bars

A. All miscellaneous steel shall be standard cold-rolled sections, new, free from rust, and conforming to ASTM A-36.

2.03 Steel Pipe

A. All steel pipe shall be black steel pipe, except where indicated to be galvanized, complying with provisions of:
    1. ASTM A-120, Schedule 40 for pipe less than four (4) inch diameter.
    2. ASTM A-53 ERW for pipe greater than four (4) inch diameter.

2.04 Steel Tubing

A. All steel tubing shall be cold-formed steel tubing conforming to ASTM A-500, Grade B.

2.05 Fasteners

A. General: Provide electro-zinc plated fasteners for exterior use or where built into exterior walls or slabs. Select fasteners for the type, grade and class specified.
B. Bolts and Nuts: Regular hexagon-head carbon steel type conforming to ASTM A-307, Grade A with electro-zinc plating.

C. Flat Washers: U.S.S. standard round carbon steel type conforming to FS FF-W-92 with electro-zinc plating.
D. Lock Washers: Helical spring carbon steel type conforming to FS FF-W-84 with electro-zinc plating.
E. Anchor Bolts: Nonheaded “J” bolt type, unless otherwise indicated on Drawings, conforming to ASTM A-307, Grade A with electro-zinc plating.

2.06 Shop Paint

A. Primer shall be Red Oxide Primer, conforming to Federal Specification TT-P-31 for steel surfaces and Federal Specifications TT-P-64b for galvanized surfaces.

2.07 Grout

A. Pre-mixed, factory packaged, non-shrinking, non-metallic, non-staining, non-corrosive and non-gaseous group complying with CE CRD-C588. Provide grout specifically manufactured for exterior applications.

PART 3 - EXECUTION

3.01 General

A. Comply with AISC Code and Specifications and maintain Work in safe and stable conditions during erection. Provide temporary bracing and shoring as required; remove when final connections are in-place.
B. Execute all Work using skilled metal workers only. Do all welding as per AWS Specifications with certified welders.
C. When possible, fit and shop assemble all metal Work, ready for installation, with shop and field connections welded or attached with fasteners as indicated on Drawings.
D. Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where fabrication and installation of the work of this section may properly commence.
E. Make all required measurements in the field to ensure proper and adequate fit of miscellaneous metal items.
F. It is the intent of the Drawings to indicate detail connections. Where connection detail is not shown, detail shall be patterned after a connection similar condition, or an AISC standard type.

3.02 Fabrication

A. General
    1. Use materials of size and thickness indicated on Drawings or on accepted Shop Drawings to produce strength and durability in finished product for use

intended. Work to dimensions are indicated on drawings or on accepted Shop Drawings, using proven details of fabrication and support.

2. All fabrication shall be in accordance with AISC Specifications for fabrication of structural steel, California Building Codes, and requirements of regulatory agencies.
3. Do not field cut or alter structural metal units, members or brackets without accepted Shop Drawings.
4. Fabricate and pre-assemble work in shop to greatest extent possible.
5. Fabricate exposed work true to line, shape and level with accurate angles and radiuses. Ease exposed metal edges to a radius of approximately 1/32 inch.
6. Make cuts, bends, punching and drilling accurate, neat and properly located. Grind and file smooth all parts exposed to view; leave exposed surfaces free of fabrication marks. Mark and match-mark units requiring field assembly.
7. All welds shall be continuous, unless otherwise indicated, complying with AWS Specifications. Form exposed connections with tight, flush and smooth hairline joints. Grind exposed welds smooth and flush to match and blend with adjoining surfaces.
8. Cut, reinforce, drill and tap fabricated metal work as indicated on Drawings to receive finish hardware, fasteners and similar items.

B. Bolted Connections:
   1. Punch or drill holes 1/16 inch larger than bolt size and spear-ream before inserting bolts.
   2. Ream unfair holes, but only up to next larger bolt size. Where unfairness exceeds maximum, weld hole in base material solid and drill hole of proper size.
   3. As erection progresses, bolt up work to take care of dead load, lateral forces, and erection stresses. Provide any additional bracing necessary to resist all possible forces during erection. Contractor is entirely responsible for the stability of the structural steel work until the job is complete.

C. Assembly with Standard Threaded Fasteners:
   1. Beveled Washers: Provide under bolt heads or nuts resting on surfaces exceeding 5 percent slope with respect to head or nut.
   2. Draw up tight, check threads with chisel, or provide approved lock washers or self-tightening nuts.

D. Welded Connections:
   1. Perform welding using shielded metal arc, submerged arc, gas metal arc, or flux cored arc methods in accordance with appropriate sections of AWS D1.1 and CBC Chapter 27.

2. In addition to specific requirements of Drawings, details of welded joints shall comply with all requirements for joints which are accepted without qualification tests under the AWS Code. If sizes of fillet welds are not shown on Drawings, use AWS minimum weld size, but not less than thinnest part thickness minus 1/16 inch.
3. Plan welding operations to eliminate stress build-up.
4. Field Welding:
   a) Perform field welding in accordance AWS D1.1.
   b) Where field welding is applied to existing flexural members involving application of significant amounts of heat to member, provide temporary shoring to prevent deflections.
   c) Provide Special Inspection per the CBC, latest edition.

E. Column Bases:
1. Finish in accordance with AISC. Lack of contact bearing with column shall not exceed 1/16 inch.

F. Bearing Plates:
1. Finish in accordance with AISC. Provide for attachment as shown on Drawings.
2. Cut, drill (tap where indicated or required), or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.

3.03 Shop Painting

A. Shop paint all metal Work, except members or portions of members to be embedded in concrete or masonry, surfaces and edges to be field welded, stainless steel, and galvanized surfaces, unless otherwise indicated.
B. Clean all metal work to be primed and painted in accordance with Section 09 91 00 – Painting and Finishes.
C. Immediately after surface preparation brush or spray on primer in accordance with manufacturer's instruction at a rate to provide uniform dry film thickness of 20 mils for each coat. Use painting methods which will result in full coverage of joints, corners, edges and exposed surfaces.
D. Apply one (1) shop coat to fabricated metal items, except apply two (2) coats of primer to surfaces inaccessible after assembly or installation.
E. Give any painted built-in portions one (1) field coat of primer on all abraded areas after installation.

3.04 Galvanizing

A. All metal fabrications intended for exteriors use or for use in high moisture areas are to be hot-dip galvanized, unless otherwise noted.

B. Hot dip galvanizing or zinc coatings, applied on products fabricated from rolled, pressed and forged steel shapes, plates, bars and strips shall comply with ASTM Specification A123-73.
C. Hot dip galvanizing or zinc coatings on assembled steel products shall comply with ASTM Specifications A386.
D. The weight of coatings shall be as designated in Table 1 for the class and thickness of material to be coated. Galvanized surfaces for which a shop coat of paint is specified shall be chemically treated to provide a bond for the paint.
E. Except for bolts and nuts, all galvanizing shall be done after fabrication.

3.05 Installation

A. General:
    1. Compliance: Erect and install all miscellaneous metal in strict accordance with the Drawings, the reviewed shop drawings, and the referenced standards, aligning straight, plumb, and level within a tolerance of one in 200. Accurately assemble structural steel to lines and elevations indicated, within specified AISC tolerances.
    2. Splice metal work only where indicated and approved on shop Drawings.
    3. Install anchorage devices and fasteners where required for securing miscellaneous metal fabrications to in-place construction; including anchorage devices and fasteners that require to be cast into concrete or masonry. Provide temporary bracing or anchors in formwork for items cast into concrete or similar construction.
    4. Perform cutting, drilling, and fitting required for installation of miscellaneous metal fabrications. Set Work accurately in location, alignment and elevation. Install items plumb, level, true and free of rack; measured from established lines and levels.
    5. Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded due to shipping size limitations. Grind exposed joints smooth and touch-up shop paint coat.
    6. Do not weld, cut or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.
    7. All field welds shall conform to AWS Specifications. Grind all exposed welds smooth and flush to match and blend with adjoining surfaces.
    8. Clean and touch-up all field welds and scratches with shop paint as specified.

3.06 Finishes

A. Finish all fabricated metal Work as per Section 09 91 00: Painting and Finishes

END OF SECTION

SECTION 09 91 00
PAINTING AND FINISHES (GENERAL)

PART 1 - GENERAL

1.01 Conditions

A. The general provisions of the Contract, including General Conditions and Special Provisions apply to the work specified in this Section.

1.02 Description

A. Work includes, but is not limited to the following:
   1. Provide all materials, tools, equipment, appliances, labor and supervision required to paint and finish all surfaces and/or components as specified herein and as indicated on the Drawings, including all miscellaneous items and labor required to complete the Work of this Section.
   2. Surface preparation, priming and painting of all metal surfaces as indicated on Drawings or as follows:
      a) Miscellaneous surfaces.
   3. All surfaces that are left unfinished by the requirements of other sections shall be painted or finished as part of this contract.

B. Related Work described elsewhere.
   1. Section 05 12 00: Structural and Miscellaneous Steel

C. Definition: The term “paint”, as used herein, shall mean all coating systems materials, including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime intermediate or finish coats.

1.03 Work Not Included

A. Pre-Finished Items: Unless otherwise specified or indicated on the Drawings, do not include the painting of items that are specified to receive manufacturer’s factory finish, i.e. such items as site furnishings, irrigation equipment, electrical equipment, etc. See applicable Sections.

B. Finished Metal Surfaces: Unless otherwise specified, all metal surfaces or anodized aluminum, stainless steel, chromium plate, copper, bronze or similar finished materials do not require painting.

1.04 Submittals

A. Provide in accordance with the General Conditions prior to ordering material, a complete, detailed list of materials proposed for use on work. Include affidavit from manufacturer stating that proposed materials are the best of their

respective kinds and suitable for intended purpose. Submit in ample time to avoid delays in work if the list, or portions thereof, are rejected.

B. Painter shall prepare and submit color samples to match color chips in 12- inch square size and must receive approval from Project Inspector before applying final paint coats to finish surfaces. Approved samples shall be retained at the Project Inspector's office for record.

1.05 Paint Coordination

A. Provide prime coats which are compatible with finish paints used. Review other Sections of these specifications in which prime paints are to be provided to ensure compatibility of total painting system for various surfaces. Upon request from other trades, furnish information and specifications for finish materials proposed for use, to ensure compatible prime coats are used. Provide barrier coats over incompatible primers or remove and reprime as required. Notify Project Inspector in writing of any anticipated problems using specified painting systems with surfaces primed by others.

1.06 Job Conditions

A. Applicator shall examine areas, surfaces and conditions under which painting Work is to be applied and notify the Project Inspector in writing of conditions detrimental to proper and timely completion of Work. Do not proceed with Work until unsatisfactory conditions have been corrected in a manner acceptable to Project Inspector and Applicator, or Applicator shall assume responsibility for and rectify any unsatisfactory finish resulting.

B. Starting of painting Work shall be construed as Applicator's acceptance of surfaces and conditions.

1.07 Weather Conditions

A. Apply water base paints only when temperature of surfaces to be painted and surrounding air temperature are between fifty (50) degrees F (10 degrees C) and ninety (90) degrees F (32 degrees C), unless otherwise permitted by paint manufacturer's printed specifications.

B. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between forty-five (45) degrees F (7 degrees C) and ninety-five (95) degrees F (35 degrees C), unless otherwise permitted by paint manufacturer's printed specifications.

C. Do not apply paint in rain, fog or mist; or when relative humidity exceeds eighty-five (85) percent; or to damp or wet surfaces.

1.08 Delivery and Storage

A. Deliver materials to job site in original, new and unopened packages or containers bearing manufacturer's name and label, and the following information:
   1. Manufacturer's Name
   2. Manufacturer's stock number and date of manufacture
   3. Special color mix: name and number
   4. Contents by volume for major pigment and vehicle constituents
   5. Thinning instructions
   6. Application instructions

B. Store materials and equipment as approved by applicable codes and enforce good housekeeping practices. Any soiled or used rags waste, etc., shall be removed from the site every night and every precaution shall be taken to avoid the danger of fire. No paint materials shall be washed or emptied on the site or into any sewer drains, storm drains or street gutters.

1.09 Protections

A. Protect Work of other trades, whether to be painted or not, against damage by painting and finishing Work. Provide suitable covering or other methods of protection during progress of this Work. Correct any damage by cleaning, repairing or replacing, and repainting, as acceptable to the Project Inspector.

B. Provide "Wet Paint" signs as required to protect newly painted surfaces. Remove all protective materials upon completion of the Work and touch-up and restore all damaged or defaced surfaces, including the removal of paint spots from other surfaces.

1.10 Guarantee

A. Adhesion: All materials applied shall be guaranteed for a period of two (2) years against failure due to surface conditions, materials, or application. There shall be no evidence of fingerprints blisters, running, peeling, scaling, chalking, streaks or stains.

PART 2 - PRODUCTS

2.01 Color Schedule

A. Project Inspector shall furnish to the Contractor a color schedule of paints to be used based on one of the approved manufacturer's color charts or requirements for specially mixed colors. Use of one of the other approved manufacturer requires the Contractor to match the color schedule provided by the Project Inspector.

B. Manufacturers names used to designate colors of color schedule is not intended to imply that products names are required to the exclusion of equivalent products of other manufacturers.
C. All colors and manufacturers shall be approved and authorized by the Project Inspector before commencing work.

2.02 Materials Quality

A. Provide best quality grade of various types of paints as regularly manufactured by acceptable paint materials manufacturer. Materials not displaying manufacturer's identification as a standard, best-grade product will not be acceptable. Acceptable paint manufacturers include:
   1. Kelley-Moore
   2. Benjamin Moore Company
   3. The Glidden Company
   4. Pratt and Lambert, Inc.
   5. Dunn and Edwards
   6. Sherwin-Williams
   7. W.P. Fuller Company
   8. Tiger Drylac
B. Provide primer and undercoat paint produced by the same manufacturer as finish paint. Use only thinners approved by paint manufacturer, and use only within recommended limits.
C. Epoxy paints and wood stains for use in standard comfort stations shall be as specified on plans.

2.03 Metal Primer

A. Primer for metal surfaces shall be Red Oxide Primer, conforming to Federal Specification TT-P-31 for metal surfaces and Federal Specification TT-P-64b for galvanized surfaces.

PART 3 - EXECUTION

3.01 Surface Preparation

A. General: Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions, and as herein specified, for each particular surface condition.
B. Paint no items fitted with finish hardware or other similar items until hardware has been removed or provided with surface-applied protection prior to surface preparation and painting operations. Install hardware or remove surface-applied protection after paint has dried.

C. Metal Surfaces: Clean all metal surfaces, which are not galvanized or shop-painted, of scale, dirt, rust and other deleterious materials before priming. Clean metal in accordance with Steel Structures Painting Council (SSPC) Specifications.
   1. SP-2: Hand Tool Cleaning
   2. SP-3: Power Tool Cleaning
   3. SP-7: Brush-off Blasting Cleaning

   Remove oil, grease, and similar contaminants in accordance with:
   1. SP-1: Solvent Cleaning

D. Galvanized Surface: Clean all galvanized surfaces of oil and other surface contaminants with a crystalline zinc phosphate pretreatment (phosphoric acid etch). Remove pretreatment solution by thoroughly washing with clean water and wipe dry.

3.02 Materials Preparation

A. Mix and prepare painting materials in accordance with manufacturer's specifications.
B. Stir materials before application to produce a mixture of uniform density, and stir as required during application. Do not stir surface film into materials. Remove film and if necessary, strain materials before using.

3.03 Application of Primer Coat

A. Apply primer coast to all surfaces which are required to be painted or finished, and which have not been prime coated or shop-painted by others. For metal surfaces, tough up shop-painted coats as required.
B. Immediately after surface preparation brush or spray on primer in accordance with manufacturer's instructions at a rate to provide uniform dry film thickness of two (2.0) mils for each coat. Use painting methods which shall result in full coverage of joints, corners, edges and exposed surfaces.
C. All primer coats shall be free from runs, sags, and other defects. All coats shall be thoroughly dry before applying succeeding coats.
D. Apply one (1) coat of metal primer for metal surfaces, as specified and/or as recommended by manufacturer's instructions.

3.04 Application of Paint

A. Apply paint in accordance with manufacturer's instructions. Use applicators and techniques best suited for each surface and type of materials being painted.
B. All painting Work shall be done by skilled workman in a professional manner. All coats shall be evenly spread and shall be free from run, sags and other defects. All coats shall be thoroughly dry before applying succeeding coats.

C. All individual coats of paint shall be inspected and approved by the Project Inspector before application of the succeeding specified coat; otherwise no credit for the coat applied shall be given, and the Applicator shall automatically assume responsibility to recoat the Work. The applicator shall provide the Project Inspector a report of each coat applied when completed for inspection and approval to comply with the above.
D. Where coverage is incomplete, not uniform, or not to the required dry film thickness, provide an additional coat at no extra cost to the Developer.
E. Apply finish coats of paint to all exposed surfaces as follows:
    1. For primed metal surfaces, apply two (2) coats of 100% acrylic latex base paint, per manufacturer's recommendations. Apply first coat of paint within 72 hours of primer application. If first coat of finish paint cannot be applied within the specified application time, the contractor shall re-clean and re-primer all exposed metal surfaces prior to start of metal paining operations.
F. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.
G. Apply first-coat material to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practical after preparation and before subsequent surface deterioration.
H. Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure and application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
I. Apply all coating without reduction, except as specifically required by label directions, or required by this Section.
J. Sand carefully between all coats on smooth surfaces for good adhesion of subsequent coats.
K. Paint all exposed surfaces and anything inaccessible after installation prior to installation, if required to be painted.

3.05 Application of Epoxy Paint

A. Use epoxy paint for floor and wall in restrooms up to ADA height.

END OF SECTION

SECTION 12 93 00
SITE FURNISHINGS

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.

B. The requirements set forth in the Supplemental Conditions shall be in addition to the standards provided herein.

1.02 Description

A. Furnish all labor, materials and equipment for the complete installation of all site furniture, including play equipment and play surfacing, as shown on the Plans and as specified herein.

1.03 References

A. All play equipment shall meet or exceed the standards set forth by the Consumer Product Safety Commission (CPSC), comply with the Americans with Disabilities Act (ADA), meet all current ASTM standards and be consistent with State and local codes.

B. The play area surfacing shall meet or exceed the fall absorption/impact rates set forth by the CPSC guidelines and ASTM standards. The surfacing shall be an accessible surface and manufactured specifically for play areas.

C. Nothing in the Plans or Specifications is to be construed to permit work not conforming to regulating codes and standards. The Contractor shall furnish without extra charge any material and labor, when required, by the compliance with these rules and regulations, even though the work was not mentioned in these particular Specifications or shown on the Plans.

D. The product manufacturer shall supply complete Specifications for the installation of all site furnishings, including play equipment and play surfacing.

1.04 Submittals

A. Submittals for specified items are required. The Contractor shall submit a materials summary sheet indicating which items will be installed as specified and which items are proposed for substitutions. The Contractor shall submit proof of order within ten (10) working days of the Notice to Proceed, indicating all specified materials have been ordered, noting “as specified” or “substitution proposed”. For the following items, also provide:

1. Resilient Play Surfacing (i.e. rubber surfacing material) Submittal shall include IPEMA certification of materials and the most recent impact absorption test results.
2. Play Equipment and Swings submittals shall include color samples, manufacturer's materials and parts list, and installation instructions.
3. All items with "color as selected by City" shall include color samples.

B. On the date of the Notice to Proceed, the Contractor shall immediately place the order to purchase all site furnishings, including the play equipment and play surfacing as specified on the Plans and as outlined herein. **Proof of all orders shall be submitted to the Project Manager within ten (10) working days of the Notice to Proceed.**

C. The Contractor shall submit a Certificate of Compliance from a third party certified playground inspector which verifies that the entire playground, including individual components, and surfacing meets or exceeds regulated requirements as described in Section 1.03 above.

1.05 Record Drawings

A. The Contractor shall keep an accurate record of the as-built conditions of the miscellaneous site amenities. These records shall be updated daily and kept at the construction site. At any time, the Inspector may examine the conditions of the "as-builts" to ensure compliance of the above.

PART 2 - PRODUCTS

2.01 Materials

A. Play Equipment shall be custom configuration as shown on the Plans and as specified herein. The equipment shall be as distributed by *(contact name and phone number)*, and as manufactured by *(contact name and phone number)* or accepted equal. Color as selected by the City.

B. Swings shall be the custom configuration as shown on the Plans as distributed by *(contact name and phone number)*, and as manufactured by *(contact name and phone number)*, or accepted equal. Color as selected by the City.

C. Poured-in-place resilient surfacing shall be as shown on the Plans and as specified herein. The play surfacing shall be Tot Turf TPV Poured Surfacing as manufactured by Robertson Industries, contact Frank Horwath, (510) 433-0655 or accepted equal. Color as selected by the City.
   1. Thickness of surfacing shall meet or exceed ASTM F 1292-93 Thickness vs. Fall Height requirements. The topcoat shall be ½ inch thick.
   2. Color shall be 50/50 black and brown mix, unless custom colors are shown on plans. For yellow, gold, red, and green colors use an aromatic binder.

For blue, gray, purple, teal and tan colors use an aliphatic binder to preserve the color.

3. Poured-in place resilient surfacing shall have a five (5) year warranty.

D. Engineered wood fiber shall be clean, engineered wood fiber, manufactured specifically for play areas.
   1. Engineered wood fiber manufacturer shall provide testing certification by an independent testing agency that the results comply with CPSC guidelines and ASTM standards.
   2. Engineered wood fiber shall meet the following requirements: ASTM F1951-99 (ADA Compliance Test) and ASTM F 1292-96 (Shock Absorbency).
   3. Manufacturer shall provide a Certificate of Insurance that shall provide coverage for products liability with the limit of liability not less than $1,000,000.
   4. The manufacturer shall also provide written guarantee for three (3) years from the date of installation against decay and biochemical degradation calling for replacement of defective materials during the guarantee period.
   5. Manufacturer certifies that the engineered wood fiber has been installed in not less than three (3) sites for periods of not less than three (3) years demonstrating the claims made with regard to these Specifications.

E. Picnic Tables shall be as shown on the Plans and as specified herein. The tables shall be as distributed by *(contact name and phone number)*, and as manufactured by *(contact name and phone number)* or accepted equal. Tables shall be in-ground mount and made of perforated steel. Color as selected by the City.

F. Benches shall be as shown on the Plans and as specified herein. The benches shall be as distributed by *(contact name and phone number)*, and as manufactured by *(contact name and phone number)* or accepted equal. Benches shall be made of perforated steel and surface-mount, unless otherwise specified on plans. . Color as selected by the City.

G. Drinking Fountain shall be MDF #10145 SM (bottle filler, dual bowl and accessible) and stainless steel surface carrier as distributed by Husbands and Associates (800) 821-9838 and as manufactured by Most Dependable Fountains or accepted equal. Color to be stainless powder coated black or as approved. Include recessed hose bib with locking cover, stainless steel control valves with O-rings, and external stainless steel surface mount carrier. Install with a sand strainer when sand amenities are included in the park design.

H. Infield Mix shall be 60/40 red lava/ screened clay mix as distributed by Cascade Rock, 916-383-1300 or accepted equal.

I. Park Identification Sign shall be fabricated by Quick Crete Products Corp., Norco, CA, (916) 447-8644, or by Outdoor Creations, Inc., Anderson, CA, (530) 365-6106, or accepted equal.
J. Play Area Age-Appropriate Signage shall contain the following language: "This play area has been designed for the use of children aged *(fill in the appropriate age range)* years of age."
K. Park Namesake Plaque shall be a 24" by 18" digital high pressure laminate graphic panel fabricated or accepted equal. Plaque shall be mounted on a SlimLine single pedestal sign system or accepted equal. Manufacturer for the plaque and sign system (model # 2418 SL-SLP-AL) is KVO Industries (Chris Howell, (707) 573-6868). Installation location shall be verified in the field with the Project Manager.
L. Playground rules sign shall be as fabricated by Gopher Sign Company, (651) 698- 5095, or accepted equal.
M. Pickleball & Tennis Court Surfacing shall be Plexipave via California Sports Surfaces Inc., or City accepted equal, color: as selected by City.
N. Line Paint (for basketball courts): Hawker - Laykold; Koch Materials - Decocolor; Extol - Color; L&M - Nova acrylic; California Products Corp - Plexicolor Laykold; or accepted equal.
O. Trash Receptacle shall be as shown on the Plans and as specified herein. The trash receptacle shall be as distributed by *(contact name and phone number)*, and as manufactured by *(contact name and phone number)* or accepted equal.
P. Other (See Design Guidelines for additional information) shall be as shown on the Plans and as specified herein. The *(site amenity)* shall be as distributed by *(contact name and phone number)*, and as manufactured by *(contact name and phone number)* or accepted equal. Color as selected by the City.

PART 3 - EXECUTION

3.01 Installation

A. Contractor to provide experienced workers or subcontractors to install all site furnishings, including the play equipment and play surfacing described in these Specifications. The workers or subcontractor must demonstrate that at least five (5) similar play structures and five (5) play surface applications similar to that specified for this project have been installed in the last three (3) years.
B. All site furnishing, including play equipment shall be installed per manufacturer's instructions.
C. Engineered wood fiber shall be blown in place to avoid damage to adjacent improvements unless specifically approved by City.
D. Poured-in-place rubber play surfacing and access ramps shall be installed as shown on the plans. Install poured-in-place rubber over a 4" thick concrete base.

The rubber base coat shall be " and the rubber topcoat shall be 1/2", unless otherwise noted on the plans. Apply the appropriate binder with all finished poured-in-place rubber surfaces based on color as outlined in Section 2.01 J and per manufacturer's instructions. Installation of poured-in-place rubber surfacing shall be performed by an International Playground Equipment Manufacturer Association (IPEMA) certified and experienced installer. Submit a copy of the installer's certification prior to installation. "Experience" is as defined in 3.01 A above.

For Aggregate sub base: Grading to be +/- .375 (3/8") inside the play area 4" minimum thickness. Applied as follows:

Step 1 Install 2", compact
Step 2 Apply by hand Portland cement to entire surface
Step 3 Apply ¼" water to entire surface
Step 4 Repeat Steps 1, 2, & 3 to attain required thickness

Sub base to be installed before play equipment in order to utilize large compaction equipment. Jumper compactor equipment to be utilized along outside perimeter of play area curb. Compaction test shall be performed to verify that the aggregate is compacted to 95%. Sub base (aggregate) must be sloped per ADA requirements.

E. Heights of tables and benches shall be as follows, unless otherwise required by ADA; California Title 24 or other code requirements:

Description	**Height Above Finish Grade**
Table Surface Height	34" Maximum
Knee Space Height	27" Minimum Clear Space
Knee Space Depth	17" Minimum from edge of table to nearest obstruction under table top
Width of Knee Space	30" Minimum clear width beneath table
Bench Surface Height	16" Minimum, 18" Maximum

F. Heights for play equipment, including ramps and transfer decks shall comply with the approved recommendations by the U.S. Architectural and Transportation Barriers Compliance Board: Play Facilities Regulatory Negotiation Committee.

G. For play equipment, locate all footings prior to installation of drain lines. Adjust drain lines to accommodate play structure footings. Provide appropriate fall zones as shown on the Plans and per applicable codes and guidelines.

H. All footings shall be Class A concrete with 3/4" maximum size aggregate, unless otherwise noted. Footings shall be in accordance with Caltrans Standard Specifications, Section 90. Install all footings below finish surface. In paved areas, install paved surface over footing for a clean finished surface as shown on the Plans.

I. Carefully install all furnishings and equipment without disturbance to adjacent finishes. Contractor shall be responsible for the damage and subsequent repairs of damaged finished product.
J. Install park namesake plaque. Installation location shall be verified in the field with the Project Manager.
K. Install age-appropriate stickers on all play structures, per manufacturer's instruction.
L. Install playground rules sign. Installation location shall be verified in the field with the Project Manager.

3.02 Cleaning

A. Thoroughly clean all areas where work has occurred. Remove from the site excess material, debris and rubbish.
B. Take all precautions to protect completed work. Immediately repair or replace all damaged areas due to tire ruts, erosion, compaction failure, etc. Keep all erosion control measures intact.

PART 4 - WARRANTY

4.01 General

A. Contractor shall warranty all site amenities included under this Section.
B. Contractor shall also provide a written warranty covering all materials, equipment and workmanship furnished by him to be free of all defects after installation is accepted, including all defective parts that may have been found.
C. Submit written warranty on company letterhead addressed to the City when providing As-built drawings.
D. Contractor shall submit to the City, upon completion of work, a Certificate of Compliance by a third party certified playground inspector for the installation of the play structure and safety surfacing. Certification shall include testing for compliance of ASTM 1292 (Impact Attenuation of Surfacing Systems under and around Play Equipment). All tests, including re-tests, shall be the responsibility of the Contractor. Submit all test results to the City.
E. Submit maintenance manual for poured-in-place resilient surfacing.
F. Contractor shall submit to the City, upon completion of work, a Certificate of Compliance from the manufacturer of the play structure for the installation of the play structure.
G. Contractor shall submit to the City, upon completion of work, critical fall criterion used to certify all play surfacing material.
H. Attach cut sheets of installed items to the warranty.

END OF SECTION

SECTION 26 00 00
SITE ELECTRICAL

(This Section is only partially complete. Consultant shall provide all applicable 260000 series Sections specific to the project scope.)

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.
B. The requirements set forth in the Special Conditions shall be in addition to the standards provided herein.
C. The standards set forth in the City of Roseville Design and Construction Standards, latest edition and requirements outlined by the City of Roseville Electric Department shall be in addition to the standards provided herein.
D. The standards set forth in the latest edition of the California Electrical Code (CEC), incorporating the latest edition of the NEC with City of Roseville amendments shall be in addition to the standards provided herein.

1.02 Description

A. Furnish all labor, materials and equipment for the complete installation of site electrical as shown in the Plans and as specified herein.
B. Submittals shall be required for requested substitutions or plan deviations ONLY. The Contractor shall install all specified electrical fixtures, poles and equipment, unless otherwise accepted and determined as an equivalent.

1.03 References

A. Conform to requirements outlined in the latest editions of the California Electrical Code (CEC), California Administrative Code (Title 24), California Building Code (CBC), California Administrative Code (Title 22) and other applicable codes.
B. Conform to requirements outlined in the latest edition of the Roseville Electric Specifications for Commercial Construction.

1.04 Record Drawings

A. Record drawings are required as a part of this work. At all times, the Contractor shall maintain accurate information of the work in progress. Deviation in layout of conduit or other materials shall be recorded to the satisfaction of the Inspector. Upon completion of the project, as-builts shall be submitted to the

City on reproducible plan sheets and shall depict all changes in a neat and legible manner.

PART 2 - PRODUCTS

2.01 Service Panels

A. Service panels shall meet the Roseville Electric approved sections of the EUSERC requirements. The list of acceptable panels can be found at https://the.euserc.org/s/Roseville-City-of-Acceptability-Pages.pdf
B. Service panel shall be:
   1. Built to UL508A standards
   2. Metered
   3. Single phase or three phase application
   4. Rated for 120 to 480 volts
   5. Color: Hunter Green

2.02 Electronic Astronomic Time Switch

A. Electronic Astronomic Time Switch shall be DWZ Model series, as manufactured by Tork, or accepted equal.

2.03 Conduit and Fittings

A. For primaries (12,000 volts), conform to Roseville Electric's Specifications for Commercial Construction, latest edition.
B. All other conduit and fittings shall conform to the California Electric Code, latest edition.

2.04 Wires and Cables

A. Conform to the California Electric Code, latest edition.
B. All wires shall be copper only, 90-degree-C THHN/THWN insulation.

2.05 Wire Connections and Devices

A. Conform to the California Electric Code, latest edition.
B. Splices and joints for #10 AWG or smaller wiring shall be twisted together electrically and mechanically strong and insulated with approved type insulated electrical spring connectors, Scotchlok or Ideal. Joints and connections for #8 AWG or larger shall be made with Burndy, T & B, or approved equal, solderless tool applied pressure lugs and connectors. Uninsulated lugs and wire ends shall be insulated with layers of plastic tape equal to insulation of wire and with all irregular surfaces properly padded with "Scotchfil" putty prior to application of tape. Tape shall be equal to Scotch #33, General Electric #AW-1, or approved equal. Feeder splicing is not permitted.

C. Receptacles: 15 & 20 Amp 125 Volt receptacles shall be "Specification" grade, duplex, UL Listed, rated Weatherproof where installed outdoors or in damp or wet locations. Where only one receptacle is connected to a 20 ampere circuit, a 20 ampere receptacle shall be used. Receptacles to be Hubbell 5262 series, 5362 series, or equal. Provide an equipment grounding jumper (pigtail) connecting the grounding terminal of the receptacle to the grounded box.

2.06 Outlet Boxes

A. Cast Metal boxes shall be cadmium plated, cast iron alloy by Crouse-Hinds Form 8 condulets, Appleton Form 35 Unilets or accepted equal.
B. Cast Metal Outlet boxes shall be four inch (4”) round, galvanized cast iron alloy with threaded hubs and mounting lugs as required. Boxes shall be furnished with cast cover plates of the same material as the box and neoprene gaskets by Crouse-Hinds VXF series, Appleton JBX series or accepted equal.

2.07 Pull and Junction Boxes

A. Per City of Roseville Electric Department’s Specifications for Commercial Construction, latest edition.

2.08 Parts Identification

A. Consistent with the City of Roseville Electric Department’s Specifications for Commercial Construction, latest edition.

2.09 Electrical Support Equipment

A. Concrete Fasteners shall be Philips “Red-Head” or accepted equal. Powder driven concrete pin fasteners, low velocity type shall be Remington, Ramset or accepted equal.
B. Conduit Straps shall be hot dipped galvanized, cast malleable iron, one hole type strap with cast clamp-backs and spacers (as required) by O-Z/Gedney No. 15-50G strap and #14G spacer, Efcor No. 231 strap and No.131 spacer or accepted equal.
C. Concrete Inserts shall be pressed galvanized steel, spot insert with oval slot capable of accepting support nuts of ¼ inch to ½ inch diameter thread by Unistrut No. M2506 series, Globestrut CSI series or accepted equal.
D. Construction Channel shall be 1-1/2 inch by 1-1/2 inch 12 gauge galvanized steel channel with 17/32 inch diameter bolt holes, 1-1/2 inch on center, in the base of the channel by Kindorf 905 series, Unistrut P-1000-HS or accepted equal.
E. Cable Ties and Clamps shall be one piece, nylon, reusable type lashing tiesby Thomas and Betts Co “Ty-Raps”, Panduit “Pan-Ty” or accepted equal.

F. General Fasteners shall be wood screws for fastening to work; machine screws for fastening to steel; toggle bolts for fastening to gypsum board or plaster walls; expansion anchors for attachments to pre-poured concrete.
G. GFI Outlet Cover shall be metal, lockable, and flush with the surface it is installed in. Cover must conform to the California Electric Code, latest edition.

2.10 Fixtures and Poles

A. Parking Lot lights shall be:
B. Pathway/Security lights shall be:
   1. LED: Hadco: RL54 B B N N 1 A W N N N A 2 N N N N SP1
   2. Pod: die-cast aluminum housing with tool-less access
   3. Globe: clear prismatic injection molded U.V. stabilized acrylic
   4. Symmetric photometric distribution
   5. Rated 120 volts
C. Poles shall be:
   1. Whatley: TR34 16 DE BLK TXT 30-30 or accepted equal
   2. Fiberglass, direct burial
   3. Textured round, tapered
   4. 16’ mounting height
   5. Include –RC receptacle on select poles only, as shown on plans

2.11 Tracer Wire

A. Insulated solid copper wire, minimum #12 gauge.

PART 3 - EXECUTION

3.01 Installation

A. Install (luminaire and poles) in accordance to manufacturer’s instructions.
B. Ensure proper handling and installation of fixtures including hardware necessary for a complete installation. Fixtures (luminaire and poles) shall be clean, plumb and level.
C. All lamps shall be new and in operating condition. New lamps shall have less than 100 hours of operation on-site.
D. All splices in exterior fixtures or fixture outlet boxes shall be made watertight, using specified epoxy resin splicing kits.
E. Operate the entire system, once complete, in the presence of the Inspector. Immediately correct any improper connections or other items.
F. Install concrete collars around light poles. Concrete collars shall be per the Parks Construction Standards, latest edition.
G. Install tracer wire on top of conduit for all up-lighting and sports field lighting.

3.02 Clean Up

A. At all times, maintain a safe and clean work site, free of debris and rubbish.
B. All electrical parts shall be clean of conductive and deleterious materials.
C. All enclosures shall be free of dirt and debris.
D. Clean all finishes and touch up damaged areas prior to pre-final inspection.

3.03 Excavation & Backfill

A. Refer to Section 33 00 00 Utilities.

3.04 Equipment Pads

A. Concrete reinforced pads for mounting of equipment (i.e. switchboard, transformers, freestanding panels, etc.) shall be minimum 3000psi, 6" thick with #4 rebar at 12" on center each way. Rebar shall be centered in pad. Pad shall extend 2" beyond equipment and 1.5" above surrounding area. Backfill and compact to 95% maximum dry density at optimum moisture content in layers not to exceed 6" when compacted.

3.05 Grounding

A. Grounding and ground bonding of the electrical installation shall be in accordance with CEC Article 250, and any applicable codes. Ground fittings shall be approved manufactured type, installed and connected to conform with Code requirements.
B. Neutral conductors and noncurrent-carrying parts of equipment at each installation shall be grounded in accordance with applicable code. Ground conductor shall be copper having a current capacity sized in accordance with CEC.
C. All equipment cases, motor frames, etc., shall be completely grounded to satisfy requirements of CEC. Install bond wire in flexible conduit. Install copper bond wire, sized in accordance with CEC, in all nonmetallic raceways and bond to all metallic parts using approved fittings.
D. Service ground conductor shall be connected to a "Ufer" encased ground and bonded to the metallic cold water pipe system and to the metallic natural gas line. 5/8” x 10 ft copper clad ground rods may be used in lieu of the Ufer ground where no footing is available.
E. All connections shall be made with solderless connectors or molded fusion-welding process.
F. Equipment grounding conductors shall be insulated with a continuous green outer finish along its entire length. Conductors size #4 AWG and larger may be identified (with green electrical tape applied half-lapped) at each end and at every point where the conductor is accessible. Tape shall be applied from its point of entry to point of exit or termination.

G. Insulated grounded (neutral) conductors shall be identified with a continuous white outer finish along its entire length. Neutral conductors #4 AWG or larger can be identified by a distinctive white marking (applied half-lapped with white electrical tape) for the last 12 inches at each end.

3.06 Field Testing

A. Perform Insulation Resistance (IR) "Megger" Testing per NETA Standards. Submit test results. Provide testing for:
   1. All feeders 100 Amps and higher.
   2. Branch circuits 100 Amps and higher.

B. Each ground rod shall be tested. A ground rod which does not have a resistance to ground of 25 ohms or less shall be augmented by one additional ground rod at no less than 8 feet from each other.

3.07 Consultant to complete.

END OF SECTION

SECTION 31 10 00
CLEARING AND GRUBBING

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.
B. The requirements set forth in the Supplemental Conditions shall be in addition to the standards provided herein.

1.02 Description

A. Preserve and protect existing site amenities to remain, including, but not limited to, trees, shrubs, underground utilities and other improvements as shown on the Plans. Protection of work shall include affected improvements on adjoining properties.
B. Scope of work includes: site preparation, removal of debris, staging of equipment and materials and securing the site for construction.

1.03 Related Work

A. Section 31 20 00: Earthwork
B. Section 01 57 23: Storm Water Pollution Control

1.04 Protection/Replacement

A. Prior to demolition, erect protective fencing a minimum of one foot (1') beyond the canopy of all trees to remain. The radius of the canopy shall be measured from the longest branch furthest from the trunk. Refer to the environmental document for additional requirements for protective fencing on other existing natural features. For work within or near protected trees, a tree permit may be required.
B. If public use is to be maintained on unaffected portions of the project site, the Contractor shall be responsible for directing pedestrian and vehicular traffic safely around the construction zone. Utilization of temporary fencing, barricades, signage, etc. shall be the responsibility of the Contractor. Safe detours shall be available to the general public at all times during the course of construction.
C. Protection of existing site improvements shown to remain, including, but not limited to, fencing, signs, benches, picnic tables, play structures, shade structures, drinking fountains, concrete paving, concrete wall and curbs,

decomposed granite paving, asphalt concrete paving, recreational site improvements, etc. are to be protected and preserved.

D. The Contractor shall be responsible for any damage to and maintenance of all existing street improvements, drainage facilities and irrigation systems and to re-establish these improvements to their original condition as soon as possible after completion of the work in the area, to the complete satisfaction of the Project Manager and Inspector. Realignments or modifications to the existing facilities as shown on the plans are accepted.
E. Survey monuments and markers either shown on the Plans or encountered during the course of construction shall be protected and preserved. The Contractor shall notify the Inspector upon discovery of an unmarked monument, at which time, arrangements for the relocation or adjustment of the monument will be determined. All costs associated with the relocation or adjustment of these monuments shall be the Contractor's responsibility.
F. Burning or burying removed material on-site is prohibited.
G. Where the removal of specific material creates an open hole, pit, trench or other depression, the Contractor shall immediately backfill and compact the areas consistent with requirements outlined in Section 31 20 00 of these Specifications.
H. All items identified in the Plans to remain or identified in the field to remain, removed in error by the Contractor, shall be repaired or replaced to match in equal or better construction, at no cost to the City. The quality of the repair or replacement shall be measured as that existing at contract award.

PART 2 - PRODUCTS

Intentionally left blank.

PART 3 - EXECUTION

3.01 Pre-Construction Site Review

A. Contractor shall review existing site conditions with the Inspector prior to start of construction and document any conditions which adversely affect the satisfactory execution of the work and final acceptance of the project.
B. Commencement of work constitutes acceptance of existing conditions. The Contractor shall, at his expense, be responsible for correcting all unsatisfactory and defective work.

3.02 Clearing

A. Completely remove trees, shrubs, stumps, vines, rubbish/debris, undergrowth, deadwood, structures, and other elements identified to be removed and/or which interfere with the construction as shown on the Plans and as specified.

B. Obtain verification from the Project Manager for non-identified items scheduled to be removed prior to actual removal.

3.03 Grubbing

A. Remove all stumps, roots, grasses and weeds in its entirety. Apply systemic weed killer. Confirm weed kill prior to removal.
B. For projects with native soils, once surface material is removed, the Contractor shall stockpile the top twelve inches (12”) of topsoil for use during the final grading phase of work. This soil shall be free of rocks, debris, roots and other undesirable material.

3.04 Utilities

A. Contact USA North 811 at (800) 642-2444, or submit an online ticket at USANorth811.org, prior to commencement of any demolition or excavation work. Provide a minimum of 48 hours’ notice. Verify all utilities entering into and their locations within the project site.
B. Where utilities lie within the project site, but are not a part of the project, the Contractor shall cooperate with the agency or utility company having jurisdiction to maintain its use and the integrity of the structure.
C. Where utilities enter into the project site and taps, connections to or extensions of the utility are identified in the Plans, the Contractor shall coordinate all work with the agency or utility company having jurisdiction to minimize or eliminate disruption of use by the adjacent properties.
D. Verify that all utilities, shown to be removed on the Plans, are inactive and turned off prior to disconnection and/or re-routing, prior to demolition.

3.05 Debris Removal

A. All materials removed as a part of this contract shall become the property of the Contractor and shall be legally disposed of off-site, unless otherwise noted on the Plans.
B. Where a portion of a concrete slab, curb or wall and asphalt concrete paving or curb is to be removed, the concrete shall be cut with a concrete saw at a 90 degree angle so that the edge of the remaining concrete shall form a neat, straight line. Conform to the City of Roseville Design and Construction Standards, latest edition.

END OF SECTION

SECTION 31 20 00
EARTHWORK

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.
B. The requirements set forth in the Supplemental Conditions shall be in addition to the standards provided herein.
C. The standards set forth in the Caltrans Standard Specifications, latest edition, shall be in addition to the standards provided herein.
D. The requirements set forth by CAL OSHA shall be in addition to the standards provided herein.

1.02 Description

A. Provide all labor, operations and materials necessary for earthwork, including, but not limited to, staking and surveying, grading; excavating; installation of facilities necessary to perform excavation and subsequent removal of such facilities upon completion of work; subgrade preparation; backfilling; and other incidental items necessary for a complete project.
B. This project (is a balanced cut and fill project) (requires export of material) or (requires import of material) – select one. The (import) or (export) of material shall be a part of the Contractor's bid price.
C. The intent of the grading plan is to provide positive drainage and to maintain slopes on walkways as required by the Americans with Disabilities Act and California Title 24 throughout the project site. The Project Manager shall be notified immediately of any discrepancies between the Plans and actual field conditions and/or conflicts between the design and code requirements.

1.03 Related Work

A. Section 31 10 00: Clearing and Grubbing
B. Section 33 00 00: Utilities
C. Section 32 84 00: Irrigation System
D. Section 32 90 00: Planting
E. Section 26 00 00: Site Electrical
F. Section 01 57 23 Storm Water Pollution Control

1.04 Quality Assurance

A. All work shall conform to local codes and regulations, including standards set forth in the Standard Specifications of the State of California, Business and Transportation Agency, Department of Transportation (Caltrans), Chapter 70 of the Uniform Building Code and ASTM.
B. Relative compaction shall be the in-place dry density of soil denoted as a percentage of the maximum dry density of the same material. This shall be as determined by ASTM 1557. The optimum moisture is measured by the water content which corresponds to the maximum dry density.
C. Upon discovery of unforeseen subsurface site conditions, the Contractor shall notify the Inspector immediately.
D. Upon discovery of hazardous materials, cease all activity and immediately contact the Fire Department.

1.05 Protection

A. Provide and install all supports, shoring, bracing, underpinning, sheet piling and other methods for the sides of excavations necessary for ensuring safe working conditions for the workmen and to protect adjacent improvements to remain.
B. Provide any and all protection measures necessary to ensure the protection of the workmen, the general public, including children and the project site. These protection requirements remain the Contractor's sole responsibility throughout the duration of the project, including non-working hours.
C. Do not obstruct vehicular, bicycle or pedestrian thoroughfares, unless previously accepted by the City. Provide safe and adequate detours around the construction as required by City and State regulations.
D. Trenches shall be covered at all times when work directly associated with the trenches is not occurring, including non-work hours.
E. During the course of construction, the Contractor shall ensure surface drainage does not create a nuisance onto adjacent properties.

1.06 Erosion Control Measures

A. Construction sites shall have required erosion and sediment control measures in place as required by the SWPPP. If construction is in progress, the Contractor shall ensure the construction site is prepared prior to the onset of any storm. At a minimum, erosion control measures shall include:
    1. Broadcast seed
    2. Drainage area protection
    3. Dust/mud control
    4. Drain inlet filters
    5. Silt fence and straw wattles
    6. Slope protection

7. Straw bales
8. Silt controlling devices

PART 2 - PRODUCTS

2.01 Base Rock

A. Class 2 aggregate base per Caltrans Standard Specifications, latest edition.

2.02 Drain Rock

A. Drain rock shall be Class 2 permeable, washed, unbroken stone or gravel. Material gradation shall conform to the following:

Sieve Size	Percent Passing
1 inch	100
No. 4	20-50
No. 50	0-10
No. 200	0-5

2.03 Pea Gravel

A. Pea gravel shall be natural stone, free of clay, shale or organic matter, and shall conform to the following:

Sieve Size	Percent Passing
3/8 inch	100
No. 4	47
No. 8	2
No. 16	1

2.04 Fill

A. Structural Fill shall conform to Caltrans Standard Specifications or the accepted site-specific geotechnical report generated for the project.
B. Fill for non-structural areas shall conform to the following standards:
   1. Plasticity: ASTM D4318-84
   2. Expansion Index: No greater than twenty (20)
   3. Testing: UBC 29-9 and ASTM D422-72
   4. Particle Size: No greater than one inch (1”)

2.05 Topsoil

A. The top eight to ten inches (8” – 10”) of native soil containing more than three percent (3%) organic material. Topsoil shall be free of rocks no larger than one inch (1”) in diameter, free from subsoil, roots, heavy or stiff clay, course sand, destructive seeds, noxious chemicals, brush, debris, litter and other undesirable materials.
B. For any import soil to be used in turf/planting areas, submit a soils analysis with soil amendment recommendations (for plant growth) for review and acceptance

prior to placement on-site. Soils test information shall be as outlined in Section 32 90 00: Planting – 1.06.

2.06 Soil Sterilant

A. Sterilizer shall be standard, quick-acting, short-lived and non-selective weed and grass killer, commonly used under roadway/transportation projects. Application of the sterilant shall pose no short or long term health threats to the installer or the general public. Submit analysis for approval prior to applying.

2.07 Sand

A. Granular, fine, free of organic matter, mica, loam or clay material.

PART 3 - EXECUTION

3.01 Construction Staking

A. The layout of all work shall be performed by a California State licensed land surveyor provided by the Contractor.
B. Notify the Inspector immediately of any discrepancies between actual field conditions and the Plans. Minor field adjustments may be necessary in order to fulfill the intent of the Plans.
C. Non-notification of discrepancies between actual field conditions and the Plans by the Contractor, in writing, shall indicate his acceptance of such field conditions. Adjustments/modifications to the construction to accommodate the inconsistencies (without notification) shall be at no additional cost to the City.

3.02 Excavation

A. All excavations shall be as noted on the Plans. Excavations shall include accommodation of base material.
B. Do not over-excavate. Excavations shall provide appropriate space to install shoring, bracing, formwork, etc., as needed to ensure the safe and proper construction of the work.
C. Take every precaution to prevent water from entering, softening, and undercutting excavated areas, including, pits, footings, trenches, etc.
D. Notify the Inspector immediately upon discovery of unsatisfactory soils materials or unforeseen site conditions. Excavation shall include the complete removal of the unsatisfactory material and its legal disposal thereof.

3.03 Site Grading

A. A grading permit is required to be obtained by the Contractor prior to commencing any earthwork.
B. Grading shall include adjacent transition areas, new elevations/contours as shown on the Plans. All subgrade areas shall be graded parallel to the finish

grades and contours and shall be uniform in slope. Transition areas shall provide a smooth connection between new and existing grades and shall not create additional drainage or ponding onto adjoining properties.

C. Surface grades shall provide for positive drainage away from structures and footings, and shall be uniformly smooth throughout.
D. Rough grading shall:
    1. Be graded to a tolerance of 0.10 feet, plus or minus for planted and turf areas.
    2. Be graded with a tolerance less than .04’ from specified grade and cross section for subgrade in which pavement, curbs and other structural elements are to be placed immediately above.
    3. Provide a subgrade surface free of exposed rocks, stones and boulders.
    4. Provide a subgrade surface free of depressions, pits, etc., with proper backfill and compaction. See paragraph 3.04 below.

3.04 Placement of Fill Material

A. Prior to placement of fill material, the Contractor shall:
    1. Obtain approval of the subgrade surface from the Inspector.
    2. Scarify, dry and compact soft and/or wet areas.
    3. Remove and replace unsuitable subgrade material to the satisfaction of the Inspector.
    4. Take all necessary corrective action.
B. Do not use topsoil as fill or backfill material, unless otherwise accepted in writing.
C. Fill shall be placed in the following manner:
    1. Accepted engineered fill material for structural slabs and areas to be paved shall be placed in six-inch (6”) loose thickness, uniform layers over the entire area.
    2. Fill material in planted areas shall be placed in twenty-four inch (24”) maximum loose thickness throughout the areas to receive fill.
D. Aerate or water each lift to obtain the required compaction rate indicated on the Plans. Thoroughly mix material to ensure proper moisture content for compaction. Repeat the operations until grades, as shown on the Plans, are obtained. Jetting of trenches shall be reviewed and accepted by the Inspector prior to performance of work.
E. Do not place fill when the subgrade is frozen, muddy or wet. Allow conditions to thaw and dry out before resuming operations.
F. Use hand tampers or vibrating compactors around foundations walls, retaining walls and other structural elements. Do not use large equipment in these areas and do not begin compaction operations until the bearing surfaces have reached its design strength.

G. Fill around existing trees to remain shall not exceed twelve inches (12”).
   1. Minor fill (6” or less) shall utilize topsoil and shall be placed by hand. Do not cover crown of trunk. Feather grades to the extent possible.
   2. Fills between 6” and 12” shall utilize 3/4” pea gravel on grade, placed up to three inches (3”) below finish grade. Apply topsoil, by hand, to meet finish grade elevations. Feather grades to the extent possible.
H. Construct mounds from on-site material. The core of the mound (1’ below finish elevations) shall be compacted to 90%. The top twelve inches (12”) shall be compacted to 85%. Place topsoil in the top twelve inches (12”).
I. Place topsoil in all turf and planting areas a minimum of twelve (12) inches deep. See Section 31 10 00, 3.03-B: Clearing and Grubbing.

3.05 Trenching, Backfilling and Compacting

A. For trenches greater than five feet (5’) in depth, submit an OSHA permit related to the work.
B. All trenches shall be straight, true and cut vertical at 90 degrees to the surface plane.
C. For trenches through existing paved surfaces, use a concrete saw or other tool to achieve straight, clean lines. Replace paved surface to the same or better condition as existing prior to cut.
D. Do not over-excavate. Maintain bearing surfaces true, level and undisturbed to the extent possible.
E. Trenches shall be kept dry and frost-free. Do not allow standing water to collect.
F. Do not allow trenches to remain exposed at any time when work directly related is not occurring. Cover all trenches during non-work hours.
G. Bedding for all trenches to receive pipes shall be as follows:
   1. Bedding material shall be consistent with the City of Roseville Design and Construction Standards, latest edition.
   2. Pipe shall lie completely on bedding. Pipe fittings or joints shall not bear weight.
   3. Bedding shall be uniform throughout the length of pipe.
H. Initial backfill for storm drains, sewer lines and electrical conduit shall conform to the applicable City standard set forth by the Department having jurisdiction.
I. Backfill beyond the initial operations shall be native soil, placed in twelve-inch (12”) lifts. Compaction for trenched areas shall be 95% for parking lot, driveway and roadway areas; 90% for hardscape (i.e. walkways, picnic pads basketball and tennis courts); and 85% in areas to be planted. Place topsoil over trenches in planted areas. Upon completion, all trenches shall be filled flush with adjacent finish grades.
J. Compaction tests shall be required for trenched areas, hardscape areas and areas where fill over two feet in depth will be placed. The Inspector shall

determine the number of tests and the locations. Re-tests shall be the Contractor's responsibility.

K. Potholing shall be required in areas where existing utilities are indicated. Hand digging may be required.

3.06 Soil Sterilant

A. Soil sterilant shall be applied to areas where paving is to be installed. The worker applying the sterilant shall take every precaution to avoid overspray of sterilant onto areas to be planted. The sterilant shall be placed no further than six inches (6") beyond the edge of pavement.

B. Soil sterilant shall not be applied in inclement weather and windy days.

3.07 Drainage Areas

A. All bare areas, regardless of slope, within 50 feet of natural drainages shall be covered with straw and pressed in place.

B. No grading or trenching, except as required for erosion or sediment control, shall occur within 35 feet from the centerline of perennial and intermittent drainage swales between October 5 and April 1 unless approved by the Engineering Division, as well as any other governmental agency which may have additional jurisdiction and/or requirements.

3.08 Dust/Mud Control

A. Adjacent Streets: Adjacent street frontages shall be swept at least once a day to remove silt and other dirt which is evident from construction activities.

B. Construction Vehicles: The Contractor is responsible for cleaning construction vehicles leaving the site on a daily basis to prevent dust, silt, mud and dirt from being released or tracked offsite. Adjacent streets shall be swept clean daily.

C. Grading Spoils: Dry stockpiles of soil shall be watered to prevent the generation of airborne dust. Trucks transporting dry soil shall be covered with tarpaulins.

D. Water: Water shall be sprayed on all exposed earth surfaces during clearing, grading, earth moving and other site preparation activities. The exposed earth shall be watered throughout the day to minimize dust. The Contractor shall obtain a hydrant permit from the Environmental Utilities Department.

E. Wind Allowances: Grading activities shall be restricted or halted when winds exceed 15 miles per hour as deemed necessary by the Public Works Inspector.

END OF SECTION

SECTION 32 12 16
ASPHALT CONCRETE PAVING

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.
B. The requirements set forth in the Supplemental Conditions shall be in addition to the standards provided herein.
C. The standards set forth in the City of Roseville Design and Construction Standards and the City of Roseville Parks Construction Standards, latest editions, shall be in addition to the standards provided herein.
D. The standards set forth in the State of California, Title 24, Americans with Disabilities Act, latest edition, shall be in addition to the standards provided herein.

1.02 Description

A. Furnish all labor, materials and equipment for the complete installation of asphalt concrete paving, including international disabled signs as shown in the City Standard, as shown on the Plans and as specified herein.

1.03 References

A. Caltrans Standard Specifications for asphaltic concrete, latest edition.

1.04 Tolerances

A. All surface areas shall drain. Ponding, puddling or birdbaths are not acceptable.
B. Surface grades shall conform to the following:

Description	shall not exceed, ... from indicated line, grade or thickness
Base Course	0.1 foot +/-
Finish Surface	0.05 foot +/-
Thickness of finished pavement	0.01 foot less

C. Flatness: maximum variance of 1/8” as measured with a ten (10) foot straight edge.

1.05 Testing

A. Testing shall occur during the installation of pavement. The number and frequency of tests shall be as determined by the Inspector.

PART 2 - PRODUCTS

2.01 Aggregate Base

A. Conform to Caltrans Standard Specification, Section 26 paragraph 1.02B, Class 2.

2.02 Asphalt Concrete

A. Conform to Caltrans Standard Specification, Section 39 and the City of Roseville Design and Construction Standards, latest edition.

2.03 Soil Sterilant

A. Sterilizer shall be standard, quick-acting, short-lived and non-selective weed and grass killer, commonly used under roadway/transportation projects. Application of the sterilant shall pose no short or long term health threats to the installer or the general public. Submit analysis for approval prior to applying.

2.04 Striping

A. Traffic marker paint, in accordance with Caltrans Standard Specifications, Section 83-3.02.
B. Thermoplastic marking tape in accordance with Caltrans Standard Specifications, Section 84-2.02. (Required for bike trails)

2.05 Header

A. Per City of Roseville Parks Construction Standards, latest edition.

2.06 Accessible Parking Signs

A. Signs for parking stalls shall conform to the California Manual on Uniform Traffic Control Devices (CMUTCD), the Standard Highway Signs manual with the Caltrans California Sign Specifications.
B. Notification sign: Notification sign shall read: “Unauthorized vehicles parked in designated handicapped spaces not displaying distinguishing placards or license plates issued for physically disabled persons may be towed at owner’s expense. Towed vehicles may be reclaimed at Roseville PD, 1051 Junction Blvd or by telephoning (916) 774-5000. CVC 22511.8”.
C. Sign posts: shall conform to Section 56 Signs in the City of Roseville Design and Construction Standards.

PART 3 - EXECUTION

3.01 Preparation

A. Upon completion of grading operations, compact the subgrade at the required elevation to a relative compaction density of 95%, unless otherwise noted on

the Plans. A load or performance test shall be conducted in the presence of the Inspector prior to the placement of AC.

B. Apply soil sterilant per manufacturer's directions. Limit the work zone of the sterilant application to the area to receive paving plus three feet (3') on each side.
C. Completely install redwood header as shown in the City of Roseville Parks Construction Standards, latest edition, if shown on the Plans.
D. No material shall be placed in muddy conditions, nor shall any material be placed during or immediately after inclement weather, i.e. rain storms, temperatures below 35 degrees F, etc.
E. In areas where soil conditions are less than optimal, geotechnical tests shall be performed to verify compaction rates. The Inspector shall determine the number of tests necessary in order to verify conditions. Initial tests will be provided by the City. Re-tests shall be the Contractor's responsibility.

3.02 Installation

A. Spread aggregate base material in six-inch (6") lifts.
B. Compact base surface to a relative compaction of 95% and in accordance to the Caltrans Standard Specifications, Section 26.
C. Spread asphalt concrete material in accordance to the Caltrans Standard Specifications, Section 39.
D. Upon completion, apply water to the finished surface and allow water to run-off. All areas of ponding, puddling or birdbaths shall be filled with asphalt and fine aggregate. Conform fill surface with adjacent surface to the point edges are not visible.
E. Take every precaution to protect adjacent amenities or structures from material spillage or damage. In case of spillage or damage, the Contractor shall immediately repair or replace the damaged area to the satisfaction of the City.
F. Clean and oil all manhole covers, grates and other surface structures within the pavement area.
G. Clean all surface structures that lie within the asphalt concrete area.

3.03 Striping

A. Conform to the City of Roseville Design and Construction Standards, latest edition.
B. Ensure that all pavement to receive striping is completely cured. Clean all pavement surfaces.
C. Accurately lay out all pavement markings, including, parking stripes, centerline stripes, international disabled parking logo, striping for disabled access ramp, directional arrows, game court lines and other pavement markings as shown on the Plans or as required by code.

D. All pavement lines, striping and lettering shall be four inches (4”) in width, unless otherwise indicated on the Plans.
E. Lines painted with traffic paint shall receive two coats of paint. Allow each coat to dry completely prior to applying the second coat.
F. Apply all pavement markings on clean, dry surfaces, during weather conditions where temperatures are higher than 35 degrees F, no rain is occurring or predicted within the next twenty-four (24) hours, and the humidity is less than 80.
G. Remove all excess adhesives and tracking onto unmarked areas.
H. All pavement striping applications shall conform to Caltrans Standard Specifications, Sections 84 and 85.

3.04 Accessible Parking Signs (For parking lots only)

A. Verify language on the signs meets with current laws and regulations prior to installation. Immediately notify project manager of discrepancies.
B. For signs at parking stalls: install one per space designated for disabled parking. Locate sign as shown on the Plans. Verify location in the field prior to installation. Sign bottom shall be set at seven feet (7’) above finished grade.
C. For notification signs: install one per driveway entrance. Verify location in the field prior to installation. Sign bottom shall be set at two feet (2’) above finished grade unless otherwise directed.
D. Sign post installation shall conform to TS-17A of the City of Roseville Development Services Design and Construction Standards.

3.05 Protection and Cleaning

A. Do not allow equipment or vehicles to park on new asphalt surfaces upon completion operations. At his discretion, the Contractor may allow the parking of equipment and vehicles on the asphalt concrete material has been laid, passing applicable compaction tests and **PRIOR TO** applications of striping.

END OF SECTION

SECTION 32 15 40
DECOMPOSED GRANITE PAVING

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.

B. The requirements set forth in the Supplemental Conditions shall be in addition to the standards provided herein.

C. The standards set forth in the City of Roseville Design and Construction Standards and the City of Roseville Parks Construction Standards, latest editions, shall be in addition to the standards provided herein.

1.02 Description

A. Furnish all labor, materials and equipment for the complete installation of decomposed granite paving, including redwood headers as shown in the Plans and as specified herein.

1.03 References

A. Caltrans Standard Specifications, latest edition.

1.04 Submittals

A. Submittals for specified items are not required; however, submittals are required for any proposed substitutions or deviations from the Plans or Specifications. Additionally, submittals are required for the specific items listed below. The Contractor shall submit a materials summary sheet indicating which items will be installed as specified and which items are proposed for substitutions. The Contractor shall submit proof of order within ten (10) working days of the Notice to Proceed, indicating all specified materials have been ordered, noting “as specified” or “substitution proposed”. Submittals are required on the following items:

1. Decomposed granite material and binding material: provide a sample “brick” for review and approval.

PART 2 - PRODUCTS

2.01 Crushed Quarry Rock

A. Crushed rock, graded between #4 and #200. Rock shall be high quality and well-graded.

B. Hastie's Capitol Sand and Gravel, Roseville, CA (916) 989-4600 or accepted equal.

2.02 Header

A. 1"x6"or 2"x6" Redwood header board.

2.03 Binding Material

A. PolyPavement, Los Angeles, CA (323) 954-2240 or accepted equal.

PART 3 - EXECUTION

3.01 Preparation

A. Upon completion of grading operations, compact the subgrade at the required elevation to a relative compaction density of 95%, unless otherwise noted on the Plans.
B. Completely install redwood header as shown in the City of Roseville Parks Construction Standards.
C. No material shall be placed in muddy conditions, nor shall any material be placed during or immediately after inclement weather, i.e. rain storms, etc.

3.02 Installation

A. Provide a 10' by specified width test sample, to be approved prior to installation. This sample shall be the basis of overall approval.
B. Thoroughly combine binder per manufacturer recommendations.
C. Spread crushed granite fine/binder material in two (2) one and one half inch (1-1/2") lifts (thickness after compaction).
D. Wet and roll each lift to form a uniform, smooth surface with a cross slope of 2%. Compact each lift to a 95% relative compaction density.
E. Upon completion of the final lift, fill any depressions, holes or divots and re- roll using the above process.
F. Provide a Certificate of Compliance verifying the binder/stabilizer has been mixed per manufacturer's recommendations.

3.03 Clean Up and Protection

A. Thoroughly clean all areas where work has occurred. Remove from site excess material, debris and rubbish.
B. Take all precautions to protect completed work. Immediately repair or replace all damaged areas due to tire ruts, erosion, compaction failure, etc.

END OF SECTION

SECTION 32 31 13
CHAIN LINK FENCING

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.
B. The requirements set forth in the Special Conditions shall be in addition to the standards provided herein.

1.02 Description

A. Furnish all labor, materials and equipment for the complete installation of the chain link fence system, including gates as shown on the Plans and as specified herein.

1.03 References

A. Caltrans Standard Specifications, latest edition.

PART 2 - PRODUCTS

2.01 General

A. Wire used in the fabric shall be galvanized and shall have a tensile strength of 80,000 lbs. per square inch based on cross sectional areas of the wire. One sample shall be tested without removing bends caused by weaving of the wire with the mesh. A second test shall be conducted on a wire strand carefully straightened. The tensile strength is finally determined as the average reading between the two tests. Wire to match fabric selection.
B. Fabric shall be 1-3/4" 9-gauge nominal wire mesh, *hot-dipped galvanized or black vinyl coated* after weaving as shown on the plans. Conform to ASTM A392, with tensile strength as described in 2.01A above. Fabric shall be knuckled top and bottom with single width to full height of fence.
C. Ties/Fasteners shall be 9-gauge aluminum or black powder coated wire.
D. Fittings, clips, bolts, bands, bars, post tops/covers and other hardware necessary for a complete fence system shall be *galvanized or black powder coated*.
E. Where fencing is shown on the Plans to be black vinyl or powder coated, all appurtenances, including fabric, posts, rails, clips, bands, fittings, etc., necessary for a complete fence system shall be black vinyl or powder coated. Vinyl or powder coating shall be the industry standard for this type of finish.

2.02 Posts and Rails

A. Posts and rails shall be *hot-dipped galvanized per ASTM A53 or black powder coated*, to match fabric and as shown on the Plans. All posts shall be installed with moisture-proofed caps on the top.
B. Size and lengths of posts shall be as shown in the City of Roseville Design and Construction Standards PK-40, latest edition.

2.03 Gates

A. Fabric and finish to match fence.
B. Hinges and latches shall be industrial strength, heavy duty and shall fit snugly around post. Latches shall be lockable.
C. Size and lengths of posts shall be as shown in the City of Roseville Parks Standard Details, latest edition.

PART 3 - EXECUTION

3.01 Post Installation

A. Posts are to be spaced evenly as shown on the City Standard and set plumb and true to lines with the top line uniform as shown in the City of Roseville Design and Construction Standards PK-40, latest edition.
B. All posts shall be set in concrete as shown in the City of Roseville Design and Construction Standards PK-40, latest edition.
C. Where nicks on vinyl or powder coated finished occurs due to installation, the Contractor shall re-finish and patch damaged areas immediately.

3.02 Fabric

A. Attach fabric using fabric bands or clips spaced approximately 14” apart. Connections to top rails and tension wires shall utilize wire ties placed 24” on center.
B. For corner and vertical end connections, install stretcher bars banded to posts and gate frames at 24” apart (maximum).
C. All fabric to be stretched tight, free from sags and bulges.

3.03 Rails

A. For splices along the top rail, provide couplings every 20’. The coupling shall produce a continuous brace from end to end of each stretch of fence. Install a heavy spring at every fifth coupling to allow for expansion or contraction.
B. Utilize the appropriate fittings to ensure that all rails are rigidly clamped to end and corner posts.
C. Clamp mid and bottom rails at each post.

3.04 Gates

A. Gates shall be installed consistent with the City Standard detail. Verify grade conditions along the fence bottom to ensure proper use of the gate(s).
B. Gate openings shall be face-to-face dimensions and shall swing according to the Plans.

3.05 Cleaning

A. Thoroughly clean all areas where work has occurred. Remove from the site excess material, debris and rubbish.
B. Take all precautions to protect completed work. Immediately repair or replace all damaged areas due to tire ruts, erosion, compaction failure, etc. Keep all erosion control measures intact.

END OF SECTION

SECTION 32 32 19
MODULAR CONCRETE RETAINING WALLS

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.
B. The requirements set forth in the Supplemental Conditions shall be in addition to the standards provided herein.

1.02 Description

A. Work includes furnishing and installing concrete modular block retaining wall units to the lines and grades shown on the construction drawings and as specified herein.
B. Work includes preparing foundation soil, furnishing and installing leveling pad, unit fill and backfill to the lines and grades shown on the construction drawings.
C. Keystone retaining walls of low height may be constructed without reinforcement using simple techniques, while high walls and walls with surcharge may be constructed with geogrid reinforcement and compacted backfill to suit a wide range of engineering requirements.

Delete the following paragraph if all retaining walls are unreinforced.

D. Work includes furnishing and installing geogrid reinforcement and backfill to the lines and grades designated on the construction drawings.

1.03 Related Sections

A. Section 31 20 00: Earthwork
B. Section 03 30 00: Site Concrete

1.04 References

A. ASTM C 33 - Standard Specification for Concrete Aggregates.
B. ASTM C 150 - Standard Specification for Portland Cement.
C. ASTM C 331 - Standard Specification for Lightweight Aggregates for Concrete Masonry Units.
D. ASTM C 618 - Standard Specification for Fly Ash and Raw Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.
E. ASTM C 989 - Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars.
F. ASTM D 698 - Standard Method of Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3) 600kN-m/m3)).

G. ASTM D 1557 - Standard Specification for Laboratory Compaction Characteristics of Soils Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN- m/m3).

1.05 Definitions

A. Structural Geogrid: A structural element formed by a regular network of integrally connected tensile elements with apertures of sufficient size to allow interlocking with surrounding soil, rock, or earth and to function primarily as reinforcement.
B. Modular Unit: A concrete retaining wall element machine made from Portland cement, water, and aggregates.
C. Unit Fill: A drainage aggregate which is placed within and immediately behind the modular concrete units.
D. Reinforced Backfill: A compacted soil which is placed within the reinforced soil volume as outlined on the plans.

1.06 Submittals

A. Submit under provisions of Section 01 10 00: Summary of Work.
B. Product Data: Submit manufacturer's product data for proposed materials and method of installation.
C. Samples: Submit samples of each product used in the work of this section.
D. Certifications: Submit a manufacturer's certification, prior to start of work, that the retaining wall system components meet the requirements of this specification.
    1. Contractor's submittal package shall include but not be limited to actual test results for tension/creep, durability/aging, construction damage, geogrid/facing connection, pullout, and quality control.
    2. Contractor shall submit certification, prior to start of work, that the retaining wall system (modular concrete units and specific geogrid):
        a) has been successfully utilized on a minimum of five (5) similar projects, i.e., height, soil fill types, erection tolerances, etc.; and
        b) has been successfully installed on a minimum of 1 million (1,000,000) square feet (92,000 sq m) of retaining walls.
E. Test Reports: Submit test reports documenting strength of specific modular concrete unit and geogrid reinforcement connection. The maximum design tensile load of the geogrid shall be equal to the laboratory tested ultimate strength of geogrid/concrete retaining wall unit connection at a maximum normal force limited by the "Hinge Height" of the structure divided by a safety factor of 1.5. The connection strength evaluation shall be performed in accordance with NCMA test method SRWU-1.
F. Contractor shall submit engineering plans prepared by a professional engineer experienced with Mechanically Stabilized Earth retaining wall systems and

registered in the state of the project location. The engineering designs, techniques, and material evaluations shall be in accordance with the KEYSTONE Design Manual, 2020, NCMA Design Guidelines for Segmental Retaining Walls, 2012, or the AASHTO Standard Specifications for Highway Bridges, Section 5.8, 1997 Interim, whichever is applicable.

G. Submit a list of previous projects totaling of 500,000 square feet (46,000 sq m) or more where the specific retaining wall system has been used successfully. Contact names and telephone numbers shall be listed for each project.

1.07 Quality Assurance

A. Owner will engage and pay for independent soil testing services during earthwork operations.

1.08 Delivery, Storage and Handling

A. Contractor shall check the materials upon delivery to assure proper materials have been received.

B. Contractor shall prevent excessive mud, wet cement, epoxy, and similar materials (which may affix themselves) from coming in contact with the materials.

C. Contractor shall protect the materials from damage. Damaged materials shall not be incorporated into the retaining wall structure.

Delete the following two paragraphs if all retaining walls are unreinforced.

D. Geogrids shall be stored above minus 20 degrees F.

E. Rolled geogrid material may be laid flat or stood on end for storage.

1.09 Record Drawings

A. The Contractor shall keep an accurate record of the as-built conditions of the modular concrete retaining walls. These records shall be updated daily and kept at the construction site. At any time, the Inspector may examine the conditions of the “as-builts” to ensure compliance of the above.

PART 2 - PRODUCTS

2.01 Manufacturer

A. Provide modular concrete retaining wall units and accessory materials fabricated by authorized licensed manufacturers of Keystone Retaining Wall Systems, 4444 West 78th Street, Minneapolis, MN 55435. Telephone 612-897-1040. ASD. FAX 612-897-3858, or accepted equal.

2.02 Modular Concrete Retaining Wall Units

A. Modular concrete units shall conform to the following architectural requirements:

1. Modular concrete unit color: Manufacturer's standard color.
2. Face finish: Sculptured rock face in angular multiplanar configuration. Other face finishes will not be allowed without written approval.
3. Bond configuration - running with bonds nominally located at midpoint vertically adjacent units, in both straight and curved alignments.
4. Exposed surfaces of units shall be free of chips, cracks or other imperfections when viewed from a distance of 20 feet (6.1 m) under diffused lighting.
5. Corners: Provide 90 degree corners, finished two sides, where indicated.
6. Cap units: Provide solid cap units with parallel sides for straight walls and convex walls, angular sides for concave walls.

B. Modular concrete units shall conform to the following material requirements:
   1. Cement: Materials shall conform to the following applicable specifications.
      a) Portland Cement: ASTM C 150.
      b) Modified Portland Cement: Portland cement conforming to ASTM C 150, modified as follows:
         1) Limestone - calcium carbonate, with a minimum 85 percent content, may be added to the cement, provided these requirements of ASTM C 150 as modified are met:
            a. Limitation on insoluble residue 1.5 percent.
            b. Limitation on air content of mortar by volume: 22 percent maximum.
            c. Limitations of loss of ignition: 7 percent.
      c) Blended Cements: ASTM C 618.
      d) Pozzolans: ASTM C 618.
      e) Blast Furnace Slag Cement: ASTM C 989.
   2. Aggregates: Conform to the following specifications:
      a) Normal Weight Aggregates - ASTM C 33.
      b) Lightweight Aggregates - ASTM C 331.
   3. Other Constituents: Air entraining agents, coloring pigments, integral water repellents, finely ground silica, and other constituents shall be previously established as suitable for use in modular concrete retaining wall units and shall conform to applicable ASTM standards or, shall be shown by test or experience to be not detrimental to the durability of the modular concrete units or any material customarily used in retaining wall construction.

C. Modular concrete units shall conform to the following structural and geometric requirements:
   1. Compressive strength: 3000 pounds per square inch (20MPa) minimum.
   2. Absorption: 8 percent maximum for standard weight aggregates.
   3. Unit width to height ratio: 2.25 to 1.

In the next four paragraphs concerning unit depth, weight, shear strength, and connection strength, delete the requirement for Standard or Compact units, respectively, if only one type is required. If both types are required, retain both.

4. Unit depth:
   a) Standard units: 20 inches (508 mm) minimum.
   b) Compact units: 12 inches (305 mm) minimum.
5. Unit weight:
   a) Standard units: 90 pounds (40 kg) per unit minimum for standard weight aggregates.
   b) Compact units: 75 pounds (34 kg) per unit minimum for standard weight aggregates.
6. Inter-unit shear strength:
   a) Standard units: 1500 pounds per linear foot (21,000 N/m), minimum, at 2 pounds per square inch (13 kPa) normal pressure.
   b) Compact units: 400 pounds per linear foot (5800 N/m), minimum, at 2 pounds per square inch (13 kPa) normal pressure.
7. Geogrid/unit peak connection strength:
   a) Standard units: 1000 pounds per linear foot (14600 N/m), minimum, at 2 pounds per square inch (13 kPa) normal force.
   b) Compact units: 600 plf minimum at 2 psi normal force. 600 pounds per linear foot (8700 N/m), minimum, at 2 pounds per square inch (13 kPa) normal force.
8. Maximum horizontal gap between erected units: 1/2 inch (13 mm).

D. Modular concrete units shall conform to the following constructability requirements:
   1. Vertical setback: 1/8 inch (3 mm) plus/minus per course (near vertical) or 1-1/4 inch (31.3 mm) plus/minus per course per the design drawings.
   2. Alignment and grid positioning mechanism: Fiberglass pins, two per unit minimum.

2.03 Shear Connectors

A. Strength of shear connectors between vertical adjacent units shall be applicable over a design temperature range of minus 10 degrees F (minus 23 degrees C) to plus 100 degrees F (plus 38 degrees C). Shear connectors shall be ½-inch (13 mm) diameter thermoset isopthalic polyester resin- pultruded fiberglass reinforcement rods. Connectors shall have a minimum flexural strength of 128,000 pounds per square inch (882 MPa) and short beam shear of 6,400 pounds per square inch (44 MPa).

B. Shear connectors shall be capable of holding the geogrid in the proper design position during grid pre-tensioning and backfilling.

2.04 Adhesive

A. Construction Adhesive: Keystone Kapseal as supplied by manufacturer of modular concrete units.

2.05 Base Leveling Pad Material

A. Material shall consist of a compacted crushed stone base or non-reinforced concrete as shown on the drawings.

2.06 Unit Fill

A. Unit fill shall consist of clean 1-inch minus crushed stone or crushed gravel meeting the gradation listed below.
   1. 1-inch (25 mm) sieve, 100 percent passing.
   2. ¾-inch (19 mm) sieve, 75-100 percent passing.
   3. No. 4 (4.75 mm) sieve, 0 - 10 percent passing.
   4. No. 50 (300 micro-m) sieve, 0 - 5 percent passing.

B. Pea gravel (3/8-inch to ½-inch (9.5 mm to 13 mm) round stone) is not acceptable.

2.07 Reinforced Backfill

A. Reinforced backfill shall be free of debris and meet the following gradation requirements:
   1. 2-inch (50 mm) sieve, 100-75 percent passing.
   2. 3/4-inch (19 mm) sieve, 100-75 percent passing.
   3. No. 4 (4.75 mm) sieve, 100-20 percent passing.
   4. No. 40 (425 micro-m) sieve, 0-60 percent passing.
   5. No. 200 (75 micro-m) sieve, 0-35 percent passing.
   6. Plasticity Index (PI) less than 10 and liquid limit less than 40.

B. The maximum aggregate size shall be limited to 3/4 inch (19 mm) unless field tests have been or will be performed to evaluate potential strength reductions to the geogrid design due to damage during construction.

C. Material can be sit-excavated soils where the above requirements can be met. Unsuitable soils for backfill (high plastic clays or organic soils) shall not be used in the backfill or in the reinforced soil mass.

D. Contractor shall submit reinforced fill sample and laboratory test results to the Architect/Engineer for approval prior to the use of any proposed reinforced fill material.

Delete the following article if all retaining walls are unreinforced.

2.08 Geogrid

A. Material: Geogrid products shall be high-density polyethylene or polypropylene expanded sheet or polyester woven fiber materials, specifically fabricated for use as soil reinforcement.

B. Tal, Allowable Tensile Design Load, shall be determined as follows:
   1. Tal = Tult/(Rfd x Rfcr x Rfcd x FS)
   2. Tal shall be evaluated based on a 75 year design life.

C. Rfcr, Reduction Factor for Creep Limited Tensile Load: Rfcr shall be determined from 10,000 hour creep testing performed in accordance with ASTM D 5262.

D. Rfd, Reduction Factor for Durability/Aging: Rfd shall be determined from polymer specific durability testing covering the range of expected soil environments.

E. Rfcd, Reduction Factor for Construction Damage: Rfcd shall be determined from product specific construction damage testing performed in accordance with GRI-GG4. Test results shall be provided for each product to be used with project specific or more severe soil type.

F. FS, Overall Factor of Safety: FS shall be 1.5 unless otherwise noted.

G. The maximum design tensile load of the geogrid shall not exceed the laboratory tested ultimate strength of the geogrid/facing unit connection as limited by the "Hinge Height" divided by a factor of safety of 1.5. The connection strength testing and computation procedures shall be in accordance with NCMA test methods.

H. Soil Interaction Coefficient, Ci: Ci values shall be determined per GRI:GG5 at a maximum 0.75 inch (19 mm) displacement.

I. Manufacturing Quality Control: The geogrid manufacturer shall have a manufacturing quality control program that includes QC testing for each 40,000 square feet (3700 sq m) of production, each lot, or each production day. The QC testing shall include:
   1. Tensile Modulus
   2. Specific Gravity
   3. Melt Flow Index (PP & HDPE)
   4. Molecular Weight (PETP)

PART 3 - EXECUTION

3.01 Examination

A. Verify that layout dimensions are correct and substrate is in proper condition for installation. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 Excavation

A. Contractor shall excavate to the lines and grades shown on the construction drawings. Obtain the Architect/Engineer's approval of excavation prior to placement of leveling material or fill soils.
B. Over-excavation of deleterious soils and replacement with suitable fill, when approved in advance by the Architect/Engineer, will be paid at unit cost rates.
C. Contractor shall be careful not to disturb embankment and foundation materials beyond lines shown.

3.03 Base Leveling Pad

A. Leveling pad material shall be placed to the lines and grades shown on the construction drawings.

Select one of the following three paragraphs for desired base leveling pad, or leave more than one if contractor may choose. Note that Proctor testing is not possible for crushed stone option.

B. Granular leveling pad material shall be compacted to a minimum of 95 percent Standard or 90 percent Modified Proctor.
C. Crushed stone leveling pad shall be compacted to yield (Proctor testing does not apply).
D. Concrete leveling pad shall be minimum inches of unreinforced concrete.
E. Leveling pad shall be prepared to ensure full contact to the base surface of the concrete units.

3.04 Modular Unit Installation

A. First course of units shall be placed on the leveling pad, and alignment and level checked. Pins or molded surfaces of modular concrete units shall be used for alignment control; do not attempt alignment from split-face surface.
B. Ensure that all units are in full contact with base and properly seated.
C. Install fiberglass-connecting pins and fill all voids in and around the modular units with unit fill material. Tamp or rod unit fill to ensure that all voids are completely filled.
D. Sweep excess material from top of units and install the next course. Ensure that each course is completely unit filled, backfilled and compacted prior to proceeding to next course.

E. Place each subsequent course ensuring that pins protrude into adjoining courses a minimum of 1 inch (25 mm). Two pins are required per unit. Push next course unit forward, away from the fill zone, locking against the pins in the previous course and backfill as the course is completed. Repeat procedure to the extent of wall height.
F. Follow wall erection and unit fill placement closely with any other backfilling required.
G. Position vertically adjacent modular concrete units as recommended by the manufacturer (in running bond pattern).
H. Maximum, stacked, vertical height of wall units, prior to wall unit fill, backfill placement and compaction, shall not exceed two courses.
I. One cubic foot, minimum, of unit fill shall be used for each square foot (0.30 cu m/sq m) of wall face. Unit fill shall be placed within cores of, between, and behind units to meet this requirement.
J. Whole, or cut, units on curves and corners to shall be erected with running bond approximately centered on units above and below.
K. Cap Installation: Apply adhesive to top surface of unit below and place cap unit into position over projecting pins from units below.

Delete the following article if all retaining walls are reinforced with geogrid reinforcement.

3.05 Unreinforced Backfill Placement

A. Place and compact backfill in lifts not to exceed 8 inches (200 mm).
B. Backfill shall be compacted to 95 percent of the maximum density as determined by ASTM D 698.
C. Place the top 8 inches (200 mm) of the structure fill using low permeability soil.
D. Only lightweight hand-operated equipment shall be allowed within 3 feet (900 mm) from the tail of the modular concrete units.
E. At the end of each day's operation, the Contractor shall slope the last lift of reinforced backfill away from the wall units to direct runoff away from wall face. The Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

Delete the following article if all retaining walls are unreinforced.

3.06 Structural Geogrid Installation

A. Geogrid shall be oriented with the highest strength axis perpendicular to the wall alignment.
B. Geogrid reinforcement shall be placed at the elevations and to the extent shown on the construction drawings or as directed by the Engineer.
C. The geogrid shall be laid over the fiberglass pins of the modular wall units and extended horizontally on compacted backfill. Place the next course of modular

concrete units over geogrid. The geogrid shall be pulled taut, and anchored prior to backfill placement on the geogrid.

D. Follow manufacturer's guidelines relative to overlap requirements of uniaxial and biaxial geogrids.
E. Geogrid reinforcements shall be continuous throughout their embedment lengths. Spliced connections between shorter pieces of geogrid is not allowed unless pre-approved by the Architect/Engineer prior to construction.

Delete the following article if all retaining walls are unreinforced.

3.07 Reinforced Backfill Placement

A. Reinforced backfill shall be placed, spread, and compacted in such a manner that minimizes the development of slack in the geogrid.
B. Backfill shall be placed from the wall back towards the embankment to ensure that the geogrid remains taut.
C. Reinforced backfill shall be placed and compacted in lifts not to exceed 8 inches (200 mm) where hand compaction is used, or 12 inches (300 mm) where heavy compaction equipment is used.
D. Reinforced backfill shall be compacted to 95 percent of the maximum density as determined by ASTM D 698. The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer and shall be within +1/-3 percentage points dry of optimum.
E. Place the top 8 inches (200 mm) of the structure fill using low permeability soil.
F. Only lightweight hand-operated equipment shall be allowed within 3 feet (900 mm) from the tail of the modular concrete unit.
G. Tracked construction equipment shall not be operated directly upon the geogrid reinforcement. A minimum fill thickness of 6 inches (152 mm) is required prior to operation of tracked vehicles over the geogrid. Tracked vehicle turning should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid.
H. Rubber tired equipment may pass over geogrid reinforcement at slow speeds, less than 10 miles per hour (16 kph). Sudden braking and sharp turning shall be avoided.
I. At the end of each day's operation, the Contractor shall slope the last lift of reinforced backfill away from the wall units to direct runoff away from wall face. The Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

END OF SECTION

SECTION 32 84 00
IRRIGATION SYSTEM

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.
B. The requirements set forth in the Supplemental Conditions shall be in addition to the standards provided herein.

1.02 Description

A. Furnish all labor, materials and equipment for the complete installation of an automated irrigation system, including all necessary appurtenances for proper operation, noted or implied, as shown on the Plans and as specified herein.
B. Water usage, meter costs, connection fees, testing and other associated utility costs are considered direct costs and is the responsibility of the Contractor until the project is accepted.
C. Installation of the water meter shall be by the City.

1.03 Related Work

A. Section 32 90 00: Planting
B. Section 26 00 00: Site Electrical

1.04 Quality Assurance

A. All work shall comply with local and state laws, codes, regulations and requirements which govern any portion or all of the work contained in this Section. These include, but are not limited to, the latest editions of:
    1. City of Roseville Park Construction Standards,
    2. City of Roseville Design and Construction Standards,
    3. City of Roseville Electric Department Standard Specifications,
    4. Local, state and federal electrical codes, manuals and guidelines, and
    5. Local, state and federal plumbing codes, manuals and guidelines.

1.05 Submittals

A. Submittals for specified items are not required for Parks or Streetscape projects, unless specifically listed below. However, submittals are required for any proposed substitutions or deviations from the parks Plans or Specifications. For Streetscapes, no substitutions will be accepted. The Contractor shall submit a materials summary sheet indicating which items will be installed as specified

and which items are proposed for substitutions. The Contractor shall submit proof of order within ten (10) working days of the Notice to Proceed, indicating all specified materials have been ordered, noting “as specified” or “substitution proposed”. Submittals are required on the following items:

1. Controller, Flow Sensor(s), and Master Valve(s).
2. Filter (Recycled water)
3.

1.06 Explanation of Drawings

A. The drawings are diagrammatic and do not reflect all offsets, fittings and other miscellaneous items required for a complete and operable irrigation system. It shall be the Contractor’s responsibility to investigate all existing site conditions, become thoroughly familiar with the site, and provide all labor, materials and equipment required for the installation of the irrigation system.
B. Avoid conflicts between other trades and the installation of the irrigation system. Minor adjustments to avoid such conflicts shall be made in the field. Major discrepancies between actual field conditions and the Plans shall be brought to the attention of the Project Manager. The lack of notification shall indicate the Contractor assumes full responsibility for any revision deemed necessary to ensure proper installation.

1.07 Product Delivery, Handling and Storage

A. All materials shall be delivered bearing manufacturer’s label with size, type and model number (if applicable) clearly marked.
B. All pipe shall be delivered in a vehicle which allows the material to lie flat without concentrated weight or stress at any point.
C. Unload all materials with care so as to avoid damage. Store materials in a covered area and do not expose PVC pipe to extreme sun or heat. Store pipe lying flat.
D. Do not install any material that has been damaged. Replace all material found to be damaged.

1.08 Record Drawings

A. The Contractor shall keep an accurate record of the as-built conditions of the irrigation system. These records shall be updated daily and kept at the construction site. At any time, the Inspector may examine the conditions of the “as-builts” to ensure compliance of the above.
B. Dimensions shall be recorded from two (2) permanent points of reference.
C. The City may at its discretion withhold progress payments to the Contractor if the as-built records are not updated to the satisfaction of the City.

PART 2 - PRODUCTS

2.01 General

A. All materials specified shall be new, bearing the brand name, type, serial numbers and model number as shown on the Plans and as specified herein, unless otherwise accepted in writing.

2.02 Backfill Material

A. Backfill shall be clean, screened, on-site material, free from organic material, large clods of earth and/or rock larger than one (1) inch in diameter, trash, debris, rubbish, tree trunks, broken concrete or asphalt and other unacceptable material.

B. Material larger than one (1) inch shall be removed from site and legally disposed. All removal shall be the responsibility of the Contractor.

2.03 Meter

A. Meter shall be as shown on the Plans and as required by the City of Roseville Environmental Utilities Department.

2.04 Backflow Prevention Device

A. Backflow Prevention Device shall be as shown on the Plans.

B. Cover shall be insulated, freeze-proof, removable and lockable, manufacturer and model per the City of Roseville Design and Construction Standards or accepted equal.

2.05 Filter (Recycled Water Only)

A. Amiad Filtration Systems, filter with scanaway semi-automatic assembly and 130 micron filter screen
   1. For 2”, Plastic Super-T Semi-Automatic Filter.
   2. For 3” and above, Steel In-line Semi-Automatic Filter.
   3. Include Scanaway 130 micron filter element.
   4. Match line size of recycled water meter, down to 2” minimum.
   5. Include lockable protective frost cover blanket.

2.06 Flow Sensor and Master Valve

A. Calsense Controllers:
   1. Flow sensor shall be a Calsense Ultrasonic Flow Meter (FM-2U), or accepted equal. Flow sensor shall be accurate to +/- 2% of full scale. Flow sensor body shall be constructed of Schedule 80 PVC for sizes up to 4”, and saddle taps for sizes 6” and above.
   2. Master valve(s) shall be Superior, 3300 series, normally open, electric globe valve, constructed of brass with dirty water protection and No Minimum Flow

feature. For recycled water systems, include -RW Recycled Water designation with purple handle for identification.

3. Flow meters to be constructed consistent with the Calsense specifications.
4. Valve boxes for master valve and flow sensor shall be 18” (jumbo) green rectangular rigid plastic valve boxes with lockable lids and extensions by Carson Industries, LLC or accepted equal. Valve box lid shall be colored green in potable water system applications and purple for recycled water system applications.

2.07 Booster Pump

A. Customflow Quality Booster Pump by V-Power Equipment, Inc. (888) 830-8025.
B. Provide technical startup support, pump certification and 30 month warranty following delivery by V-Power Equipment, Inc.
C. Variable Frequency Drive Control Panel with Fuji Eco Drive, NEMA 12 enclosure, main disconnect, DC choke, panel cooling fan, HOA switch on panel door, 110 volt transformer for controls and external fan, Terminals for wire connections, (2) Pump start relays for irrigation controller controls, ET/U.L. 508A Listed and proprietary programmed for City of Roseville standard operation by Custom Pump & Power, Inc.
D. IFM Efector PA3224 transducer is rated for 0-145PSI and adjustable through the VFD.
E. Enclosures to be sized to fit pump, VFD, valves, bypass, transducer, and pump inserted Hot Stop temperature protection to be activated at 120 degree with manual reset mounted on the VFD panel door. Flange connection for inlet and outlet outside the enclosure. Standard enclosure to be fitted for padlock and have a shock assisted opening on the front. Larger enclosures with removable doors with built in lock with the 402 key. All enclosures to be steel and powder coated dark green.
F. Installation by licensed contractor as shown on plans and connect power wires from meter pedestal and 24-volt control wire from the controller to the VFD line connectors inside the enclosure.

2.08 Pipe

A. PVC Pressurized Mainline
   1. For lines three inch (3”) or larger: polyvinyl chloride (PVC) 1120-1220, SDR 21, Class 200 rubber gasketed pipe, and NSF accepted per Standard No. 14, Type I, Grade I. Conform to:

Material	ASTM
Pipe	D1784, D2241
Rubber Gasket	F477

2. For lines two and one half inches (2-1/2”) or smaller: Schedule 40 polyvinyl chloride (PVC) 1120-1220, and NSF accepted per Standard No. 14, Type I, Grade I. Conform to:

Material	ASTM
Pipe	D1784, D1785

B. PVC Non-Pressurized Lateral Lines
   1. Schedule 40 polyvinyl chloride (PVC) 1120-1220, SDR 21.0, NSF accepted per Standard No. 14, Type 1, Grade II.

C. Recycled Water
   1. Pipes shall meet the standards outlined in Sections 2.08, A and B above, unless otherwise noted in the City of Roseville Design and Construction Standards for recycled water, latest edition.
   2. All pipes containing recycled water shall be purple, NSF accepted and conform to the City of Roseville Design and Construction Standards, latest edition.

2.09 Fittings and Nipples

A. Fittings for Mainline Pipe:
   1. For all control valves on mainlines three inches (3”) and larger, use painted, ductile iron saddle taps with double stainless steel straps and nuts. Model #202 by Romac Industries, Inc. or accepted equal.
   2. For all other connections on mainlines three inches (3”) and larger mainline pipe, use glued schedule 80 fittings.
   3. For all control valves on mainlines two and one half inches (2-1/2”) or smaller, use glued schedule 80 fittings.
   4. For all other connections on mainlines two and one half inches (2-1/2”) or smaller, use glued schedule 40 fittings.

B. Fittings for Solvent Weld Pipe- Laterals:
   1. Schedule 40 polyvinyl chloride (PVC), standard weight, conforming to ASTM D2466-73.
   2. Weld-on #P-70 primer and Weld-on #711 gray glue or accepted equal.
   3. Teflon tape for all threaded PVC fittings.

C. Plastic Nipples shall be Schedule 80, Type 1, Grade 1, polyvinyl chloride (PVC), threaded at both ends, and conforming to ASTM D1784 -85. Nipples shall be uniformly gray.

D. Fittings for Recycled Pipe:
   1. Fittings shall meet the standards outlined in Sections 2.09, A, B and C above, unless otherwise noted in the City of Roseville Design and Construction Standards for recycled water, latest edition.

2.10 Swing Joints

A. Swings joints shall be as shown in the City Parks Construction Standard detail. Schedule 40 threaded PVC triple swing joints or an accepted equal.

2.11 Electric Remote Control Valve

A. Sizes as shown on the Plans. All valves shall be Rainbird PEB series or accepted equal and shall contain the following:
   1. a globe-type electric remote control, normally closed diaphragm type with slow opening and closing action,
   2. encapsulated solenoid type actuation,
   3. a minimum rating of twenty-four (24) volts,
   4. sixty (60) cycle,
   5. two to five (2-5) watts,
   6. a manual flow adjustment with shut-off provisions,
   7. provisions for an external “bleed” of the diaphragm chamber for manual operation.
   8. a ball valve on the inlet.
   9. Schedule 80 PVC threaded fittings from main line to valve.

B. Valve boxes shall be rectangular, rigid plastic valve boxes with lockable lids and extensions by Carson Industries, LLC or accepted equal. Valve box shall be sized appropriately to house entire valve assembly with space to accommodate maintenance access. Valves for drip zones require Jumbo size boxes.
   1. Boxes shall be colored green in potable applications, and purple for recycled water applications.
   2. Valve boxes used on recycled water systems shall be permanently colored purple through the manufacturer. Boxes painted purple will be rejected.
   3. Label lids using heat branded identification, T:Turf, S:Shrubs, B:Bubblers

C. Controller station identification number shall be standard yellow tags with permanent numbers by Christy or accepted equal.

2.12 Root Watering System

A. Provide pre-manufactured root watering system.
   1. Pressure compensating bubbler. See irrigation sheets for flow rates.
   2. Check valve where applicable to prevent low head drainage.
   3. Swing joint assembly
   4. Locking grate top on semi-rigid mesh tube. Use purple grate for Recycled water systems
   5. Filter fabric sleeve

2.13 Irrigation Heads

A. All irrigation heads shall conform to type, size, precipitation rate, gallons per minute discharge, pressure and throw radius as shown on the Plans, unless otherwise accepted in writing.
B. In all available models, all irrigation heads shall have stainless steel risers, unless otherwise approved in writing.
C. For recycled water applications, irrigation heads shall be colored purple, have debris pocket, and wiper seals with 3 touch points.
D. Irrigation heads shall have built-in pressure regulation for pop up sprays and/or water-efficient heads.
E. Include built-in check valve where applicable to prevent low head drainage.

2.14 Drip Irrigation

A. Sub-surface dripline.
    1. Flexible polyethylene tubing shall have factory-installed pressure-compensating, inline emitters spaced evenly per listed spacing.
    2. Emitter shall incorporate elemental or ionic copper root intrusion prevention technology, and shall be warranted by the manufacturer to be free of emitter plugging due to root intrusion for a period of fifteen (15) years minimum.
    3. Emitter shall have a built-in check valve that will hold back, at minimum, an 8.5' column of water.
    4. Dripline for use with recycled water systems shall be properly and permanently marked for non-potable use.
    5. Acceptable products include Rainbird XFS-CV Series or Netafim Techline HCVXR Series, or approved equal.
B. All fittings shall be constructed of injection molded, brown plastic having a nominal outside dimension of 17mm (0.56”). Female and male threaded ends shall be capable of mating to standard PVC pipe with tapered threads.
C. Line flushing valve
    1. Valve shall be schedule 40 PVC ball valve with brass hose thread adapter.
    2. Valve box shall be rigid plastic, with lockable cover by Carson Industries, LLC or accepted equal. Boxes shall be colored green in potable applications, and purple for recycled water applications.
    3. Drip system operation indicator shall be Rainbird 1812 Pop-up spray body with 4-VAN nozzle set to 0-degree pattern, with Rainbird SA-125050 swing assembly and XFF-TFA barbed bt ½” FIPT fitting, or accepted equal.
D. Pressure Regulating Filters shall be Rainbird PRB Pressure Regulating Basket Filter, or approved equal, and shall include: Basket style body and jar-top cap constructed of heavy-duty glass-filled, UV-resistant polypropylene, with 150 PSI (10,3 bar) operating pressure rating. Standard 200 mesh (75 micron) filter screen constructed of stainless steel attached to propylene frame. Normally-

open in-line pressure regulating device, constructed of durable, UV resistant non-corrosive material able to accommodate an inlet pressure rating of not less than 150 PSI (10,3 bar), with preset outlet pressure of approximately 40 PSI (2,8 bar).

2.15 Thrust Blocks

A. All thrust blocks shall be concrete. The size of the blocks shall be determined by the average safe soil-bearing load of 700 lbs. per square foot.
B. Polyethylene sheeting at thrust blocks shall be 6mil.

2.16 Quick Coupler Valves

A. For potable water, quick coupling valves shall be Rainbird #44LRC or accepted equal. For recycled water, quick coupling valves shall be Rainbird #44NP lockable or accepted equal. All quick coupling valves shall be:
    1. brass or bronze with one (1) IPS female pipe connection,
    2. two piece body with a removable upper portion (for replacement), and
    3. durable yellow covers for potable and purple for recycled.
B. Valve keys shall be brass or bronze and shall be of the same manufacturer and size as the valve.
C. Valve box shall be rigid plastic, a minimum of ten inches (10”) in diameter with lockable cover by Carson Industries, LLC or accepted equal. Boxes shall be colored green in potable applications, and purple for recycled water applications.
D. Where recycled water is used, conform to the City of Roseville Design and Construction Standards.

2.17 Manual Valves

A. For pipe four inches (4”) and larger gate valves shall be:
    1. located where shown on the Plans,
    2. flanged with Class 125 cast iron body,
    3. bronze trimmed with a non-rising stem,
    4. square operating nut,
    5. able to withstand a cold water pressure of 150 pounds per square inch, and
    6. sized to match the pipeline which the valves serve, unless otherwise shown on the Plans.
B. For pipe three inches (3”) or smaller
    1. located where shown on plans
    2. lead free
    3. Able to withstand cold water pressure of 300 pounds per square inch
    4. sized to match the pipeline which the valves serve, unless otherwise shown on the Plans.

5. Nibco T-113-LF or approved equal.

C. Pipes which feed directly into a remote control valve, ball valves shall be installed and shall:
   1. allow for manual operations,
   2. rapid on/off , drip-tight shut-off control,
   3. be constructed of bronze or brass with heavy-duty handle,
   4. operate up to 22 gallons per minute,
   5. operate between 15 and 150 pounds per square inch, and
   6. be sized to match the pipeline which the valves serve, unless otherwise shown on the Plans.

D. Valve box shall be rigid plastic, a minimum of ten inches (10”) in diameter with extensions and lockable cover by Carson Industries, LLC, as shown on the Plans or accepted equal. Boxes shall be colored green in potable applications, and purple for recycled water applications.

2.18 Automatic Irrigation Controller

A. Automatic controllers shall be Calsense CS3000 or accepted equal. Each controller shall include:
   1. CS3-## – Calsense (##) Station Base Model,
   2. FM-2U – Flow Meter (Ultrasonic),
   3. -S1– Stainless Steel Enclosure with 1 hole for Stubby Antenna.
   4. CS3000 Transient Protection
   5. TP-110 – AC Line Protection,
   6. GR-STUBBY – Antennae w/2ft cable
   7. On/Off Switch
   8. GFI electrical outlet inside enclosure.

   When multiple controllers are used, include:
   9. CS3-FL – Flowsense software (for multiple controllers sharing POC and/or communications)
   10. CS3-MSSE-KIT or CS3-SR-KIT – Hardwire or SR radio,

   When multiple flow sensors are used, include:
   11. CS3-2WIRE-OPT & CS-2W-POC (one per POC) – Additional Flow Meter interface.

B. Third-Party Communications hardware required:
   1. Sierra Wireless AirLink RV55 LTE-A PRO Router (#1104303)
   2. Router AC Adapter (#2000579)
   3. AT-5 (or higher) Ethernet Cable - 1ft (#A3L781-01-BLU)

C. Communication wire between controllers, when required, shall be Paige Cable P7171D or accepted equal.

2.19 Control Wires

A. Direct burial solid copper wire AWG-U.F. 600 volt.
B. Common wire and two spare wires shall be minimum #12-gauge.
C. Pilot wires shall be red, minimum #14-gauge. Wire gauge shall be, at minimum:

Wire Gauge	#14	#12	#10	#8
Max. Distance (ft.)	2,500	3,250	4,000	4,800

D. Splices:
   1. Wire connections at remote control valves only shall utilize 3M direct bury splice kit model #DBY (yellow) or model #DBR (red).
   2. All other splices, including line splices, connections to flow meters and othersensors,shallutilize 3M Scotchcast 3570G Connector Sealing Packs, no known equal.
E. Wiring colors shall be:

USE	**COLOR**
Flow	Yellow
Master	Blue
Pump	Black
Valves	Red
Common	White
Spare	Orange
Tracer	Green

2.20 Sleeves

A. Schedule 40 PVC 1120-1220 and two times the diameter of the pipe to be accommodated by the sleeve, one (1) for control wires and one (1) for main line, and one (1) for lateral lines.
B. Maximum one (1) line per sleeve.
C. Add one (1) spare, same size as largest.

2.21 Tracer Wire

A. Insulated solid copper wire, minimum #12 gauge. Color shall be green.

PART 3 - EXECUTION

3.01 Site Conditions

A. Prior to start of irrigation work, review the site conditions to verify that stub- outs, points of connections, sizes of the points of connections, water pressure and other essential items necessary for irrigation work to commence are as shown on the Plans and as indicated in the Specifications.
B. Notify the Inspector immediately of any existing conditions which are unacceptable for the commencement of irrigation work.

3.02 Coordination of Work

A. Coordinate all work with other trades.
B. The irrigation plan is diagrammatic. Whenever possible, locate all pipes in planted or turf areas. Do not scale off of the Plans. Where field conditions have changed, notify the Inspector immediately.

3.03 Excavation and Trenching

A. Trenches shall be dug straight and in such a manner as to completely support the pipe continuously along the bottom of the trench. In rocky conditions, over-excavation and placement of clean bedding material may be required to ensure protruding rocks do not place undue stress on pipes. Trench layout shall follow that shown on the Plans, except where accepted by the City.
B. The following minimum cover shall be provided for pipe:

Pipe Type	Minimum Cover
Pressurized Mainlines	24”
Non- Pressurized Lateral Lines	18”
Domestic Water Lines	24”
Control wires	24”
PVC Sleeves under Paving	18”
PVC Sleeves under Auto X-ings	24”

C. Install detection wire, looped in and out of valve boxes and attached to all irrigation mainlines.
D. High voltage wires shall not be installed in the same irrigation water line trench.

3.04 Testing and Flushing

A. Pressure Testing shall occur only when the following conditions can be fulfilled:

Item Description	Condition
Quick coupler valves	Installed and capped
Electric remote control valves	Installed
Flow valve	Installed and open
Ball/Gate valves	Installed and open
Lateral lines	Disconnected
Welded PVC joints	Cured at least 24 hours
Pipe	Center loaded with backfill
Concrete Thrust Blocks	Installed and cured at least 48 hours
Couplings and fittings	Exposed
Detection wire	Installed

B. A pressure gauge shall be installed at the lowest point of the line. Continuous pressure shall be applied at a rate of 125 psi for all mainlines. The pressure shall remain stable for a minimum of two hours with no detectable leakage. Upon completion of the test, a complete examination of the line shall be conducted by the City. Leaks resulting from the test shall be repaired and the

line shall be re-tested. This process shall be repeated until the line passes the leakage test.

C. All lines and risers shall be flushed prior to final installation of irrigation heads. All control valves shall be left open during the flushing process.

3.05 Backfilling and Compacting

A. Backfilling of trenches shall not occur until all tests and reviews have been performed. See inspection record contained in the Parks Construction Standards, latest edition. Any trench that is prematurely backfilled may be required to be re-dug for review.
B. Compaction of the trenched areas shall meet the following compaction rates of 95% in areas to receive paving and 85% in areas to be planted.
C. Do not flood trenches unless otherwise accepted by the City.
D. Sunken trenches shall be re-finished flush with the adjacent grades.

3.06 Backflow Prevention Device and Enclosure

A. Install per local codes and manufacturer’s instructions.
B. When the flow meter is installed above grade, install a backflow prevention device enclosure with lockable gate.

3.07 Flow Meter Installation

A. Install per local codes and manufacturer’s instructions.
B. All flow meters shall be installed in ground.
C. Install 3/4" conduit from irrigation controller to flow meter valve box. Install a pull box every 100’.
D. Valve box lids shall be permanently marked identifying FM for flow meter and MV for master valve and GR for grounding rod with heat branding using stencils in a uniform location on all boxes throughout.

3.08 Booster Pump Installation

A. Install per local codes and per manufacture's instruction.
B. Furnish wires and conduits to connect electrical power, and 24-volt pump start controls to the VFD panel located inside the VFD panel
C. Ductile iron plumbing from the flanges above ground to the mainline.
D. Install level concrete housekeeping pad for the pump enclosure per plans, 4" thick, 1"above ground, with 1/2" tool edges
E. Thrust blocks to be installed per pump manufacturer’s and landscape architect’s requirements.

3.09 Pipe Installation

A. Install irrigation pipe in planted areas whenever possible.
B. All pipe and fittings shall be cleaned and free from dirt, dust and moisture.

C. Pipe may be assembled along the trench at grade to avoid undue strain on the pipe or the fittings. All solvent weld connections shall be primed before applying glue. Snake the pipe within the trench to compensate for expansion and contraction.
D. All PVC pipe and metal valve connections shall be made with threaded fittings consistent with drawings PK-15 and PK-16 of the City of Roseville Parks Construction Standards.
E. All PVC-to-PVC threaded connections shall be made with Teflon tape.
F. Install concrete thrust blocks in locations where rubber gasketed irrigation mainlines change directions, e.g. ells, tees; as required on other lines and fittings; and at the termination point of the mainline. Do not conduct a pressure test within 48 hours of the thrust block pours. The size of the thrust blocks shall be per manufacturer's instructions and shall be adequate in size to absorb thrusts up to the maximum internal water pressure. Refer to 3.18 Thrust Blocks.
G. Use glued fittings for all connections inside of a sleeve and within 20' of a sleeve.
H. When multiple pipes are in the same trench, provide a minimum 2" horizontal separation between pipes, or equal to diameter of pipe, whichever is larger. Do not stack pipes vertically.

3.10 Electric Remote Control Valves

A. Install per local codes, manufacturer's instructions, City of Roseville Design and Construction Standards and as shown on the Plans.
B. Install one (1) electric remote control valve per box and whenever possible, group valve boxes together. Align boxes in a straight and neat row and flush to finish grade. Provide a minimum of six (6) inches between boxes.
C. All valves shall be tagged for easy identification of valve number. Valve box lids shall be permanently marked identifying valve number and controller letter with heat branding using stencils in a uniform location on all boxes throughout.
D. Each valve shall be separately saddle tapped. Manifolded valves shall be rejected.
E. Locate valve boxes outside of turf areas, adjacent to paving, i.e. sidewalks, hardscape, etc. except where shown on the Plans.
F. Provide a minimum of eighteen (18) inches of a complete set of spare control wires, looped, within all control valve boxes.

3.11 Irrigation Heads

A. Install all heads where shown on the Plans and as specified herein.
B. Turf rotary pop-up heads shall be placed two (2) inches from any edge of adjacent walkway, concrete mow band, concrete curb, header board or other hardscape edging, or as required by current WELO regulations.

C. Rotary pop-up heads shall be installed flush with the top of finish grades of turf or planting areas.
D. Sprinkler head riser nipples sizes shall match or be the same as the riser opening of the sprinkler body.
E. Install sprinkler heads with internal check valves where heads are located in low drainage areas, i.e. bottom of berms, bottom of drainage swales, toe of slopes, etc.
F. Install all heads perpendicular to ground surface with an offset from the edge of pavement as indicated in the details.

3.12 Drip Irrigation

A. Drip irrigation is to be installed in a grid pattern layout of equal spacing between rows, unless otherwise noted on approved plans.
B. All drip irrigation shall be installed sub-surface, per manufacturer's specifications. Staple all tubing to soil at 5 feet on-center spacing prior to backfilling.
C. Drip line shall be installed prior to plant installation, with the exception of 15-gallon and larger plant container sizes, which may be installed first at the discretion of the contractor.
D. Line Flushing Valves are to be installed below grade, as detailed, in a valve box with bolt-down lid to allow for periodic inspection and flushing.
    1. Minimum of One (1) Line Flushing Valve shall be installed for every fifteen (15) GPM of zone flow, and at every termination point within a zone, and shall be installed at a point farthest away from the source (typically on an exhaust header) as possible.
E. Pop-up drip system operation indicators shall be placed within eighteen inches (18") of each Flush Valve and shall not be placed such that it will be obstructed by vegetation. Place minimum twelve (12) inches from adjacent hardscapes.
F. If required, Air/Vacuum Relief Valves shall be installed below grade in valve boxes to allow for periodic inspection.
G. Valve box lids shall be permanently marked identifying LF for Line Flush valve and AR for Air/vacuum Relief with heat branding using stencils in a uniform location on all boxes throughout.

3.13 Quick Coupler and Gate Valves

A. Install per local codes and manufacturer's instructions.
B. Locate valve boxes flush with finish grade, twelve (12) inches from walkways, curbs, header boards, etc., and within planted area whenever possible.
C. Install one (1) valve per box.

D. For quick coupler valves, install at 100 feet on center to the extent possible. Provide a 24” steel support staked adjacent to the riser using two (2) stainless steel clamps.
E. For gate valves, install at locations indicated on the Plans.
F. For valve boxes installed below grade, provide 3M ball markers.
G. Valve box lids shall be permanently marked identifying GV for gate valve and QC for quick couplers, and SB for splice boxes with heat branding using stencils in a uniform location on all boxes throughout.

3.14 Automatic Controller

A. Install per local codes and manufacturer’s instructions within the specified enclosure.
B. Provide single Paige Cable P-7171D installed in conduit between all controllers.
C. Provide all necessary wiring for a complete installation between the controller and the valves.
D. Above grade wiring shall be installed in metal conduit, unless otherwise accepted. Securely mount conduit onto enclosure or wall and paint to match the adjacent surface.
E. Provide a grounding rod and bonding for each enclosure as required for lightning protection. Grounding rod shall be consistent with drawing PK-1 of the City of Roseville Parks Construction Standards. Install separate grounding rods for each enclosure where bonding is impractical.
F. Label each controller, using permanent markings, with the letter identification indicated on the Plans. Affix label on the inside of the controller cabinet door.
G. Install 110V outlet (GFIC) inside controller enclosure.
H. Provide two (2) reduced as-built irrigation diagrams, laminated and color-coded indicating controller letter, valve/station numbers, valve size, operating pressure, gallons per minute and type of planting for each valve. See Section 01 10 00: Summary of Work 1.15B.
I. Ground test to be conducted after installation. Test results shall not exceed 25 ohms.

3.15 Control Wires

A. Wherever possible, install control wires in common trenches with mainline. The wires shall be taped in bundles at ten (10) feet on center and laid to the side of the pipe. Provide slack between ties to allow for contraction.
B. Wire valve to controller as shown on the plans.
C. Where runs are long, provide an extra three (3) feet of extra common and control wires looped at 200’ intervals. Snake wires within trenches to allow for contraction.

D. Line splices shall occur in valve boxes at grade, label and allowed only on lengths greater than 2500'. Show locations on as-built plans.
E. Do not wrap wire around pipe or allow any wiring to be placed in concrete or concrete thrust blocks.
F. Install two (2) spare wires starting from the controller, looped to each valve box to the furthest valve box, without splices.

3.16 Tracer Wire

A. Install tracer wire on top of the mainline.
B. Provide a twelve-inch (12") loop in and out of each valve box. Solder all splices.
C. Where potable water lines are placed in a separate trench, install a tracer wire on top of the potable water line per City of Roseville Design and Construction Standards
D. Tracer wire shall be tested during review and pressure test of the mainline.

3.17 Sleeves

A. Install sleeves under all pavement and as shown on the Plans.
B. Install sleeves at the depths indicated in Section 3.03B above.
C. Extend sleeves a minimum of twelve (12) inches beyond the edge of pavement.
D. At every sleeve location installed in roadways, provide a spare PVC sleeve capped at each end and marked with a 3M ball marker.

3.18 Thrust Blocks

A. Install polyethylene sheeting between mainline and concrete.
B. Thrust blocks shall be formed against a solid trench wall. The thrust block cavity shall be in undisturbed soil or previously placed compacted backfill that yields an acceptable allowable bearing pressure.
C. Concrete thrust blocks shall not be poured on valve wires.

3.19 Cross Connection Testing for Recycled Water Systems

A. The Recycled Water System shall be tested for cross connection in accordance with Uniform Plumbing Code Appendix J prior to use.
B. All testing of Recycled Water Systems must be performed utilizing a potable water source via a construction water connection per City of Roseville Construction Standards. No Recycled Water may enter a Recycled Water System until all testing is successfully completed.
C. At the time a cross connection test is to be performed, construction on both the Potable and Recycled Water Systems being tested must be complete and both systems fully operational and functioning as designed.
D. Cross connection testing shall be performed in the system by City forces with the assistance of the contractor. The test must be coordinated through the

Parks Department Inspector. Allow one week's notice to schedule the cross-connection test. Depending on complexity of the site, a preliminary field meet may be required.

3.20 Coverage Test

A. Prior to planting, the Contractor shall perform a coverage test to confirm that water coverage is complete and adequate, and produces no overspray onto hardscapes. Irrigation pressure readings at the head or emission device may also be taken as part of the coverage test to confirm adequate system hydraulics.
B. The coverage test shall be performed on the entire irrigation system and shall be performed in the presence of the Parks Inspector. The irrigation system must be connected to the City water system through the water meter. Temporary connections are not allowed. On recycled water systems, the coverage test shall take place only after successful completion of the cross-connection test, with the recycled water meter in place.
C. On Park projects containing turf, a comprehensive survey of the Distribution Uniformity (Low Quarter) of each irrigation zone containing turf shall be performed by a third-party, Certified Landscape Irrigation Auditor prior to planting of turf. The irrigation system must be 100% complete, including functionality of the irrigation controller and booster pump, if present. The irrigation auditor shall prepare and submit a report listing each zone's Distribution Uniformity, including actual mapping data of individual catch cans recorded on irrigation plan sheets, and noting any potential deficiencies in the system leading to any inadequate findings. Reported deficiencies in Distribution Uniformity will be evaluated by the Project Manager and may require corrective measures prior to approval of turf planting. Deficiencies caused by improper installation shall be corrected at no additional cost to City.

3.21 Irrigation Audit

A. A landscape irrigation audit shall be performed after all landscape and irrigation is installed. The irrigation system must be 100% complete, including functionality of the irrigation controller and booster pump, if present.
B. All landscape irrigation audits shall be conducted by a third party certified landscape irrigation auditor. Landscape audits shall not be conducted by the person who designed the landscape or installed the landscape.
C. The water audit shall conform to the specific water audit requirements of the City of Roseville Environmental Utilities Department, and any supplemental requirements from the City of Roseville Parks, Recreation & Libraries

Department. The contractor shall submit a comprehensive landscape irrigation audit. This shall include, but is not limited to:

1. A completed Irrigation Audit Report-(City of Roseville provided forms only)
2. Complete system evaluation, including site conditions, system and flow data.
3. Scheduling parameters used to set the irrigation controller.
4. An Irrigation schedule for the landscape provided to the owner.

D. A minimum of 25% of all zones shall be audited. The 25% minimum shall be a representative sample of each irrigation method present (i.e. Rotors, bubblers, rotary nozzles, drip, etc.), and is in addition to any turf zones audited during the coverage test.

E. Any deficiencies noted in the audit report such as, but not limited to, run-off, overspray, obstruction of spray patterns, etc., shall be corrected and signed off as such by the original irrigation auditor prior to submission of the report. Do not submit audit reports with uncorrected deficiencies.

3.22 Clean Up

A. Each phase of work shall be immediately cleaned up. Excess equipment, material, etc., shall be legally disposed of and removed from site. All concrete, asphalt and/or decomposed granite paving shall be kept free of soil. Damage to such surfaces shall be immediately repaired to the satisfaction of the City.

PART 4 - GUARANTEE

4.01 General

A. Contractor shall provide a written guarantee covering all materials, equipment and workmanship furnished by him to be free of all defects after installation is accepted, including all defective parts that may have been found.

B. All paved areas shall be swept clean and planted areas shall be weed-free.

C. All irrigation heads shall be properly adjusted. Debris and refuse shall be removed from site prior to inspection.

4.02 Pre-Final (Punch List) Review

A. See Section 01 10 00 1.16 - Summary of Work for notification process.

4.03 Establishment

A. Full automated utilization of the irrigation system shall be included as part of the maintenance of the project. See Section 329000: Planting for additional information.

B. Program and utilize the establishment schedule as submitted with the turn-in items.

C. Contractor to run the system in “quantity” mode or “time plus flow” for a minimum of one (1) week.
D. Check the irrigation system weekly to ensure proper operations. Make all necessary adjustments, including watering schedule to ensure proper and healthy plant growth. At no time shall pools of water be present within any part of the project. Conversely, at no point shall dry or under-watered spots be visible upon inspection. Improper irrigation management resulting in flooding or dry conditions to the detriment of plant material may constitute an extension of the establishment period, at no additional cost to the City.

4.04 Final Review

A. The Contractor shall demonstrate to the City, valve by valve, the entire irrigation system to be operable. All heads shall be adjusted/flushed and all drip zones shall be flushed prior to the on-site review. Any item requiring adjustments shall be completed immediately and to the satisfaction of the City.
B. Provide necessary training to City staff in the proper operations and maintenance of the booster pump.
C. The date of final acceptance by the City Council or the recordation of the property transfer shall signify the start date of the warranty period. Final acceptance shall include the project in total and will not segregate any specific item or trade included in the construction of the project.

END OF SECTION

SECTION 32 90 00
PLANTING

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.
B. The requirements set forth in the Supplemental Conditions shall be in addition to the standards provided herein.

1.02 Description

A. Furnish all labor, materials and equipment for the complete installation of landscape items, including all trees, shrubs, groundcovers and turf; maintenance for the establishment of new plant materials; and all necessary appurtenances for proper planting, noted or implied, as shown on the Plans and as specified herein.

1.03 Related Work

A. Section 31 20 00: Earthwork
B. Section 32 84 00: Irrigation System

1.04 Quality Assurance

A. Provide an experienced foreman who shall directly supervise the work force during all work to be performed under this contract. The foreman shall be present during the time when work is to be performed.
B. Plant material shall conform to current “American Standards for Nursery Stock” and the State of California Grading Code of Nursery Stock, No. 1 grade. Use only nursery-grown stock.
C. All plant material shall be certified free of plant diseases and insect infestations from the County Agricultural Commissioner as required by law. Each shipment of plant material shall be required to have clearance certificates.
D. Prior to planting, a soils fertility test/analysis shall be conducted by an accepted and qualified testing laboratory. Test results shall contain existing nutrient levels, soil texture, cation exchange capacity, soluble salts, pH levels, infiltration rates and recommended soil amendments/fertilizers to ensure proper growth of the specified plantings.

1.05 Submittals

A. Submittals for specified items are not required; however, submittals are required for any proposed substitutions or deviations from the Plans or Specifications. Additionally, submittals are required for the specific items listed below. The Contractor shall submit a materials summary sheet indicating which items will be installed as specified and which items are proposed for substitutions. The Contractor shall submit proof of order within ten (10) working days of the Notice to Proceed, indicating all specified materials have been ordered, noting “as specified” or “substitution proposed”. Submittals are required on the following items:
   1. Bark mulch material,
   2. Certificates of compliance for turf seed mix, soil amendments, fertilizers and hydroseed mix,
   3. Sod-grown turf,
   4. Soils test-with soil amendment recommendations.
   5. Trees
      a) Submit for approval, plant sources including the names of nurseries proposed as sources of acceptable trees, and a list of the trees they will provide. The plant list shall include the botanical and common name and the size at the time of selection, including basal caliper and height.
      b) Submit all requests for substitutions of plant species or size for approval. Request for substitution shall be accompanied with a list of nurseries contacted in the search for the required plant and a record of other attempts to locate the required material. Requests shall also include sources of plants found that may be of a smaller or larger size, or a different shape or habit than specified, or plants of the same genus and species but different cultivar origin, or which may otherwise not meet the requirements of the specifications, but which may be available for substitution.

1.06 Soil Testing

A. Native soil and in-place topsoil shall be tested for amendment determination. Soil Tests shall include soil texture, macro nutrients, micro nutrients, lime, base saturation, pH, sodium, boron, salinity, Cation Exchange Capacity (CEC), and Organic content.
B. Submit soils report for review and approval after completion of grading operations. Soil Testing shall be performed by an agriculture-based lab, with detailed, written recommendations for soil amendments and fertilizers specific to ornamental landscape plants and turf.

1.07 Product Delivery, Handling and Storage

A. All materials shall be delivered bearing nursery label with botanical, common names, including cultivars.
B. Carefully handle plant material to ensure that limbs are not broken during the planting or storage of the material.
C. Store plant material in a covered area on-site, protected from inclement or hot weather on-site. Keep root balls moist by frequent watering (during hot weather) of all accepted stock until such time as planting occurs.

1.08 Inspection of Plant Material

A. Notify the Project Manager a minimum of 48 hours prior to date of delivery. All plant material is subject to inspection at the time of delivery. A sample number of plants will be inspected for the following items:

If the sample....	**then the plant shall be...**
is healthy, shapely and well rooted	accepted.
bears a strong central leader	accepted.
is wilted, wind-blown or sunburned	rejected.
is root-bound, restricted or deformed	rejected.
does not bear a strong central leader or has been severely pruned back	rejected.

B. Stock to be consistent with CALFIRE Nursery/Tree Quality Cue card and Root Management Cue Card. Inspector may require contractor to remove tree or plant stock from plant containers to examine roots.
C. 15 gal tree needs to have at least 1” in basal caliper, a 24” box tree needs to have at least 2” in basal caliper, a 36” box tree needs to have at least 3” in basal caliper. Basal caliper is measured as 6” above the ground.
D. Based on the sample inspection, the Project Manager or Inspector reserves the right to reject any or all of the plant material delivered. All rejected plant material shall be immediately disposed of off-site.

1.09 Record Drawings

A. The Contractor shall keep an accurate record of the as-built conditions of the landscaping. These records shall be updated daily and kept at the construction site. At any time, the Inspector may examine the conditions of the “as-builts” to ensure compliance of the above.

PART 2 - PRODUCTS

2.01 Plants

A. The material to be planted shall conform to that indicated on the plans, unless otherwise accepted. The quantity shown on the Plans is approximate and is

furnished for convenience only. Verify all quantities prior to ordering plant material.

2.02 Turf

A. Turf shall be *seed or sod*.
B. Seed –
   1. 98% pure, weed-free mixture with a minimum of 95% germination. Deliver on-site unopened and in the original containers.
   2. 100% Turf Saver RTF (Rhizomatous Tall Fescue) by Barenbrug or accepted equal.
   3. Turf seed mix shall be Blue tag certified.
C. Sod – Tall fescue blend with named, improved turf-type varieties only. Blend shall contain a minimum 25% Lateral Spread, Rhizomatous, or Self-Repair type tall fescue. Sod shall be non-netted, and contain no more than 10% Bluegrass.
D. Seed / Sod must be submitted and accepted by the Project Manager prior to ordering.

2.03 Soil Amendment

A. As recommended by soils test report.

2.04 Mulch

A. Regular “Walk-on” fir bark as manufactured by Redi-Gro Corporation, Sacramento, CA (916) 381-6063, Mallard Creek, Inc, Rocklin, CA (916) 645-1681, My Bark Company, Inc., Linden, CA (209) 649-4250 or accepted equal.
B. Decorative bark, shredded lumber or saw dust, and construction debris are not permitted. The mulch must be free of needles.

2.05 Topsoil

A. Stockpiled, on-site material.
B. Imported topsoil shall be natural, friable, well-draining, free from admixture of subsoil and foreign objects larger than one inch (1”) in diameter, free from toxins or any other harmful substance which may deter healthy plant growth.
C. Perform a soils test for all imported soil. Soil test shall comply with Section 1.06. Submit soils report for review and approval prior to import activities.

2.06 Pre- and Post- Emergent Herbicide

A. Clean, and non-staining. Consult with a pesticide specialist.

2.07 Tree Stakes and Ties

A. Trees furnished in #15 nursery containers require 2” diameter stakes. Trees less than 8' in height require an 8' stake; trees 8' or greater in height require a 10' stake. Stakes shall be pine or Douglas fir (pressure or non-pressure treated).

B. Trees furnished in 24” boxes or larger require 3” diameter by 10’ long stakes. Stakes shall be, pine or Douglas fir (pressure or non-pressure treated).
C. Tree ties and Tree Guying shall be Super Tree Tie, bursting strength 300psi, tensile strength 300lbs , 1” vinyl impregnated Nylon, waterproof, Manufactured by: Arthur Enterprises. Cut to length. Color to be Green.

2.08 Native Seed

A. Where required, native seed shall be applied as follows:
   1. Upland areas

Elymus glaucus (Blue Wildrye)	10.0 lbs/acre
Nassella pulchra (Purple Needlegrass)	9.0 lbs/acre
Nassella cernua (Nodding Needlegrass)	6.0 lbs/acre
Melica caljfornica (Californiameljc)	3.0 lbs/acre
Vulpia microstachys (Small Fescue)	3.0 lbs/acre
Poa secunda (Native Pine Bluegrass)	3.0 lbs/acre
Bromus carinaws (California Brome)	2.0 lbs/acre

   2. Channel / Wetland Edges (bottom to 3’ above high water level)

Elymus trachycaulus (Slender Wheetgrass)	12.0 lbs/acre
Hordeum brachyantherum (Meadow Barley)	10.0 lbs/acre
Leymus triticoides 'Yolo' (Creeping Wildrye)	8.0 lbs/acre
Agrostis exarata (Bentgrass)	3.0 lbs/acre
Elymus glaucus (Blue Wildrye)	5.0 lbs/acre

   3. Wildflowers (addition to seed mix(es) above, if specified)

Clarkia amoena (Farewell to Spring)	0.5 lbs/acre
Eschscholzia caljfornica (California Poppy)	2.0 lbs/acre
Lupinus nanus {Sky Lupine)	3.5 lbs/acre
Nemophila menziesii (Baby Blue Eyes)	1.5 lbs/acre
Lasthenia californica (Common Goldfields)	1.5 lbs/acre

B. Areas with sandy, dry soil shall receive: Zorro Annual Fescue 6 lbs/acre, Rose Clover 9 lbs/acre
C. A fertilizer consisting of 15-15-15 shall be applied at a rate of one half pound per 1,000 square feet. Fertilizer shall be Natural-based, slow release, and balanced in N, P, & K.
D. Seed for creek banks shall conform to the latest requirements of the California Department of Fish and Game.

PART 3 - EXECUTION

3.01 Site Preparations

A. Prior to start of landscaping work, review the site conditions to verify final grades have been established, plant/turf beds are weed free, and the irrigation system is operational as shown on the Plans and as indicated in the Specifications.
B. For landscaping within all street right-of-ways, conduct a soils analysis test of the existing soils and remove all lime-treated soils, aggregate base or other non-organic material to a minimum depth of two feet before planting or irrigation installation. Import topsoil to bring the finish grade to specified grades. Submit the soils analysis test results of the imported material prior to import.
C. Notify the Inspector immediately of any existing conditions which are unacceptable for the commencement of landscaping work.

3.02 Coordination of Work

A. Coordinate all work with other trades.

3.03 Preparation of Planting and Turf Areas

A. Upon completion of grading and underground activity, Contractor shall obtain a soils test as outlined in 1.06.
B. Place stockpiled topsoil in all areas to receive planting or turf to a minimum depth of twelve inches (12”).
C. Rip topsoil surface in two directions to a minimum depth of twelve inches (12”).
D. Spread soil amendments at the rates indicated in the soils report.
E. Rototill amendments to recommended depths. Till amendments to a depth of 6” or as recommended by soils report.
F. Remove all rock and debris which are greater than ½ inch in areas to receive turf and one inch (1”) in areas to be planted.
G. All planted and turf areas to be smooth and uniform in grade as shown on the Plans.
H. Planting areas to be sloped to drain as shown on the Plans.

3.04 Storage of Plants and Trees

A. Protect materials from deterioration during delivery and storage. Adequately protect plants from drying out, exposure of roots to sun, wind or extremes of heat and cold temperatures. If planting is delayed more than 24 hours after delivery, set plants in a location protected from sun and wind. Provide adequate water to the root ball package during the shipping and storage period, including weekends and Holidays.

B. Soil moisture shall be maintained above wilting point and below field capacity for the root ball substrate or soil.
C. All plant materials must be available for observation prior to planting. Any plants determined to damaged or distressed due to improper watering may be rejected by inspector and shall be replaced at no cost to City.

3.05 Plant Installation

A. Tree and Shrub Planting
   1. Remove only those plants which will be planted the same day. Place such plants in the proposed locations for review and accepted by the City prior to actual planting. Notify the Inspector a minimum of 48 hours prior to day of planting.
   2. Dig planting pits as shown on the Plans and as shown in the Parks Construction Standards. Scarify the sides and bottom of pit to prevent glazing. Fill pit completely with water and allow the water to completely drain from the pit prior to actual planting.
   3. Relocate any plantings taller than 6” in height that fall in front of any irrigation head in order to ensure proper coverage of the irrigation system.
   4. For pits that retain water, completely penetrate the hardpan layer at the bottom of the pit and backfill with topsoil. Fill pit with water to test and ensure proper drainage.
   5. Prior to tree planting a central leader needs to be established by structural pruning, as necessary. Codominant leaders need to be removed or suppressed by structural pruning. Refer to the CALFIRE "Tree Training", "Tree Planting", and "Tree Quality" cue cards and "Tree and Plant Root Management Standard and Quality Expectations" contained in Section 5 of these Standards.
   6. Plants shall be removed from their containers only at the time of placement within the plant pit. Perform root pruning on all four sides of the root ball by shaving and cutting away the root ball periphery to reduce the amount of circling roots. Starting from the top and then cutting/slicing down to the bottom of the root ball. On a 15 gal container at least 1-1.5 inches of the root ball periphery needs to be removed by slicing or shaving. On a 24” and 36”box tree at least 2 inches of the root ball periphery needs to be removed by slicing or shaving. A sharp hand pruning saw needs to be used for the slicing or shaving of the root ball. Refer to the CALFIRE "Root Management" cue card contained in Section 5 of these Standards. This process will remove many girdling and circling roots deflected by the container wall and allows for root penetration within the planting basin. Spread all roots to the side to allow proper root development. Add native backfill and amendments

as shown in the Parks Construction Standards and as recommended by the soils testing laboratory.

7. Plant tree at least three inches (2”) above grade on mount to prevent bowl effect. The tree’s beginning root flare must be located at top of grade with installed sod.
8. Carefully place plant into the plant pit without damaging the root ball. Water the backfill until saturated. For trees, water in by hand after planting using at least ten (10) gallons of water, minimum.
9. Where mowing will occur, provide an eight-foot (8’) minimum horizontal clearance between trees and other site improvements, including shrubs.
10. Tree ties should be installed via a figure eight loop and each tie shall be secured with a nail on the tree stake. Install two (2) Super Tree Ties at 2/3 of tree height and two (2) Super Tree Ties at ½ of tree height.
11. Tree stakes should be inserted into the ground to a minimum depth of 18".

B. Groundcover Planting
   1. Place groundcover plants in neat, straight, and parallel rows, triangularly spaced as shown on the Plans and as indicated herein.
   2. Start the first row of planting at a distance equal to the on-center spacing required per plan, minimum, from the edge of the adjacent hardscape, mow band or header board.
   3. Groundcover shall be installed to the outside edge of the water basins of trees or shrubs.

3.06 Seeding- Turf and Native

(Hydroseeding for turf or natural areas)

A. Lightly scarify areas to be hydroseeded.
B. Tank, hose and associated apparatus must be thoroughly clean and free of debris or other material prior to placement/spraying of seed.
C. Hydroseed turf mix shall contain the following:

Material	**Application Rate**
Turf Seed	Per Manufacturer’s Recommendations
Wood Cellulose Fiber Mulch	60 lbs. per 1,000 SF
Binder	Per Manufacturer’s Recommendation
Fungicide (turf only)	1/3 lb. per 1,000 SF
Fertilizer	15-15-15 All Purpose Fertilizer. Rate per Manufacuter’s Recommendation
Soil Conditioner	Per Soil Conditioner soils lab recommendation and as approved by Parks, Recreation & Libraries Department

D. Blend mix in a hydraulic mixer until all material is consistently blended.

E. Apply mix at a rate of 125 pounds per 1,000 square feet unless otherwise recommended by the manufacturer.
F. Spray mixture consistently over the area to be hydroseeded. Protect adjacent areas such as paving, walls, play areas and other from overspray.
G. At the end of each day of spraying operations, clean up all areas where overspray has occurred.
H. Once seed is placed, it should not be allowed to dry out.

3.07 Sod- Turf

A. Remove all “humps” and depressions prior to sodding.
B. Keep all sod rolls shaded and moist prior to installation.
C. Do not store sod rolls more than one (1) day. Sod shall be laid upon delivery.
D. Unroll sod one at a time for immediate installation.
E. Provide tight seam between rolls of sod (less than 1/8” gaps).
F. Stagger rows so that the ends of sod rolls are stepped.
G. For turf areas where sod is partially provided, add topsoil at all transition edges to same as finish grade.
H. Sod planted during high Summer temperatures may require fungicide application(s) as a preventative measure. A Pest Control Advisor should be consulted for recommendations. Contractor is responsible for the continued health and establishment of sod and any costs of preventative treaments.

3.08 Mulch

A. Prior to placing mulch, apply post-emergent herbicide to any weeds present, per label directions. After achieving die-off, weeds shall be mechanically cut down or hand-pulled to allow for mulch installation.
B. Prior to placing mulch, apply pre-emergent herbicide in all planting areas, per label directions.
C. Apply three inches (3”) of mulch in all landscape planter areas.
D. Keep mulch a minimum of three inches (3”) away from the trunks of all woody shrubs and four inches (6”) away from all trees. Taper mulch profile away from this point to prevent subsequent collection of mulch against trunks.

3.09 Watering

A. Upon completion of each planting or turf area, irrigate appropriately to ensure proper health and growth.
B. Continually adjust the irrigation for plant needs regardless of air temperature.

3.10 Clean-up

A. Upon completion of planting operations, collect and remove from site all empty plant containers, debris, rubbish and other trash.

B. Sweep clean and wash all hardscape areas.
C. Clean up shall occur, at minimum of once a week, at the end of the work week.
D. Maintain the entire site in a clean condition to the satisfaction of the City.

3.11 Pre-Final (Punch List) Review

A. See Section 011000 1.16 of the Summary of Work for notification process.
B. The following conditions must be met in order for planting to be considered towards substantial completion, as required to enter into the establishment period described in Section 011000, 1.16:
    1. For seeded turf:
        a. Upon completion of the second mowing of completely germinated turf. Second mowing is defined as full coverage of turfed area 90% weed free.
        b. Root depth – Turf grass roots shall be healthy, creamy-white in color and be 4” or greater in length/depth as measured from the soil surface to root tip. This shall be consistent throughout turfed area.
        c. Turf shall be of uniform green color with no visible signs of stress due to soil fertility, moisture, disease or pests.
    2. For sodded turf:
        a. Accepted installation of the sod.
        b. Turf shall be of uniform green color with no visible signs of stress due to soil fertility, moisture, disease or pests.
    3. For trees and shrubs:
        a. Trees and shrubs shall be properly installed, and with no visible signs of stress due to soil fertility, moisture, disease or pests.

3.12 Establishment Period

A. Active maintenance is required throughout the entire establishment period:
    1. Maintain turf to a height of two and one half inches (2-1/2”) for cool season turf varieties and one and one half inches (1-1/2”) for warm season turf varieties. Maintained height shall be measured from the surface of finish grade to the top of the leaf blade throughout the establishment period, and mowed as frequently as required to maintain said height. At no time shall the leaf blade be mowed or cut more than 1/3 of the length of the blade. Root mass/depth must remain consistent as measured at the start of establishment or greater.
    2. Edge all turf areas along hardscape edges.
    3. Re-seed all bare areas within the turf as soon as evident.
    4. Immediately replace all dead plants.
    5. As necessary, raise all trees and shrubs which have sunk within the plant pit beyond the levels indicated in the Standard details.
    6. Keep all areas free of weeds, pests and disease.

7. For trees located in turf areas, maintain a circle free of turf at a distance described in the Standard details

B. Prior to the start of the final thirty (30) days of establishment:
   1. All plant replacements shall be completed.
   2. All plantings and turf shall be thriving and in a healthy condition.
   3. The lack of active maintenance prior to the final thirty (30) days may constitute a delay in the start of the final thirty (30) days of the establishment period.

3.13 Final Review

A. The Inspector shall review the site for completion of items noted, but not limited to, “B” below. All corrective action is required to enter into the final thirty (30) days of establishment.
B. The site shall be prepared for review, by ensuring that:
   1. All spray heads have been properly adjusted,
   2. Dead plants have been replaced,
   3. Planting areas have been weeded,
   4. Turf areas have full germination, are consistent in green color and are weed-free,
   5. Walkways and paved areas have been swept and washed, and
   6. Turf roots meet standards outlined in 3.10
C. Failure to complete any one or all of the above items may constitute non-performance of the final review and will require re-scheduling. In this case, the cost of the extended establishment period shall be at no additional cost to the City.

PART 4 - GUARANTEE

4.01 General

A. Contractor shall provide a written guarantee covering all plant materials (trees & shrubs) furnished by them to be free of all defects or disease and that all plants are in a healthy and thriving condition at the completion of the contract. Deciduous plant material shall be warranted beyond the time of contract completion until such time as growth becomes evident.

(For all park construction projects)

B. All plants, except those provided by the City, shall be warrantied for a period of one (1) year, commencing on the date of final acceptance. The warranty shall be as outlined in Section 011000: Summary of Work, paragraph 1.19.

(For all streetscapes, street landscape frontage, street medians and Lighting & Landscape District projects.)

C. All plants, except those provided by the City, shall be warrantied for a period of nine (9) months, minimum, commencing on the date of final acceptance. Warrantee responsibilities expire upon acceptance and approval of the “Notice of Completion” for the overall development project. The warrantee shall be as outlined in Section 011000: Summary of Work, paragraph 1.19.

END OF SECTION

SECTION 33 00 00
UTILITIES

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.
B. The requirements set forth in the Supplemental Conditions shall be in addition to the standards provided herein.
C. The standards set forth in the City of Roseville Design and Construction Standards, latest edition, for storm drainage throughout the project and for sanitary sewer installations within the public rights-of-ways, easements, or as shown on the improvement plans shall be in addition to the standards provided herein.
D. The standards set forth in the latest edition of the California Building Code (CBC) for sanitary sewer installation within the project site, outside of the public right-of-way or easement shall be in addition to the standards provided herein.

1.02 Description

A. Furnish all labor, materials and equipment for the complete installation of the storm drain system and sanitary sewer pipe, and necessary appurtenances as shown on the Plans and as specified herein.
B. Submit a materials listing for review and approval prior to commencement of specified work.

1.03 Related Work

A. Section 31 10 00: Clearing and Grubbing
B. Section 31 20 00: Earthwork

1.04 Safety Requirements

A. Furnish, install and maintain required sheeting, shoring, bracing, and other methods to ensure complete and safe work environment for all workers. Upon completion of work, remove all bracing, shoring, etc. in its entirety, unless otherwise directed by the Inspector.
B. Prior to excavation or trenching, the Contractor shall contact USA Alert (800)
C. 227-2600 to locate all known utilities a minimum of 48 hours prior to start of work. During the course of construction, the Contractor shall take every precaution to maintain and protect utilities noted to remain. Said utilities shall remain operational at all times, unless otherwise noted on the plans.

D. The existing utilities are shown on the Plans based on the information available at the time of contract document development. The City shall not assume responsibility for any inaccuracies or incompleteness of the Plans based on such information. The Contractor shall immediately notify, upon damage of any pipeline or facility, the Owner and/or its agents and take every action necessary to repair or replace damaged facilities to the satisfaction of the Inspector, and at no additional cost to the City.
E. Trenches, excavations and repair of pavement shall be consistent with Section 31 20 00: Earthwork.

1.05 Coordination

A. The piping system as shown on the Plans is diagrammatic. The Contractor shall make reasonable adjustments to the layout to avoid conflicts, based on actual field conditions. Said changes shall not interfere with the design intent of the system.

1.06 Tolerance

A. The allowable tolerance for the installation of pipe is 0.05 feet within grades or spot elevations indicated on the Plans.

1.07 Product Storage

A. Take every precaution to protect the materials and pipes from damage during the delivery, storage and installation of the pipe system. Store in a cool, contained area, protected from direct sunlight and per manufacturer's recommendations. Pipe shall be supported on firm level ground at the site.

1.08 Record Drawings

A. The Contractor shall keep an accurate record of the as-built conditions of the storm drain and sanitary sewer system. These records shall be updated daily and kept at the construction site. At any time, the Inspector may examine the conditions of the "as-builts" to ensure compliance of the above.

PART 2 - PRODUCTS

2.01 General

A. All products shall conform to City of Roseville Design and Construction Standards, latest edition, except as noted below.

2.02 Drain Pipe

A. Solid drainpipe shall be PVC SDR 35 and shall conform to ASTM D1784, or accepted equal. Gasketed connections shall conform to ASTM F477.

B. Perforated drainpipe shall be smooth walled PVC, open per Caltrans Section 68-1.02K, or accepted equal.

2.03 Drain Rock

A. Drain rock shall be Class 2 washed, ¾" diameter.

2.04 Filter Fabric

A. Filter fabric shall be Mirafi 140N, or accepted equal.

2.05 Drains

A. Drain Inlets shall be pre-cast and a minimum size of twenty-four inches (24") square or round by Jensen Precast, or accepted equal.
   1. Grate shall be heavy duty, cast iron, walk-on, and bolt down.
   2. Box extensions shall be Jensen Precast, or accepted equal.
   3. The base shall be six inches (6") thick.
   4. Walls shall be six inches (6") thick.
   5. A "No Dumping" Metal Storm Drain Marker shall be affixed to the concrete color of each drain inlet (See Detail DR-20)
   6. Contractor may install cast-in-place drain inlets in lieu of pre-cast drain inlets. Submit shop drawings and concrete mix design for review and approval.

B. Channel Drains for baseball/softball backstop areas shall be Polycast 600 series pre-sloped trench drains with galvanized steel slotted grates or accepted equal.

C. Sanitary sewer clean outs shall be as specified in the City of Roseville, Design and Construction Standards, latest edition.

2.06 Manholes

A. Manholes shall have tongue and groove joints, be forty-eight inches (48") minimum in diameter, meeting ASTM C-478.

B. Covers shall be cast iron.

C. All components shall conform to the City of Roseville Design and Construction Standards, latest edition.

2.07 Tracer Wire

A. Insulated solid copper wire, minimum #12 gauge. Color per City of Roseville Design and Construction Standards.

2.08 Sanitary Sewer Pipe

A. Vitrified clay pipe (VCP) shall be as specified in Section 91 Sanitary Sewer in the City of Roseville, Design and Construction Standards, latest edition.

B. PVC SDR 35 may be used for drinking fountain drain applications only, with prior approval, and shall conform to ASTM D3034.

2.09 Potable Water Warning Tape

A. On sites with both Recycled water and potable water lines. Blue plastic tape, 3 inches wide, with the words “CAUTION: POTABLE WATERLINE” imprinted in minimum 1-inch high, black letters per City of Roseville Design and Construction Standards. Imprinting shall be continuous and permanent.

2.10 Other (Specify)

A. Additional products not listed in City Standard.

PART 3 - EXECUTION

3.01 General

A. All pipes shall slope uniformly from given elevations shown on the Plans.
B. All pipes shall be accurately laid true to line and grade, utilizing accepted construction methods.
C. Damaged or cracked pipe and fittings shall not be installed and shall be removed from site.
D. Install all pipe in locations shown on the Plans, except where existing conditions necessitate minor changes.
E. All pipe and fittings shall be kept clean and closed throughout the course of construction.
F. Connections to existing sanitary sewer stubs shall be “TV-ed” and air tested prior to the start of construction per the City of Roseville Design and Construction Standards, latest edition.

3.02 Installation

A. Installation of the specified pipe lines shall conform to the City of Roseville Design and Construction Standards, latest edition.
B. Notify the Inspector a minimum of 48 hours prior to covering of work to ensure timely inspections.
C. Cutting of AC or concrete paving shall be clean, vertical and straight, using a saw, or other tool specific to this application. Replace paving to existing or better condition prior to work.
D. Trench and backfill shall be per City of Roseville Design and Construction Standards, latest edition.
E. Catch basins and drain inlets shall be installed with a concrete collar with “No Dumping” message and fish symbol depressed into the concrete or bolted in place, consistent with Drawing DR-20 the City of Roseville Design and Construction Standards, latest edition.

F. Drain inlets installed in mulched planter areas shall have a 12-inch wide collar of 2- to 6-inch river cobble placed over filter fabric.
G. Channel drains shall be set per manufacturer's instructions. Place slotted grates along the entire length of the backstop, including wing fencing, wherever concrete is placed adjacent to the backstop system. Provide a below grade piped connection at all gate openings into the infield area. Do not install grated drain sections at these entry/exit points.
H. Manholes shall be per City of Roseville Design and Construction Standards, latest edition. Install grate flush with finish grade.
I. Sanitary Sewer Clean-outs shall be installed with 3M ball markers and shall be located within planted or turf areas, whenever possible. Place clean-outs at 100' intervals throughout the project. Clean-outs shall not be located within play areas. Install per City of Roseville Design and Construction Standards, latest edition.
J. Upon completion, thoroughly flush storm drain system in the presence of the Parks Inspector.
K. Installation of additional products not listed in the City Standards.

3.03 Tracer Wire

A. Install tracer wire on top of the potable water lines
B. Tracer wire shall be continuous with no splices.

3.04 Potable Water Warning Tape

A. To be used on all potable water piping installed within the same project limits as on-site recycled water piping.
B. Install plastic warning tape in pipe backfill, six inches above pipe, for the entire length of the pipe.

3.05 Cleaning

A. Keep site clean at all times. Remove from the site all debris and rubbish and legally dispose.

END OF SECTION