



Contract Specifications for:

**Phase I Improvements
Cabana Park**

6251 Fremont Cir.
Sacramento, CA 95841

PROJECT MANAGER

Virgil Anderson
Sunrise Recreation & Park District
7801 Auburn Boulevard
Citrus Heights, CA 95610
916.725.0133
vanderson@sunriseparks.com

DATE: February 27, 2019

CONTRACT NO.

PROJECT NO.

2019-2-CA

NOTICE TO CONTRACTORS

Notice is hereby given that the Sunrise Recreation and Park District of Sacramento County, California, will receive sealed bids as follows:

BID DATE and TIME: **On or before 2:00 PM - Wednesday, April 3, 2019;**

REQUIRED DOCUMENTS: Pages 1 thru 7 of Bid Proposal Sheets and Bid Guarantee

SUBMIT BIDS TO: SUNRISE PARK & RECREATION DISTRICT
c/o **Virgil Anderson**
7801 Auburn Boulevard, Citrus Heights, CA 95610
By 2:00 P.M.

BID OPENING **IMMEDIATELY FOLLOWING**

FOR: **CONTRACT NO. 2019-2-CA**
Phase I Improvements, Cabana Park

ESTIMATED CONSTRUCTION COST FOR BASE BID: **\$ 172,000**

CONTRACTOR'S CALIFORNIA LICENSE AND/OR CLASS REQUIRED **'A' General Engineering Contractor**

PRE-BID CONFERENCE DATE and TIME: **9:00 AM Wednesday, March 13, 2019**

PRE-BID CONFERENCE LOCATION **Cabana Park located at 6251 Fremont Circle, CA - at the intersection of Fremont Cir. & Shenandoah Drive.**

PROJECT DESCRIPTION: The work to be performed under this contract includes the furnishing of all labor, materials, equipment, transportation and services necessary for the installation and implementation of best management practices (BMPs) for the erosion and sediment control plan (ESCP); minor excavation of existing vegetation and soils; saw cutting, demolition and removal of existing concrete walkway and minor asphalt ; removal and disposal of all excavated/demolished materials off-site as per the County of Sacramento ordinances. Grading, Storm Drain Lines, Area Drains Trench Drain, ATT Utility Relocation, Concrete Paving, Mow Bands, 6' Chain Link Fence and gates, all installed to meet the most current Accessibility Guidelines. All trees shown on plans must be protected from damage throughout the length of construction, as per the Sacramento County Tree Ordinance.

Award of this contract requires a valid California contractor's license with the classification identified above.

PREVAILING WAGE - Pursuant to the California Labor Code Section 1720 and following this is a prevailing wage project.

The County of Sacramento received final approval from the Director of the California Department of Industrial Relations as a Labor Compliance Program effective March 15, 1994. All questions regarding this Labor Compliance program should be directed to the Sacramento County Labor Compliance Officer, Harmail Nijjar (916) 875-2771.

DIR Registration – All contractors and subcontractors must register with the DIR and meet DIR requirements before bidding on public works contracts in California.

PROCEDURE TO PURCHASE AND OBTAIN CONTRACT DOCUMENTS:

- The Plans and Specifications are available for download from the District's website at no cost to the contractor at: <http://sunriseparks.com/about/bids-rfps/> . It is the contractor's responsibility to check the website for addendums and updates. Bid results will be posted on the website for 30 days following the bid date.
- Plans and Specifications: Plan and specifications can be sent electronically by emailing vanderson@sunriseparks.com. Emails should contain contractors name and contact information (name, mailing address, phone, fax, email address, etc.).
- Plans and Specifications are also available at the following locations:
 - 1.) **Sacramento Builders Exchange** – 5370 Elvas Ave, Sacramento CA
 - 2.) **Placer County Contractors Assoc.** - 10656 Industrial Ave. Roseville, CA 95678
 - 3.) **McGraw Hill Construction** – online at <http://construction.com/dodge/>

The Standard Construction Specifications, which are incorporated by reference in the Contract Documents, may be downloaded from the County website at www.saccountyspecs.net .

SUBMITTALS - Each bid must be submitted on the proposal bid forms provided in the Contract Documents. Each bid must also be accompanied by security in the form of a bid bond issued by a corporate surety, a certified check, or cashier's check payable to the Sunrise Recreation and Park District, or cash for an amount not less than ten percent (10%) of the aggregate sum of the bid.

The successful bidder shall be required to execute a Material and Labor Payment Bond and Performance Bond issued by a corporate surety, acceptable to the Sunrise Recreation and Park District, for the PHASE I IMPROVEMENTS, CABANA PARK. Each bond shall not be less than one hundred percent (100%) of that portion of the contract price.

Pursuant to California Contract Code Section 22300, the contractor may, at its own expense, substitute securities for any money being withheld by the County to ensure performance under this contract.

QUESTIONS - Please direct pre-bid questions in writing to the Project Manager Virgil Anderson, Sunrise Recreation & Park District, by e-mail at vanderson@sunriseparks.com.

Deadline for questions is 5:00 PM Monday, March 18, 2019. Addendums and answers to all questions will be posted to the website on Wednesday, March 20, 2019. It is the Contractors responsibility to check the District Website for updates.

The Board reserves the right to reject any or all bids, to waive any informality in any bid, and to determine which bid, in the judgment of the Board, is the lowest responsive bid of a responsible bidder.

By order of the Board of Directors Sunrise Recreation and Park District a Special District of the County of Sacramento, California, dated August 1, 2018.

Dave Mitchell
District Administrator
Sunrise Recreation and Park District



HAVE YOU:

- USED THE CORRECT BID PROPOSAL SHEETS? A REVISED BID PROPOSAL SHEETS IS SOMETIMES ISSUED BY ADDENDUM.
- CHECKED YOUR UNIT PRICES FOR CORRECT PLACEMENT OF DECIMAL POINTS?

- CHECKED YOUR ARITHMETIC?
- ACKNOWLEDGED RECEIPT OF ALL ADDENDA, IF ANY, IN THE SPACE PROVIDED?
- SIGNED THE BID PROPOSAL SHEETS IN THE SPACE PROVIDED?
- INCLUDED WITH YOUR PROPOSAL -- BID PROPOSAL SHEET A, BIDDER'S BOND, CERTIFIED CHECK OR CASHIER'S CHECK IN AN AMOUNT NOT LESS THAN TEN PERCENT (10%) OF THE AMOUNT BID (INCLUDING ANY ALTERNATE BID)?
- PROVIDED ALL INFORMATION CALLED FOR IN THE DESIGNATION OF SUBCONTRACTORS?

CAUTION: FAILURE TO COMPLY WITH THESE REQUIREMENTS ON PAST PROJECTS HAS RESULTED IN THE REJECTION OF BIDS. IT IS EXTREMELY IMPORTANT THAT THE BIDDER COMPLETES ALL PORTIONS OF THE BID PROPOSAL SHEETS AND CHECK ALL ENTRIES.

**SUNRISE RECREATION AND PARK DISTRICT
START OF SEVEN (7) PAGE BID PROPOSAL SHEETS
CONTRACT NO. 2019-2-CA**

Phase I Improvements, Cabana Park

SUBMIT BID TO:

Sunrise Recreation and Park District
c/o Virg Anderson
7801 Auburn Boulevard
Citrus Heights, CA 95610

BID OPENING:

Sunrise Recreation and Park District
7801 Auburn Boulevard
Citrus Heights, CA 95610

**NO LATER THAN: 2:00 P.M.
ON WEDNESDAY, APRIL 3, 2019**

FOLLOWING THE BID DEADLINE

TO: Board of Directors
Sunrise Recreation and Park District
STATE OF CALIFORNIA

I. BID:

Pursuant to your published NOTICE TO CONTRACTORS for the above-referenced project, and in accordance with the approved Plans and Specifications for that project, the following bid for said entire project is hereby submitted by the firm indicated in Part VII (Contractor Information) of this Bid Form.

LUMP SUM ITEM BASE BID "A":

ITEM NO.	ITEM DESCRIPTION	UNIT OF MEASURE	AMOUNT (IN FIGURES)
1	Mobilization and Staking	LS	
2	Temporary Fencing	LS	
3	Construction Grading	LS	
4	Erosion Control	LS	
5	Earthwork and Fine Grading	LS	

SUBTOTAL A Bid:

SUM OF ALL LUMP SUM ITEMS **BASE BID A** AMOUNT

\$ _____
(in figures)

SUBMIT THIS SHEET AS PART OF YOUR BID

FIRM NAME _____

PROJECT NO. 2019-2-CA

UNIT PRICE ITEMS BASE BID "B":

ITEM NO.	ITEM DESCRIPTION	UNIT OF MEASURE	APPROX. QTY.	UNIT PRICE (IN FIGURES)	AMOUNT (IN FIGURES)
1	Relocate ATT Utility Line	LF	210		
2	6" Storm Drain Line	LF	136		
3	8" Storm Drain Line	LF	50		
4	Area Drain	EA	4		
5	Concrete Pavement	SF	2,490		
6	Concrete Mowband 6"	LF	400		
7	6' Chain Link Fence	LF	450		
8	Double Gates - Chain Link	EA	2		
9	Pedestrian Gates - Chain Link	EA	3		
10	Trench Drain	LF	12		

SUBTOTAL B Bid:

SUM OF ALL UNIT PRICE ITEMS **BASE BID B** AMOUNTS \$ _____
(in figures)

ADDITIVE ALTERNATE UNIT PRICE ITEMS BID "C":

ITEM NO.	ITEM DESCRIPTION	UNIT OF MEASURE	APPROX. QTY.	UNIT PRICE (IN FIGURES)	AMOUNT (IN FIGURES)
1	Retaining Wall	LF	96		
2	Concrete Mow Band 9"	LF	313		

SUBTOTAL C Bid:

SUM OF ALL UNIT PRICE ITEMS **ADD ALTERNATE BID C** AMOUNTS \$ _____
(in figures)

TOTAL BID:

TOTAL OF SUBTOTAL A; PLUS SUBTOTAL B; PLUS SUBTOTAL C \$ _____
(in figures)

SUBMIT THIS SHEET AS PART OF YOUR BID

Notes:

1. Bidders must submit bids for each lump sum item, unit price item and for each additive bid alternate. If a bid is missing a lump sum price or a unit price in either the unit price items or any alternate, then the bid will be deemed incomplete and the bid may be rejected as non-responsive.
2. In the event the product of a unit price and an estimated quantity do not equal the extended amount stated, the unit price will govern and the correct product of the unit price and the estimated quantity shall be deemed to be the amount bid.
3. The Sunrise Recreation and Park District intends to award the contract to the lowest, responsible bid. The District reserves the right to reject any and all bids offered in response to this posting, and either rebid or take any other action permitted by statute.
4. The District reserves the right to negotiate the terms and conditions of the final contract for the purchase of the items(s) described above.
5. The Sunrise Recreation and Park District shall determine the lowest responsible, responsive bidder based on the lowest **TOTAL BID** (SUBTOTAL A + SUBTOTAL B + SUBTOTAL C = TOTAL BID) and criteria permitted by statute.

SUBMIT THIS SHEET AS PART OF YOUR BID

II. ADDENDA:

Acknowledgment is hereby made of receipt and incorporation of addendum number _____ through _____ into this Bid.

III. BID GUARANTEE:

Bid security must be a bidders bond, a certified check or cashier's check payable to Sunrise Recreation and Park District, or cash. **Bids secured by personal checks or personal guarantees will be rejected.**

IV. AFFIDAVIT OF NONCOLLUSION:

The bidder swears and deposes that he or she is the party making the foregoing bid, that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive for sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company, association, organization, bid depository or to any member or agent thereof to effectuate a collusive or sham bid.

V. SUBCONTRACTOR LISTING:

In accordance with the California Public Contract Code, Division 2, Part 1, Chapter 4, Section 4100, and following, the subcontractors listed on the Bid Form will perform the indicated work of improvement on the project.

VI. TYPE OF BUSINESS (Check One):

CORPORATION STATE OF INCORPORATION _____

PARTNERSHIP

JOINT VENTURE

PRIVATE INDIVIDUAL

INDIVIDUAL DOING BUSINESS UNDER A FIRM NAME

SUBMIT THIS SHEET AS PART OF YOUR BID

VII. CONTRACTOR INFORMATION

Firm Name _____
NOTE: In addition, place name on each Proposal Sheet where space is provided

Address _____

E-mail _____

Telephone () _____ Fax () _____

Contractor's License Number _____

Contractor's License Expiration Date _____

Contractor's License Classification(s) _____

Contractor's California DIR Number _____

I HEREBY CERTIFY UNDER PENALTY OF PERJURY THAT THE ABOVE STATEMENTS ARE TRUE.

BID AND CERTIFICATION SUBMITTED _____
DATE

SIGNATURE _____
AUTHORIZED REPRESENTATIVE

PRINT OR TYPE NAME

TITLE _____

How did you hear about this bid opportunity? (Check one please)

- Direct notice by mail or email
- Daily Journal
- Sac Regional Builders Exchange
- McGraw Hill
- Placer Co. Contractors Association
- Other (please specify)

Thank you. This will help us to determine how to best promote bid opportunities.

SUBMIT THIS SHEET AS PART OF YOUR BID

DESIGNATION OF SUBCONTRACTORS

In accordance with the Public Contract Code, Part 1, Chapter 4, Subletting and Subcontracting, bidders must list the names and location of places of business of all subcontractors who will perform work or labor or render service to the bidder in an amount in excess of one-half of one percent (0.5%) of the total bid. Refer to Section 2-8 of the Standard Construction Specifications.

The apparent low bidder must submit a listing of license numbers for all subcontractors within three days, not counting Saturdays, Sundays, and holidays, of bid opening. If the low bidder is not the apparent low bidder, the apparent low bidder shall submit the license numbers of all listed subcontractors to the Agency within three days not counting Saturdays, Sundays, and holidays, of the date notified.

If the percentage of the work is not filled out, it will be assumed that the sub is responsible for 100% of the line items related to his trades work.

PORTION OF CONTRACT FOR THIS SUB	SUBCONTRACTOR'S NAME & DIR REG #	BUSINESS LOCATION CITY, STATE
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

(USE ADDITIONAL SHEETS IF NECESSARY)

SUBMIT THIS SHEET AS PART OF YOUR BID

Examples of Contractor Competency

Provide 4 examples of concrete paving projects greater than 2500 SqFt that the Concrete Contractor has completed in the last 5 years.

Project Name:

--

Contract Date
(Month/Year)

--

SQ Ft:

--

Project Name:

--

Contract Date
(Month/Year)

--

SQ Ft:

--

Owners Contact Information:

Owners Name:

--

Phone:

--

Email:

--

Owners Contact Information:

Owners Name:

--

Phone:

--

Email:

--

Project Name:

--

Contract Date
(Month/Year)

--

SQ Ft:

--

Project Name:

--

Contract Date
(Month/Year)

--

SQ Ft:

--

Owners Contact Information:

Owners Name:

--

Phone:

--

Email:

--

Owners Contact Information:

Owners Name:

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Phone:

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Email:

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SUBMIT THIS SHEET AS PART OF YOUR BID

CONTRACT NO. 2019-2-CA**PHASE I PARK IMPROVEMENTS
CABANA PARK****TABLE OF CONTENTS FOR CONTRACT DOCUMENTS****BIDDING REQUIREMENTS**

NOTICE TO CONTRACTORS
PROPOSAL -- BID FORM

PAGES INCLUSIVE

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Note: All portions of the County of Sacramento Municipal Services Agency Standard Construction Specifications, dated September 2001, revised March 2004, January 2008, 2010 and 2016 are hereby made part of these specifications. Modifications to the Standard Construction Specifications are noted in section 01000 of these specifications. The Standard Construction Specifications along with these project specifications shall be considered as one body of specifications.

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- 3.8 CLEANING
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APPENDIX A - Submittal List

SECTION 00 00 00 – SPECIAL DISTRICT CONTRACT PROVISIONS**1.01 SCOPE OF WORK**

The Contractor shall perform, furnish and complete the following under one contract:

The work to be performed under this contract includes the furnishing of all labor, materials, equipment, transportation and services necessary for the installation and implementation of best management practices (BMPs) for the erosion and sediment control plan (ESCP); minor excavation of existing vegetation and soils; saw cutting, demolition and removal of existing concrete walkway and minor asphalt ; removal and disposal of all excavated/demolished materials off-site as per the County of Sacramento and City of Citrus Heights ordinances. Grading, Storm Drain Lines, Area Drains Trench Drain, ATT Utility Relocation at Deeper Depth, Concrete Paving, Mow Bands and 6' Chain Link Fence and gates all installed to meet the most current Accessibility Guidelines. All trees shown on plans must be protected from damage throughout the length of construction, as per the Sacramento County Tree Ordinance.

Award of this contract requires a valid California contractor's license with the classification that allows the above work to be performed.

Note: All trees marked on plans to remain on site must be protected from damage throughout the length of construction, as per the Sacramento County Tree Ordinance and Section 1.28.

All work shall be performed per the plans and specifications and as per Sacramento County Construction Standards, January 2008 revised 2010 & 2016. The contract price shall include full compensation for all equipment, materials and labor to complete all work as specified herein and no additional compensation shall be allowed.

1.02 PROJECT LOCATION**Cabana Park**

6251 Fremont Circle.
Sacramento, CA 95841

1.03 DRAWINGS

The contract drawings are entitled:

**PHASE I IMPROVEMENTS CABANA PARK
PROJECT NO. 2019-2-CA**

1.04 SUBMISSION OF BIDS AND AWARD OF CONTRACT

Preparation and submission of the bid proposal and award of contract shall be in accordance with Section 2 and 3 of the Standard Construction Specifications except as modified herein.

1.05 CONTRACT BONDS

Refer to Section 3-4 of the Standard Construction Specifications along with the following clarifications.

A faithful Performance Bond and Payment Bond in a sum not less than 100% of the total contract price shall be provided by the contractor. Bond forms shall be those shown in Appendix A of the Standard Construction Specifications.

If you have any questions, contact the Project Manager, Virg Anderson at: vanderson@sunriseparks.com.

1.06 CERTIFICATE OF INSURANCE

Before beginning any work, the contractor shall furnish or have on file, satisfactory certificates of insurance. The certificates must be held by the Sunrise Recreation and Park District, a special district of Sacramento County and must remain in effect for the duration of the contract. See Section 3-9 of the Standard Construction Specifications for insurance requirements. The standard Insurance Accord Form is acceptable.

If you have any questions, contact Sunrise Recreation and Park District at:

Sunrise Recreation and Park District
Phone number (916) 725-1585
Fax number (916) 725-2541

1.07 ENVIRONMENTAL LIABILITY INSURANCE

Environmental Liability Insurance will not be required for this project.

1.08 BUILDER'S RISK INSURANCE

Builder's Risk Insurance will be required for this project.

1.09 TIME OF COMPLETION

The time for completion of this contract shall be 90 Calendar days commencing as specified in Section 7-1 of the Standard Construction Specifications.

1.10 LIQUIDATED DAMAGES

Liquidated damages shall be \$200 for each calendar day(s) delay beyond the established contract completion date that all work, is not completed. Refer to Section 8-10 of the Standard Construction Specifications.

1.11 PRE-BID CONFERENCE

A pre-bid conference will be held as noted in the NOTICE TO CONTRACTORS.

1.12 LABOR COMPLIANCE

The County of Sacramento received final approval from the Director of the California Department of Industrial Relations as a Labor Compliance Program effective March 15, 1994. All questions regarding this Labor Compliance program should be directed to the Construction Management Division, Labor Compliance Division, Attn: Harmail Nijjar 916.875.2711 or fax 916.875.2717. In accordance with Section 1771.5 of the California Labor Code, the payment of the general prevailing rate of per diem wages or the general prevailing rate of per diem wages for holiday and overtime is not required for any project of \$25,000, or less, when the project is for construction work, or of \$15,000, or less, when the project is for alteration, demolition, repair, or maintenance work.

This is a “construction” project in accordance with Section 1771.5 of the California Labor Code. “Prevailing Wage Requirements” will apply.

Pursuant to the California Labor Code Section 1720 and following, and Section 1770 and following, the successful bidder shall pay not less than the prevailing rate of per diem wages as determined by the Director of the California Department of Industrial Relations. Copies of the prevailing wage determinations are on file in the office of the Clerk of the Board and are available upon request from the labor compliance office at (916) 875-2700. Wage schedules may be downloaded at the DIR website: <http://www.dir.ca.gov/dlsr/DPreWageDetermination.htm>

1.13 MASTER FORMAT

The *MasterFormat*® is the system used for organizing this document.

The Masterformat® divisions or sections shall not operate to make the County an arbiter to establish subcontract limits between Contractor and/or subcontractors. The General Contractor is responsible to the County for all phases of construction and a complete job.

1.14 MODIFICATIONS TO STANDARD CONSTRUCTION SPECIFICATIONS

Modifications shall be made to the Standard Construction Specifications as follows:

A. 2-3. EXAMINATION OF PLANS, SPECIFICATIONS, AND SITE OF WORK

The following statement shall be added to this section: “Direct pre-bid questions in writing to Project Manager Virg Anderson, Sunrise Recreation and Park District, at: vanderson@sunriseparks.com”

B. 2-6. COMPETENCY OF BIDDERS

In addition to the requirements within the most recent Sacramento County Standard Construction Specifications, the following will also be required at bid opening.

1. Primes and All Subcontractors

- a. The concrete flatwork as herein described and specified in Division 2 of the Project Manual shall be the complete responsibility of a qualified and specifically licensed Contractor (A license classification

within the State of California) with experience in concrete flatwork installation.

- b. The General Contractor shall require any sub-contractor to furnish to the General Contractor performance and payment bonds in the amount of 100% of the sub-contractor's bid written by a Surety Company properly registered in the State of California and listed by the U.S. Treasury. The expense of the bond(s) is to be borne by the Contractor or Subcontractor. The General Contractor shall clearly specify the amount and requirements of the bond(s) in the General Contractor's written or published request for sub bids. The General Contractor's written or published request for sub bids shall also specify that the bond(s) expense is to be borne by the Contractor or Subcontractor.
- c. Contractor or Subcontractor certifies that it meets the qualifications and experience requirements established in Division 2 of these specifications as follows:
 - i. Contractor or Subcontractor has, in the last five (5) years, installed at least four (4) concrete paving projects, totaling a minimum of 2,500 square feet each. Contractor or this may be concrete flatwork, such as walkways, curbing, gutters or other similar structures.
 - ii. The form on Proposal Sheets 7, "Competency of Bidders", must be filled out, detailing a minimum of four (4) references for each portion of work requested, and submitted with bid. Failure to do so will be grounds for rejection

2. Quality Assurance

- a. All work in this section shall be performed or supervised by the General Contractor.
- b. Qualifications of Workers:
 - i. The contractor / subcontractor for this portion of the Work shall have been successfully engaged in the respective trade for at least four (4) years immediately prior to commencement of this work, and shall demonstrate to the approval of the Owner's Representative that his record of workmanship is satisfactory.
 - ii. For actual construction operations, use only thoroughly trained and experienced workers completely familiar with the materials and methods specified.
 - iii. Provide at least one person who shall be present at all times during execution of this portion of the Work and who shall be thoroughly familiar with the type of materials being installed, the referenced standards, and the requirements of this Work, and who shall direct all Work performed under this Section.
- c. Standards:
 - i. All equipment and installation shall comply with the most recent Sacramento County Standard Construction Specifications.

- ii. In addition to complying with County Standards, all electrical equipment and installation shall be designed, manufactured, and supplied in accordance with the latest applicable standards of:
 - A. American National Standards Institute (ANSI)
 - B. American Society for Testing and Materials (ASTM)
 - C. Insulated Cable Engineers Association (ICEA)
 - D. National Electric Manufacturers Association (NEMA)
 - E. Underwriters Laboratories Inc. (UL)

C. 2-8. SUBCONTRACTORS

NO CHANGES

D. 3-3 CONSIDERATION OF BIDS

Sentence three of paragraph two shall be replaced with the following:

If the bid is missing a lump sum price or a unit price, in either the base bid or any alternate, then the bid may be deemed incomplete and the bid will be rejected as non-responsive.

E. 3-9.04.C BUILDER'S RISK INSURANCE

Builder's Risk Insurance will not be required on this project.

F. 4-3. CONFORMANCE WITH CODES AND STANDARDS

Add to the Applicable Standards and Regulations "The UMC".

G. 5-8.01. SUBMITTALS – GENERAL

The last sentence of the first paragraph shall be replaced with the following:

Submittals shall be submitted within 30 days of execution of the contract, or at least 60 days prior to when the material will be ordered.

Sentence one of paragraph three shall be replaced by the following:

2 Copies of all submittals shall be furnished.

H. 5-9.01 AGENCY-FURNISHED SURVEYS

The entire section shall be deleted and replaced with the following:

The contractor shall be responsible for and shall perform all surveys and measurements necessary for layout and control of work in accordance with Section 5-9.03 of the Standard Construction Specifications.

I. 7-1. BEGINNING OF WORK

NO CHANGES

J. 7-10. PROTECTION OF WORK, PERSONS, AND PROPERTY

The following paragraph shall be added to this section:

Provide temporary fencing, lock boxes etc., as required to protect material storage, equipment and building under construction from theft, vandalism and unauthorized entry.

The Contractor shall be responsible for the protection of all utilities and site improvements, etc., from damage, cosmetic or real, during the Work. The Contractor shall be responsible for all damage in the area of Work, or any other area in the building or on the site, caused by Contractor, his employees or subcontractors.

K. 9-23. NO WAIVER OF GOVERNMENT CLAIM PROCESS

The following paragraph shall be added to section 9 CHANGES AND CLAIMS

9-23 NO WAIVER OF GOVERNMENT CLAIM PROCESS

No statement in the County of Sacramento Standard Construction Specifications or any Special Provisions for this Contract shall constitute a waiver of government claim filing requirements pursuant to Title 1, Division 3.6 of the California Government Code or as otherwise set forth in local, state and federal law.

L. 10-4.04. STORMWATER POLLUTION PREVENTION PLAN

Existing wattles and Drain Inlet bags shall be maintained in a working order. If damage, repaired or replace to prevent storm water pollution.

M. 10-4.05. EROSION AND SEDIMENT CONTROL BMP

The following paragraph shall be added to this section.

An Erosion and Sediment Control Plan (ESCP) has been prepared in these Contract Documents.

Acceptance of the contract does not preclude the Contractor from responsibility for taking the proper actions to prevent contaminates and/or sediments from leaving the construction site should any unforeseen circumstances occur. The Contractor shall take immediate action if directed by the Project Manager, or if the Contractor observes contaminates and /or sediments entering on the surface or ground water drainage, to prevent further storm water from entering the drainage.

The CONTRACTOR shall be responsible throughout the duration of the PROJECT for installing, inspecting, and maintaining the Best Management Practices (BMP) control measures and for removing and disposing of temporary control measures. At a minimum the contractor shall bag all downstream Drain Inlets, channels or drainage routes between the project and the creek.

The CONTRACTOR shall clean all tracking on the surface streets that are caused by him or his sub-contractors.

Full compensation for complying with and implementing the Erosion and Sediment BMP, including all labor, materials, tools, equipment and incidentals, and all work necessary to place, maintain and remove BMPs as required, and to carry out all training, inspection, monitoring programs, and to perform any other work necessary to comply with the requirements, shall be included in the lump sum bid price.

N. 11-3. RECORD DRAWING SPECIFICATIONS

The entire Section 11-3 shall be replaced with paragraph 1.16 of this specification section.

1.15 ACCURACY OF DRAWINGS AND SPECIFICATIONS

The existing conditions depicted on the drawings and specifications are developed from record information. Exact locations, distances, dimensions, elevations, etc., shall be governed by actual field conditions and verified by the Contractor.

1.16 RECORD DRAWINGS AND SPECIFICATIONS

- a. Maintain on the construction site, one set of the following record documents, which record actual revisions to the work:
 1. Drawings
 2. Specifications
 3. Addenda
 4. Request for information
 5. Field instructions
 6. Change orders and other modifications to the contract
 7. Reviewed shop drawings, product data and samples
 8. Manufacturer's instruction for assembly, installation, and operation
- b. Ensure entries are complete and accurate, enabling future reference by the County.
- c. Store record documents separate from documents used for construction.
- d. Record information on as-built by end of each workday.
- e. Specifications: Legibly mark and record at each product section a description of the actual products installed, including the following:

1. Manufacturer's name, product model, and number.
2. Product substitutions or alternates utilized.
3. Changes made by addenda and modifications.

A. Record drawings

1. Legibly mark each item to record actual construction including:
 - a. Measured horizontal and vertical locations of underground utilities and appurtenances referenced to permanent surface improvements. This shall include, but shall not be limited to piping, conduit, valves, stubouts, etc.
 - b. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the work. This shall include, but shall not be limited to piping, conduit, valves, stubouts, etc.
 - c. Field changes of dimension and detail.
 - d. Details not on original contract drawings.

G. Progress Record Documents

Record Documents shall include all subcontractor changes and shall be kept current as the work progresses. Progress documents shall be made available and subject to review and approval by the Project Inspector and the Project Manager at each progress payment.

H. Final Record Documents

The Contractor shall submit one completed set of Record Drawings and Specifications, to the Project Inspector a minimum of one week prior to the final inspection. These Record Documents shall include certification by the Contractor that the Record Drawings and Specifications are a true representation of the Work as actually constructed. The Work will not be formally accepted until the Record Documents are reviewed and accepted by the Project inspector and Project Manager.

I. Measurement and Payment

In addition to the retention provided for in Sections 8-7, 8-8 and 8-9 of the Standard Construction Specifications, the County shall retain five percent (5%) of each progress or final payment when Record Documents are found not to be in compliance with the contract requirements. Full compensation for Record Documents is included in the prices paid for the various items of work and no separate payment will be made.

1.17 UTILITIES

- A. **UTILITY SHUTDOWNS** - The Project Inspector shall be notified two (2) working days in advance of any contemplated shutdown of electricity or other utility. The Project Inspector's approval shall be obtained prior to any shutdown activity.

- B. In addition to the requirements of Section 6-10 and 6-16 of the Standard Construction Specifications, the Contractor shall schedule and coordinate all connections and other work to be performed by public and private utility organizations necessary for the completion of the project.
- C. CONTRACTOR shall coordinate with ATT for the relocation of ATT's existing conduit to a 24" cover depth as shown on plans or as coordinated with ATT representative and the District's Project Manager.

1.18 SITE ACCESS, STORAGE OF SUPPLIES, MATERIALS, EQUIPMENT, ETC.

The Contractor shall obtain the prior approval of the Project Inspector for acceptable site access or before using any area or space for Contractor's storage during construction operations. Materials, equipment, etc., shall not be piled or stored in any location which shall interfere with the conduct of normal functions of the building and/or facilities, and shall not constitute a hazard to persons or property. Any required safety precautions such as signs, danger signals, lanterns, barricades, etc., shall be installed by the Contractor during construction operations.

1.19 TESTING

The CONTRACTOR will supply a curve of the recycled aggregate base material as part of the submittal requirements.

The DISTRICT will pay for the first compaction test of the proof roll of the native soil conditions or the recycled aggregate base material once placed.

In the case of unacceptable compaction results, the CONTRACTOR will assume the liability for subsequent testing's by the geo-tech consultant.

1.20 ASBESTOS MATERIALS

- A. It is the intent of these Contract Documents to exclude from the work all materials containing asbestos.
- B. If asbestos materials are encountered during any work, the Contractor shall immediately notify the Project Inspector in writing.
- C. Unless specifically specified, the Contractor shall not install any asbestos-containing building materials. Materials such as mastics, joint compounds and flashing tars shall have a manufacturer's statement or label verifying that the material is asbestos free.

1.21 SIGNS

No advertising signs of any kind will be permitted except by written permission of the Project Manager.

1.22 CONTRACTOR'S FIELD OFFICE

A field office as such is not required and space is not available.

1.23 INSPECTOR'S FIELD OFFICE

A field office is not required.

1.24 CONSTRUCTION SITE UTILITIES

- A. WATER: Contractor may connect a temporary line to the existing water service lines at the site. A quick coupler valve is available within a short distance of the work area. The Contractor shall be responsible for safety related to tripping hazards created by hose. Connections to existing water service lines shall be coordinated with the Sunrise Recreation and Park District, Jeff Rivard, at (916) 224-7330. Water used in construction must comply with section 16 of the Standard Construction Specifications.
- B. ELECTRICAL POWER: There is no existing service. The Contractor shall arrange for and shall install power service from SMUD service lines, or shall provide a portable generator for power requirements.
- C. TELEPHONE: Contractor shall not have access to phones on site and therefore, shall arrange for his own pager or portable phone if needed for on-site communication.
- D. FIELD TOILETS: The Contractor shall furnish, install, and remove at completion of the job, all sanitary (portable toilet) facilities required during project construction. Facilities shall be provided in sufficient quantities to comply with CAL-OSHA regulations. All such sanitary facilities shall be made available for use by all workers, subcontractors, consultants, and County personnel associated with the project. The type and location of the facilities shall be subject to acceptance by the Project Inspector. The Contractor shall maintain sanitary facilities in a proper, safe, operating, and sanitary condition for the duration of the work.

1.25 CUTTING AND PATCHING

- A. The Contractor shall be responsible for all cutting, fitting, and patching required to complete the work including penetrations of surfaces for installation of curbs ducts and conduit.
- B. Cutting of structural members not specifically shown on the contract drawings, or cutting which might affect the integrity or effectiveness of weather exposed or moisture resistant elements or systems, must be approved in advance by the Engineer.
- C. The Contractor is responsible for inspecting existing conditions, including elements subject to damage or movement during cutting or patching, prior to commencing any cutting operation. The Contractor shall provide temporary support adequate to insure the structural integrity of the affected portions of the work, and shall provide devices or use methods to protect other portions of the facility from damage.
- D. The Contractor shall provide patching of a smooth and continuous nature, and shall refinish and paint all affected surfaces to match adjacent surfaces.

1.26 SPECIAL SECURITY REQUIREMENTS

- A. The Contractor's workers and equipment shall be limited to the work areas as designated by this contract.
- B. The Contractor shall protect his finished product until final acceptance by District.

1.27 SCHEDULE OF WORK AND LIMITATIONS

- A. During the progress of work, the existing facilities shall be maintained without interruption, and existing street shall remain open to the public, except by specific arrangement with the County of Sacramento for a temporary road closure. Project Inspector shall receive a written copy of approved road closure as approved by county.
- B. The Contractor shall coordinate the work of this contract through the Project Inspector assigned by the Project Manager, Virg Anderson, 916 725-0133.
- C. The Contractor will be allowed to work Monday – Friday, 7 AM to 6 PM. The County of Sacramento will designate when equipment may be on the road and may require a traffic control plan.
- D. The contractor shall ensure the roadway are kept clean and open to the public at all times as required by the road closure permit. The immediate neighbor has an RV access to his rear yard. CONTRACTOR shall allow this neighbor access to his gate when requested by the neighbor. The contractor may close off certain areas within the park directly related to the construction with the prior approval of the Project Manager.

1.28 CONSTRUCTION MEETINGS

Weekly construction meetings shall be scheduled to coordinate the construction work between the contractor, client, designer and inspector.

1.29 MANUFACTURED HOUSING UNITS

NOT USED

1.30 EXTENDED WARRANTY

NOT USED

END OF SECTION

SECTION 00 72 00 – GENERAL REQUIREMENTS**PART 2 - SUBMITTALS****2.4 SHOP DRAWINGS**

- A. Shop drawings shall be submitted to the District's Representative for review only where so called for in the technical specification sections, as follows:
 - 1. Two sets of prints.
 - 2. All shop drawings shall be thoroughly reviewed and signed by the Contractor indicating approval prior to submittal of drawings to the District's Representative.

2.5 SUBMITTALS

- A. Only where called for in the technical specifications, samples of materials to be used in fulfilling the requirements of the specifications shall be deposited with the District's Representative at least 10 working days prior to their use in the work to allow sufficient time for review.
- B. Submit manufacturers' samples to the District's Representative at least ten (10) working days prior to purchase as required in the specifications and in all cases where choice of color, finish, style, or texture is involved

2.6 TESTING

- A. When testing of materials is required by these specifications, the Contractor shall give the District sufficient notice of readiness for the tests to be taken. The cost of all tests will be borne by the District except for retesting as specified below, and the minor amounts of material required for testing which the Contractor shall furnish. The Contractor will cooperate with the District's representative in the taking of test samples.
- B. Should the results of any required test fail to meet the requirements of the Specifications, then the Contractor shall furnish new samples of new materials, as directed by the District, and additional tests shall be made at the Contractor's expense until the test results are found to meet the requirements of the documents.

2.7 JOB SITE SAFETY

- A. Neither the professional activities of the District's Representative, nor the presence of the District's Representative or their employees and subconsultants at a construction/project site, shall relieve the Contractor of their obligations, duties and responsibilities including, but not limited to, construction means, methods, sequence, techniques or procedures necessary for performing, superintending and coordinating the work in accordance with the contract documents and any health or safety precautions required by any regulatory agencies. The District's Representative and their personnel have no authority to exercise any

control over any construction contractor or their employees in connection with their work or any health or safety programs or procedures. The Contractor shall be solely responsible for job site safety, and the District's Representative and the District's Representative's subconsultants shall be indemnified by the Contractor and shall be made additional insureds under the Contractor's policies of general liability insurance.

PART 3 - TEMPORARY FACILITIES AND CONTROLS

3.3 TEMPORARY FACILITIES

A. Utilities:

1. Existing water service located on-site may be used as required for the work. Contractor shall make all such arrangements as required with the responsible utility company.
2. There are no existing sanitary facilities that may be used on-site. The contractor must provide as required by OSHA and make available to all District, County and project inspectors during regular construction hours.
3. Shut downs of utilities for any reason shall be subject to approval by the District. When extended shut downs are required the Contractor shall provide standby service for normal occupancy requirements.
4. Before starting work, coordinate work and obtain clearance from utility companies and/or governmental agencies that supply existing or proposed services to project.
5. Unless they are shown to be removed, protect active utility lines shown on these plans or otherwise made known to the Contractor prior to excavating. If utilities are damaged, they shall be repaired or replaced at no additional cost to the District.
6. If active utility lines are encountered and are not shown on these plans or otherwise made known to the Contractor, the District's Representative shall be immediately notified and Contractor shall then take the necessary steps promptly to assure that service will not be interrupted.
7. If service is interrupted by work performed under this section, immediately restore service by repairing damaged utility at no additional cost to the District.
8. If existing utilities interfere with permanent facilities being constructed under this contract, immediately notify District's Representative and obtain instructions from him.
9. Do not proceed with permanent relocation of utilities until written instructions are received from the Utility and the District's Representative.

B. Protection:

1. The Contractor shall provide adequate protection for all portions of the existing site, its improvements, and its occupants throughout the work. All damage done to existing property shall be neatly repaired or replaced at the Contractor's expense. Work shall be executed in careful, orderly manner with the least possible disturbance to public and occupants of the area.

2. Contractor shall protect and save any and all utilities. Any time existing utilities are exposed, District's Representative shall be notified. Repairs on existing utilities shall not be performed without prior approval and inspection by the District's Representative.
 3. Contractor shall protect site with SWPPP Erosion Control BMP's as required in Section 01 57 13. Contractor shall maintain and repair all existing BMP's existing on site until site as achieved required vegetative coverage.
- C. Field Office and Enclosures:
1. Fences, enclosures, storage sheds, etc., required by the Contractor for the storing of tools and materials shall be located where approved in advance by the District. Such fences, enclosures, storage sheds, etc., are at the Contractor's option.
- D. A 6-foot high temporary chain link construction fence shall be installed as shown on plans and shall be maintained for the duration of the project. The temporary construction fencing shall be in good condition, staked into ground wherever possible, and installed with a top tension wire. The fence posts shall be two inch (2") diameter galvanized steel. The fence fabric shall be 11-gauge, with knuckled barbs on the top edges.
- 3.4 CLEAN-UP
- A. During the construction period, the premises shall be kept free from the accumulation of waste materials or rubbish on a daily basis. The final cleaning shall leave the facilities ready for occupancy with no additional clean up. Clean up dirt, grease, asphalt, etc., from all surfaces. Use no cleaning materials that will damage finishes.
- B. Tracking onto the street shall be cleaned up at the end of each work day.

PART 4 - MATERIALS AND EQUIPMENT

4.1 GENERAL

- A. Deliver all materials and equipment to the project site in the manufacturer's original sealed, labeled containers, if any, and protect all packaged and unpackaged items against moisture, dust, tampering or damage from improper handling or storage. Storage location shall be as approved in advance by the District.
- B. Place materials and equipment on order in time to avoid job delay or hindrance. Schedule deliveries to coincide, as nearly as possible, with construction schedule.
- C. Except as specifically noted otherwise, the installation and/or maintenance directions provided by the manufacturer shall be followed for all materials and equipment.
- D. All materials shown on the drawings or specified herein shall be new unused materials unless specified otherwise.

- E. All materials not conforming to the requirements of these specifications shall be considered as defective and all such materials, whether in place or not, shall be rejected and shall be removed immediately from the job site.
- F. Prior to ordering materials or starting work, the Contractor shall verify all measurements at the site and shall be held responsible for their accuracy. No extra compensation will be allowed for differences between actual dimensions and the measurements shown on the drawings.

4.2 SUBSTITUTIONS

- A. In addition to the statements set forth in Paragraph 1.3D of this Section regarding the specification and naming of products, brand names, manufacturers, etc., as referenced within these Specifications, the following will apply:
 - 1. Specific names are indicated to establish quality and functional standards required to do the work, and to meet the quality and functional standard of the contract.
 - 2. Substitute items shall be equal or superior to the items specified at no additional cost to the District.
 - 3. It shall be the responsibility of the Contractor to prove the equality of item(s) proposed for substitution. Therefore, the Contractor shall submit for the District's approval all pertinent product data and samples as the District deems appropriate, to establish said product equality before commencing with that portion of the work. Failure of the Contractor to receive the District's approval in writing shall cause the District to reject said product and its related assembly and/or installation, and require the complete replacement with that item specified, all at the Contractor's cost. Submittals for proposed substitutions will be reviewed once at the cost of the District. Subsequent reviews of submittals will be at the cost of the Contractor on an hourly basis.

4.3 MEASUREMENT & PAYMENT

- A. Where the estimated quantities for a specific portion of the work are designated on the plans as final pay quantities, said estimated quantities shall be the final quantities for which payment for such specific portion of the work will be made, unless the dimensions of said portions of the work shown on the plans are revised by the District's Representative. If such dimensions are revised, and such revisions result in an increase or decrease in the quantities of such work, the final quantities for payment will be revised in the amount represented by the changes in the dimensions. The estimated quantities for such specific portion of the work shall be considered as approximate only and no guarantee is made that the quantities that can be determined by computations, based on the details and dimensions shown on the plans, will equal the estimated quantities. No allowance will be made in the event that the quantities based on computations do not equal the estimated quantities.

In case of a discrepancy between the quantities shown on the plans as final pay quantities and the quantity of the same items shown on the bid form, payment will be based on the final pay quantities shown on the plans.

PART 5 - RECORD DRAWINGS

- 5.1 One complete set of prints shall be furnished to the Contractor by the Landscape Architect on that the Contractor will fully illustrate all revisions, with complete dimensions, made by all crafts in the course of work. This shall include all field changes, adjustments, variances, substitutions, and deletions, whether covered by Change Orders or not. Underground installations must be located precisely as constructed on the Record Drawings.

The Record Drawings shall be updated on a Daily basis and submitted complete to the District with each pay request. The updated plans will be made available to the District's project manager upon request for the District's review. Pay requests will not be processed without the aforementioned Record Drawings.

Upon completion of the work, it shall be the responsibility of the Contractor to transfer all revisions to a complete set of reproducible mylars, which will be furnished by the Landscape Architect and paid for by the District. The Contractor shall submit the reproducible Record Drawings to the District with request for final payment. Final payment will not be processed without the aforementioned Record Drawings.

PART 6 - GUARANTEES

- 6.1 The Contractor shall provide a written guarantee for all the work as required in the Technical Specification section.
- 6.2 Assemble and bind three (3) sets of all certificates, warranties, guarantees, and maintenance manuals into clearly organized files and present the files to the District at the completion of the work.

PART 7 – FINAL MEASUREMENT AND PAYMENT

- 7.1.1 Full compensation for conforming to the requirements of this section shall be considered as included in the contract prices paid for the various items of work involved and no separate payment will be made therefore.

END OF SECTION 00 72 00

SECTION 26 56 00 SITE ELECTRICAL (NOT IN CONTRACT)**PART 1 - GENERAL** (See also General Provisions, Special Provisions, and General Requirements)

1.6 SCOPE

- A. Furnish and install all labor and materials for complete installation of conduits, pullboxes, conductors, detectable tape, trenching and backfilling, concrete, light fixtures, poles, concrete bases, and miscellaneous related work as shown on drawings.
- B. Related work specified elsewhere:
 - 1. Trenching and Backfilling - Section 31 33 00
 - 2. Site Concrete - Section 32 13 13
- C. Contractor shall visit the site prior to submission of his bid, verify all conditions that will affect the performance of his work, make all necessary measurements, and notify the City of any discrepancies between the plans and the actual field conditions, prior to bidding.
- D. Permits: Contractor shall coordinate and secure all necessary permits for any and all work in this section and shall be responsible for payment of any and all fees and expenses associated with the permitting, inspection and compliance. Contractor shall not be reimbursed separately by City (verify payment clause).
- E. Utility Connection: The Contractor shall be responsible for coordinating all work with any and all utility companies. All charges and fees by the utility company for initial connection shall be paid for by the Contractor and reimbursed separately by the City as a change order (verify payment clause).
- F. Contractor shall coordinate his work with the other trades, reviewing areas of possible conflict of space.

1.7 SUBMITTALS

- A. Prior to ordering any materials, Contractor shall furnish the City's Representative with manufacturer's literature and catalog sheets, per the General Requirements section, and/or manufacturers' data sheets for the following items:
 - 1. Solar PV Lighting LED fixtures, drivers, solar panels, charger controllers and batteries, and poles
 - 2. Pull boxes
 - 3. Conduit and conduit fittings
 - 4. Conductors
 - 5. Conduit sealing materials
 - 6. Detectible warning tape

1.8 STANDARDS

- A. Unless otherwise indicated or specified, all materials and methods shall conform to the appropriate current sections of:
 - 1. The City Standards for Public Improvements.
 - 2. The State of California, latest edition of the Department of Transportation Standard Specifications (DTSS), except for measurement and payment requirements.
 - 3. Applicable ASTM specifications as they reasonably apply to this work, except for measurement and payment requirements.
 - 4. Where conflicts occur, most stringent requirements apply.
- B. All materials shall be new with the Underwriter's acceptance label attached.
- C. All work shall conform to the requirements of the current edition of the National Electrical Code, OSHA, California State Safety Orders and the City regulations.
- D. The complete electrical installation shall be permanently grounded per the current edition of the National Electrical Code and local regulations.

1.9 RECORD DRAWINGS: Contractor to keep accurate and scaled reproducible record plans of the entire electrical installation. Deviations and changes from the Contract Drawings shall be noted on this drawing. All work that is installed under this Contract shall be included on these drawings.

1.10 GUARANTEES: The Electrical Contractor shall guarantee, in writing, for a period of one year from date of acceptance, that all work installed shall be free from defects in workmanship and materials. If during this period of one year any such defects appear, the Contractor shall, without cost to the City, remedy such defects. If the Contractor defaults on this guarantee, the City may have such work done and charged to the Contractor.

PART 2 – PRODUCTS

2.1 CONDUITS

- A. Non-metallic: for use underground, Schedule 40 PVC, by Carlon, PW Pipe, or approved equal. All conduits entering pull boxes shall have end bells.
- B. Metallic: for use above ground, galvanized rigid steel, as manufactured by Allied, Appleton, or approved equal.

2.2 CONDUCTORS

- A. Shall be copper, thermoplastic insulated, 600V, type THWN, THW, by Southwire, Rome, Phelps Dodge, or equal.
- B. Ground electrode conductors at light poles shall be bare copper.

2.6 PULLBOXES

- A. Site boxes for use as pullboxes shall be reinforced concrete with steel traffic rated lids with hold-down penta-head bolts. Boxes shall be complete with base section, riser, and lids, and indicated on Drawings. As manufactured by Jensen Precast HT1017-B with HT1017-LO3 lid, non-slip *Traxplate*, or approved equal. Provide with vandal resistance locking covers as indicated on Drawings.
- B. Top of pullboxes located flush with pavement. In landscaped areas top of pullboxes shall be set flush with final grade.
- C. Set base of pullboxes on 6inch base of crushed drain rock, and as indicated on Drawings. Covers shall be marked indicating type of service, i.e. Electric.

2.4 DETECTIBLE WARNING STRIPS

- A. Detectible warning strips, direct burial, 3" wide red color, as manufactured by Mule, 3M, or approved equal.

2.5 LIGHTING FIXTURES AND POLES: As indicated on the drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The Contractor shall be responsible for coordinating the inspection of the system during and upon completion of installation. Refer to paragraph 3.2 of this section
- B. The Contractor shall furnish and install the lighting fixtures per the requirements of the City and as indicated on drawings.
- C. Contractor is responsible for the removal of all debris from job site caused by this work. Protect and cover all equipment during construction to keep material free from scratches and blemishes.

3.2 TESTING:

- A. The Contractor shall test the complete installation in the presence of the City, upon completion of the project, including tests for insulation resistance, improper grounds, ground resistant of grounding electrode, lighting control, and fixture operation, & etc. Tests shall be conducted during the construction period and at completion to determine conformity with applicable codes and with these specifications. Tests shall be performed in the presence of the City Engineer.

- B. Tests shall include, but are not limited to, the following:
 - 1. Lighting: Demonstrate that solar powered lighting is fully charged and operational, and has operating sequences properly programmed per specifications.
 - 2. Grounds at Light Poles: Test grounding electrode for ground resistance using Ground Megger, by Biddle, or by AMP. Maximum allowed resistance is 25ohms. If measurement is above 25ohms install ground rod separated by at least 10feet to achieve required resistance.

3.3 EXCAVATION AND BACKFILLING

- A. Excavate and backfill as required for the installation of electrical work. Restore all surfaces, roadways, walks, curbs, walls existing underground installations, etc., cut by installations to original condition in an acceptable manner. Maintain all warning signs, barricades, flares and lanterns as required.
- B. Dig trenches straight and true to line and grade, with bottom clear of any rock points. Support conduit for entire length on undisturbed original earth. Minimum conduit depth of pipe crown shall be 2 feet below finished or natural grade.
- C. All backfill material, placement and compaction shall conform to applicable requirements of earthwork section of these specifications.

3.4 CONDUCTORS

- A. The Contractor shall furnish and install the lighting fixtures per the requirements of the City and as indicated on drawings.
- B. Contractor is responsible for the removal of all debris from job site caused by this work. Protect and cover all equipment during construction to keep material free from scratches and blemishes.

3.4.0 TESTING:

- A. The Contractor shall Conform to ATT's satisfaction for the installed conduit.

END OF SECTION 26 56 00

SECTION 31 20 00 - EARTH MOVING**PART 1 - GENERAL****1.1 SECTION INCLUDES**

- A. Excavation and/or embankment from existing ground to subgrade, including soil sterilant, for roadways, driveways, parking areas, building pads, walks, paths, or trails and any other site improvements called for on the Plans.

1.2 SECTION EXCLUDES

- A. Earthwork related to underground utility installation shall be performed in accordance with Sections 31 21 00, Utility Trenching and Backfill.

1.3 RELATED SECTIONS

- A. Section 31 10 00, Site Clearing

1.4 RELATED DOCUMENTS**A. ASTM**

1. D1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort
2. D1586, Method for Penetration Tests and Split-Barrel Sampling of Soils
3. D2487, Classification of Soils for Engineering Purposes
4. D3740, Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
5. D4318. Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils
6. E329, Specification for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction
7. E548, Guide for General Criteria Used for Evaluating Laboratory Competence

- B. California Building Code, California Code of Regulations, Title 24, Part 2, Chapter 18, Soils and Foundations, and Chapter 33, Safeguards During Construction

C. Caltrans Standard Specifications, 2015

1. Section 17, General
2. Section 19, Earthwork

- D. CAL/OSHA, Title 8.

1.4 DEFINITIONS

- A. Borrow: Approved soil material imported from off-site for use as Structural Fill or Backfill.

- B. Excavation: Removal of material encountered above subgrade elevations.
 - 1. Authorized Over-Excavation: Excavation below subgrade elevations or beyond indicated horizontal dimensions as shown on plans or authorized by the Geotechnical Engineer.
 - 2. Unauthorized Over-Excavation: Excavation below subgrade elevations or beyond indicated horizontal dimensions without authorization by the Geotechnical Engineer. Unauthorized excavation shall be without additional compensation.
- C. Geotechnical Testing Agency: An independent testing agency qualified according to ASTM E329 to conduct soil materials and rock definition testing, as documented according to ASTM D3740 and ASTM E548.
- D. Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material $\frac{3}{4}$ cubic yards or more in volume that when tested by an independent geotechnical testing agency, according to ASTM D1586, exceeds a standard penetration resistance of 100 blows/2 inches.
- E. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man made stationary features constructed above or below grade.
- F. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, base or topsoil materials.
- G. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches in diameter; and free of weeds, roots, and other deleterious materials.
- H. Unsuitable Material: Any soil material that is not suitable for a specific use on the Project. The Geotechnical Engineer will determine if a soil material is unsuitable.
- I. Relative Compaction: In-place dry density of soil expressed as percentage of maximum dry density of same materials, as determined by laboratory test procedure ASTM D1557.
- J. Utilities: onsite underground pipes, conduits, ducts and cables.

1.5 SUBMITTALS

- A. Samples:
 - 1. If required by the Geotechnical Engineer, provide 20 pound samples, sealed in airtight containers, tagged with source locations and suppliers of each proposed soil material from on-site or borrow sources, 72 hours prior to use. Do not import materials to the Project without written approval of the Geotechnical Engineer.
 - 2. Provide materials from same source throughout work. Change of source requires approval of the Geotechnical Engineer.

- B. Material Test Reports: Provide, from a qualified testing agency, the following test results showing compliance with the project requirements:
- C. Classification according to ASTM D2487 of each onsite or borrow soil material proposed for fill and backfill.
 - 1. Laboratory compaction curve in conformance with ASTM D1557 for each onsite or borrow soil material proposed for fill and backfill.

1.6 QUALITY ASSURANCE

- A. Provide an independent testing agency qualified according to ASTM E329 to conduct soil materials and rock definition testing, as documented according to ASTM D3740 and ASTM E548.
- B. Conform all work and materials to the recommendations or requirements of the project specifications and meet the approval of the Engineer.
- C. Conform all work in accordance with Caltrans Standard Specification Section 17, General and Section 19, Earthwork.
- D. Percentage of compaction specified shall be the minimum acceptable. The percentage represents the ratio of the dry density of the compacted material to the maximum dry density of the material as determined by the procedure set forth in ASTM D1557.
- E. Perform excavation, filling, compaction and related earthwork under the observation of the Geotechnical Engineer. Materials placed without approval of the Geotechnical Engineer will be rejected by the District. Notify the Geotechnical Engineer at least 24 hours prior to commencement of the earthwork and at least 48 hours prior to testing.
- F. The Geotechnical Engineer will perform observations and tests required to enable him to form an opinion of the acceptability of the Project earthwork. Correct earthwork that, in the opinion of the Geotechnical Engineer, does not meet the requirements of these Technical Specifications and the Geotechnical Report.
- G. Upon completion of the construction work, certify that all compacted fills and foundations are in place at the correct locations, and have been constructed in accordance with sound construction practice. In addition, certify that the materials used are of the types, quality and quantity required by these Technical Specifications and the Geotechnical Report. The Contractor shall be responsible for the stability of all fills and backfills constructed by his forces and shall replace portions that in the opinion of the Geotechnical Engineer have been displaced or are otherwise unsatisfactory due to the Contractor's operations.
- H. Finish subgrade tolerance at completion of grading:
 - 1. Building and paved areas: ± 0.05 feet
 - 2. Other areas: ± 0.10 feet

1.7 PROJECT CONDITIONS

- A. Promptly notify the District's Representative of surface or subsurface conditions differing from those disclosed in the Geotechnical Report. First notify the District's Representative verbally to permit verification and extent of condition and then in writing. No claim for conditions differing from those anticipated in the Contract Documents and disclosed in the Geotechnical Report will be allowed unless the Contractor has notified the District's Representative in writing of differing conditions prior to the Contractor starting work on affected items.
- B. Protect open excavations, trenches, and the like with fences, covers and railings to maintain safe pedestrian and vehicular traffic passage.
- C. Prevent erosion of freshly-graded areas during construction and until such time as permanent drainage and erosion control measures have been
Temporarily stock-pile fill material in an orderly and safe manner and in a location approved by the District's Representative.
- D. Environmental Requirements: When unfavorable weather conditions necessitate interrupting earthwork operation, areas shall be prepared by compaction of surface and grading to avoid collection of water. Provide adequate temporary drainage to prevent erosion. After interruption, compaction specified in last layer shall be re-established before resuming work.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: On-site soils are considered suitable for use as fill provided the materials are placed in accordance with Geotechnical Recommendations. Highly expansive soils shall not be used as select structural fill, or used as backfill for trenches located within hardscape areas.
- B. Imported fill soils, if required, should be predominantly granular in nature, and should be free of organics, debris, or rocks over 3 inches in size, and shall be approved by the Geotechnical Engineer before importing to the site. Imported non-expansive soils shall have a Plasticity Index less than 15 as determined by ASTM D4318, an R-value of at least 20, and fines content between 15 and 65 percent. Import fill shall be considered non-hazardous per Department of Toxic Substances Control guidelines (DTSC, 2017) and non-corrosive per Caltrans Corrosion Guidelines (Caltrans, 2015).

2.2 SOIL STERILANT

- A. Commercial chemical for weed control, registered by EPA. Provide granular, liquid or wet-able powder form.

PART 3 - EXECUTION**3.1 GENERAL**

- A. Perform work in accordance with Caltrans Standard Specification Section 19, Earthwork, as modified by the Contract Documents.
- B. Placement and compaction of material by flooding, ponding, or jetting will not be permitted.
- C. The use of explosives will not be permitted.
- D. Grading and earthwork operations shall be observed and tested by a representative of the Geotechnical Engineer for conformance with the project plans/specifications. This work includes site preparation, selection of satisfactory materials, and placement and compaction of the subgrades and fills. Sufficient notification prior to commencement of earthwork is essential to make certain that the work will be properly observed.

3.2 CONTROL OF WATER AND DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding the site and surrounding area. Provide dewatering equipment necessary to drain and keep excavations and site free from water.
- B. Dewater during backfilling operation so that groundwater is maintained a least 1 foot below level of compaction effort.
- C. Protect subgrades from softening, undermining, washout and damage by rain or water accumulation.
- D. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations.
- E. Maintain dewatering system in place until dewatering is no longer required.

3.3 WET WEATHER CONDITIONS

- A. Do not prepare subgrade, place or compact soil materials if subgrade or materials are above optimum moisture content.
- B. If the Geotechnical Engineer allows work to continue during wet weather conditions, conform to supplemental recommendations provided by the Geotechnical Engineer.

3.4 BRACING AND SHORING

- A. Conform to California and Federal OSHA requirements.
- B. Place and maintain such bracing and shoring as may be required to support the sides of the excavations for the proper protection of workmen; to facilitate the work; to prevent damage to the facility being constructed;

and to prevent damage to adjacent structures or facilities. Remove all bracing and shoring upon completion of the work.

- C. Be solely responsible for all bracing and shoring and, if requested by the District's Representative, submit details and calculations to the District's Representative. The District's Representative may forward the submittal to the Geotechnical Engineer, the Consulting Engineer and/or the California Division of Industrial Safety for their review. The Contractor's submittal shall include the basic design, assumed soils conditions and estimation of forces to be resisted, together with plans and specifications of the materials and methods to be used, and shall be prepared by a civil engineer or structural engineer registered in California. No excavations related to the proposed facility shall precede a response to the submittal by the District's Representative.
- D. Be solely responsible for installing and extracting the sheathing in a manner which will not disturb the position or operation of the facility being constructed or adjacent utilities and facilities.

3.5 TOPSOIL STRIPPING

- A. Remove topsoil in accordance with Section 31 10 00, Site Clearing.

3.6 EXCAVATION

- A. Excavate earth and rock to lines and grades shown on plans and to the neat dimensions indicated on the plans, required herein or as required to satisfactorily compact backfill.
- B. Remove and dispose of large rocks, pieces of concrete and other obstructions encountered during excavation.
- C. Excavation through buried concrete and other unknown obstructions will require specialized techniques for demolition and removal.
- D. Where forming is required, excavate only as much material as necessary to permit placing and removing forms.
- E. Provide supports, shoring and sheet piles required to support the sides of excavations or for protection of adjacent existing improvements.

3.7 GRADING

- A. Uniformly grade the Project to the elevations shown on plans
- B. Finish ditches, gutters and swales to the sections, lines and grades indicated and to permit proper surface drainage.
- C. Round tops and bottoms of slopes as indicated or to blend with existing contours.

3.8 SUBGRADE PREPARATION

- A. Subgrade Preparation: Prior to backfilling depressions created by the removal of old foundations and utility lines, scarify the bottom of the excavation to an approximate depth of 8 inches and uniformly moisture condition the scarified surfaces to a moisture content that is at least 2 percent over optimum. Compact the scarified surfaces to a minimum of 90 percent relative compaction at above optimum moisture content.
- B. Over-excavate any remaining soft (pumping) areas down to firm soil and backfill the area.
- C. Subgrade shall be maintained in a moist, but not wet, condition by periodically sprinkling water prior to the placement of additional fill or installation of roads. Subgrade that has been permitted to dry out and loosen or develop desiccation cracking should be scarified, moisture conditioned, and re-compacted as recommended above.
- D. Install underground utilities and service connections prior to final preparation of subgrade and placement of base materials for final surface facilities. Extend services so that final surface facilities are not disturbed when service connections are made.
- E. Prepare subgrades under the structural section of paved areas, curbs, gutters, walks, structures, other surface facilities and areas to receive structural fill.
- F. Protect utilities from damage during compaction of subgrades and until placement of final pavements or other surface facilities.
- G. Obtain the Geotechnical Engineer's approval of subgrades prior to placing pavement structural section.

3.9 LOT FINISH GRADING

- A. Blade finish lots to lines and grades indicated.

3.10 FILL PLACEMENT AND COMPACTION

- A. Place fill in uniformly moisture conditioned and compacted lifts not exceeding 8 inches in loose thickness. Each lift should be thoroughly moisture conditioned and compacted. See section 3.10F for compaction requirements.
 - e. In order to achieve satisfactory compaction in the subgrade and fill soils, it may be necessary to adjust the soil moisture content at the time of soil compaction per geotechnical recommendations. This may require that water be added and thoroughly mixed into any soils which are too dry or that scarification and aeration be performed in any soils which are too wet.
- B. Do not drop fill on structures. Do not backfill around, against or upon concrete or masonry structures until structure has attained sufficient strength to withstand loads imposed and the horizontal structural system had been installed.

- C. Do not compact by ponding, flooding or jetting.
- D. Perform compaction using rollers, pneumatic or vibratory compactors or other equipment and mechanical methods approved by the Engineer.
- E. Compaction requirements (unless specified otherwise by the Geotechnical Engineer):
 - 1. Compact landscape areas to 85 percent compaction.
 - 2. Compact subgrade of the DG areas to 90 percent to the edge of the DG
 - 3. Compact upper 6" of subgrade to 90 percent of paved areas and extend 90 percent compaction to 5 feet beyond edge of pavement.
 - 4. Compact aggregate base to 95 percent under all pavement

3.11 SOIL STERILIZATION

- A. Apply soil sterilant to areas indicated, such as beneath asphalt concrete pavement, brick pavement, concrete pavement and at grade concrete slabs, including sidewalks, curbs and gutters. Also where indicated apply soil sterilant below expansion and control joints and at areas where pipes, ducts or other features penetrate slabs.
- B. Apply soil sterilant uniformly and at the rates recommended by the manufacturer.
- C. Apply soil sterilant to prepared subgrade, or after installation of aggregate base as recommended by the manufacturer.

3.12 DISPOSAL

- A. Lawfully dispose of all unsuitable and excess or surplus material off-site at no cost to the District.

END OF SECTION 31 20 00

SECTION 31 21 00 - UTILITY TRENCHING AND BACKFILL

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Excavation, bedding, and backfill for underground storm drain, sanitary sewer, and water piping, underground HVAC piping, electrical conduit, telephone conduit, gas piping, cable TV conduit, etc., and associated structures.
- B. Provide labor, material, equipment, and services necessary to complete the backfilling and compacting as necessary for this project. Section includes, but is not limited to:
 - 1. Select Backfill Material
 - 2. Aggregate Base
 - 3. Detectable Tape
 - 4. Trench Excavation
 - 5. Pipe Bedding
 - 6. Trench Backfill
 - 7. Trench Surfacing
- C. This section excludes drainage fill material and placement around subdrains.

1.2 RELATED SECTIONS

- A. Section 31 10 00 – Site Clearing
- B. Section 31 20 00 – Earthwork Moving
- C. Section 33 10 00 – Water System
- D. Section 33 30 00 – Sanitary Sewer System

1.3 RELATED DOCUMENTS

- A. ASTM
 - 1. D1557, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.
 - 2. D2321, Standard Practice for Underground Installation of Thermoplastic Pipe for Sewer and Other Gravity-Flow Applications.
- B. California Administrative Code, Title 24, Part 2 - Basic Building Regulations, Chapter 24, Excavations, Foundations, and Retaining Walls.
- C. Caltrans Standard Specifications, 2015
 - 1. Section 19, Earthwork
 - 2. Section 26, Aggregate Bases

- 3. Section 68, Subsurface Drains
- 4. Section 96, Geosynthetics

D. CAL/OSHA, Title 8

1.4 DEFINITIONS

- A. AC: Asphalt Concrete
- B. ASTM: American Society for Testing and Materials
- C. Base: The layer placed between the subgrade and surface pavement in a paving system.
- D. Bedding: Material from bottom of trench to bottom of pipe
- E. CDF: Controlled Density Fill
- F. DIP: Ductile Iron Pipe
- G. Engineered Fill:
 - 1. Soil or soil-rock material approved by the District and transported to the site by the Contractor in order to raise grades or to backfill excavations.
 - 2. Contractor shall provide sufficient tests, and a written statement that all materials brought onto the project site comply with specification requirements.
- H. Excavation: Consists of the removal of material encountered to subgrade elevations
- I. Initial Backfill: Material from bottom of pipe to 12 inches above top of pipe
- J. PCC: Portland Cement Concrete
- K. RCP: Reinforced Concrete Pipe
- L. Relative Compaction: In-place dry density of soil expressed as percentage of maximum dry density of same materials, as determined by laboratory test procedure ASTM D1557.
- M. Springline of Pipe: Imaginary line on surface of pipe at a vertical distance of $\frac{1}{2}$ the outside diameter measured from the top or bottom of the pipe.
- N. Subgrade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below base.

- O. Subsequent Backfill: Material from 12 inches above top of pipe to subgrade of surface material or subgrade of surface facility or to finish grade.
- P. Trench Excavation: Removal of material encountered above subgrade elevations and within horizontal trench dimensions.
 - 1. Authorized Trench Over-Excavation: Excavation below trench subgrade elevations or beyond indicated horizontal trench dimensions as shown on plans or authorized by the Geotechnical Engineer.
 - 2. Unauthorized Trench Over-Excavation: Excavation below trench subgrade elevations or beyond indicated horizontal trench dimensions without authorization by the Geotechnical Engineer. Unauthorized excavation shall be without additional compensation.
- Q. Utility Structures:
 - 1. Storm drainage manholes, catch basins, drop inlets, curb inlets, vaults, etc.
 - 2. Sanitary sewer manholes, vaults, etc.
 - 3. Water vaults, etc.

1.5 SUBMITTALS

- A. Test Reports: Submit the following report for import material directly to the District from the Contractor's testing services
- B. Samples:
 - 1. If required by the Engineer, provide 20-pound samples of all imported trench bedding and backfill material sealed in airtight containers, tagged with source locations and suppliers of each proposed material. Do not import materials to Project without written approval of the Engineer and the District.
 - 2. Provide materials from same source throughout work. Change of source requires approval of the Engineer and the District.

1.6 QUALITY ASSURANCE

- C. Conform all work and materials to the recommendations or requirements of the project specifications and meet the approval of the Engineer.
- D. Conform all work to the appropriate portion(s) of the Caltrans Standard Specifications, Section 19, Earthwork.
- E. Percentage of compaction specified shall be the minimum acceptable. The percentage represents the ratio of the dry density of the compacted material to the maximum dry density of the material as determined by the procedure set forth in ASTM D 1557.

- F. Soil Testing:
 - 1. Contractor to engage a geotechnical testing agency, to include compaction testing and for quality control testing during fill operations.
 - 2. Test results will be submitted to the District.

1.7 PROJECT CONDITIONS

- G. Barricade open excavations and post with warning lights.
 - 1. Operate warning lights and barricades as required.
 - 2. Protect structures, utilities, sidewalks, pavements, and other facilities immediately adjacent to excavations, from damages caused by settlement, lateral movement, undermining, washout, and other hazards.
 - 3. Protect open, trenches, and utility structure excavations with fences, covers and railings to maintain safe pedestrian and vehicular traffic passage.
- H. Stockpile on-site and imported backfill material temporarily in an orderly and safe manner.
- I. Environmental Requirements:
 - 1. Protect existing storm drainage system from silt and debris resulting from construction activities. If contamination occurs, remove contamination at no cost to the District.
 - 2. Protect existing streams, ditches and storm drain inlets during work on this project.
- J. Protection of Subgrade: Do not allow equipment to pump or rut subgrade, stripped areas, footing excavations, or other areas prepared for project.
- K. Transport all excess soils materials by legally approved methods to disposal areas.
 - 1. Coordinate with the Engineer.
 - 2. Any additional fill requirements shall be the responsibility of the Contractor.

1.08 EXISTING UTILITIES

- A. Locate existing underground utilities in the areas of work. For utilities that are to remain in place, provide adequate means of protection during excavation operations.
 - 1. Locating of existing underground utilities shall include but not be limited to pot-holing prior to the start of construction.
- B. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult District and/or utility agency immediately for directions.

1. Cooperate with the District and public and private utility companies in keeping their respective services and facilities in operation.
 2. Repair damaged utilities to the satisfaction of the agency with jurisdiction.
- C. Do not interrupt existing utilities serving facilities occupied and used by the District or others, except when permitted in writing by the District and then only after acceptable temporary utility services have been provided.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Import materials will be subject to approval of the Geotechnical Engineer.
- B. For approval of imported fill material, notify the District at least 7 days in advance of intention to import material.

2.2 PIPE BEDDING AND INITIAL BACKFILL

- A. ASTM D2321, Class IA, IB or II.
 1. Clean and free of clay, silt or organic matter.
- B. Permeable Material: In accordance with Section 68-2.02F of Caltrans Standard Specifications, Class 1, Type A or Class 2.
- C. Class 2 Aggregate Base: In accordance with Section 26 of Caltrans Standard Specifications, $\frac{3}{4}$ inch maximum.
- D. Sand: In accordance with Section 19-3.02F of Caltrans Standard Specifications.

2.3 SELECT BACKFILL

- E. Select backfill material shall be gravel, free of clay or organic matter and shall conform to the following gradation:

Sieve Size	Percentage Passing
1 inch	100
$\frac{3}{4}$ inch	90 – 100
No. 4	35 – 60
No. 200	2 - 9

- F. For gas pipe and fuel piping select backfill shall be clean, graded building sand conforming to the following gradation:

Sieve Size	Percentage Passing
No. 4	100
No. 200	0 -5

2.4 WARNING TAPE

- A. Polyethylene plastic and metallic core or metallic-faced, acid- and alkali-resistant, polyethylene plastic warning tape manufactured specifically for warning and identification of buried utility lines. Provide tape on rolls, 3 inch minimum width, color coded as specified below for the intended utility with warning and identification imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION, BURIED (intended service) LINE BELOW" or similar wording. Color and printing shall be permanent, unaffected by moisture or soil.
1. Warning Tape Color Codes
 - a. Red: Electric
 - b. Yellow: Gas, Oil; Dangerous Materials
 - c. Orange: Telephone and Other Communications
 - d. Blue: Water Systems
 - e. Green: Sewer Systems
 - f. White: Steam Systems
 - g. Gray: Compressed Air
 2. Warning Tape for Metallic Piping: Acid and alkali-resistant polyethylene plastic tape conforming to the width, color, and printing requirements specified above. Minimum thickness of tape shall be 0.003 inch. Tape shall have a minimum strength of 1500 psi lengthwise, and 1250 psi crosswise, with a maximum 350 percent elongation.
 3. Detectable Warning Tape for Non-Metallic Piping: Polyethylene plastic tape conforming to the width, color, and printing requirements specified above. Minimum thickness of the tape shall be 0.004 inch. Tape shall have a minimum strength of 1500 psi lengthwise and 1250 psi crosswise. Tape shall be manufactured with integral wires, foil backing, or other means of enabling detection by a metal detector when tape is buried up to 3 feet deep. Encase metallic element of the tape in a protective jacket or provide with other means of corrosion protection.

2.5 DETECTION WIRE FOR NON-METALLIC PIPING

- A. Detection wire shall be insulated single strand, solid copper with a minimum of 12 AWG.

2.6 SUBSEQUENT BACKFILL

- A. Conform to on-site or imported structural backfill in Section 31 20 00, Earth Moving.

2.7 CONTROLLED DENSITY FILL (CDF) (in trenches)

- A. Provide non-structural CDF, from bottom of trench to finish subgrade of subbase or base material, that can be excavated by hand and produce unconfined compressive 28-day strengths from 50-psi to a maximum of 150-psi. Provide aggregate no larger than 3/8 inch top size. The 3/8 inch aggregate shall not comprise more than 30% of the total aggregate content.
- B. Cement: Conform to the standards as set forth in ASTM C150, Type II Cement.
- C. Fly Ash: Conform to the standards as set forth in ASTM C618, for Class F pozzolan. Do not inhibit the entrainment of air with the fly ash.
- D. Air Entraining Agent: Conform to the standards as set forth in ASTM C260.
- E. Aggregates need not meet the standards as set forth in ASTM C33. Any aggregate, producing performances characteristics described herein will be accepted for consideration. The amount of material passing a #200 sieve shall not exceed 12% and no plastic fines shall be present.
- F. Provide CDF that is a mixture of cement, Class F pozzolan, aggregate, air entraining agent and water. CDF shall be batched by a ready mixed concrete plant and delivered to the job site by means of transit mixing trucks.
- G. The Contractor shall determine the actual mix proportions of the controlled density fill to meet job site conditions, minimum and maximum strengths, and unit weight. Entrained air content shall be a minimum of 4.0%. The actual entrained air content shall be established for each job with the materials and aggregates to be used to meet the placing and unit weight requirements. Entrained air content may be as high as 20% for fluidity requirements.
- H. Mix design shall meet the Geotechnical Engineer's approval.

2.8 GEOSYNTHETICS

- A. Filter Fabric:
 - 1. Filter Fabric: Section 96-1.02 of Caltrans Standard Specifications.
 - 2. Mirafi 140N, Mirafi Inc., or approved equal.

PART 3 – EXECUTION

3.1 GENERAL

- A. Protect existing trees to remain. No grading is permitted under the drip line of protected trees.
- B. Excavations for appurtenant structures, such as, but not limited to, manholes, transition structures, junction structure, vaults, valve boxes, catch basins, thrust blocks, and boring pits, shall be deemed to be in the category of trench excavation.
- C. Unless otherwise indicated in the Plans, all excavation for pipelines shall be open cut.
- D. Prior to commencement of work, become thoroughly familiar with site conditions.
- E. In the event discrepancies are found, immediately notify the District in writing, indicating the nature and extent of differing conditions.
- F. Backfill excavations as promptly as work permits.
- G. Do not place engineered fill or backfill until rubbish and deleterious materials have been removed and areas have been approved by the District.
- H. Place acceptable soil material in layers to required subgrade elevations, for each area classification listed below.
- I. In excavations, use satisfactory excavated or borrow material.
- J. Under grassed areas, use satisfactory excavated or borrow material.

3.2 SITE PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, which are to remain, from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Protect existing storm drainage system from silt and debris resulting from construction activities. If contamination occurs, remove contamination at no cost to the District.

3.3 EXISTING UTILITIES

- A. Identify the location of existing utilities.
 - 1. Prior to trenching, the Contractor shall excavate at locations specifically indicated on the Plans, if any, and where new lines cross other utilities of

uncertain depth and determine the elevation of the utility in question to ensure that the new line will clear the potential obstruction.

2. The Contractor shall contact Underground Service Alert (USA) at 1-800-227-2600 for assistance in locating existing utilities.
 3. If, after the excavation, a crossing utility does present an obstruction, then the line and grade of the new line will be adjusted as directed by the District to clear the utility.
- B. Protect all existing utilities to remain in operation.
- C. Movement of construction machinery and equipment over existing pipes and utilities during construction shall be at Contractor's risk.
- D. Excavation made with power-driven equipment is not permitted within 2 feet of any known utility or subsurface structure.
1. Use hand or light equipment for excavating immediately adjacent to known utilities or for excavations exposing a utility or buried structure.
 2. Start hand or light equipment excavation on each side of the indicated obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured.
 3. Support uncovered lines or other existing work affected by excavation until approval for backfill is obtained.
 4. Report damage of utility line or subsurface structures immediately to the District.
- E. Backfill trenches resulting from utility removal in lifts of 8 inches maximum.

3.4 TRENCH EXCAVATION

- A. General
1. Excavation shall include removal of all water and materials that interfere with construction. The Contractor shall remove any water which may be encountered in the trench by pumping or other methods during the pipe laying, bedding and backfill operations. Material shall be sufficiently dry to permit approved jointing.
 2. Excavation shall include the construction and maintenance of bridges required for vehicular and pedestrian traffic, support for adjoining utilities.
 3. The Contractor shall be responsible to safely direct vehicular and pedestrian traffic through or around his/her work area at all times.
 4. The Contractor shall relocate, reconstruct, replace or repair, at his/her own expense, all improvements which are in the line of construction or which may be damaged, removed, disrupted or otherwise disturbed by the Contractor.

- B. Existing Paving and Concrete:
 - 1. Existing pavement over trench shall be sawcut, removed, and hauled away from the job. Existing pavement shall be neatly sawcut along the limits of excavations.
 - 2. Existing concrete over the trench shall be sawcut to a full depth in straight lines, at a minimum distance of 12 inches beyond the edge of the trench, either parallel to the curb or a right angles to the alignment of the sidewalk.
 - 3. Boards or other suitable material shall be placed under equipment outrigging to prevent damage to paved surfaces.

- C. Trench Width:
 - 1. The maximum allowable trench widths at the top of the all pipe materials outside diameter of barrel pipe plus 18 inches. shall be as follows:
 - a. The maximum trench width shall be inclusive of all shoring.
 - b. If the maximum trench width is exceeded, the State's representative may direct the Contractor to encase or cradle the pipe in concrete at no additional charge.
 - 2. For pipes 3 inch diameter and larger, the free working space on each side of the pipe barrel shall not be less than 6 inches.

- D. Excavation Width at Springline of Pipe:
 - 1. Up to a nominal pipe diameter of 24 inches: Minimum of twice the outside pipe diameter, or as otherwise allowed Nominal pipe diameter of
 - 2. 30 inches through 36 inches: Minimum of the outside pipe diameter plus 2 feet, or as otherwise allowed
 - 3. Nominal pipe diameter of 42 inches through 60 inches: Minimum of the outside pipe diameter plus 3 feet, or as otherwise allowed

- E. Open Trench:
 - 1. The maximum length of open trench shall be 300 feet or the distance necessary to accommodate the amount of pipe installed in a single day, whichever is greater. No trench shall be left open at the end of the day.
 - 2. Provisions for trench crossings and free access shall be made at all street crossings, driveways, water gate valves, and fire hydrants.
 - 3. Excavate by hand or machine. For gravity systems begin excavation at the outlet end and proceed upstream. Excavate sides of the trench parallel and equal distant from the centerline of the pipe. Hand trim excavation. Remove loose matter.
 - 4. Excavation Depth for Bedding: Minimum of 6 inches below bottom of pipe or as otherwise allowed, except that bedding is not required for nominal pipe diameters of 2 inches or less.
 - 5. Over-Excavations: Backfill trenches that have been excavated below bedding design subgrade, with approved bedding material.
 - 6. Where forming is required, excavate only as much material as necessary to permit placing and removal of forms.

7. Grade bottom of trench to provide uniform thickness of bedding material and to provide uniform bearing and support for pipe along entire length. Remove stones to avoid point bearing.
- F. Excavated Material:
1. All excavated material not required for backfill shall be immediately removed and properly disposed of in a legal manner by the Contractor.
 2. Material excavated in streets and roadways shall be laid alongside the trench no closer than 2 feet from the trench edge and kept trimmed to minimize inconvenience to public traffic.
 3. Provisions shall be made whereby all storm and wastewater can flow uninterrupted in gutters or drainage channels.

3.5 CONTROL OF WATER AND DEWATERING

- A. Be solely responsible for dewatering trenches and excavations and subsequent control of ground and surface water. Provide and maintain such pumps or other equipment as may be necessary to control ground water and seepage to the satisfaction of the Engineer and the District until backfilling is completed.
- B. Dewater during backfilling operation so that groundwater is maintained a least one foot below level of compaction effort.
- C. Obtain the Engineer's approval for proposed control of water and dewatering methods.
- D. Reroute surface water runoff away from open trenches and excavations. Do not allow water to accumulate in trenches and excavations.
- E. Maintain dewatering system in place until dewatering is no longer required.

3.6 BRACING AND SHORING

- A. Conform to California and Federal OSHA requirements.
- B. Place and maintain such bracing and shoring as may be required to support the sides of the excavations for the proper protection of workmen; to facilitate the work; to prevent damage to the pipes and appurtenances being constructed; and to prevent damage to adjacent structures or facilities. Remove all bracing and shoring upon completion of the work.
- C. Be solely responsible for all bracing and shoring and, if requested by the District, submit details and calculations to the District. The District may forward the submittal to the Consulting Engineer and/or the California Division of Industrial Safety for their review. The Contractor's submittal shall include the basic design, assumed soils conditions and estimation of forces to be resisted, together with plans and specifications of the materials and methods to be used,

and shall be prepared by a civil engineer or structural engineer registered in California. No excavations in trench section or around structures shall precede a response to the submittal by the District.

- D. Be solely responsible for installing and extracting the sheathing in a manner which will not disturb the line, grade, or backfill compaction or operation of the utility being installed or adjacent utilities and facilities.

3.7 PIPE BEDDING

- A. Obtain approval of bedding material from the Engineer.
- B. Accurately shape bedding material to the line and grade called for on the Plans. Carefully place and compact bedding material to the elevation of the bottom of the pipe in layers not exceeding 8 inches in loose thickness. Compact bedding material at optimum water content to 90% relative compaction unless specified otherwise on the Plans or by the Engineer. Compact by pneumatic tampers or other mechanical means approved by the Engineer. Jetting or ponding of bedding material will not be permitted.
- C. Stabilization of Trench Bottom: When the trench bottom is unstable due to wet or spongy foundation, trench bottom shall be stabilized with gravel or crushed rock. The State's inspector will determine the suitability of the trench bottom and the amount of gravel or crushed rock needed to stabilize a soft foundation. Soft material shall be removed and replaced with gravel or crushed rock as necessary.
- D. Placement of Bedding Material: The trench bottom shall be cleaned to remove all loose native material prior to placing select backfill material. Sufficient select backfill material shall be placed in trench and tamped to bring trench bottom up to grade of the bottom of pipe. The relative compaction of tamped material shall be not less than 90 percent. It is the intention of these requirements to provide uniform bearing under the full length of pipe to a minimum width of 60 percent of the external diameter.

3.8 BACKFILLING

- A. Initial Backfill:
 - 1. Obtain approval of backfill material from Engineer.
 - 2. Bring initial backfill up simultaneously on both sides of the pipe, so as to prevent any displacement of the pipe from its true alignment. Carefully place and compact initial backfill material to an elevation of 12 inches above the top of the pipe in layers not exceeding 8 inches in loose thickness. Compact bedding material at optimum water content to 90% relative compaction unless specified otherwise on the Plans or by the

Engineer. Compact by pneumatic tampers or other mechanical means approved by the Engineer. Jetting or ponding of initial backfill material will not be permitted.

- B. Pipe Detection: In trenches containing pressurized plastic pipes, tracer wire shall be placed directly above the pipe and shall be connected to all valves, existing exposed tracer wires, and other appurtenances as appropriate.
- C. Subsequent Backfill:
 - 1. Above the level of initial backfill, the trench shall be backfilled with non-expansive native material from trench excavation or with imported select backfill material (Contractor's option). Subsequent backfill shall be free of vegetable matter, stones or lumps exceeding 3 inches in greatest dimension, and other unsatisfactory material.
 - 2. Bring subsequent backfill to subgrade or finish grade as indicated. Carefully place and compact subsequent backfill material to the proper elevation in layers not exceeding 8 inches in loose thickness. Compact bedding material at optimum water content to 90% relative compaction, except that the upper 36 inches in areas subject to vehicular traffic shall be compacted to at least 95% relative compaction, unless specified otherwise on the Plans or by the Engineer. Compact by pneumatic tampers or other mechanical means approved by the Engineer. Jetting or ponding of subsequent backfill material will not be permitted.
- D. Do not use compaction equipment or methods that produce horizontal or vertical earth pressures that may cause excessive pipe displacement or damage the pipe. Jetting of trench backfill is not permitted.
- E. Utility backfill shall be inspected and tested by the Geotechnical Engineer during placement. Cooperate with the Geotechnical Engineer and provide working space for such tests in operations. Backfill not compacted in accordance with these specifications shall be re-compacted or removed as necessary and replaced to meet the specified requirements, to the satisfaction of the Geotechnical Engineer and the District prior to proceeding with the Project.
- F. Compaction testing shall be in accordance with California Test Method ASTM D1556 or D1557.

3.9 CLEANUP

- G. Upon completion of utility earthwork all lines, manholes catch basins, inlets, water meter boxes and other structures shall be thoroughly cleaned of dirt, rubbish, debris and obstructions of any kind to the satisfaction of the District.

END OF SECTION 31 21 00

SECTION 32 31 00 CHAIN LINK FENCING

PART 1 - GENERAL

1.1 SCOPE

Furnish and install all labor, material, equipment, and services required to perform such work including, but not limited to, work as shown on the drawings and the following:

1. *Installation of new chain link fence.*
2. *Installation of new chain link gates.*

1.2 SUBMITTALS

- A. Contractor shall submit two complete sets of product data and materials order confirmation within 10 days after award of bid.

1.3 STANDARD SPECIFICATIONS

- A. Section 80-3 of the DTSS for materials and installation shall apply to this Section unless noted otherwise and except for payment and measurement.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Fabric: Chain link, 9-gauge with a uniform square mesh measuring approximately 2 inches between its parallel sides, woven galvanized wire with a minimum of 1.20 oz. per square foot. Black, fusion bonded, vinyl clad (Class 2B).
- B. Posts: Intermediate posts shall be Sch. 40 steel pipe, 2-3/8 inches outside diameter. Terminal posts shall be 2-7/8 inches outside diameter. Post to be galvanized.
- C. Top Rail, Bottom Rail, Mid Rail, and/or Tension Bar: The fence shall have a continuous top, mid, and bottom rail for its full length of galvanized steel 1-5/8 inches outside diameter tubing, weighing 1.73 pounds per foot; and a bottom 6-gauge tension wire. Tension Bar to be 6-gauge. All shall be galvanized with black, fusion bonded, vinyl clad (Class 2B).
- D. Truss Braces: Truss braces and truss rods with turnbuckle attachments shall be installed between terminal posts and each adjacent intermediate post; sizes and

specific locations as engineered by the fabricator and approved on the shop drawing. All shall be galvanized.

- E. Fittings: All fixed component parts, such as tie wire, hog rings, post tops, bands, connections and rail ends, shall be galvanized. Post tops shall be simple can-type without ornamentation.
- F. Concrete Backfill: For all posts, shall be one part Portland Cement, three parts clean, sharp sand and five parts gravel or crushed rock.
- G. Tie Wires: Secure fabric with 9 gauge aluminum ties to intermediate posts at 1'-2" on center spacing and to rails at 2'-0" on center spacing. Secure fabric to tension wire with galvanized hog rings spaced 1'-0" on center.
- H. Chain Link Fence Gates: Shall be per plans, fabric to match fence.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Fabric: Shall be installed on the park side of the posts; tops and bottom selvage knuckled and attached to posts with 9-gauge hog rings spaced no further than twelve inches apart.
- B. Tension Wire: Shall be tied to the fabric near the bottom at 24 inch intervals with galvanized hog rings.
- C. Top and Bottom Rail: Shall pass through openings provided in the post tops and each length shall be coupled with a sleeve coupling, or by a 3 inch long swaged end. Fabric shall be attached to the top rail by means of double-wrap tie wires spaced at intervals of approximately 2'-0".
- D. Posts: To be installed integral with mow band, where occurs, per drawings.

PART 4 - MEASUREMENT AND PAYMENT

- 4.1 All work under this section shall be included in the lump sum price bid for Chain Link Fencing and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in Chain Link Fencing, and related incidental work.

END OF SECTION 32 31 00

SECTION 32 13 13 SITE CONCRETE

PART 1 - GENERAL

1.1 SCOPE

- A. Furnish and install all concrete as shown and specified. This work includes, but is not necessarily limited to concrete pavement, mowbands, footings, forms, reinforcing, and miscellaneous items.

1.2 STANDARDS

- A. Unless otherwise shown or specified, all materials and methods shall conform to the appropriate current sections of:
 - 1. The State of California, Department of Transportation Standard Specifications (DTSS) sections 52, 73 and 90 except for measurement and payment requirements.
 - 2. Applicable ASTM Specifications as they reasonably apply to this work, except for measurement and payment requirements.
 - 3. American Concrete Institute (ACI), current standards.
 - 4. Sacramento County Standard Specifications, current standards.

1.3 TOLERANCES

- A. Tolerances for subgrade, subbase and finished grade shall be as specified by DTSS except that Contractor shall deliver the full aggregate base and concrete thickness shown. No combination of high and low tolerances that compromise the section will be permitted.
- B. Concrete Final Finishes: The Contractor shall demonstrate to the satisfaction of the District's Representative that he, or his subcontractor, possesses sufficient skills and experience to perform the work. Photographs and/or site visits of past work may be required to supply this information. A 6' x 6' sample of the concrete shall be poured and finished at the site for District's Representative's review of each of the finishes prior to commencing concrete pouring. Once the samples have been reviewed, the Contractor shall meet or exceed that quality of finish in all subsequent work. Contractor shall be responsible for removal of the samples at the completion of the work.
- C. Submittals: The following shall be submitted by the Contractor to the Landscape Architect in accordance with the applicable portions of the referenced specifications:
 - 1. The proposed mix design, giving the brand of cement, type, gradations and source of aggregates, water/cement ratio, mix proportions, and unit weight.

2. Manufacturer's literature for admixtures, embedded items, liquid membrane-form curing compound and non-shrink grout.
3. Certification that materials are in compliance with specification requirements.
4. Method of transporting and placing concrete.

1.4 JOB CONDITIONS

- A. Weather Limitations: Construct concrete surface course only when atmospheric temperature is above 40 degrees F., when the underlying base is dry, and when weather is not rainy.
- B. Grade Control: Establish and maintain the required lines and grades, including cross-slope during construction operations. All concrete shall slope to drain with no ponding of water.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Forms and Reinforcing: Per section 52.
- B. Concrete: All pavement and mowbands shall conform to Section 73 of the DTSS "Minor Concrete". All other concrete structures shall conform to Section 90 of the DTSS "Minor Concrete".
 1. Cement: Type II modified conforming to ASTM-C-150-02a.
 2. Aggregate: Shall not be less than 3/8" or more than 1 inch in size.
 3. Compression strength at 28 days to be a minimum 3,000 p.s.i.
- C. Expansion Joint Filler: Fiber Expansion Joint Filler by W.R. Meadows, conforming to ASTM D 1751.
- D. Cleaning Agents: As required.
- E. Aggregate Base: Class II per (DTSS).

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clear area to be paved of all debris and organic material. Recompact and regrade as necessary prior to placement of concrete. Verify that the subgrade and/or aggregate base is properly compacted and at suitable grade.
- B. Before beginning paving work and during construction, take all steps necessary for protection of existing improvements. As the concrete is being placed,

extreme care shall be taken not to discolor or damage any improvements. If damage occurs, repair same, and if satisfactory repair cannot be made, remove and replace the section as directed.

- C. Formwork and Reinforcement:
 - 1. Assure that excavations and formwork are completed.
 - 2. Check that reinforcement is secured in place.
 - 3. Verify that expansion joint material, anchors, and other embedded items are secured in position.

3.2 INSTALLATION

- A. Finishes
 - 1. Concrete Pavement: Shall receive medium sandblast. Provide a uniformly textured medium sandblast finish to expose the sand particles in the mix. Sample finish shall be reviewed prior to pouring the concrete.
 - 2. Mowband: Shall receive trowel finish. Smooth, parallel to longest surface direction.
 - 3. Sloped Pavement in Dog Park: Shall receive heavy broom finish. Broom stroke direction parallel to shortest surface direction.

- 3.3 CLEAN UP: Upon completion of the work under this section, remove immediately all surplus materials, rubbish, and equipment associated with or used in the performance of this work.

PART 4 - MEASUREMENT AND PAYMENT

- 4.1 The contract unit bid price for Concrete Pavement shall include full compensation for furnishing all labor, materials tools, equipment, and incidentals, including aggregate base installed under concrete pavement, and for doing all work involved in Concrete Pavement and related incidental work.
- 4.2 The contract unit bid price for Mowband shall include full compensation for furnishing all labor, materials tools, equipment, and incidentals, and for doing all work involved in Mowband and related incidental work.
- 4.3 Full compensation for Footings and incidentals shall be considered included in the contact price paid for Footings and no separate payment will be made therefore.

END OF SECTION 32 13 13

SECTION 32 15 40 DECOMPOSED GRANITE PAVING

PART 1 - GENERAL

1.1 SCOPE

- A. Furnish and install all decomposed granite paving as shown and specified.

1.2 QUALITY CONTROL

- A. Standards: Unless otherwise shown or specified, all materials and methods shall conform to the appropriate current sections of:
 - 1. The State of California, Department of Transportation Standard Specifications (DTSS) Section 20-5.
 - 2. Applicable ASTM Specifications as they reasonably apply to this work.
- B. Tolerances: Tolerances for subgrade, subbase, and finish grade shall be as specified by DTSS except that Contractor shall deliver the full decomposed granite thickness shown. No combination of high and low tolerances that compromise the section will be permitted.

1.3 SUBMITTALS

- A. Soil Sterilant: Submit written recommendation from a State of California appropriately licensed individual along with complete product data from proposed manufacturer, for review by District Inspector and/or District's appropriately licensed individual.
- B. Decomposed Granite: A one-quart sample with supplier and source clearly indicated of decomposed granite to be used shall be submitted to the Engineer for approval prior to delivery to the site.
- C. Mixing Facilities: Method or supplier source for paving product shall be submitted to the Engineer with sufficient notice so inspection of batching and mixing operations can be made.
- D. Stabilizer: Submit product data.
- E. Reviews: Contractor shall stake and layout all paving areas for review by the Engineer prior to excavation.
- F. Samples: The Contractor shall demonstrate to the satisfaction of the Engineer that he or his subcontractor possesses sufficient skills and experience to perform the work in all aspects required. A five-square-foot sample of decomposed granite paving shall be installed at the site for the Engineer's review and approval. The Contractor shall meet or exceed that quality of work in

all subsequent work. Contractor shall be responsible for the removal of the sample at the completion of work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Soil Sterilant: Shall be a commercially available herbicide material such as "Trifluralin HF", "Treflan", or approved equal, and as recommended for this project by a State of California appropriately licensed individual. The licensed individual shall review the type of construction, soils, base, adjacent plantings, time and season of application, and other project requirements; verify compatibility; and recommend procedures for proper application. Contractor shall be responsible for all overspray, spreading, or runoff of material into adjacent areas. Products listed above are for Contractor's general reference only as these products may not be suitable for all conditions at the site.
- B. Decomposed Granite: Decomposed granite, hereafter referred to as "DG", shall be a material with a 3/8" minus gradation, per the following specifications:

<u>Sieve Size</u>	<u>Percent Passing</u>
3/8"	100%
No. 4	85% - 95%
No. 8	70% - 80%
No. 16	50% - 60%
No. 30	40% - 50%
No. 50	25% - 35%
No. 100	15% - 25%
No. 20	10% - 20%

The yellow-brown color of decomposed granite is a requirement for this material.

PART 3 - MIXES

3.1 INSTALLATION

- A. Soil Sterilant: Shall be applied to the subgrade soil of areas to be paved prior to paving operations; uniformly applied per manufacturer's recommendations; minimum rate of 2.5 to 3.0 lbs./1000 square feet and watered with a minimum of 3 gallons/100 square feet. Contractor shall take all precautions necessary to avoid spray onto or runoff into planting areas, play areas, or other surfaces. District inspector shall be onsite to verify rate and application of material.
- B. Immediately prior to placing the decomposed granite, the subgrade shall be moistened. The decomposed granite shall be deposited in such a manner as to

minimize the necessity for spotting, picking up, or otherwise shifting the decomposed granite. The decomposed granite shall be leveled by raking and compacted by use of a light roller.

- C. Fill in any low spots or cracks with additional decomposed granite.

3.2 GRADES

- A. The finish grades of the decomposed granite paving shall conform to the lines and grades on the drawings and allow for drainage.

3.3 CLEAN-UP

- A. All waste produced as a result of decomposed granite paving construction shall be removed from the site and disposed of legally. All excess decomposed granite shall be removed from planting areas.

PART 4 - MEASUREMENT AND PAYMENT

- 4.1 All work under this section shall be included in the square foot price bid for decomposed granite paving and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in decomposed granite paving, and related incidental work.

END OF SECTION 32 15 40

SECTION 32 32 23 RETAINING WALLS

PART 1 - GENERAL

1.1 SCOPE

- A. Furnish and install modular concrete block retaining wall as shown and specified.

1.2 STANDARDS

- A. Unless otherwise shown or specified, all materials and methods shall conform to:
 - 1. ASTM C90-93 Hollow Load Bearing Masonry Units.
 - 2. ASTM C140-91 Sampling and Testing Concrete Masonry Units.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, installation instructions, anchor details, and general recommendations for wall.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Modular Wall Units
 - 1. Wall units shall be Basalite "Bayfield Block." Retaining wall blocks or equal as produced by a licensed manufacturer.
 - 2. Wall units shall have minimum 28 day compressive strength of 3,000 psi (20.67 MPA) in accordance with ASTM C90.
 - 3. Wall units shall provide a minimum of 110 pounds total weight per square foot of wall face area.
 - 4. Exterior face shall be textured. Color tan.
- B. Wall Cap: Glue to units with an all-weather adhesive as recommended by manufacturer. Color to match Retaining Wall Block.
- C. Pea Gravel: per plans.
- D. Filter Fabric: per plans.
- E. Aggregate Base: per plans.
- F. Drain Pipe: per plans.

PART 3 - EXECUTION

3.1 FOUNDATION SOIL PREPARATION

- A. Foundation soil shall be excavated as dimensional on the plans and compacted to a minimum 90% compaction prior to placement of the base material.

3.2 BASE

- A. Base material shall be placed as shown on construction drawing. Top of base shall be located to allow bottom wall units to be buried to proper depths as per wall heights and specifications.
- B. Base material shall be installed on undisturbed native soils or suitable replacement fills compacted at 90% standard proctor.
- C. Base shall be compacted at 90% standard proctor to provide a level hard surface on which to place the first course of blocks. The base shall be constructed to insure proper wall embedment and the final elevation shown on the plans. Well-graded sand can be used to smooth the top ½ inch on the leveling pad.
- D. Base material shall be 3 inch depth minimum for walls under 4 feet and 6 inch minimum depth for walls over 4 feet.

3.3 UNIT INSTALLATION

- A. The first course of wall units shall be placed on the prepared base with the raised lip facing out and the front edges tight together. The units shall be checked for level and alignment as they are placed.
- B. Insure that units are in full contact with base. Proper care shall be taken to develop straight lines and smooth curves on base course as per wall layout.
- C. All cavities in and around the base row shall be filled with base materials and compacted. Backfill front and back of entire base row to firmly lock in place. Check again for level and alignment. All excess material shall be swept from top of units.
- D. Install next course of wall units on top of base row. Position blocks to be offset 3" from seams of blocks below. Perfect "running bond" is not essential, but a 3" minimum offset is recommended. Check each block for proper alignment and level. Fill all cavities in and around wall units and to a 12" depth behind block with drainage material. Spread backfill in uniform lifts not exceeding 8". Employ methods using lightweight compaction equipment that will not disrupt the stability or batter of the wall. Hand-operated plate compaction equipment shall

be used on the block and within 3' of wall to achieve consolidation. Compact to 90% S.P. in backfill beyond consolidation zone.

- E. Backfill shall be placed, spread and compacted in such a manner that minimizes the development of wrinkles in and/or movement of the geogrid.
- F. Install each subsequent course in like manner. Repeat procedure to the extent of wall height.
- G. Allowable construction tolerance at the wall face is 2 degrees vertically and 1" in 10' horizontally.

PART 4 - MEASUREMENT AND PAYMENT

- 4.1 The contract unit price paid per linear foot for Retaining Wall shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in retaining wall, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions.

END OF SECTION 32 32 23

SECTION 33 30 00 SANITARY SEWER SYSTEM

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Sanitary gravity sewers and force mains up to five feet from any on-site building

1.2 RELATED SECTIONS

- A. Section 31 21 00, Utility Trenching and Backfill

1.3 RELATED DOCUMENTS

A. AASHTO

- 1. M199: Standard Specification for Precast Reinforced Concrete Manhole Sections
- 2. M252: Standard Specification for Corrugated Polyethylene Drainage Pipe
- 3. M294: Standard Specification for Corrugated Polyethylene Pipe, 12 to 60 inch Diameter

B. ASTM

- 1. A615: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
- 2. ASTM A674: Standard Practice for Polyethylene Encasement for Ductile Iron Pipe for Water or Other Liquids
- 3. C143: Standard Test Method for Slump of Hydraulic-Cement Concrete
- 4. C443: Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
- 5. C478: Standard Specification for Circular Precast Reinforced Concrete Manhole Sections
- 6. C923: Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals
- 7. C1173: Standard Specification for Flexible Transition Couplings for Underground Piping Systems
- 8. C1244: Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill
- 9. D2321: Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications
- 10. D3034: Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
- 11. D4101: Standard Specification for Propylene Injection and Extrusion Materials
- 12. F477: Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

13. F679: Standard Specification for Poly(Vinyl Chloride) (PVC) Large Diameter Plastic Gravity Sewer Pipe and Fittings
14. ASTM F1056: Standard Specification for Socket Fusion Tools for Use in Socket Fusion Joining Polyethylene Pipe or Tubing and Fittings
15. F1336: Standard Specification for Poly(Vinyl Chloride) (PVC) Gasket Sewer Fittings

C. AWWA

1. C104: Cement-Mortar Lining for Ductile-Iron Pipe and Fittings
2. C105: Polyethylene Encasement for Ductile-Iron Pipe Systems
3. C110: Ductile-Iron and Gray-Iron Fittings
4. C111: Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
5. C115: Flanged Ductile-Iron Pipe With Ductile-Iron or Gray-Iron Threaded Flanges
6. C116: Protective Fusion-Bonded Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings
7. C150: Thickness design of Ductile Iron Pipe
8. C151: Ductile-Iron Pipe, Centrifugally Cast
9. C153: Ductile-Iron Compact Fittings
10. C219: Bolted, Sleeve-type Couplings for Plain-End Pipe
11. C512: Air Release , Air/Vacuum, and Combination Air Valves for Water and Wastewater Service
12. C600: Installation of Ductile-Iron Water Mains and Their Appurtenances.
13. C606: Grooved and Shouldered Joints
14. C900: Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 60 In. for Water Transmission and Distribution
15. C905: Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 In. Through 48 In. for Water Transmission and Distribution
16. C906: Polyethylene (PE) Pressure Pipe and Fittings, 4 In. Through 65 In. for Waterworks
17. M23: PVC Pipe – Design and Installation
18. M41: Ductile Iron Pipe and Fittings

D. Caltrans Standard Specifications, 2015

1. Section 51, Concrete Structures
2. Section 65, Concrete Pipe
3. Section 75 Miscellaneous Metal
4. Section 90, Concrete

E. Federal Specification

1. SS-S-00210 (GSA-FSS)

1.3 DEFINITIONS

- A. AASHTO: American Association of State Highway and Transportation Officials
- B. ASTM: American Society for Testing Materials
- C. AWWA: American Water Works Association
- D. HDPE: High-density polyethylene
- E. PE: Polyethylene
- F. DIP: Ductile iron pipe
- G. PVC: Polyvinyl Chloride
- H. RCP: Reinforced concrete pipe
- I. NPS: Nominal pipe size

1.4 SUBMITTALS

- A. Product data for the following:
 - 1. Piping materials and fittings
 - 2. Special pipe couplings
 - 3. Joint sealants
 - 4. Cleanout plugs or caps
 - 5. Sewage air relief valves
- B. Shop drawings: Include plans, elevations, details and attachments for the following:
 - 1. Precast concrete manholes, frames and covers
 - 2. Precast concrete clean out boxes and box covers
 - 3. Force main piping access openings
- C. Design Mix Reports and Calculations: For each class of cast in place concrete
- D. Field Test Reports: Indicate test results for compliance with performance.

1.5 DELIVERY AND STORAGE

- 1. Piping: Inspect materials delivered to site for damage; store with minimum of handling. Store materials on site in enclosures or under protective coverings. Store plastic piping and jointing materials and rubber gaskets under cover out of direct sunlight. Do not store materials

directly on the ground. Keep inside of pipes and fittings free of dirt and debris.

2. Metal Items: Check upon arrival; identify and segregate as to types, functions, and sizes. Store off the ground in a manner affording easy accessibility and not causing excessive rusting or coating with grease or other objectionable materials.

1.6 HANDLING

1. Handle pipe, fittings, and other accessories in such manner as to ensure delivery to the trench in sound undamaged condition. When handling lined pipe, take special care not to damage linings of pipe and fittings; if lining is damaged, make satisfactory repairs. Carry, do not drag, pipe to trench.
2. Handle precast concrete pipe, manholes and other precast structures according to manufacturer's written instructions.
3. Protect imported bedding and backfill material from contamination by other materials.

PART 2 - PRODUCTS

2.1 PVC PIPE

- A. Pipe:
 1. 4 inch through 15 inch: ASTM D3034, SDR 26
- B. Bell and spigot joints
- C. Fittings:
 1. 4 inch through 27 inch: ASTM F1336
- D. Joint Gasket: Elastomeric seal, ASTM F477
- E. Special Pipe Coupling: ASTM C1173. Rubber or elastomeric sleeve and band assembly fabricated to match outside diameters of pipes to be joined.

2.2 GRAVITY PIPE CLEANOUTS

- A. Piping: Same as sanitary sewer line if possible
- B. Top Cap: Threaded and of same material as piping if possible
- C. Box Size: As required to provide access and allow easy removal and reinstallation of cap
- D. Box Types:
 1. Non-Traffic Areas: Portland cement concrete box and box cover, light duty

2. Traffic Areas: Portland cement concrete box and box cover or steel or cast iron cover, heavy duty, both box and cover to be rated for AASHTO H20 loading
- E. Box Cover Markings: "SANITARY SEWER" unless otherwise specified
- F. Available Manufacturers: Subject to compliance with requirements, box manufacturers offering products that may be incorporated into the Project include, but are not limited to the following:
 1. Associated Concrete Products, Inc.
 2. Brooks Products Inc.
 3. Christy Concrete Products, Inc., or approved equal

PART 3 - EXECUTION

3.1 GRAVITY PIPE INSTALLATION

- A. General: Install pipe, fittings, and appurtenances utilizing best practices, manufacturer's instructions, and in accordance with Section 6 and 7 of ASTM D 2321 for plastic pipe, Caltrans Standard Specification Section 65-2.03 for reinforced concrete pipe and chapter 11.3.3 of AWWA M41 for ductile iron pipe.
- B. Pipe Depth and Trench Configuration: Conform to typical trench section(s) indicated.
- C. Excavation, Bedding, Backfill, and Compaction: Section 31 21 00, Utility Trenching and Backfill.
- D. Handling: Carefully handle during loading, hauling, unloading and placing operations to avoid breakage or damage. Use strap type slings for lifting and placing; no chains or hooks will be permitted. Comply with the manufacturer's recommendations.
- E. Laying: Before lowering pipe into the trench, remove all stakes, debris, loose rock and other hard materials from the bottom of the trench. Lay accurately in conformance with lines and grades indicated. Start laying the pipeline at the low end and proceed upstream. Lay bell and spigot pipe with the bell end facing upstream. Lay pipe on a bed prepared by handwork, dug true to grade. Furnish firm bearing for pipe throughout its entire length with bell holes provided at the ends of each pipe length of sufficient size to permit making up the particular type of joint being used. Adjust pipe to line and grade by scraping away or filling and tamping material under the body of the pipe for the entire pipe length and not by blocking or wedging. After final positioning, hold pipe in place in trench with backfill material placed equally on both sides of the pipe at as many locations as required to hold the pipe section in place.

- F. Curved Alignment: When necessary to conform to the alignment specifically indicated, lay pipe on a curved alignment by means of asymmetrical closure of joints or bending of the pipe barrel. Use shorter lengths of pipe than the standard length if necessary to achieve curvature specified. Do not exceed the recommendations of the pipe manufacture for deflections at the joints or pipe bending.
- G. Closure: Close open ends of pipes and appurtenance at the end of each day's work or when work is not in progress.

3.2 INSTALLATION OF POLYVINYL CHLORIDE PIPING

- A. Comply with the recommendations for pipe installation, joint assembly and appurtenance installation in AWWA M23.
- B. Comply with the applicable requirements of AWWA C600 for joint assembly, and with the recommendations of Appendix A to AWWA C111.
- C. Jointing:
 - 1. Provide push-on joints with the elastomeric gaskets specified for this type joint, using either elastomeric-gasket bell-end pipe or elastomeric-gasket couplings.
 - 2. For pipe-to-pipe push-on joint connections, use only pipe with push-on joint ends having factory-made bevel.
 - 3. For push-on joint connections to metal fittings, valves, and other accessories, cut spigot end of pipe off square and re-bevel pipe end to a bevel approximately the same as that on ductile-iron pipe used for the same type of joint.
 - 4. Use an approved lubricant recommended by the pipe manufacturer for push-on joints.
 - 5. Assemble push-on joints for connection to fittings, valves, and other accessories in accordance with the applicable requirements of AWWA C600 for joint assembly.
 - 6. Make compression-type joints/mechanical-joints with the gaskets, glands, bolts, nuts, and internal stiffeners previously specified for this type joint. Cut off spigot end of pipe for compression-type joint or mechanical-joint connections and do not re-bevel.
 - 7. Assemble joints made with sleeve-type mechanical couplings in accordance with the recommendations of the coupling manufacturer using internal stiffeners as previously specified for compression-type joints.
- D. Pipe Anchorage:
 - 1. Provide concrete thrust blocks or restrained joints for pipe anchorage, except where metal harness is indicated on the Plans.

3.3 SPECIAL PIPE COUPLINGS

- A. General: Use where required to join piping and no other appropriate method is specified. Do not use instead of specified joining methods.
- B. Installation: Manufacturers' instructions

3.4 GRAVITY PIPELINE AIR TESTING AND FLUSHING

- A. All new sections of sanitary sewer shall be tested using the following procedures:
 1. Test is conducted between two consecutive manholes, or as directed by the Project Manager.
 2. The test section of the sewer shall be plugged at each end. One of the plugs used at the manhole shall be tapped and equipped for the air inlet connection for filling the line from an air compressor.
 3. All service laterals, stubs, and fittings into the sewer test section shall be properly capped or plugged and carefully braced against the internal pressure to prevent air leakage by slippage and blowout.
 4. Connect air hose to tapped plug selected for the air inlet. Connect the other end of the air hose to the portable air control equipment, which consists of valves and pressure gauges used to control the air entry rate into the sewer test section, and to monitor the air pressure in the pipeline. More specifically, the air control equipment includes a shut-off valve, pressure regulating valve, pressure reduction valve, and a monitoring pressure gauge having a pressure range from 0-5 psi. The gauge shall have minimum divisions of 0.10 psi and an accuracy of 0.40 psi.
 5. Connect another air hose between the air compressor (or other source of compressed air) and the air control equipment. This completes the test equipment set-up. Test operations may commence.
 6. Supply air to the test section slowly, filling the pipeline until a constant pressure of 3.5 psig is maintained. The air pressure must be regulated to prevent the pressure inside the pipe from exceeding 5.0 psig.
 7. When constant pressure of 3.5 psig is reached, throttle the air supply to maintain the internal pressure above 3.0 psig for at least 5 minutes. This time permits the temperature of the entering air to equalize with the temperature of the pipe wall. During this stabilization period, it is advisable to check all capped and plugged fittings with a soap solution to detect any leakage at these connections. If leakage is detected at any cap plug, release the pressure in the line and tighten all leaky caps and plugs. Start the test operation again by supplying air. When it is necessary to bleed off the air to tighten or repair a faulty plug, a new 5-minute interval must be allowed after the pipeline has been refilled.
 8. After the stabilization period, adjust the air pressure to 3.5 psig and shut-off or disconnect the air supply. Observe the gauge until the air pressure reached 3.0 psig. At 3.0 psig, commence timing with a stopwatch until

the pressure drops to 2.5 psig, at which time the stop watch is stopped. The time required, as shown on the stopwatch, for a pressure loss of 0.5 psig is used to compute the air loss.

9. If the time, in minutes and seconds, for the air pressure drop from 3.0 to 2.5 psi is greater than that shown in the following table for the designated pipe size, the section undergoing test shall have passed and shall be presumed to be free of defects. The test may be discontinued at any time.
10. If the time, in minutes and seconds, for the 0.5 psig drop is less than that shown in the following table for the designated pipe size, the section of the pipe shall not have passed the test; therefore, adequate repairs must be made and the line retested.

Requirements for Air Testing

Pipe Size (in inches)	Time	
	Minutes	Seconds
4	2	32
6	3	50
8	5	6
10	6	22
12	7	39
14	8	56
15	9	35
16	10	12
18	11	34
20	12	30

11. For 8 inch and smaller pipe, only: if, during the 5 minute saturation period, pressure drops less than 0.5 psig after the initial pressurization and air is not added, the pipe section undergoing test shall have passed.
12. Multi-pipe sizes: when the sewer line undergoing test is 8 inch or larger diameter pipe and includes 4 inch or 6 inch laterals, the figures in the table for uniform sewer main sizes will not give reliable or accurate criteria for the test. Where multi-pipe sizes are to undergo the air test, the Project Manager can compute the “average” size in inches which is then multiplied by 38.2 seconds. The results will give the minimum time in seconds acceptable for a pressure drop of 0.5 psig for the “averaged” diameter pipe.
13. Adjustment Required for Groundwater:
 - a. An air pressure correction is required when the ground water table is above the sewer line being tested. Under this condition, the air test pressure must be increased .433 psi for each foot the ground water level is above the invert of the pipe.
 - b. Where ground water is encountered or is anticipated to be above the sewer pipe before the air testing will be conducted, the

following procedure shall be implemented at the time the sewer main and manholes are constructed.

1. Install a ½ inch diameter pipe nipple (threaded one or both ends, approximately 10 inch long) through the manhole wall directly on top of one of the sewer pipes entering the manhole with threaded end of nipple extending inside the manhole.
 2. Seal pipe nipple with a threaded ½ inch cap.
 3. Immediately before air testing, determine the ground water level by removing the threaded cap from the nipple, blowing air through the pipe nipple to remove any obstruction, and then connecting a clear plastic tube to the pipe nipple.
 4. Hold plastic tube vertically permitting water to rise in it to the groundwater level.
 5. After water level has stabilized in plastic tube, measure vertical height of water, in feet, above invert of sewer pipe.
 6. Determine air pressure correction, which must be added to the 3.0 psig normal starting pressure of test, by dividing the vertical height in feet by 2.31. The result gives the air pressure correction in pounds per square inch to be added.
- B. After the line has passed the air test, it shall be balled and flushed with water to clean. A metal screen shall be used downstream at the point of connection to the existing system to collect and remove any rock or other debris that is flushed out during cleaning.

3.5 DEFLECTION TESTING

- A. Upon completion of work, perform a deflection test on entire length of installed plastic pipeline. Completed work includes superimposed loads adjacent to and over the pipeline, such as compacted backfill and earthwork, and does not include paving, concrete curbs and gutters, sidewalks, walkways, and landscaping.
- B. Under external loads, deflection of pipe in the installed pipeline shall not exceed 4.5 percent of the average inside diameter of pipe.
- C. Determine whether the allowable deflection has been exceeded by use of a pull-through device or a deflection-measuring device.
- D. Pull-Through Device:
1. Provide a spherical, spheroidal, or elliptical ball, a cylinder, or circular sections fused to a common shaft.
 - a. Circular sections shall be so spaced on the shaft that distance from external faces of front and back sections will equal or exceed diameter of the circular section.

- b. Pull-through device may also be of a design approved by the Uni-Bell Plastic Pipe Association, provided that the device meets the applicable requirements specified in this paragraph, including those for diameter of the device.
- 2. Ball, cylinder, or circular sections shall conform to the following:
 - a. A diameter, or minor diameter as applicable, of 95 percent of the average inside diameter of the pipe; tolerance of plus 0.5 percent will be permitted.
 - b. A homogeneous material throughout, with a density greater than 1.0 as related to water at 39.2 degrees F, and a surface Brinell hardness of not less than 150.
 - c. Center bored and through bolted with a ¼ inch minimum diameter steel shaft having a yield strength of not less than 70,000 pounds per square inch, with eyes or loops at each end for attaching pulling cables.
 - d. Each eye or loop shall be suitably backed with a flange or heavy washer such that a pull exerted on opposite end of shaft will produce compression throughout remote end.
- E. Pull-Through Device:
 - 1. Pass the pull-through device through each run of pipe, either by pulling it through or flushing it through with water.
 - 2. If the device fails to pass freely through a pipe run, replace pipe which has the excessive deflection and completely retest in same manner and under same conditions as specified.
- F. Deflection measuring Device:
 - 1. Sensitive to 1.0 percent of the diameter of the pipe being tested and accurate to 1.0 percent of the indicated dimension.
 - 2. Obtain approval of deflection measuring device prior to use.
- G. Deflection Measuring Device Procedure:
 - 1. Measure deflections through each run of installed pipe.
 - 2. If deflection readings in excess of 4.5 percent of average inside diameter of pipe are obtained, retest pipe by a run from the opposite direction.
 - 3. If retest continues to show a deflection in excess of 4.5 percent of average inside diameter of pipe, remove pipe which has excessive deflections, replace with new pipe, and completely retest in same manner and under same conditions.
- H. Warranty Period Test: Pipe found to have a deflection of greater than 5 percent of average inside diameter when deflection test is performed just prior to end of 1 year warranty period shall be replaced with new pipe and tested as specified for leakage and deflection.

3.6 CLEANING

- A. Thoroughly clean sewer lines and manholes of sediments, dirt, debris, and obstructions of any kind.

3.7 TELEVISION INSPECTION

- A. After completion of the pipe installation, service connections, flushing and cleaning, and prior to placement of pavement, the sewer line shall be televised with a color closed-circuit television with tilt-head camera recorded in DVD format. The original disc and log sheets shall be provided to the District for review.
- B. The following observations from television inspections will be considered defects in the construction of sewer pipelines and will require correction prior to placement of pavement:
 - 1. Low spot (1 inch or greater - mainlines only)
 - 2. Joint separations (3/4 inch or greater opening between pipe sections)
 - 3. Cocked joints present in straight runs or on the wrong side of pipe curves
 - 4. Chips in pipe ends
 - 5. Cracked or damaged pipe
 - 6. Dropped joints
 - 7. Infiltration
 - 8. Debris or other foreign objects
 - 9. Other obvious deficiencies
 - 10. Irregular condition without logical explanation

END OF SECTION

SECTION 33 41 00 - STORM UTILITY DRAINAGE PIPING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Roadway and/or site storm drainage system up to five feet of any on-site building

1.2 RELATED SECTIONS

- A. Section 31 21 00, Utility Trenching and Backfill

1.3 RELATED DOCUMENTS

A. AASHTO

- 1. M199: Precast Reinforced Concrete Manhole Sections
- 2. M252: Corrugated Polyethylene Drainage Pipe
- 3. M294: Corrugated Polyethylene Pipe, 12 to 604 inch Diameter

B. ASTM

- 1. A74: Cast Iron Soil Pipe and Fittings
- 2. A615: Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
- 3. C143: Standard Test Method for Slump of Hydraulic-Cement Concrete
- 4. C443: Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
- 5. C478: Circular Precast Reinforced Concrete Manhole Sections
- 6. C564: Rubber Gaskets for Cast Iron Soil Pipe and Fittings
- 7. C923: Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals
- 8. C1173: Flexible Transition Couplings for Underground Piping Systems
- 9. D1785: Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
- 10. D2321: Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications
- 11. D2564: Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems
- 12. D3034: Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
- 13. D4101: Propylene Injection and Extrusion Materials
- 14. F477: Elastomeric Seals (Gaskets) for Joining Plastic Pipe
- 15. F656: Primers for Use in Solvent Cement Joints of Poly(Vinyl Chloride) (PVC) Plastic Pipe and Fittings
- 16. F679: Poly(Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings
- 17. F1336: Poly(Vinyl Chloride) (PVC) Gasket Sewer Fittings

- C. AWWA
 - 1. C104: Cement-Mortar Lining for Ductile-Iron Pipe and Fittings
 - 2. C105: Polyethylene Encasement for Ductile-Iron Pipe Systems
 - 3. C110: Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In. for Water
 - 4. C111: Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
 - 5. C115: Flanged Ductile-Iron Pipe With Ductile-Iron or Gray-Iron Threaded Flanges
 - 6. C116: Protective Fusion-Bonded Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings
 - 7. C150: Thickness design of Ductile Iron Pipe
 - 8. C151: Ductile-Iron Pipe, Centrifugally Cast
 - 9. C153: Ductile-Iron Compact Fittings
 - 10. C219: Bolted, Sleeve-type Couplings for Plain-End Pipe
 - 11. M41: Ductile Iron Pipe and Fittings

- D. Caltrans Standard Specifications, 2015
 - 1. Section 51, Concrete Structures
 - 2. Section 52, Reinforcement
 - 3. Section 65, Concrete Pipe
 - 4. Section 66, Corrugated Metal Pipe
 - 5. Section 70, Miscellaneous Drainage Facilities
 - 6. Section 72, Slope Protection
 - 7. Section 75, Miscellaneous Metal
 - 8. Section 90, Concrete

- E. Caltrans Standard Plans, 2015
 - 1. Plan D94A: Metal and Plastic Flared End Sections
 - 2. Plan D94B: Concrete Flared End Sections
 - 3. Plan D97A: Corrugated Metal Pipe Coupling Details No. 1, Annular Coupling Band Bar and Strap and Angle Connection
 - 4. Plan D97C: Corrugated Metal Pipe Coupling Details No. 3, Helical and Universal Couplers
 - 5. Plan D97D: Corrugated Metal Pipe Coupling Details No. 4, Hugger Coupling Bands
 - 6. Plan D97E: Corrugated Metal Pipe Coupling Details No. 5, Standard Joint
 - 7. Plan D97F: Corrugated Metal Pipe Coupling Details No. 6, Positive Joint
 - 8. Plan D97G: Corrugated Metal Pipe Coupling Details No. 7, Downdrain
 - 9. Plan D98A: Slotted Corrugated Steel Pipe Drain Details
 - 10. Plan D98B: Slotted Corrugated Steel Pipe Drain Details

1.4 DEFINITIONS

- A. AASHTO: American Association of State Highway and Transportation Officials
- B. ASTM: American Society for Testing Materials

- C. AWWA: American Water Works Association
- D. CMP: Corrugated metal pipe
- E. DIP: Ductile iron pipe
- F. HDPE: High-density polyethylene
- G. NPS: Nominal pipe size
- H. PE: Polyethylene
- I. PVC: Polyvinyl Chloride
- J. RCP: Reinforced concrete pipe

1.5 SUBMITTALS

- A. Product data for the following:
 - 1. Piping materials and fittings
 - 2. Special pipe couplings
 - 3. Polymer-concrete, channel drainage systems (trench drains)
 - 4. Joint sealants
 - 5. Plastic area drains
 - 6. Cleanout plugs or caps
 - 7. Precast concrete catch basins, inlets, curb inlets, junction structures and area drains, including frames and grates
 - 8. Precast clean out boxes and box covers
 - 9. Concrete, metal and plastic flared end sections
- B. Shop drawings: Include plans, elevations, details and attachments for the following:
 - 1. Precast concrete manholes, frames and covers
- C. Design Mix Reports and Calculations: For each class of cast in place concrete
- D. Field Test Reports: Indicate and interpret test results for compliance with performance.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Delivery and Storage
 - 1. Piping: Inspect materials delivered to site for damage; store with minimum of handling. Store materials on site in enclosures or under protective coverings. Store plastic piping and jointing materials and rubber gaskets under cover out of direct sunlight. Do not store materials directly on the ground. Keep inside of pipes and fittings free of dirt and debris.

2. Metal Items: Check upon arrival; identify and segregate as to types, functions, and sizes. Store off the ground in a manner affording easy accessibility and not causing excessive rusting or coating with grease or other objectionable materials.
- B. Handling
1. Handle pipe, fittings, and other accessories in such manner as to ensure delivery to the trench in sound undamaged condition. When handling lined pipe, take special care not to damage linings of pipe and fittings; if lining is damaged, make satisfactory repairs. Carry, do not drag, pipe to trench.
 2. Handle precast concrete pipe, manholes and other precast structures according to manufacturer's written instructions.
 3. Protect imported bedding and backfill material from contamination by other materials.

PART 2 - PRODUCTS

2.1 PVC PIPE, 4 INCH AND LARGER

- A. Pipe
1. 4 inch through 15 inch: ASTM D3034, SDR 35
- B. Bell and spigot joints
- C. Fittings:
1. 4 inch through 27 inch: ASTM F1336
- D. Joint Gasket: Elastomeric seal, ASTM F477
- E. Special Pipe Coupling: ASTM C 1173. Rubber or elastomeric sleeve and band assembly fabricated to match outside diameters of pipes to be joined

2.2 PIPE ANCHORS

- A. General: Location, configuration bearing area, etc. as indicated

2.3 PIPE CLEANOUTS

- A. Piping: Same as storm drain line if possible
- B. Top Plug or Cap: Same material as piping if possible. Plug or cap to be secure but removable, threaded or non-threaded.
- C. Box Size: As required to provide access and allow easy removal and reinstallation of cap
- D. Box Types

1. Non-Traffic Areas: Portland cement concrete box and box cover, light duty
 2. Traffic Areas: Portland cement concrete box and box cover or steel or cast iron cover, heavy duty, both box and cover to be rated for AASHTO H20 loading
- E. Box Cover Markings: "S.D.," unless otherwise specified
- F. Available Manufacturers: Subject to compliance with requirements, box manufacturers offering products that may be incorporated into the Project include, but are not limited to the following:
1. Associated Concrete Products, Inc.
 2. Brooks Products Inc.
 3. OldCastle Precast/Christy Concrete Products, Inc.
- 2.4 CURB INLETS, CATCH BASINS, DROP INLETS, JUNCTION STRUCTURES, AREA DRAINS, ETC.
- A. General: Size, shape, configuration, depth, etc. of structure and frame, grate, or cover shall be as indicated.
- B. Precast Structure: Rate for AASHTO H20 loading in traffic areas.
- C. Steps: ASTM C 478 or AASHTO M199. Manufacture from deformed, ½ inch steel reinforcement rod complying with ASTM A615 and encased in polypropylene complying with ASTM D4101. Include pattern designed to prevent lateral slippage off step. Acceptable manufacturer is Hanson Concrete Products, (Milpitas, CA) (Tel 408-262-1091).
- D. Frames, Grates and Covers: Caltrans Standard Specification Section 75-1.02, 75-1.02.B and 75-2
1. Galvanize steel frames, grates and covers
 2. Grates and covers shall be non-rocking
 3. Rate for AASHTO H20 loading in traffic areas
- E. Trench Drain System:
1. ACO Klassik Drain Model K100
 2. Grate: Type 447D/448D Longitudinal Stainless Steel Grate (ADA)
- 2.5 JOINT SEALANT FOR PRECAST STRUCTURES AND MANHOLES
- A. Mortar: Caltrans Standard Specification Section 51-1.02F
1. Use to seal around pipes at connections to structures and manholes. Also use to seal joints between precast sections of structures and manholes.
- B. Gaskets: Preformed flexible rubber or plastic gasket
1. Rubber Gaskets: ASTM C443

2. Plastic Gaskets: Federal Specification SS-S-00210 (GSA-FSS), Type I, Rope Form; or alternate standard which may exist. Acceptable material is "Ram-Nek," as manufactured by Henry Company, or approved equal.

2.6 PIPE TO STRUCTURE CONNECTOR/SEAL

- A. A flexible pipe to manhole connector shall be used for all pipe penetrations to pre-cast and/or cast-in-place concrete structures.
 1. The seal shall provide a flexible, positive, watertight connection between pipe and concrete wastewater structures. The connector shall assure that a seal is made between (1) the connector and the structure wall, and (2) between the connector and the pipe. The seal between the connector and the manhole wall shall be made by casting the connector integrally with the structure wall during the manufacturing process in such a manner that it will not pull out during coupling. The seal between connector and pipe will be made by way of a stainless steel take down band compressing the gasket against the outside diameter of the pipe.
 2. The connector shall be molded from materials whose physical/chemical properties meet or exceed the physical/chemical resistant properties outlined in ASTM C923. The connector and stainless steel hardware shall meet or exceed the performance requirements proscribed in ASTM C923.
 3. The connector shall be of size specifically designed for the pipe material being used and shall be installed in accordance with recommendations of the manufacturer.
 4. Connectors shall be Z-LOK or G3 connectors manufactured by A-LOK Products Inc. or approved equivalent.

PART 3 - EXECUTION

3.1 PIPE INSTALLATION

- A. General: Install pipe, fittings, and appurtenances utilizing best practices, manufacturer's instructions, and in accordance with Section 6 and 7 of ASTM D 2321 for plastic pipe, Caltrans Standard Specification Section 65-2.03 for reinforced concrete pipe, Caltrans Standard Specification Section 66-1.03 for corrugated metal pipe, and chapter 11.3.3 of AWWA M41 for cast iron and ductile iron pipe.
- B. Pipe Depth and Trench Configuration: Conform to typical trench section(s) indicated.
- C. Excavation, Bedding, Backfill, and Compaction: Section 31 21 00, Utility Trenching and Backfill
- D. Handling: Carefully handle during loading, hauling, unloading and placing operations to avoid breakage or damage. Use strap type slings for lifting and

placing; no chains or hooks will be permitted. Comply with the manufacturer's recommendations.

- E. Laying: Before lowering pipe into the trench, remove all stakes, debris, loose rock and other hard materials from the bottom of the trench. Lay accurately in conformance with lines and grades indicated. Start laying the pipeline at the low end and proceed upstream. Lay bell and spigot pipe with the bell end facing upstream. Lay pipe on a bed prepared by handwork, dug true to grade. Furnish firm bearing for pipe throughout its entire length with bell holes provided at the ends of each pipe length of sufficient size to permit making up the particular type of joint being used. Adjust pipe to line and grade by scraping away or filling and tamping material under the body of the pipe for the entire pipe length and not by blocking or wedging. After final positioning, hold pipe in place in trench with backfill material placed equally on both sides of the pipe at as many locations as required to hold the pipe section in place.
- F. Curved Alignment: When necessary to conform to the alignment specifically indicated, lay pipe on a curved alignment by means of asymmetrical closure of joints or bending of the pipe barrel. Use shorter lengths of pipe than the standard length if necessary to achieve curvature specified. Do not exceed the recommendations of the pipe manufacture for deflections at the joints or pipe bending.
- G. Closure: Close open ends of pipes and appurtenance at the end of each day's work or when work is not in progress.

3.2 SPECIAL PIPE COUPLINGS

- A. General: Use where required to join piping and no other appropriate method is specified. Do not use instead of specified joining methods.
- B. Installation: Manufacturers' instructions

3.3 INSTALLATION OF CURB INLETS, CATCH BASINS, DROP INLETS, JUNCTION STRUCTURES, AREA DRAINS, ETC. AND MANHOLES

- A. Excavation, Bedding, Backfill, and Compaction: Section 31 21 00, Utility Trenching and Backfill
- B. Poured in Place Structures: Install as indicated and Caltrans Standard Specification Section 51.
 - 1. Shape bottoms to convey flows as indicated.

- C. Precast Structures: Install as indicated.
 - 1. Seal all joints and pipe entrances and exits.
 - 2. Place concrete in bottom and shape to convey flows as indicated.

3.4 TRENCH DRAIN INSTALLATION

- A. Install: As indicated and in accordance with the manufacturer's instructions.

3.5 POURED-IN-PLACE CONCRETE

- A. Concrete shall be mixed in accordance with applicable provisions of Section 90 of Caltrans Standard Specifications.
- B. Construction of concrete structures shall conform to applicable provisions of Section 51 of the Caltrans Standards Specifications. Unless otherwise noted herein or in the Plans, exposed surfaces of structures shall be Class 1 surface finish.
- C. Curing shall conform to applicable portions in Section 90 of Caltrans Standard Specifications. No pigment shall be used in curing compounds. All work shall be subject to inspection. No concrete shall be placed until the Project Manager has approved the forms and reinforcement.
- D. Concrete shall not be cropped freely where reinforcing bars will cause segregation, nor shall it be dropped freely more than six feet. Spouts, elephant trunks, or other approved means shall be used to prevent segregation

3.6 PIPELINE FLUSHING

- A. Newly constructed storm drain pipes shall be flushed with water to clean. A metal screen shall be used to collect and remove any rock, silt and other debris that is flushed out during cleaning.

3.7 DEFLECTION TESTING

- A. Upon completion of work, perform a deflection test on entire length of installed plastic pipeline. Completed work includes superimposed loads adjacent to and over the pipeline, such as compacted backfill and earthwork, and does not include paving, concrete curbs and gutters, sidewalks, walkways, and landscaping.
- B. Under external loads, deflection of pipe in the installed pipeline shall not exceed 4.5 percent of the average inside diameter of pipe.
- C. Determine whether the allowable deflection has been exceeded by use of a pull-through device or a deflection-measuring device.

D. Pull-Through Device:

1. Provide a spherical, spheroidal, or elliptical ball, a cylinder, or circular sections fused to a common shaft.
 - a. Circular sections shall be so spaced on the shaft that distance from external faces of front and back sections will equal or exceed diameter of the circular section.
 - b. Pull-through device may also be of a design approved by the Uni-Bell Plastic Pipe Association, provided that the device meets the applicable requirements specified in this paragraph, including those for diameter of the device.
2. Ball, cylinder, or circular sections shall conform to the following:
 - a. A diameter, or minor diameter as applicable, of 95 percent of the average inside diameter of the pipe; tolerance of plus 0.5 percent will be permitted.
 - b. A homogeneous material throughout, with a density greater than 1.0 as related to water at 39.2 degrees F, and a surface Brinell hardness of not less than 150.
 - c. Center bored and through bolted with a ¼ inch minimum diameter steel shaft having a yield strength of not less than 70,000 pounds per square inch, with eyes or loops at each end for attaching pulling cables.
 - d. Each eye or loop shall be suitably backed with a flange or heavy washer such that a pull exerted on opposite end of shaft will produce compression throughout remote end.
3. Pull-Through Device:
 - a. Pass the pull-through device through each run of pipe, either by pulling it through or flushing it through with water.
 - b. If the device fails to pass freely through a pipe run, replace pipe which has the excessive deflection and completely retest in same manner and under same conditions as specified.

E. Deflection measuring Device:

1. Sensitive to 1.0 percent of the diameter of the pipe being tested and accurate to 1.0 percent of the indicated dimension.
2. Obtain approval of deflection measuring device prior to use.

F. Deflection Measuring Device Procedure:

1. Measure deflections through each run of installed pipe.
2. If deflection readings in excess of 4.5 percent of average inside diameter of pipe are obtained, retest pipe by a run from the opposite direction.
3. If retest continues to show a deflection in excess of 4.5 percent of average inside diameter of pipe, remove pipe which has excessive

deflections, replace with new pipe, and completely retest in same manner and under same conditions.

- G. Warranty Period Test: Pipe found to have a deflection of greater than 5 percent of average inside diameter when deflection test is performed just prior to end of 1 year warranty period shall be replaced with new pipe and tested as specified for leakage and deflection.

3.8 CLEANING

- H. Thoroughly clean storm drain lines, manholes, catch basins, field inlets, culverts, and similar structures, of dirt, debris, and obstructions of any kind.

3.9 TELEVISION INSPECTION

- I. After completion of the pipe installation, service connections, flushing and cleaning, and prior to placement of pavement, the drain line shall be televised with a color closed-circuit television with tilt-head camera recorded in DVD format. The original disc and log sheets shall be provided to the District for review.
- J. The following observations from television inspections will be considered defects in the construction of sewer pipelines and will require correction prior to placement of pavement:
 - 1. Low spot (1 inch or greater - mainlines only)
 - 2. Joint separations (3/4 inch or greater opening between pipe sections)
 - 3. Cocked joints present in straight runs or on the wrong side of pipe curves.
 - 4. Chips in pipe ends
 - 5. Cracked or damaged pipe
 - 6. Dropped joints
 - 7. Infiltration
 - 8. Debris or other foreign objects
 - 9. Other obvious deficiencies
 - 10. Irregular condition without logical explanation

END OF SECTION 33 41 00

Appendix A

**Phase I Improvements
Cabana Park**

Note: This submittal list is provided for the contractor's convenience and may not represent ALL submittals required by the contract documents. Contractor is ultimately responsible for identifying and providing ALL required submittals.

- SD** Shop Drawings
- D** Data / List of Materials
- P** Product Catalog Sheets
- Q** Quality Control Submittals
- S** Samples or Mockups
- OM** Operation and Maintenance
- W** Warranty Over One Year
- SP** Spare Parts
- T** Training
- O** Other

REQUIRED SUBMITTAL LIST											
SPEC. SECTION	ITEM REQUIRING A SUBMITTALS	REQUIRED SUBMITTAL TYPE									
		SD	D	P	Q	S	OM	W	SP	T	O
00 00 00	Construction Schedule	X									
00 00 00 1.16	Record Drawings and Specifications	X									
00 72 00 2.2	General Requirements										X
26 56 00 1.2	Site Electrical - (Not In Contract)										
31 20 00 1.6	Earthmoving				X						
31 21 00 1.6	Utility Trenching and Backfill			X							
32 31 00 1.2	Chain Link Fencing		X	X							
32 13 13 1.3.C	Site Concrete		X	X							X
32 15 40 1.3	Decomposed Granite Paving				X						
32 32 23 1.3	Retaining Walls			X							
33 30 00 1.5	Sanitary Sewer System			X							
33 41 00 1.5	Storm Utility Drainage Piping										

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END OF MATRIX