

CITY OF GUADALUPE CALIFORNIA



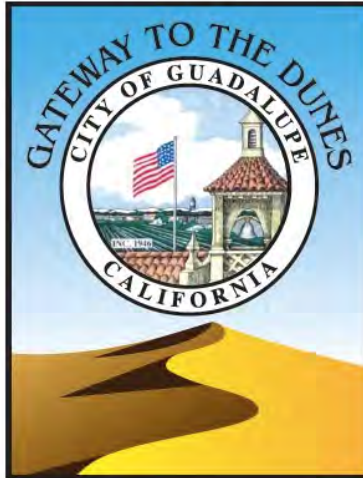
LAS MUJERES PARK (FORMERLY CENTRAL PARK) RENOVATION PROJECT

NOTICE TO CONTRACTORS

AND

SPECIAL PROVISIONS

CITY PROJECT NO. 2025-8-1



LAS MUJERES PARK RENOVATION PROJECT

MANDATORY PRE-BID MEETING 10 AM on Tuesday, September 16, 2025
DEADLINE FOR SUBMITTAL OF QUESTIONS:.....5 PM on Friday, September 26, 2025
BID OPENING DATE: 2 PM on Tuesday, October 14, 2025



Jeff van den Eikhof
City Engineer

08/25/2025
Date

LICENSE REQUIREMENT: Class A License at the time of the award.
TIME OF CONTRACT: 140 working days after the date of notice to proceed
LIQUIDATED DAMAGES:.....\$1,500/day

ENGINEER'S ESTIMATE:.....\$3,500,000

For use in connection with the Standard Specifications Dated 2018 and Standard Plans Dated 2018 of the California Department of Transportation, and the Labor Surcharge and Equipment Rental Rates in effect on the date the work is accomplished.

LAS MUJERES PARK RENOVATION PROJECT

CONTRACT DOCUMENTS, SPECIAL PROVISIONS and TECHNICAL SPECIFICATIONS

Plans and Technical Specifications

Prepared By

**Pacific Coast Land Design, Inc.
461 East Main Street
Ventura, CA 93001
805-644-9697**

Approved By



08/25/2025

**Jeffrey A. van den Eikhof, City Engineer
Registered Civil Engineer, C59920**

INDEX OF DOCUMENTS

NOTICE INVITING BIDS	1
PROPOSAL	3
BID SCHEDULE	4
LIST OF SUBCONTRACTORS.....	9
PUBLIC CONTRACT CODE	10
PUBLIC CONTRACT CODE 10232 STATEMENT	11
NONCOLLUSION DECLARATION.....	12
CONTRACTOR'S LICENSING STATEMENT.....	13
WORKERS' COMPENSATION INSURANCE CERTIFICATE.....	14
BIDDER'S BOND	15
CONTRACTOR'S AND SUBCONTRACTOR'S STATEMENT OF EXPERIENCE AND FINANCIAL CONDITION	16
FAITHFUL PERFORMANCE BOND.....	22
LABOR AND MATERIAL BOND	24
GUARANTEE AND DEFECTIVE MATERIAL BOND.....	26
SAMPLE AGREEMENT	28
SECTION 1 SPECIFICATIONS AND PLANS.....	41
1-1 SPECIFICATIONS AND PLANS.....	41
1-2 DEFINITIONS AND TERMS.	41
SECTION 2 PROPOSAL REQUIREMENTS AND CONDITIONS	44
2-1 CONTENTS OF PROPOSAL FORMS.	44
2-2 EXAMINATION OF PLANS, SPECIFICATIONS, CONTRACT, AND SITE OF WORK.	44
2-3 APPROXIMATE ESTIMATE.	45
2-4 PROPOSAL FORMS.	45
2-5 PREPARATION AND SUBMISSION OF BIDS.	45
2-6 INTERPRETATIONS.	45
2-7 REQUIRED LISTING OF PROPOSED SUBCONTRACTORS.	46
2-8 DESIGN ENGINEERS MAY NOT BID ON CONSTRUCTION CONTRACT.....	46
2-9 REJECTION OF PROPOSALS.	46
2-10 PROPOSAL GUARANTY.....	46
2-11 WITHDRAWAL OF PROPOSALS.....	47
2-12 PUBLIC OPENING OF PROPOSALS.....	47
2-13 RELIEF OF BIDDERS.	47
2-14 DISQUALIFICATION OF BIDDERS.....	47
2-15 MATERIAL GUARANTY.....	47
2-16 ADDENDA AND BULLETINS.....	47
2-17 QUALIFICATIONS OF BIDDERS.	48
2-18 TRADE NAMES AND ALTERNATIVES.....	48
SECTION 3 AWARD & EXECUTION OF CONTRACT	49
3-1 AWARD OF CONTRACT.....	49
3-2 EXECUTION OF CONTRACT.	49
3-3 CONTRACT BONDS.	49
3-4 PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE.	49
3-5 FAILURE TO EXECUTE CONTRACT.....	52
3-6 RETURN OF PROPOSAL GUARANTEES.	52
3-7 BIDDING PROTECT PROCEDURES	52
SECTION 4 PROSECUTION, PROGRESS, AND ACCEPTANCE OF THE WORK	54
4-1 GENERAL	54
4-2 COMMENCEMENT OF WORK.	54
4-3 LIQUIDATED DAMAGES.....	54
4-4 PRE-CONSTRUCTION CONFERENCE.	55
4-5 PROGRESS SCHEDULE	55
4-6 DISPUTES AND CLAIMS	55
SECTION 5 (Not Used)	56

SECTION 6 ADDITIONAL PROVISIONS AND NOTICES REQUIRED BY STATE LAW	57
6-1 GENERAL	57
6-2 WORKING HOURS.....	57
6-3 TRAVEL AND SUBSISTENCE PAY.....	57
6-4 PROTECTION OF WORKERS IN TRENCH EXCAVATIONS.	57
6-5 DAMAGE RESULTING FROM CERTAIN ACTS OF GOD.	57
6-6 CONCRETE FORMS, FALSE WORK, AND SHORING.....	58
6-7 SUBMISSION OF BIDS; AGREEMENT TO ASSIGN.	58
6-8 PUBLIC WORKS CONTRACTS; ASSIGNMENT TO AWARDING BODY.....	58
6-9 REMOVAL, RELOCATION OR PROTECTION OF EXISTING UTILITIES.	58
6-10 SUBSTITUTION OF SECURITIES.	58
6-11 LISTING OF SUBCONTRACTORS.	58
6-12 BIDS FOR TRENCHING AND EXCAVATION WORK.....	59
6-13 STATE WAGE DETERMINATION.....	59
6-14 PAYROLL RECORDS; RETENTION; INSPECTION; NONCOMPLIANCE PENALTIES; RULES AND REGULATIONS.....	59
6-15 APPRENTICES.	60
6-16 WORKERS COMPENSATION.....	60
SECTION 7 MISCELLANEOUS.....	61
7-1 LABOR NON-DISCRIMINATION.....	61
7-2 NIGHT, SATURDAY, SUNDAY, AND HOLIDAY WORK.	61
7-3 (Not Used).....	61
7-4 PARTIAL AND FINAL PAYMENT.....	61
7-5 (Not Used).....	61
7-6 HAZARDOUS WASTE IN EXCAVATION.....	61
7-7 PROJECT APPEARANCE.....	62
7-8 DISPOSAL OF EXCESS MATERIAL.	62
7-9 CLEANUP AND DUST CONTROL.....	62
7-10 GUARANTEE.	62
7-11 PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS.....	62
7-12 UTILITIES.	63
7-13 (Not Used)	63
7-14 SUBMITTALS.	63
SECTION 8 (Not Used)	66
SECTION 9 EXTRA WORK.....	66
SECTION 10 TECHNICAL SPECIFICATIONS.....	73
APPENDIX A GEOTECHNICAL REPORT	A
APPENDIX B ARBORIST REPORT	B

CITY OF GUADALUPE, CA

NOTICE INVITING BIDS

CITY OF GUADALUPE PROJECT NO. 2025-8-1

PROPOSALS FOR THE WORK DESCRIBED AND SHOWN ON THE PLANS ENTITLED:

LAS MUJERES PARK RENOVATION PROJECT

Will be received at the offices of the Building Department, City of Guadalupe, 918 Obispo Street, Guadalupe, California 93434, until **2:00 PM, October 14, 2025**, at which time they will be publicly opened and read at the same address.

GENERAL WORK DESCRIPTION: The work involves the renovation of the Las Mujeres Park (formerly Central Park), including construction of a skate park, half basketball court, bocce ball court, dog park, picnic areas, reconstruction of the existing parking lot, installation of a pre-manufactured restroom, landscaping, and other items as specified in the Contract Documents.

WORK SCHEDULE: Work must be completed within **140** working days from the Notice to Proceed.

CONTRACT DOCUMENTS: Contract documents (Plans, Notice to Contractors, Special Provisions, Proposal, and Sample Contract) or other related information are available for review online at <https://cityofguadalupe.org/>, <https://slocbe.com>, or <https://smvca.org>, and at City Hall, 918 Obispo Street, Guadalupe, California, 93434.

QUESTIONS: Questions must be submitted no later than 5:00 PM on Friday, September 26, 2025, to allow sufficient time for response. All questions shall be submitted by email to jeff@eikhofdesigngroup.org.

MANDATORY PRE-BID MEETING: A mandatory pre-bid meeting will be held at 10 AM on September 16, 2025, at the Las Mujeres Park (Formerly Central Park) parking lot at the east end of 9th Street coming from Highway 1 (Guadalupe Street) near the railroad pedestrian bridge in Guadalupe, CA.

PROPOSALS: Proposals must include all work described in the Contract Documents. Proposals must be made on the proposal forms furnished in the Contract Documents. All other proposal forms will be rejected. Attention to prospective bidders is called to Section 2, "Proposal Requirements and Conditions," within the Contract Documents, for full direction as to bidding and other items.

Notice is given to all bidders that no more than 50% of the work, as defined by the contract price, may be done by subcontractors.

Notice is also hereby given that all Bidders may be required to furnish a sworn statement of their financial responsibility, technical ability, and experience before an award is made to any particular Bidder.

The successful Contractor will be required to obtain a business license from the City and pay related fees.

The right is reserved by the City of Guadalupe to reject any or all Bids, to evaluate the Bids submitted, waive any minor irregularities, and award the contract to the lowest responsible Bidder. The City further reserves the right to waive any informalities or minor irregularities in the Bid.

BONDS: Each proposal must be accompanied by cash, a certified or cashier's check, or bidder's bond of the prescribed form and made payable to the City of Guadalupe for an amount equal to at least ten percent (10%) of the amount bid, such guaranty to be forfeited, should the bidder to whom the contract is awarded fail to furnish the required bonds and to enter into a contract with the City within ten (10) days after awarding of the contract.

The successful contractor will be required to furnish three (3) acceptable surety bonds: one for faithful performance, one for labor and materials, and the other for maintenance following construction. Each bond is to be executed in City of Guadalupe

a sum equal to one hundred percent (100%) of the contract price, except that the maintenance bond shall be for ten percent (10%) of the contract price and shall remain in effect for one year following acceptance of the project for final payment.

LICENSE REQUIREMENTS: In accordance with provisions of California Public Contract Code Section 3300, the City has determined that the **Contractor shall possess a valid Class A license at the time of award.** The Contractor shall be properly licensed at the time the contract is awarded. No contract will be awarded to a Contractor who has not been licensed in accordance with the provisions of Chapter 9 of Division 3 of the Business and Professions Code.

In addition, the following conditions apply:

- No contractor or subcontractor may be listed on a bid proposal for a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1777.1(a)]. Proof of the contractor or subcontractor's current registration to perform public work pursuant to Labor Code section 1725.5 will be required as part of the bid proposal.
- No contractor or subcontractor may be awarded a contract for a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.
- This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

STANDARD SPECIFICATIONS: The Standard Specifications for this project are contained in the 2018 edition, including all supplementary documents of the Caltrans Standard Specifications.

PREVAILING WAGE RATES: Pursuant to Section 1773 of the Labor Code, the general prevailing wage rates in the County of Santa Barbara, in which the work is to be done, have been determined by the Director of the California Department of Industrial Relations in accordance with Section 1770 of the Labor Code. These wages are set forth in the General Prevailing Wage Rates for this project, available from the California Department of Industrial Relations' website at <http://www.dir.ca.gov>.

Future effective general prevailing wage rates, which have been predetermined and are on file with the California Department of Industrial Relations, are referenced but not printed in the general prevailing wage rates.

The Contractor will be required to maintain and distribute certified payroll records in compliance with Section 1776 of the California Labor Code.

RETENTION: Five (5) percent of the invoiced amount shall be retained until 30 calendar days after the Notice of Completion is recorded by the County of Santa Barbara. The Contractor may elect to receive 100 percent of payments due under the Contract Documents from time to time, without retention from any portion of the payment by the City, by depositing securities of equivalent value with the City in accordance with the provisions of Section 22300 of the California Public Contract Code. Such securities, if deposited by the Contractor, shall be valued by the City, whose decision on an evaluation of the securities shall be final. Securities eligible for investment under this provision shall be limited to those listed in Section 22300 and Section 16430 of the California Government Code.

Dated at City of Guadalupe, County of Santa Barbara, California this _____ day of _____, 20____.

By

City Clerk
City of Guadalupe, CA

PROPOSAL
TO
THE CITY OF GUADALUPE
FOR
LAS MUJERES PARK RENOVATION PROJECT
CITY PROJECT NO. 2025-8-1

NAME OF BIDDER _____

BUSINESS P.O. BOX _____

CITY, STATE, ZIP _____

BUSINESS STREET ADDRESS _____

CITY, STATE, ZIP _____

TELEPHONE NO.: _____

FAX NO.: _____

EMAIL ADDRESS: _____

LICENSE NUMBER AND TYPE: _____

DIR NUMBER: _____

The work for which this Proposal is submitted is for construction in accordance with the Special Provisions (including the payment of not less than the State General Prevailing Wage Rates or the Federal minimum wage rates when set forth herein), the Plans described below, including any addenda thereto, the contract annexed hereto, and also in accordance with the Caltrans Standard Specifications dated 2018, and the City of Santa Maria Standard Specifications (adopted by the City of Guadalupe on June 23, 2009, pursuant to Resolution No. 2009-24) insofar as the same may apply, specifications which may be referred to in the Special Provisions or project plans, and the Labor Surcharge And Equipment Rental Rates in effect on the date the work is accomplished.

The Technical Specifications for the work to be done are entitled:

CITY OF GUADALUPE, CALIFORNIA;
LAS MUJERES PARK RENOVATION PROJECT

The Bidder's attention is directed to Section 2, "Proposal Requirements and Conditions," of the Contract Documents.

The undersigned as Bidder declares that he/she has carefully examined the location of the proposed work above described, read and examined the Contract Documents, and Addendum/Addenda (List Addenda Received: ____, ____, ____, ____) therefore, read the Notice to Contractors, the Proposal Requirements, including the Caltrans Standard Specifications, and hereby proposes and agrees, if this Proposal is accepted by the City, to furnish all materials and services required to do all the work required to complete the said construction in accordance with the Contract Documents in the time stated herein, for the unit prices given below:

BID SCHEDULE

ITEM NO.	BID ITEMS	TOTAL QUANTITIES	UNIT	UNIT PRICE	TOTAL COST
1	Mobilization	1	LS		
2	SWPPP and BMPs	1	LS		
3	Traffic Control	1	LS		
4	Demolition	1	LS		
5	Remove Existing Water Line	169	LF		
6	Cap And Abandon Existing Well	1	LS		
7	Existing Trees Protect In Place -Tree Protection Fencing	18	EA		
8	Salvage And Relocate Existing Bus Stop	1	LS		
9	Clearing And Grubbing	40,607	SF		
10	Storm Drain Utilities	1	LS		
11	Detention/Bioretenion Media	1	LS		
12	Rough Grading (Including Export)	1,159	CY		
13	1-1/2" Water Service Line	320	LS		
14	1-1/2" Water Meter and Meter Box	1	LS		
15	1-1/2" Schedule 80 PVC Water Line	325	LF		
16	1-1/2" Domestic Water Service Backflow Preventer and Enclosure	1	EA		
17	1-1/2" Irrigation Water Service Backflow Preventer and Enclosure	1	EA		
18	8" CL 205 DR 14 C900 PVC Water Line	240	LF		
19	8" Ductile Iron Gate Valve and Thrust	2	EA		
20	Ductile Iron Bend with Thrust Block	2	EA		
21	1-1/2" Water Blow Off	1	EA		
22	4" PVC SDR 35 Sewer Lateral	1	LF		
23	Sewer Cleanout	1	EA		
24	Sewer Connection	1	LS		
25	Concrete Paving	8,835	SF		
26	Concrete Header	792	LF		
27	Aluminum Header	542	LF		
28	Concrete Curb Ramp (Includes Detectable Warning Surface)	1	EA		
29	Concrete Curb	225	LF		
30	Decomposed Granite Paving	3,934	SF		
31	Pea Gravel Dog Park Surfacing	54	CY		

ITEM NO.	BID ITEMS	TOTAL QUANTITIES	UNIT	UNIT PRICE	TOTAL COST
32	Recycled Concrete Slope	444	SF		
33	Asphalt Concrete Pavement	3,587	SF		
34	Parking Lot Striping and Signage	1	LS		
35	Bocce Court Surfacing	11	TON		
36	Cast-In-Place Concrete Bocce Sidewall/Header	168	LF		
37	Basketball Court Surfacing and Striping	1,867	SF		
38	PIP Rubberized Play Surfacing	2,662	SF		
39	Orchard Parking Pavers and Grate	4	EA		
40	Concrete Unit Pavers	108	SF		
41	Skatepark Fine Grading	1,800	SF		
42	Skatepark Flatwork	3,900	SF		
43	Skatepark Shotcrete	1,800	SF		
44	Skatepark Walls	250	LF		
45	Skatepark Formwork	950	LF		
46	Skatepark Metals and Rails	550	LF		
47	Bench	13	EA		
48	Trash/Recycling Receptacles	10	EA		
49	Charcoal Ash Receptacle	2	EA		
50	BBQ	4	EA		
51	Picnic Table	4	EA		
52	Gameboard Table	4	EA		
53	Bike Rack	5	EA		
54	Swings	1	LS		
55	Climber	1	EA		
56	Standing Spinner	1	EA		
57	Spring Bouncer	1	EA		
58	Exercise Equipment: 2-Person Leg Press	1	EA		
59	Exercise Equipment: Accessible Chest Press	1	LS		
60	Exercise Equipment-Elliptical	1	LS		
61	Drinking Fountain with Pet Fountain	1	EA		
62	Drinking Fountain with Bottle Filler	1	EA		
63	Removable Bollard	2	EA		
64	Pet Waste Bag Station	2	EA		
65	Basketball Hoop	1	EA		
66	Monument Sign	1	EA		
67	Prop 68 Sign	1	EA		
68	Restroom (Portland Loo)	1	EA		
69	Restroom Foundation	1	LS		
70	Masonry Public Art Wall (H=4'-8")	145	LF		

ITEM NO.	BID ITEMS	TOTAL QUANTITIES	UNIT	UNIT PRICE	TOTAL COST
71	Masonry Public Art Wall at Skatepark (H=5'-6")	145	LF		
72	Skatepark Dune Retaining Wall	138	LF		
73	Black Vinyl Chain Link Dog Park Fence (H=4'-0")	244	LF		
74	Dog Park Fence Gate (H=4'-0")	3	EA		
75	Composite Fence (H=6'-0")	209	LF		
76	Electrical Meter Enclosure	1	LS		
77	Black Vinyl Chain Link Fence (H=6'-0")	167	LF		
78	Black Vinyl Chain Link Fence with Privacy Slats (H=6'-0")	163	LF		
79	New Electrical Meter/Main	1	LS		
80	Light Fixture A	2	EA		
81	Light Fixture A1	1	EA		
82	Light Fixture A2	2	EA		
83	Light Fixture A3	1	EA		
84	Light Fixture B (Bollard Light)	12	EA		
85	Restroom Lockable Disconnect	1	EA		
86	Conduit And Wiring	1	LS		
87	Electrical Pull Box	2	EA		
88	Post-Mounted Weatherproof Duplex Outlet	1	LS		
89	Flush Landscape Receptacle Box with Locking Cover	5	EA		
90	NEMA 3R Junction Box	1	EA		
91	Low Voltage Conduit and Wiring	1	LS		
92	Weatherproof IDF Enclosure	1	EA		
93	Ruggedized Cellular Router	1	EA		
94	Hardened PoE+ Managed Switch	1	EA		
95	Security Cameras	4	EA		
96	Planting Irrigation	1	LS		
97	Root Barrier	439	LF		
98	Planting Area Soil Preparation & Amendments	18,527	SF		
99	Organic Mulch	124	CY		
100	Planting Area Fine Grading	18,527	SF		
101	Shrubs - 1 gallon	743	EA		
102	Shrubs - 5 gallon	147	EA		
103	Shrubs - 15 gallon	33	EA		
104	Trees - 24" box	25	EA		
105	Trees - 15 gallon	9	EA		
106	Bioretention Basin (sod)	709	SF		
107	Turf (sod)	4,430	SF		

ITEM NO.	BID ITEMS	TOTAL QUANTITIES	UNIT	UNIT PRICE	TOTAL COST
108	90 Day Plant Establishment and Maintenance Period	18,527	SF		
TOTAL BASE BID (ITEMS 1 THROUGH 108)					

TOTAL BASE BID IN WORDS:

Total Base Bid Amount shall be shown in both words and figures.

ADD ALTERNATE NO. 1 BID SCHEDULE

ITEM NO.	BID ITEMS	TOTAL QUANTITIES	UNIT	UNIT PRICE	TOTAL COST
A1	Exterior Painting of Historic Jail	700	SF		

TOTAL ADD ALTERNATE NO. 1 BID IN WORDS:

Total Add Alternate No. 1 Bid Amount shall be shown in both words and figures.

The award of the contract, if it be awarded, will be to the lowest responsible bidder whose proposal complies with all the requirements prescribed. Bids will be compared by the Total Mathematical Bid as determined by the Engineer. The Total Mathematical Bid is the summation of all required bid items, excluding bid alternates. Bid items are calculated by multiplying the Engineers Estimate quantities by the unit bid prices. In the case of a discrepancy between the Total Mathematical Bid and the total bid written above, the Total Mathematical Bid shall govern.

The bidder to whom the contract is awarded agrees to enter into a contract with the City of Guadalupe within **fifteen (15) days** after the date of the Notice of Award, and to commence work within **ten (10) working days** after the date of the Notice To Proceed, and to diligently prosecute the work to completion within the Time of Contract shown on the cover of the Project Manual.

The undersigned understands and agrees that the City of Guadalupe will not be responsible for any errors or omissions on the part of the undersigned in preparing and submitting this Proposal.

Signature

Title

Date

LIST OF SUBCONTRACTORS

LAS MUJERES PARK RENOVATION PROJECT

Pursuant to Section 4100 of the Public Contracts Code and section 2-1.10 of the standard specifications, the Bidder is required to furnish the following information for each Subcontractor performing more than 1/2 percent (0.5%) of the total base bid. Do not list alternative subcontractors for the same work. Subcontracting must not total more than fifty percent (50%) of the submitted bid except as allowed in Section 5-1.13A of the standard specifications.

For Streets & Highways projects, subcontractors performing less than ten thousand dollars (\$10,000) worth of work need not be mentioned. Subcontractors must be registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 to be listed.

NOTE: If there are no subcontractors, write "NONE" and submit with bid.

Name Under Which Subcontractor is Licensed	License Number / DIR Number	Address and Phone Number of Office, Mill or Shop	Specific Description of Subcontract	% of Total Base Bid
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

NOTE: This form may be reproduced and attached behind this page to list more subcontractors.

PUBLIC CONTRACT CODE

Public Contract Code Section 10285.1 Statement

In conformance with Public Contract Code Section 10285.1 (Chapter 376, Stats. 1985), the bidder hereby declares under penalty of perjury under the laws of the State of California that the bidder has ____, has not ____ been convicted within the preceding three years of any offenses referred to in that section, including any charge of fraud, bribery, collusion, conspiracy, or any other act in violation of any state or Federal antitrust law in connection with the bidding upon, award of, or performance of, any public works contract, as defined in Public Contract Code Section 1101, with any public entity, as defined in Public Contract Code Section 1100, including the Regents of the University of California or the Trustees of the California State University. The term "bidder" is understood to include any partner, member, officer, director, responsible managing officer, or responsible managing employee thereof, as referred to in Section 10285.1.

Note: The bidder must place a checkmark after "has" or "has not" in one of the blank spaces provided. The above Statement is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Statement. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Public Contract Code Section 10162 Questionnaire

In conformance with Public Contract Code Section 10162, the Bidder shall complete, under penalty of perjury, the following questionnaire:

Has the bidder, any officer of the bidder, or any employee of the bidder who has a proprietary interest in the bidder, ever been disqualified, removed, or otherwise prevented from bidding on, or completing a federal, state, or local government project because of a violation of law or a safety regulation?

Yes _____ No _____

If the answer is yes, explain the circumstances in the following space.

PUBLIC CONTRACT CODE 10232 STATEMENT

In conformance with Public Contract Code Section 10232, the Contractor, hereby states under penalty of perjury, that no more than one final unappealable finding of contempt of court by a federal court has been issued against the Contractor within the immediately preceding two-year period because of the Contractor's failure to comply with an order of a federal court which orders the Contractor to comply with an order of the National Labor Relations Board.

Note: The above Statement and Questionnaire are part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Statement and Questionnaire.

Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

NONCOLLUSION DECLARATION

(Title 23 United States Code Section 112 and Public Contract Code Section 7106)

To the CITY of GUADALUPE

In conformance with Title 23 United States Code Section 112 and Public Contract Code 7106 the bidder declares 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 or 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.

Note: The above Non-collusion Affidavit is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute the signature of this Non-collusion Affidavit.

Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

CONTRACTOR'S LICENSING STATEMENT

I declare under penalty of perjury under the laws of the State of California that the following is true and correct.
Executed in the City of Guadalupe this _____ day of _____, 20____.

The undersigned is licensed in accordance with the laws of the State of California providing for the registration of the Contractors, License No. _____, Expiration Date _____.

Business Name (DBA): _____

Owner/Legal Name: _____

Indicate One: ☐ Sole-proprietor ☐ Partnership ☐ Corporation

List Partners/Corporate Officers:

Name Title

Name Title

Name Title

Name Title

Business Address: _____

City, State, ZIP Code _____

Mailing Address: _____

City, State, ZIP Code _____

Phone Number: _____

Fax Number: _____

Email Address: _____

DIR Number: _____

Signature of Bidder _____

(Print Name and Title of Bidder)

WORKERS' COMPENSATION INSURANCE CERTIFICATE

The Contractor shall execute the following form as required by the California Labor Code, Section 1861:

I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for Workers' Compensation or to undertake self-insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of the work of this Contract.

(Date)

(Contractor)

By: _____
(Signature)

By: _____
(Title)

Attest:

By: _____
(Signature)

By: _____
(Title)

BIDDER'S BOND

We, _____
_____ as Principal, and

as Surety are bound unto the City of Guadalupe, State of California, hereafter referred to as "Obligee", in the penal sum of ten percent (10%) of the total amount of the bid of the Principal submitted to the Obligee for the work described below, for the payment of which sum we bind ourselves, our heirs, executors and administrators, successors or assigns, jointly and severally,

THE CONDITION OF THIS OBLIGATION IS SUCH, THAT:

WHEREAS, the Principal is submitted to the Obligee, for the LAS MUJERES PARK RENOVATION PROJECT

NOW, THEREFORE, if the Principal is awarded the contract and, within the time and manner required under the specifications, after the prescribed forms are presented to him for signature, enters into a written contract, in the prescribed form, in conformance with the bid, and files two bonds with the Obligee, one to guarantee faithful performance of the contract and the other to guarantee payment for labor and materials as provided by law, then this obligation shall be null and void; otherwise, it shall remain in full force.

In the event suit is brought upon this bond by the Obligee and judgment is recovered, the Surety shall pay all costs incurred by the Obligee in such suit, including a reasonable attorney's fee to be fixed by the court.

Dated: _____, 20__.

Principal

Surety
By _____
Attorney-in-fact

CERTIFICATE OF ACKNOWLEDGEMENT

State of California
City/County of _____ SS

On this _____ day of _____ in the year 20__ before me

_____, personally appeared _____,
Attorney-in-fact

personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to this instrument as the attorney-in-fact of _____, and acknowledged to me that he (she) subscribed the name of the said company thereto as surety, and his (her) own name as attorney-in-fact.

(SEAL)

Notary Public

NOTE: At the discretion of the City the low and second low bidders may be required to complete and return the "Contractor's and Subcontractor's Statement Of Experience and Financial Condition" forms provided herein prior to determination regarding bid award.

**CONTRACTOR'S AND SUBCONTRACTOR'S
STATEMENT OF EXPERIENCE AND FINANCIAL CONDITION**

- _____ A Corporation
1. Name: _____
(Name Must Correspond with Contractor's License In Every Detail)
- _____ A Co-Partnership
- _____ An Individual
- _____ Combination
2. Principal Office: _____
(Street and P.O. Box) (City) (State) (Zip Code)
3. Telephone (_____) _____

The Signatory of this questionnaire guarantees the truth and accuracy of all statements and of all answers to interrogatories hereinafter made.

NOTE: When the word "you" or "your" is used herein, it shall mean you, your firm, your corporate officers, partners, principals or proprietors.

4. Names of Corporate Officers, Partners, Principals, Proprietors:

<u>NAME</u>	<u>POSITION</u>	<u>PERCENTAGE OF STOCK</u>

5. List Any Subsidiaries or Affiliated Companies:

<u>EXACT NAME</u>	<u>TYPE OF BUSINESS</u>	<u>OWNERSHIP</u>

6. Name, Address, and Telephone No. of Bank:

Total Line of Credit	How Secured	Interest Rate
\$ _____		_____

7. How much of your line of credit is currently available? \$ _____

8. Name of Loan Officer: _____

(List additional bank(s) on next page, if applicable)

9. Are you licensed as a Contractor to do business in California?

Yes___ No___ License No. _____ Type

Classification (Type) of Specialty Contractor

10. How many years has your organization been in business as a contractor under your present business name and license number? _____ years.

11. How many years' experience in _____ construction work has your organization had?

12. Has your firm or any of its principals ever petitioned for bankruptcy? _____ If answer is "Yes," enter the date(s)

13. Has your firm or any of its principals defaulted so as to cause a loss to surety? If the answer is "Yes," enter the date(s), name and address of surety and details.

14. Show the projects (10 maximum) your organization has completed during the last three years in the following tabulation; be specific as to the nature of the work your firm actually performed.

(Use as many spaces as required to complete your answer)

YEAR COMPLETED	TYPE OF WORK (be specific)	VALUE OF WORK PERFORMED	CITY AND STATE CONTACT PERSON/PHONE

15. Have you been assessed liquidated damages for any project in the past three years?

If yes, explain.

16. Have you been in litigation on a question relating to your performance on a contract during the past three years? ____ If yes, explain.

17. Have you failed to complete a contract? _____. If so, give details:

18. In what other lines of business pertaining to this Statement do you have a financial interest?

19. Name the persons with whom you have been associated in business as partners or joint venture in each of the last five years.

20. What is the construction experience of the principal individuals of your present organization?

Individual's Name	Present Position or Office In Your Organization	Years of Construction Experience	Magnitude and Type of Work

21. List 10 subcontractors with whom you have worked in the last two years:

NAME	ADDRESS	TELEPHONE

NAME	ADDRESS	TELEPHONE

22. List the names of three Architects or Engineers whose jobs you have worked on in the past two years:

Name of Architect Or Engineer	Telephone

23. Please attach a balance sheet and profit and loss statement prepared by a Certified Public Accountant or a Public Accountant.

24. List and explain all contingent liabilities. _____

25. Explain any Stop Notice(s) filed against you in the past three years.

Date	By Whom	How Resolved	Why Filed

List your five major suppliers of equipment, supplies and materials:

NAME	ADDRESS

FAITHFUL PERFORMANCE BOND

WHEREAS, the City Council of the City of Guadalupe, State of California, and _____ (hereinafter designated as the "principal") have entered into an agreement whereby principal agrees to install and complete certain designated public improvements, which said agreement, dated _____, 20____, and identified as LAS MUJERES PARK RENOVATION PROJECT, is hereby referred to and made a part hereof; and

WHEREAS, said principal is required under the terms of said agreement to furnish a bond for the faithful performance of said agreement.

NOW, therefore, we, the principal and _____, as surety, are held and firmly bound unto the City of Guadalupe hereinafter called "City," in the penal sum of _____ Dollars (\$_____) lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, successors, executors, administrators, jointly and severally, firmly by these presents.

The condition of this obligation is such that if the above bounded principal, his or its heirs, executors, administrators, successors, or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions, and provisions in the said agreement and any alteration thereof made as therein provided, on his or their part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless City, its officers, agents, and employees as therein stipulated, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

As a part of the obligation secured hereby and in addition to the face amount specified therefore, there shall be included costs and reasonable expenses and fees, including reasonable attorney's fees, incurred by City in successfully enforcing such obligation, all to be taxed as costs and included in any judgment rendered.

The surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the agreement or to the work to be performed there under or the specifications accompanying the same shall in any manner affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the agreement or to the work or to the specifications.

IN WITNESS WHEREOF, this instrument has been duly executed by principal and surety above named, on _____, 20____.

APPROVED AS TO FORM:

By: _____
City Attorney

ADDRESS OF CONTRACTOR FOR SERVICE OF DOCUMENTS UNDER BOND AND UNDER-TAKING LAW:

Principal (SEAL)

(SEAL)

Signature of Principal Title

ADDRESS OF SURETY FOR SERVICE OF DOCUMENTS UNDER BOND AND UNDERTAKING LAW

(SEAL)

Surety (SEAL)

Signature for Surety Title

LABOR AND MATERIAL BOND

WHEREAS, the City Council of the City of Guadalupe, State of California and _____ (hereinafter designated as "principal") have entered into an agreement whereby principal agrees to install and complete certain designated public improvements, which said agreement, dated _____, 20____, and identified as LAS MUJERES PARK RENOVATION PROJECT, is hereby referred to and made a part hereof; and

WHEREAS, under the terms of said agreement, principal is required before entering upon the performance of the work, to file a good and sufficient payment bond with the City of Guadalupe to secure the claims to which reference is made in Title 15 (commencing with Section 3082) of Part 4 of Division 3 of the Civil Code of the State of California.

NOW, THEREFORE, said principal and the undersigned as corporate surety, are held firmly bound unto the City of Guadalupe and all contractors, subcontractors, laborers, material, men and other persons employed in the performance of the aforesaid agreement and referred to in the aforesaid Code of Civil Procedure in the sum_of _____ Dollars (\$ _____), for materials furnished or labor thereon of any kind, or for amounts due under the Unemployment Insurance Act with respect to such work or labor, that said surety will pay the same in amount not exceeding the amount hereinabove set forth, and also in case suit is brought upon this bond, will pay, in addition to the face amount thereof, costs and reasonable expenses and fees, including reasonable attorney's fees, incurred by City in successfully enforcing such obligation, to be awarded and fixed by the court, and to be taxed as costs and to be included in the judgment therein rendered.

It is hereby expressly stipulated and agreed that this bond shall inure to the benefit of any and all persons, companies and corporations entitled to file claims under Title 15 (commencing with Section 3082) of Part 4 of Division 3 of the Civil Code, so as to give a right of action to them or their assigns in any suit brought upon this bond.

Should the condition of this bond be fully performed, then this obligation shall become null and void, otherwise it shall be and remain in full force and effect.

The surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of said agreement or the specifications accompanying the same shall in any manner affect its obligations on this bond, and it does hereby waive notice of any such change, extension, alteration or addition.

IN WITNESS WHEREOF, this instrument has been duly executed by the principal and surety above named, on _____, 20____.

APPROVED AS TO FORM:

By: _____
City Attorney

ADDRESS OF CONTRACTOR FOR SERVICE OF DOCUMENTS UNDER BOND AND UNDERTAKING LAW:

Principal (SEAL)

(SEAL)

Signature of Principal Title

ADDRESS OF SURETY FOR SERVICE OF DOCUMENTS UNDER BOND AND UNDERTAKING LAW

(SEAL)

Surety (SEAL)

Signature for Surety Title

GUARANTEE AND DEFECTIVE MATERIAL BOND

WHEREAS, the City Council of the City of Guadalupe, State of California and _____ (hereinafter designated as "principal") have entered into an agreement whereby principal agrees to install and complete certain designated public improvements, which said agreement, dated _____, 20____, and identified as LAS MUJERES PARK RENOVATION PROJECT, is hereby referred to and made a part hereof; and

WHEREAS, said principal is required under the terms of said agreement to furnish a bond for the one-year maintenance of public improvements of said agreement.

NOW, therefore, we, the principal and _____, as surety, are held and firmly bound unto the City of Guadalupe hereinafter called "City," in the penal sum of _____ dollars (\$_____) lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, successors, executors and administrators, jointly and severally, firmly by these presents.

The condition of this obligation is such that if the above bounded principal, his or its heirs, executors, administrators, successors, or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions, and provisions in the said agreement and any alteration thereof made as therein provided, on his or their part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless City, its officers, agents, and employees as therein stipulated, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

As a part of the obligation secured hereby and in addition to the face amount specified therefore, there shall be included costs and reasonable expenses and fees, including reasonable attorney's fees, incurred by City in successfully enforcing such obligation, all to be taxed as costs and included in any judgment rendered.

The surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the agreement or to the work to be performed there under or the specifications accompanying the same shall in any manner affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the agreement or to the work or to the specifications.

IN WITNESS WHEREOF, this instrument has been duly executed by the principal and surety above named, on _____, 20____.

ADDRESS OF CONTRACTOR FOR SERVICE OF DOCUMENTS UNDER BOND AND UNDER-TAKING LAW:

Principal (SEAL)

(SEAL)

Signature of Principal Title

ADDRESS OF SURETY FOR SERVICE OF DOCUMENTS UNDER BOND AND UNDERTAKING LAW

(SEAL)

Surety (SEAL)

Signature for Surety Title

SAMPLE AGREEMENT
AGREEMENT FOR CONTRACTOR SERVICES
BETWEEN
THE CITY OF GUADALUPE
AND

THIS AGREEMENT FOR CONTRACTOR SERVICES (the "Agreement") is made and entered into this ____ day of _____ 20xx, by and between the CITY OF GUADALUPE, a municipal corporation ("City") and, _____ a California _____ ("Contractor").

In consideration of the mutual covenants and conditions set forth herein, the parties agree as follows:

Section 1. Term of Agreement. Subject to the provisions of Section 19 (Termination of Agreement) of this Agreement, the term of this Agreement shall be for a period of one (1) year from the date of execution of this Agreement, as first shown above. Such term may be extended upon written agreement of both parties to this Agreement.

Section 2. Scope of Services. Contractor agrees to perform the services set forth in Exhibit A (Scope of Services) and made a part of this Agreement.

Section 3. Additional Services. Contractor shall not be compensated for any services rendered in connection with its performance of this Agreement which are in addition to or outside of those set forth in this Agreement or listed in Exhibit A unless such additional services are authorized in advance and in writing by the City Council or City Administrator of City. Contractor shall be compensated for any such additional services in the amounts and in the manner agreed to by the City Council or City Administrator.

Section 4. Compensation and Method of Payment.

(a) Subject to any limitations set forth in this Agreement, City agrees to pay Contractor the amounts specified in Exhibit A (Compensation) and made a part of this Agreement.

(b) Each month Contractor shall furnish to City an original invoice for all work performed and expenses incurred during the preceding month. The invoice shall detail charges by the following categories: labor (by subcategory), travel, materials, equipment, supplies, sub-contractor contracts and miscellaneous expenses. City shall independently review each invoice submitted by Contractor to determine whether the work performed and expenses incurred are in compliance with the provisions of this Agreement and Scope of Services. In the event that no charges or expenses are disputed, the invoice shall be approved and paid according to the terms set forth in subsection (c). In the event City disputes any charges or expenses, City shall return the original invoice to Contractor

with specific items in dispute identified for correction and re-submission. All undisputed charges shall be paid in accordance with this Agreement and Scope of Services.

(c) Except as to any charges for work performed or expenses incurred by Contractor, which are disputed by City, City will cause Contractor to be paid within thirty (30) days of receipt of Contractor's invoice.

(d) Payment to Contractor for work performed pursuant to this Agreement shall not be deemed to waive any defects in work performed by Contractor.

(e) Contractor shall have the right to suspend services if not paid in accordance with this Agreement.

Section 5. Inspection and Final Acceptance. City may inspect and accept or reject any of Contractor's work under this Agreement, either during performance or when completed, if the work is found to be defective or not in compliance with the defined Scope of Services. Acceptance of any of the Contractor's work by City shall not constitute a waiver of any of the provisions of this Agreement, including but not limited to, Sections 15 and 16, pertaining to indemnification and insurance, respectively. Contractor agrees to cooperate in any such inspection.

Section 6. Ownership of Documents. All original maps, models, designs, drawings, photographs, studies, surveys, reports, data, notes, computer files, files and other documents prepared, developed or discovered by Contractor in the course of providing any services pursuant to this Agreement shall become the sole property of City and may be used, reused or otherwise disposed of by City without the permission of the Contractor. Reuse of any materials outside the scope of this Agreement shall be at the sole risk of the City.

Section 7. Contractor's Books and Records.

(a) Contractor shall maintain any and all documents and records demonstrating or relating to Contractor's performance of services pursuant to this Agreement. Contractor shall maintain any and all ledgers, books of account, invoices, vouchers, canceled checks, or other documents or records evidencing or relating to work, services, expenditures and disbursements charged to City pursuant to this Agreement. Any and all such documents or records shall be maintained in accordance with generally accepted accounting principles and shall be sufficiently completed and detailed so as to permit an accurate evaluation of the services provided by Contractor pursuant to this Agreement. Any and all such documents or records shall be maintained for three (3) years from the date of execution of this Agreement and to the extent required by laws relating to the audits of public agencies and their expenditures.

(b) Any and all records or documents required to be maintained pursuant to this section shall be made available for inspection, audit and copying, upon reasonable notice during regular business hours, upon written request by City or its designated representative. Copies of such documents or records shall be provided directly to the City for inspection, audit and copying when it is practical to do so; otherwise, unless an

alternative is mutually agreed upon, such documents and records shall be made available at Contractor's address indicated for receipt of notices in this Agreement. The City shall compensate the Contractor for all costs associated with providing these materials to the City.

(c) Where City has reason to believe that any of the documents or records required to be maintained pursuant to this section may be lost or destroyed due to dissolution or termination of Contractor's business, City may, by written request, require that custody of such documents or records be given to the requesting party and that such documents and records be maintained by the requesting party. Access to such documents and records shall be granted to City, as well as to its successors-in-interest and authorized representatives.

Section 8. Status of Contractor.

(a) Contractor is and shall at all times during the terms of this Agreement remain a wholly independent Contractor and not an officer, employee or agent of City. Contractor shall have no authority to bind City in any manner, nor to incur any obligation, debt or liability of any kind on behalf of or against City, whether by contract or otherwise, unless such authority is expressly conferred under this Agreement or is otherwise expressly conferred in writing by City.

(b) The personnel performing the services under this Agreement on behalf of Contractor shall at all times be under Contractor's exclusive direction and control. Neither City nor any elected or appointed boards, officers, officials, employees or agents of City, shall have control over the conduct of Contractor or any of Contractor's officers, employees or agents, except as set forth in this Agreement. Contractor shall not at any time or in any manner represent that Contractor or any of Contractor's officers, employees or agents are in any manner officials, employees or agents of City.

(c) Neither Contractor nor any of Contractor's officers, employees or agents shall obtain any rights to retirement, health care or any other benefits which may otherwise accrue to City's employees. Contractor expressly waives any claim Contractor may have to any such rights.

Section 9. Standard of Performance. Contractor represents and warrants that it has the qualifications, experience and facilities necessary to properly perform the services required under this Agreement in a thorough, competent and professional manner. Contractor shall at all times faithfully, competently and to the best of its ability, experience and talent, perform all services described herein. In meeting its obligations under this Agreement, Contractor shall employ, at a minimum, generally accepted standards and practices utilized by persons engaged in providing services similar to those required of Contractor under this Agreement.

Section 10. Compliance With Applicable Laws, Permits and Licenses. Contractor shall keep itself informed of and comply with all applicable federal, state and local laws, statutes, codes, ordinances, regulations and rules in effect during the term of this

Agreement applicable to Contractor. Contractor shall obtain any and all licenses, permits and authorizations necessary to perform the services set forth in this Agreement. Neither City, nor any elected or appointed boards, officers, officials, employees or agents of City, shall be liable at law or in equity as a result of any failure of Contractor to comply with this section.

Section 11. Nondiscrimination. Contractor shall not discriminate, in any way, against any person on the basis of race, color, religious creed, national origin, ancestry, sex, age, disability, marital status or sexual orientation in connection with or related to the performance of this Agreement.

Section 12. Unauthorized Aliens. Contractor hereby promises and agrees to comply with all of the provisions of the Federal Immigration and Nationality Act, 8 U.S.C.A. sections 1101, et seq., as amended, and in connection therewith, shall not employ unauthorized aliens for the performance of work and/or services covered by this Agreement, and should any liability or sanctions be imposed against City for such use of unauthorized aliens, Contractor hereby agrees to and shall reimburse City for the cost of all such liabilities or sanctions imposed, together with any and all costs, including attorney's fees, incurred by City.

Section 13. Conflicts of Interest. Contractor will comply with all conflict of interest laws and regulations including, without limitation, the City's Conflict of Interest Code (on file in the City Clerk's Office). All officers, employees and/or agents of Contractor who will be working on behalf of the City pursuant to this Agreement, may be required to file Statements of Economic Interest. Therefore, it is incumbent upon the Contractor or Contracting firm to notify that City of any staff changes relating to this Agreement.

A. In accomplishing the scope of services of this Agreement, all officers, employees and/or agents of Contractor(s), unless as indicated in Subsection B, will be performing a very limited and closely supervised function, and, therefore, unlikely to have a conflict of interest arise. No disclosures are required for any officers, employees, and/or agents of Contractor, except as indicated in Subsection B.

B. In accomplishing the scope of services of this Agreement, Contractor(s) will be performing a specialized or general service for the City, and there is substantial likelihood that the Contractor's work product will be presented, either written or orally, for the purpose of influencing a governmental decision. As a result, the following Contractor(s) shall be subject to Disclosure Category "1" of the City's Conflict of Interest Code.

Section 14. Confidential Information; Release of Information.

(a) All information gained or work product produced by Contractor in performance of this Agreement shall be considered confidential, unless such information is in the public domain or already known to Contractor. Contractor shall not release or disclose any such information or work product to persons or entities other than City without prior written authorization from the City Administrator, except as may be required by law.

(b) Contractor, its officers, employees, agents or subcontractors, shall not, without prior written authorization from the City Administrator or unless requested by the City Attorney of City, voluntarily provide declarations, letters of support, testimony at depositions, responses to interrogatories or other information concerning the work performed under this Agreement. A response to a subpoena or court order shall not be considered "voluntary" provided Contractor gives City notice of such court order or subpoena.

(c) If Contractor, or any officer, employee, agent or subcontractor of Contractor, provides any information or work product in violation of this section, then City shall have the right to reimbursement and indemnity from Contractor for any damages, costs and fees, including attorney's fees, caused by or incurred as a result of Contractor's conduct.

(d) Contractor shall promptly notify City should Contractor, its officers, employees, agents or sub contractors be served with any summons, complaint, subpoena, notice of deposition, request for documents, interrogatories, request for admissions or other discovery request, court order or subpoena from any party regarding this Agreement and the work performed thereunder. City retains the right, but has no obligation, to represent Contractor or be present at any deposition, hearing or similar proceeding. Contractor agrees to cooperate fully with City and to provide City with the opportunity to review any response to discovery requests provided by Contractor. However, this right to review any such response does not imply or mean the right by City to control, direct, or rewrite said response. Contractor shall be compensated for all costs associated with complying with this section.

Section 15. Indemnification.

(a) City and its respective elected and appointed boards, officials, officers,

agents, employees and volunteers (individually and collectively, "Indemnitees") shall have no liability to Contractor or any other person for, and Contractor shall indemnify, defend, protect and hold harmless Indemnitees from and against, any and all liabilities, claims, actions, causes of action, proceedings, suits, damages, judgments, liens, levies, costs and expenses of whatever nature, including reasonable attorney's fees and disbursements (collectively, "Claims") which Indemnitees may suffer or incur or to which Indemnitees may become subject by reason of or arising out of any injury to or death of any person(s), damage to property, loss of use of property, economic loss or otherwise occurring as a result of or allegedly caused by Contractor's performance of or failure to perform any services under this Agreement or by the negligent or willfully wrongful acts or omissions of Contractor, its agents, officers, directors, sub contractors or employees, committed in performing any of the services under this Agreement.

(b) If any action or proceeding is brought against Indemnitees by reason of any of the matters against which Contractor has agreed to indemnify Indemnitees as provided above, Contractor, upon notice from City, shall defend Indemnitees at Contractor's expense by counsel acceptable to City, such acceptance not to be unreasonably withheld. Indemnitees need not have first paid for any of the matters to which Indemnitees are entitled to indemnification in order to be so indemnified. The insurance required to be maintained by Contractor under Section 16 shall ensure Contractor's obligations under this section, but the limits of such insurance shall not limit the liability of Contractor hereunder. The provisions of this section shall survive the expiration or earlier termination of this Agreement.

(c) The provisions of this section do not apply to Claims occurring as a result of the City's sole negligence or willfully wrongful acts or omissions.

(d) City agrees to indemnify Contractor for any such neglect or willfully wrongful acts committed by City or its officers, agents or employees.

Section 16. Insurance. Contractor agrees to obtain and maintain in full force and effect during the term of this Agreement, insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work provided by Contractor, its agents, representatives or employees in performance of this Agreement. Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A-:VII. All insurance policies shall be subject to approval by City as to form and content. These requirements are subject to amendment or waiver, if so approved in writing by City Administrator. Contractor agrees to provide City with copies of required policies upon request. Prior to the beginning of and throughout the duration of the Work, Contractor and its subcontractors shall maintain insurance in conformance with the requirements set forth below. Contractor will use existing coverage to comply with these requirements. If that existing coverage does not meet the requirements set forth herein, Contractor agrees to amend, supplement or endorse the existing coverage to do so. Contractor acknowledges that the insurance coverage and policy limits set forth in this section constitute the minimum amount of coverage required. Any insurance proceeds available to Contractor or its subcontractors in excess of the limits and coverage identified in this Agreement and which is applicable to a given loss, claim or demand, will be equally available to CITY.

Contractor shall provide the following types and amounts of insurance. Without limiting Contractor's indemnification of CITY, and prior to commencement of Work, Contractor shall obtain, provide and maintain at its own expense during the term of this Agreement, policies of insurance of the type and amounts described below and in a form satisfactory to CITY:

A. Minimum Scope of Insurance: Coverage shall be at least as broad as:

(1) Insurance Services Office Form Commercial General Liability coverage (Occurrence Form CG 0001).

(2) Insurance Services Office Form No. CA 0001 covering Automobile Liability, including code 1 "any auto" and endorsement CA 0025, or equivalent forms subject to written approval of City.

(3) Workers' Compensation insurance as required by the Labor Code of the State of California and Employers' Liability insurance and covering all persons providing services on behalf of the Contractor and all risks to such persons under this Agreement, along with a waiver of subrogation endorsement.

(4) Errors and omission liability insurance appropriate to the Contractor's profession.

B. Minimum Limits of Insurance: Contractor shall maintain limits of insurance no less than:

(1) General Liability Insurance: Contractor shall maintain commercial general liability insurance with coverage at least as broad as Insurance Services Office form CG 00 01, in an amount not less than \$3,000,000 per occurrence, \$6,000,000 general aggregate, for bodily injury, personal injury, and property damage, and a \$6,000,000 completed operations aggregate. The policy shall provide or be endorsed to provide that CITY and its officers, officials, employees, agents, and volunteers shall be additional insureds under such policies. This provision shall also apply to any excess/umbrella liability policies. The policy must include contractual liability that has not been amended. Any endorsement restricting standard ISO "insured contract" language will not be accepted. This insurance and any umbrella or excess liability insurance shall be maintained for a minimum of three years or as long as there is a statutory exposure to completed operations claims, with the City and its officers, officials, employees, and agents continued as additional insured.

(2) Automobile Liability: Contractor shall maintain automobile insurance at least as broad as Insurance Services Office form CA 00 01 covering bodily injury and property damage for all activities of the Contractor arising out of or in connection with Work to be performed under this Agreement, including coverage for any owned, hired, non-owned or rented vehicles, in an amount not less than \$1,000,000 combined single limit for each accident.

(3) Workers' Compensation and Employer's Liability: Contractor shall maintain Workers' Compensation Insurance (Statutory Limits) and Employer's Liability Insurance (with

limits of at least \$1,000,000) for Contractor's employees in accordance with the laws of the State of California, Section 3700 of the Labor Code. In addition, Contractor shall require each subcontractor to similarly maintain Workers' Compensation Insurance and Employer's Liability Insurance in accordance with the laws of the State of California, Section 3700 for all of the subcontractor's employees. Contractor shall submit to CITY.

(4) Errors and Omissions Liability: \$1,000,000 per claim as appropriate for the profession.

(5) Umbrella or excess liability insurance (if needed): Contractor shall obtain and maintain an umbrella or excess liability insurance that will provide bodily injury, personal injury and property damage liability coverage at least as broad as the primary coverages set forth above, including commercial general liability, automobile liability, and employer's liability. Such policy or policies shall include the following terms and conditions:

- A drop-down feature requiring the policy to respond in the event that any primary insurance that would otherwise have applied proves to be uncollectable in whole or in part for any reason;

- Pay on behalf of wording as opposed to reimbursement;
- Concurrency of effective dates with primary policies;
- Policies shall "follow form" to the underlying primary policies;

and

- Insureds under primary policies shall also be insureds under the umbrella or excess policies.

(6) Pollution liability insurance. Environmental Impairment Liability Insurance shall be written on a Contractor's Pollution Liability form or other form acceptable to CITY providing coverage for liability arising out of sudden, accidental and gradual pollution and remediation. The policy limit shall be no less than \$1,000,000 dollars per claim and in the aggregate. All activities contemplated in this Agreement shall be specifically scheduled on the policy as "covered operations." The policy shall provide coverage for the hauling of waste from the project site to the final disposal location, including non-owned disposal sites.

C. Other Provisions: Insurance policies required by this Agreement shall contain the following provisions:

(1) Notice of Cancellation: Each insurance policy required by this Agreement shall be endorsed and state the coverage shall not be suspended, voided, canceled by the insurer or other party to this Agreement, reduced in coverage or in limits except after thirty (30) days' prior written notice by certified mail, return receipt requested has been given to City.

(2) Primary/noncontributing: Coverage provided by Contractor shall be primary and any insurance or self-insurance procured or maintained by CITY shall not be required to contribute with it. The limits of insurance required herein may be satisfied by a combination of primary and umbrella or excess insurance. Any umbrella or excess insurance shall contain or be endorsed to contain a provision that such coverage shall also apply on a primary and non-

contributory basis for the benefit of CITY before the CITY's own insurance or self-insurance shall be called upon to protect it as a named insured.

(3) City's Rights of Enforcement: In the event any policy of insurance required under this Agreement does not comply with these requirements or is canceled and not replaced, CITY has the right but not the duty to obtain the insurance it deems necessary and any premium paid by CITY will be promptly reimbursed by Contractor or CITY will withhold amounts sufficient to pay premium from Contractor payments. In the alternative, CITY may cancel this Agreement.

(4) Waiver of Subrogation: All insurance coverage maintained or procured pursuant to this agreement shall be endorsed to waive subrogation against CITY, its elected or appointed officers, agents, officials, employees and volunteers or shall specifically allow Contractor or others providing insurance evidence in compliance with these specifications to waive their right of recovery prior to a loss. Contractor hereby waives its own right of recovery against CITY, and shall require similar written express waivers.

(5) Enforcement of Contract Provisions (non estoppel): Contractor acknowledges and agrees that any actual or alleged failure on the part of the CITY to inform Contractor of non-compliance with any requirement imposes no additional obligations on the CITY nor does it waive any rights hereunder.

(6) Requirements not Limiting: Requirements of specific coverage features or limits contained in this Section are not intended as a limitation on coverage, limits or other requirements, or a waiver of any coverage normally provided by any insurance. Specific reference to a given coverage feature is for purposes of clarification only as it pertains to a given issue and is not intended by any party or insured to be all inclusive, or to the exclusion of other coverage, or a waiver of any type. If the Contractor maintains higher limits than the minimums shown above, the CITY requires and shall be entitled to coverage for the higher limits maintained by the Contractor. Any available insurance proceeds in excess of the specified minimum limits of insurance and coverage shall be available to the CITY.

(7) Prohibition of Undisclosed Coverage Limitations: None of the coverages required herein will be in compliance with these requirements if they include any limiting endorsement of any kind that has not been first submitted to CITY and approved of in writing.

(8) Separation of Insureds: A severability of interests provision must apply for all additional insureds ensuring that Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the insurer's limits of liability. The policy(ies) shall not contain any cross-liability exclusions.

(9) Pass through Clause: Contractor agrees to ensure that its subconsultants, subcontractors, and any other party involved with the project who is brought onto or involved in the project by Contractor, provide the same minimum insurance coverage and endorsements required of Contractor. Contractor agrees to monitor and review all such coverage and assumes all responsibility for ensuring that such coverage is provided in conformity with the requirements of this section. Contractor agrees that upon request, all agreements with consultants, subcontractors, and others engaged in the project will be submitted to CITY for review.

(10) City's Right to Revise Requirements: The CITY reserves the right at any time during the term of the contract to change the amounts and types of insurance required by giving the Contractor a ninety (90) day advance written notice of such change. If such change results in substantial additional cost to the Contractor, the CITY and Contractor may renegotiate Contractor's compensation.

(11) Self-insured Retentions: Any self-insured retentions must be declared to and approved by CITY. CITY reserves the right to require that self-insured retentions be eliminated, lowered, or replaced by a deductible. Self-insurance will not be considered to comply with these specifications unless approved by CITY.

(12) Timely Notice of Claims: Contractor shall give CITY prompt and timely notice of claims made or suits instituted that arise out of or result from Contractor's performance under this Agreement, and that involve or may involve coverage under any of the required liability policies.

(13) Additional Insurance: Contractor shall also procure and maintain, at its own cost and expense, any additional kinds of insurance, which in its own judgment may be necessary for its proper protection and prosecution of the Work.

Section 17. Assignment. The expertise and experience of Contractor are material considerations for this Agreement. City has an interest in the qualifications of and capability of the persons and entities who will fulfill the duties and obligations imposed upon Contractor under the Agreement. In recognition of that interest, Contractor shall not assign or transfer this Agreement or any portion of this Agreement or the performance of any of Contractor's duties or obligations under this Agreement without the prior written consent of the City Council. Any attempted assignment shall be ineffective, null and void, and shall constitute a material breach of this Agreement, entitling City to any and all remedies at law or in equity, including summary termination of this Agreement. City acknowledges, however, that Contractor, in the performance of its duties pursuant to this Agreement, may utilize sub contractors.

Section 18. Continuity of Personnel. Contractor shall make every reasonable effort to maintain the stability and continuity of Contractor's staff assigned to perform the services required under this Agreement. Contractor shall notify City of any changes in Contractor's staff assigned to perform the services required under this Agreement, prior to any such performance.

Section 19. Termination of Agreement.

(a) City may terminate this Agreement, with or without cause, at any time by giving thirty (30) days' written notice of termination to Contractor. In the event such notice is given, Contractor shall cease immediately all work in progress.

(b) Contractor may terminate this Agreement at any time upon thirty (30) days' written notice of termination to City.

(c) If either Contractor or City fail to perform any material obligation under this

Agreement, then, in addition to any other remedies, either Contractor or City may terminate this Agreement immediately upon written notice.

(d) Upon termination of this Agreement by either Contractor or City, all property belonging exclusively to City which is in Contractor's possession shall be returned to City. Contractor shall furnish to City a final invoice for work performed and expenses incurred by Contractor, prepared as set forth in Section 4 of this Agreement. This final invoice shall be reviewed and paid in the same manner as set forth in Section 4 of this Agreement.

Section 20. Default. In the event that Contractor is in default under the terms of this Agreement, the City shall not have any obligation or duty to continue compensating Contractor for any work performed after the date of default and may terminate this Agreement immediately by written notice to Contractor.

Section 21. Excusable Delays. Contractor shall not be liable for damages, including liquidated damages, if any, caused by delay in performance or failure to perform due to causes beyond the control of Contractor. Such causes include, but are not limited to, acts of God, acts of the public enemy, acts of federal, state or local governments, acts of the City, court orders, fires, floods, epidemics, strikes, embargoes, and unusually severe weather. The term and price of this Agreement shall be equitably adjusted for any delays due to such causes.

Section 22. Cooperation by City. All public information, data, reports and maps as are existing and available to City as public records, and which are necessary for carrying out the work as outlined in Exhibit A, shall be furnished to Contractor in every reasonable way to facilitate, without undue delay, the work to be performed under this Agreement.

Section 23. Notices. All notices required or permitted to be given under this Agreement shall be in writing and shall be personally delivered, or sent by telecopier or United States mail, postage prepaid, addressed as follows:

To City: City Administrator
 City of Guadalupe
 918 Obispo Street
 Guadalupe, CA 93434

To Contractor:

Notice shall be deemed effective on the date personally delivered or transmitted by facsimile or, if mailed, three (3) days after deposit of the same in the custody of the United States Postal Service.

Section 24. Authority to Execute. The person or persons executing this Agreement on behalf of the Contractor represents and warrants that they have the authority to so execute this Agreement and to bind Contractor to the performance of its obligations hereunder.

Section 25. Binding Effect. This Agreement shall be binding upon the heirs, executors, administrators, successors and assigns of the parties.

Section 26. Modification of Agreement. No amendment to or modification of this Agreement shall be valid unless made in writing and approved by the Contractor and by the City Council. The parties agree that this requirement for written modifications cannot be waived and that any attempted waiver shall be void.

Section 27. Waiver. Waiver by any party to this Agreement of any term, condition or covenant of this Agreement shall not constitute a waiver of any other term, condition or covenant. Waiver by any party of any breach of the provisions of this Agreement shall not constitute a waiver of any other provision, nor a waiver of any subsequent breach or violation of any provision of this Agreement. Acceptance by City of any work or services by Contractor shall not constitute a waiver of any provisions of this Agreement.

Section 28. Law to Govern; Venue. This Agreement shall be interpreted, construed and governed according to the laws of the State of California. In the event of litigation between the parties, venue in state trial courts shall lie exclusively in the County of Santa Barbara. In the event of litigation in a U.S. District Court, venue shall lie exclusively in the Central District of California, in Los Angeles.

Section 29. Attorney's Fees, Costs and Expenses. In the event litigation or other proceeding is required to enforce or interpret any provision of this Agreement, the prevailing party in such litigation or other proceeding shall be entitled to any award of reasonable attorney's fees, costs and expenses, in addition to any other relief to which it may be entitled.

Section 30. Entire Agreement. This Agreement, including the attached exhibits, is the entire, complete, final and exclusive expression of the parties with respect to the matters addressed therein and supersedes all other agreements or understandings, whether oral or written, or entered into between Contractor and City prior to the execution of this Agreement. No statements, representations or other agreements, whether oral or written, made by any party which are not embodied herein shall be valid and binding. No amendment to this Agreement shall be valid and binding unless in writing duly executed by the parties or their authorized representatives.

Section 31. Severability. If a term, condition or covenant of this Agreement is declared or determined by any court of competent jurisdiction to be invalid, void or unenforceable, the remaining provisions of this Agreement shall not be affected thereby, and the Agreement shall be read and construed without the invalid, void or unenforceable provision(s).

Section 32. Preparation of Agreement. This Agreement is the product of negotiation and preparation by and among the parties and their respective attorneys. The parties, therefore, expressly acknowledge and agree that this Agreement shall not be deemed prepared or drafted by one party or another, or any party's attorney, and will be construed accordingly.

CITY:

CITY OF GUADALUPE

By: _____
Ariston Julian, Mayor

APPROVED AS TO FORM:

Philip Sinco, City Attorney

CONTRACTOR:

By: _____

Title: _____

By: _____

Title: _____

SPECIAL PROVISIONS

SECTION 1 SPECIFICATIONS AND PLANS

1-1 SPECIFICATIONS AND PLANS.

The work embraced herein shall be done in accordance with the Standard Specifications dated 2018, the Standard Plans dated 2018, of the State of California, Department of Transportation (Caltrans), and the City of Santa Maria Standard Specifications and Standard Plans (adopted by the City of Guadalupe on June 23, 2009, pursuant to Resolution No. 2009-24), insofar as the same may apply and in accordance with the Plans and Special Provisions.

In case of conflict between the Standard Specifications and these special provisions, these special provisions shall take precedence over and be used in lieu of such conflicting portions.

Any discrepancies found between the Plans and specifications and site conditions or any inconsistencies or ambiguities in the Plans or specifications shall be immediately reported to the Engineer in writing, who shall promptly correct such inconsistencies or ambiguities in writing. Work done by the Contractor after his discovery of such discrepancies, inconsistencies, or ambiguities shall be done at the Contractor's risk.

1-2 DEFINITIONS AND TERMS.

Whenever, in the Plans and Special Provisions, or in any documents or instruments where the Plans and Special Provisions govern, the following terms are used or pronouns in place of them are used, the intent and meaning shall be interpreted as follows:

- A. **Bid**. An offer to furnish the necessary services and materials to perform the work called for by the Contract Documents.
- B. **Bidder**. Any individual, firm or corporation submitting a proposal for the work contemplated, acting directly or through a duly authorized representative.
- C. **Proposal**. The offer of the Bidder for the Work when made out and submitted on the prescribed Proposal Form, properly signed and guaranteed.
- D. **Proposal Guaranty**. The cash, check or Bidder's Bond accompanying the Proposal submitted by the Bidder as a guarantee that the Bidder will enter into a Contract with the City for the construction of the Work if awarded to him.
- E. **Work**. All work specified, indicated, shown or contemplated in the Contract to construct the improvements, including all alterations, amendments or extensions thereto made by Change Orders or other written orders by the City Engineer.
- F. **City**. The City of Guadalupe, California, as created by law, and its authorized representatives.
- G. **Contract**. Written and executed contract between the City and the Contractor.
- H. **Contract Documents**. The Notice to Bidders, Proposal, Bid Sheet(s), Certification of Affirmative Action Program, Contractor's Licensing Statement, List of Subcontractors, Bid Security, Non-Collusion Affidavit, Agreement, Faithful Performance Bond, Labor and Materials Bond, Maintenance Bond, Worker's Compensation Certificate, Notice of Award, Notice to Proceed, Plans and Special Provisions, any addenda and bulletins issued during the bidding period, and all Change Orders amending or extending the work contemplated and which may be required to complete the work in a substantial and acceptable manner.

- I. **Plans**. The official plans, typical cross-sections, general cross-sections, working drawings and supplemental drawings, or reproductions thereof, approved by the City Engineer, which show the location, character, dimensions and details of the work to be done, and which are to be considered as a part of the Contract supplementary to the Special Provisions.
- J. **Special Provisions**. The Special Provisions are specific clauses setting forth conditions or requirements peculiar to the particular work called for by the Plans.
- K. **City Standard Specifications and Drawings**. Where reference is made to the City Standard Specifications and Drawings, the reference shall be to the City of Santa Maria Public Works Department Standard Specifications and Drawings (adopted by the City of Guadalupe on June 23, 2009, pursuant to Resolution No. 2009-24).
- L. **Standard Specifications**. Where reference is made to the Standard Specifications, the reference shall be to the State of California Department of Transportation Standard Specifications, 2018, or the latest edition thereof.
- M. **Standard Plans**. Where reference is made to the Standard Plans, the reference shall be to the State of California Department of Transportation Standard Plans, 2018, or the latest edition thereof.
- N. **Days**. Unless otherwise designated, days as used in the Contract Documents will be understood to mean working days.
- O. **Liquidated Damages**. The amount prescribed in the Specifications to be paid to the City, or to be deducted from any payments due or to become due Contractor, for each day's delay in completing the Work beyond the time allowed in the Specifications.
- P. **City Engineer**. The City Engineer of the City of Guadalupe, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties delegated to them.
- Q. **Inspector**. An authorized representative of the City of Guadalupe assigned by the City to make inspection of work performed or material supplied by Contractor.
- R. **Superintendent**. The executive representative of Contractor present on the work at all times during progress, authorized to receive and fulfill instructions from the City Engineer.
- S. **Design Engineer**. That individual or firm responsible for the design of the project, when the design is not by the City Engineer.
- T. **Legal Holidays**.

January 1 (New Year's Day)
Third Monday in January (Martin Luther King Day)
Third Monday in February (Presidents' Day)
Last Monday in May (Memorial Day)
July 4 (Independence Day)
First Monday in September (Labor Day)
November 11 (Veterans' Day)
Thanksgiving Day
Friday following Thanksgiving Day
December 24 (Christmas Eve)
December 25 (Christmas Day)

Any public holiday(s) which the President, Governor, or City Council of the City of Guadalupe may proclaim. When a holiday falls on a Saturday, the preceding Friday shall be observed. When a holiday falls on a Sunday, the following Monday shall be observed.

Where State Agencies, State Departments or State Officers are referred to in the above-mentioned Standard Specifications and Standard Plans, the comparable City Agency, City Department or City Officer shall be meant thereby for the purposes of these Contract Documents. In particular, intent and meaning shall be interpreted as follows:

STATE, OR COUNTY OR
STATE OF CALIFORNIA.....CITY OF GUADALUPE

DEPARTMENT OR DEPARTMENT
OF TRANSPORTATION.....CITY COUNCIL
CITY OF GUADALUPE

DIRECTOR OR DIRECTOR
OF TRANSPORTATION.....DIRECTOR OF PUBLIC WORKS
EITHER DIRECTLY OR THROUGH PROPERLY
AUTHORIZED AGENT AND CONSULTANTS

ATTORNEY GENERAL CITY ATTORNEY, CITY OF GUADALUPE

SECTION 2 PROPOSAL REQUIREMENTS AND CONDITIONS

2-1 CONTENTS OF PROPOSAL FORMS.

Prospective bidders will be furnished with proposal forms, bound together with this Project Manual, which will refer to the Specifications and Plans for the work to be done.

2-2 EXAMINATION OF PLANS, SPECIFICATIONS, CONTRACT, AND SITE OF WORK.

The bidder shall examine carefully the site of the work contemplated, The Plans and Specifications, and the Proposal and Contract forms.. The submission of a bid shall be conclusive evidence that the bidder has investigated and is satisfied as to the conditions to be encountered, as to the character, quality, and scope of work to be performed, and as to the requirements of the Contract Documents.

- (a) Where the City has made investigations of site conditions, including subsurface conditions in areas where work is to be performed under the Contract, or in other areas, some of which may constitute possible local material sources, bidders or contractors may, upon written request, inspect the records of the City as to those investigations subject to and upon the conditions hereinafter set forth. The investigations are made only for the purpose of study and design.
- (b) Where there has been prior construction by the City or other public agencies within the project limits, records of the prior construction that are currently in the possession of the City and which have been used by, or are known to, the designers and administrators of the Project will be made available for inspection by bidders or contractors, upon written request, subject to the conditions hereinafter set forth. The records may include, but are not limited to, as-built drawings, design calculations, foundation and site studies, Project reports and other data assembled in connection with the investigation, design, construction and maintenance of the prior projects.
- (c) Inspection of the records of investigations and Project records may be made at the office of the City Engineer. The records of investigations and Project records are not a part of the Contract and are available solely for the convenience of the bidder or contractor. It is expressly understood and agreed that the City assumes no responsibility whatsoever in respect to the sufficiency or accuracy of the investigations thus made, the records thereof, or of Project records, or of the interpretations set forth therein or made by the City in its use thereof and there is no warranty or guaranty, either express or implied, that the conditions indicated by the investigations or records are representative of those existing in or throughout those areas, or any part thereof, or that unlooked-for developments may not occur, or that materials other than, or in proportions different from those indicated, may not be encountered.
- (d) In some instances, information considered by the City to be of possible interest to bidders or contractors has been compiled as "Materials Information." The "Materials Information" is not a part of the Contract and is furnished solely for the convenience of bidders or contractors. It is understood and agreed that the fact that the City has compiled information as "Materials Information" and has exhibited or furnished to the bidders or contractors the "Materials Information" shall not be construed as a warranty or guaranty, express or implied, as to the completeness or accuracy of the compilations and the use of the "Materials Information" shall be subject to all of the conditions and limitations set forth herein.
- (e) When contour maps were used in the design of the Project, the bidders may inspect those maps, and if available, they may obtain copies for their use.
- (f) The availability or use of information described herein is not to be construed in any way as a waiver of the provisions of the first paragraph in this Section 2. and a bidder or contractor is cautioned to make any independent investigation and examination as they deem necessary to be satisfied as to conditions to be encountered in the performance of the work and, with respect to possible local material sources, the quality

and quantity of material available from the property and the type and extent of processing that may be required in order to produce material conforming to the requirements of the Specifications.

- (g) No information derived from the inspection of investigations or compilation thereof made by the City or from the Architect, or the Architect's assistants, will in any way relieve the bidder or contractor from any risk or from properly fulfilling the terms of the Contract.

2-3 APPROXIMATE ESTIMATE.

The quantities given in the proposal and contract are approximate only, being given as a basis for the comparison of bids. The City does not, expressly or by implication, agree that the actual amount of work will correspond therewith, and reserves the right to increase or decrease the amount of any class or portion of the work, or to omit portions of the work, as may be deemed necessary or advisable by the Engineer.

2-4 PROPOSAL FORMS.

The City will furnish to each bidder a standard proposal form, which, when filled out and executed may be submitted as that bidder's bid. Bids not presented on forms so furnished, and copies or facsimiles of the bidder's completed and executed proposal forms submitted, as a bid will be rejected.

All proposal forms shall be obtained from the office of the Building Department, City of Guadalupe, 918 Obispo Street, Guadalupe, California 93434 as designated in the Notice to Contractors.

2-5 PREPARATION AND SUBMISSION OF BIDS.

- (a) All Bids shall be submitted on the City furnished proposal forms. The proposal shall be submitted as directed in the Notice to Contractors under sealed cover plainly marked as a proposal and identifying the project to which the proposal relates and the date of the bid opening therefor. Proposals that are not properly marked may be disregarded.
- (b) All bid Items and statements shall be properly filled out. The proposal shall set forth the item prices and totals, in clearly legible figures, in the respective spaces provided, and shall be signed by the bidder in longhand, who shall fill out all blanks in the proposal form as therein required.
- (c) Bids shall not contain any recapitulations of the Work. Alternative Bids will not be received or considered unless required by the Contract Documents. No oral, telegraphic, or telephonic Proposals or modifications will be considered.
- (d) Each Bid shall be accompanied by the prescribed bid and other required documents.
- (e) Delivery of Bids shall comply with the Notice to Contractors as to place, date, and time. Bids and bid security shall be enclosed in a sealed opaque envelope bearing the title of the Work and the name of the bidder.
- (f) Prices, wording, and notations must be in ink or typewritten. No erasures will be permitted. Mistakes may be crossed out and corrections typed or written in ink adjacent thereto and must be initialed in ink by the person or persons signing the Bid.

2-6 INTERPRETATIONS.

Should any bidder find discrepancies or omissions in the Contract Documents, or if there should be doubt as to the true meaning of any part thereof, the bidder shall at once submit a written request for correction, clarification, or interpretation to the City Engineer. Such requests shall be submitted at least six days prior to the date fixed for the opening of Bids.

- (a) If the City determines the Contract Documents require changes, correction, clarification, or interpretation prior to the receipt of Bids, an appropriate bulletin or Addendum will be issued. All addenda so issued shall become part of the Contract Documents.
- (b) The City, its officers, employees, and agents shall not be responsible for any changes, instructions, clarifications, interpretations, or other information pertaining to the Contract Documents given to bidders during the bidding period in any manner other than written addenda.

2-7 REQUIRED LISTING OF PROPOSED SUBCONTRACTORS.

Each Proposal shall have listed therein the name and address of each subcontractor to whom the bidder proposes to subcontract portions of the work in an amount in excess of one-half of one percent of the total bid or \$10,000, whichever is greater, in accordance with the Subletting and Subcontracting Fair Practices Act, commencing with Section 4100 of the Public Contract Code. The bidder's attention is invited to other provisions of the Act related to the imposition of penalties for a failure to observe its provisions by using unauthorized subcontractors or by making unauthorized substitutions.

- (a) A sheet for listing the subcontractors, as required herein, is included in the "Proposal" book.

2-8 DESIGN ENGINEERS MAY NOT BID ON CONSTRUCTION CONTRACT.

No engineering or architectural firm that has provided design services for a project shall be eligible to submit a Proposal for the Contract to construct the Project nor to subcontract for any portion of the work. The ineligible firms include the prime contractor for design, subcontractors of portions of the design, and affiliates of either. An affiliate is a firm that is subject to the control of the same persons, through joint ownership or otherwise.

2-9 REJECTION OF PROPOSALS.

Proposals may be rejected if they have been transferred to another bidder, or if they show any alteration of form, additions not called for, conditional bids, incomplete bids, erasures, or irregularities of any kind.

- (a) When Proposals are signed by an agent, other than the officer or officers of a corporation authorized to sign contracts on its behalf or a member of a partnership, a "Power of Attorney" must be on file with the City prior to opening bids or shall be submitted with the Proposal; otherwise, the Proposal may be rejected as irregular and unauthorized.

2-10 PROPOSAL GUARANTY.

All bids shall be presented under sealed cover and accompanied by one of the following forms of bidder's security:

- (a) Cash, a cashier's check, a certified check, or a bidder's bond executed by an admitted surety insurer, made payable to the City of Guadalupe.
- (b) The security shall be in an amount equal to at least 10 percent of the amount bid. A bid will not be considered unless one of the forms of bidder's security is enclosed with it.
- (c) The contractor shall use the bidder's bond form found in this Project Manual when bidding on the project. The bidder's bond form shall be properly filled out and executed. (Note: this form may be reproduced for transmittal to the surety for execution and attached to the front of the original bid bond form.)
- (d) Surety shall be listed in the Current Insurance Organizations Authorized By The Insurance Commissioner To Transact Business Of Insurance In The State Of California published by the Department of Insurance, State of California, or successor publication.

2-11 WITHDRAWAL OF PROPOSALS.

Any bid may be withdrawn at any time prior to the date and time fixed for the opening of bids only by written request for the withdrawal of the bid filed at the location at which the City received the bid. The request shall be executed by the bidder or the bidder's duly authorized representative. The withdrawal of a bid does not prejudice the right of the bidder to file a new bid. Whether or not bids are opened exactly at the time fixed for opening bids, a bid will not be received after that time, nor may any bid be withdrawn after the time fixed for the opening of bids.

2-12 PUBLIC OPENING OF PROPOSALS.

Proposals will be opened and read publicly at the time and place indicated in the Notice to Contractors. Bidders or their authorized agents are invited to be present.

2-13 RELIEF OF BIDDERS.

Attention is directed to the provisions of Public Contract Code Sections 5100 to 5107, inclusive, concerning relief of bidders and in particular to the requirement therein, that if the bidder claims a mistake was made in the bid presented, the bidder shall give the City written notice within five (5) working days (excluding Saturdays, Sundays, and state holidays) after the opening of the bids of the alleged mistake, specifying in the notice in detail how the mistake occurred.

2-14 DISQUALIFICATION OF BIDDERS.

More than one Proposal from an individual, firm, partnership, corporation, or combination thereof under the same or different names will not be considered. Reasonable grounds for believing that any individual, firm, partnership, corporation or combination thereof is interested in more than one Proposal for the work contemplated may cause the rejection of all Proposals in which that individual, firm, partnership, corporation or combination thereof is interested. If there is reason for believing that collusion exists among the bidders any or all Proposals may be rejected. Proposals in which the prices obviously are unbalanced may be rejected.

2-15 MATERIAL GUARANTY.

The successful bidder may be required to furnish a written guaranty covering certain items of work for varying periods of time from the date of acceptance of the Contract. The work to be guaranteed, the form, and the time limit of the guaranty will be specified in The Specifications. The guaranty shall be signed and delivered to the City of Guadalupe before acceptance of the Contract. Upon completion of the Contract the amounts of the 2 Contract bonds required in Article B, Paragraph 2, "Contract Bonds," may be reduced to conform to the total amount of the Contract bid prices for the work to be guaranteed, and this amount shall continue in full force and effect for the duration of the guaranty period. The payment bond shall not be reduced until the expiration of the time required by Section 3249 of the Civil Code.

2-16 ADDENDA AND BULLETINS.

Full consideration shall be given to all addenda in the preparation of Bids, as addenda form a part of the Contract Documents. Bidders shall verify the number of addenda issued, if any, and acknowledge the receipt of all addenda by filling in the Addendum number in the space provided on the signature page of the Proposal. Failure to so acknowledge may cause the Bid to be rejected as not responsive.

- (a) The City may issue bulletins to advise bidders of changed requirements. All bulletins shall be incorporated into or confirmed by subsequent addenda. Such addenda may modify previously issued bulletins.

2-17 QUALIFICATIONS OF BIDDERS.

- (a) All bidders must be currently licensed as contractors according to the laws of the State and legal jurisdiction of the place where the Work is located before contract award. All bidders are required to complete the Contractor's Licensing Statement included with the proposal forms.
- (b) No person, organization, or corporation is allowed to make, submit, or be interested in more than one Bid for the Work unless in a sub contractual relationship with respect to the Bids or unless Alternative Bids are required. A person, organization, or corporation submitting sub-Proposals or quoting prices or materials to bidders is not prevented from submitting a Bid for the entire Work.

2-18 TRADE NAMES AND ALTERNATIVES.

Requests for any "or equal" substitutions regarding a material, product, thing, or service shall be made in writing before contract award. After submitting a substitution request, the contractor shall have ten (10) days for the submission of data substantiating the request for substitution per section 6-1.05 of the Standard Specifications. All "or equal" substitutions shall be approved in writing.

SECTION 3 AWARD & EXECUTION OF CONTRACT

3-1 AWARD OF CONTRACT.

The right is reserved to reject any and all proposals. The award of the contract, if it be awarded, will be to the lowest responsible bidder whose proposal complies with all the requirements prescribed. Bids will be compared by the Total Mathematical Bid as determined by the Engineer. The Total Mathematical Bid is the summation of all required bid items, excluding bid alternates. Bid items are calculated by multiplying the Engineers Estimate quantities by the unit bid prices. In the case of a discrepancy between the Total Mathematical Bid and the total bid written, the Total Mathematical Bid shall govern.

The award of the bid, if made, will be made within 35 days after the opening of the Proposal and reviewing all "or equal" requests for substitutions. This period will be subject to extension for such further period as may be agreed upon in writing between the City and the bidder concerned.

3-2 EXECUTION OF CONTRACT.

The contract shall be signed by the successful bidder and returned, together with the contract bonds, public liability and property damage insurance, and all other documentation required by the Contract Documents, within 15 days after the bidder has received the contract for execution.

3-3 CONTRACT BONDS.

The successful bidder shall furnish, at the time of execution of the contract for work, and at his/her own expense, the two (2) bonds required by the State Contract Act. One bond shall secure the payment of the claims of laborers, mechanics, or material men employed on the work under the contract. The other bond shall guarantee the faithful performance of the contract. Sureties on each of said bonds shall be satisfactory to the City Attorney.

- (a) Each of the two (2) bonds shall be in a sum equal to at least one hundred percent (100%) of the contract price.
- (b) All alterations, extensions of time, extra and additional work, and other changes authorized by the Contract Documents may be made without securing the consent of the surety or sureties on the contract bonds.

3-4 PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE.

CONTRACTOR shall procure and maintain for the duration of the Contract insurance against claims for injuries to persons or damages to property that may arise from or in connection with the performance of the work hereunder by the CONTRACTOR, his agents, representatives, employees, and subcontractors. Additional insurance requirements are set forth in Section 16 of the Sempel Agreement for Contractor Services CONTRACTOR must maintain general liability and umbrella or excess liability insurance for as long as there is a statutory exposure to completed operations claims. AGENCY and its officers, officials, employees, and agents shall continue as additional insureds under such policies.

- (a) Coverage shall be at least as broad as:
 - i. Insurance Services Office Commercial General Liability coverage (occurrence from CG 0001).
 - ii. Insurance Services Office Business Auto Coverage form number CA 0001, code 1 (any auto).
 - iii. Workers Compensation insurance as required by the State of California and Employer's Liability Insurance.

(b) Contractor shall maintain limits not less than:

General liability insurance: CONTRACTOR shall maintain commercial general liability insurance with coverage at least as broad as Insurance Services Office form CG 00 01, in an amount not less than \$3,000,000 per occurrence, \$6,000,000 general aggregate, for bodily injury, personal injury, and property damage, and a \$6,000,000 completed operations aggregate. The policy must include contractual liability that has not been amended. Any endorsement restricting standard ISO "insured contract" language will not be accepted.

Automobile liability insurance: CONTRACTOR shall maintain automobile insurance at least as broad as Insurance Services Office form CA 00 01 covering bodily injury and property damage for all activities of the CONTRACTOR arising out of or in connection with Work to be performed under this Agreement, including coverage for any owned, hired, non-owned or rented vehicles, in an amount not less than \$1,000,000 combined single limit for each accident. Employer's Liability: \$1,000,000 per accident for bodily injury or disease.

Umbrella or excess liability insurance: CONTRACTOR shall obtain and maintain an umbrella or excess liability insurance that will provide bodily injury, personal injury and property damage liability coverage at least as broad as the primary coverages set forth above, including commercial general liability, automobile liability, and employer's liability. Such policy or policies shall include the following terms and conditions:

- A drop-down feature requiring the policy to respond in the event that any primary insurance that would otherwise have applied proves to be uncollectable in whole or in part for any reason;
- Pay on behalf of wording as opposed to reimbursement;
- Concurrency of effective dates with primary policies;
- Policies shall "follow form" to the underlying primary policies; and
- Insureds under primary policies shall also be insureds under the umbrella or excess policies.

(c) Deductibles: Any deductibles or self-insured retentions must be declared to and approved by the City. At the option of the City, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the City, its trustees, officers, employees and volunteers; or the Contractor shall provide a financial guarantee satisfactory to the City guaranteeing payment of losses and related investigations, claim administration and defense expenses.

(d) The general liability and automobile liability policies are to contain, or be endorsed to contain, the following provisions:

- i. Additional Insured Status: policies shall provide or be endorsed to provide that the City and its officers, officials, employees, agents, and volunteers shall be additional insureds under such policies. This provision shall also apply to any excess/umbrella liability policies.
- ii. Primary/Noncontributing: Coverage provided by CONTRACTOR shall be primary and any insurance or self-insurance procured or maintained by AGENCY shall not be required to contribute with it. The limits of insurance required herein may be satisfied by a combination of primary and umbrella or excess insurance. Any umbrella or excess insurance shall contain or be endorsed to contain a provision that such coverage shall also apply on a primary and non-contributory basis for the benefit of AGENCY before the AGENCY's own insurance or self-insurance shall be called upon to protect it as a named insured.
- iii. Notice of cancellation: CONTRACTOR agrees to oblige its insurance agent or broker and insurers to provide to AGENCY with a thirty (30) day notice of cancellation (except for nonpayment for which a ten (10) day notice is required) or nonrenewal of coverage for each required coverage.

- iv. Waiver of Subrogation: All insurance coverage maintained or procured pursuant to this agreement shall be endorsed to waive subrogation against AGENCY, its elected or appointed officers, agents, officials, employees and volunteers or shall specifically allow CONTRACTOR or others providing insurance evidence in compliance with these specifications to waive their right of recovery prior to a loss. CONTRACTOR hereby waives its own right of recovery against AGENCY, and shall require similar written express waivers and insurance clauses from each of its subconsultants.
- (e) Acceptable Insurers: All insurance policies shall be issued by an insurance company currently authorized by the Insurance Commissioner to transact business of insurance or is on the List of Approved Surplus Line Insurers in the State of California, with an assigned policyholders' Rating of A- (or higher) and Financial Size Category Class VII (or larger) in accordance with the latest edition of Best's Key Rating Guide, unless otherwise approved by the AGENCY's risk manager
- (f) Evidence of Coverage: CONTRACTOR shall provide certificates of insurance to AGENCY as evidence of the insurance coverage required herein. Insurance certificates and endorsements must be approved by AGENCY's risk manager prior to commencement of performance. Current certification of insurance shall be kept on file with AGENCY at all times during the term of this contract. AGENCY reserves the right to require complete, certified copies of all required insurance policies, at any time.
- (g) Subcontractors Covered: Contractor shall include all subcontractors as insured under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverage and limits for subcontractors shall be subject to all the requirements stated herein.
- (h) Products/Completed Operations: Coverage shall extend a minimum of three (3) years after project completion. Coverage shall be included on behalf of the insured for covered claims arising out of the actions of independent contractors. If the insured is using subcontractors, the Policy must include work performed "by or on behalf" of the insured. Policy shall contain no language that would invalidate or remove the insurer's duty to defend or indemnify for claims or suits expressly excluded from coverage. Policy shall specifically provide for a duty to defend on the part of the insurer. The AGENCY, its officials, officers, agents, and employees, shall be included as additional insureds under the Products and Completed Operations coverage.
- (i) Agency's Rights of Enforcement: In the event any policy of insurance required under this Agreement does not comply with these requirements or is canceled and not replaced, AGENCY has the right but not the duty to obtain the insurance it deems necessary and any premium paid by AGENCY will be promptly reimbursed by CONTRACTOR or AGENCY will withhold amounts sufficient to pay premium from CONTRACTOR payments. In the alternative, AGENCY may cancel this Agreement.
- (j) Enforcement of Contract Provisions (non estoppel): CONTRACTOR acknowledges and agrees that any actual or alleged failure on the part of the AGENCY to inform CONTRACTOR of non-compliance with any requirement imposes no additional obligations on the AGENCY nor does it waive any rights hereunder.
- (k) Requirements not Limiting: Requirements of specific coverage features or limits contained in this Section are not intended as a limitation on coverage, limits or other requirements, or a waiver of any coverage normally provided by any insurance. Specific reference to a given coverage feature is for purposes of clarification only as it pertains to a given issue and is not intended by any party or insured to be all inclusive, or to the exclusion of other coverage, or a waiver of any type. If the CONTRACTOR maintains higher limits than the minimums shown above, the AGENCY requires and shall be entitled to coverage for the higher limits maintained by the CONTRACTOR. Any available insurance proceeds in excess of the specified minimum limits of insurance and coverage shall be available to the AGENCY.
- (l) Prohibition of Undisclosed Coverage Limitations: None of the coverages required herein will be in compliance with these requirements if they include any limiting endorsement of any kind that has not been first submitted to AGENCY and approved of in writing.
- (m) Separation of Insureds: A severability of interests provision must apply for all additional insureds ensuring that CONTRACTOR's insurance shall apply separately to each insured against whom claim is made or suit

is brought, except with respect to the insurer's limits of liability. The policy(ies) shall not contain any cross-liability exclusions.

- (n) Pass Through Clause. CONTRACTOR agrees to ensure that its subconsultants, subcontractors, and any other party involved with the project who is brought onto or involved in the project by CONTRACTOR, provide the same minimum insurance coverage and endorsements required of CONTRACTOR. CONTRACTOR agrees to monitor and review all such coverage and assumes all responsibility for ensuring that such coverage is provided in conformity with the requirements of this section. CONTRACTOR agrees that upon request, all agreements with consultants, subcontractors, and others engaged in the project will be submitted to AGENCY for review.
- (o) Agency's Right to Revise Requirements: The AGENCY reserves the right at any time during the term of the contract to change the amounts and types of insurance required by giving the CONTRACTOR a ninety (90) day advance written notice of such change. If such change results in substantial additional cost to the CONTRACTOR, the AGENCY and CONTRACTOR may renegotiate CONTRACTOR's compensation.
- (p) Self-insured Retentions: Any self-insured retentions must be declared to and approved by AGENCY. AGENCY reserves the right to require that self-insured retentions be eliminated, lowered, or replaced by a deductible. Self-insurance will not be considered to comply with these specifications unless approved by AGENCY.
- (q) Timely Notice of Claims: CONTRACTOR shall give AGENCY prompt and timely notice of claims made or suits instituted that arise out of or result from CONTRACTOR's performance under this Agreement, and that involve or may involve coverage under any of the required liability policies.
- (r) Additional Insurance: CONTRACTOR shall also procure and maintain, at its own cost and expense, any additional kinds of insurance, which in its own judgment may be necessary for its proper protection and prosecution of the Work.

3-5 FAILURE TO EXECUTE CONTRACT.

Failure of the lowest responsible bidder, the second lowest responsible bidder, or the third lowest responsible bidder to execute the contract and file acceptable bonds as provided herein within ten (10) days, not including Saturdays, Sundays and legal holidays, after that bidder has received the contract for execution shall be just cause for the forfeiture of the Proposal guaranty. The successful bidder may file with the City Clerk a written notice, signed by the bidder or the bidder's authorized representative, specifying that the bidder will refuse to execute the contract if it is presented. The filing of this notice shall have the same force and effect as the failure of the bidder to execute the contract and furnish acceptable bonds within the time hereinbefore prescribed.

3-6 RETURN OF PROPOSAL GUARANTEES.

The Proposal guaranties accompanying the Proposals of the first, second and third lowest responsible bidders will be retained until the contract has been finally executed, after which those Proposal guaranties, except bidders' bonds and any guaranties which have been forfeited, will be returned to the respective bidders whose Proposals they accompany. The Proposal guaranties, other than bidder's bonds, submitted by all other unsuccessful bidders will be returned upon determination, by the City, of the first, second and third lowest responsible bidders.

3-7 BIDDING PROTEST PROCEDURES

A. Time for submitting Protests

1. A protest regarding bidding documents shall be submitted in writing by the protesting bidder to the City so that the protest is received five (5) days before the day scheduled for bid opening.
2. A protest regarding bid opening procedures, bids, of the selection of the successful bidder shall be

submitted in writing, by the protesting bidder to the City, so that the protest is received within seven (7) days after bid opening.

B. Protests shall include a clear detail of the reason for the protest and the remedies sought by the bidder submitting the protest.

C. The City will issue a response within twenty (20) days after receipt of protest.

SECTION 4 PROSECUTION, PROGRESS, AND ACCEPTANCE OF THE WORK

4-1 GENERAL.

Attention is directed to the provisions in Section 8, "Prosecution and Progress" of the Standard Specifications, and these special provisions

4-2 COMMENCEMENT OF WORK.

The Contractor shall begin work within ten (10) working days after the date of the Notice to Proceed. This work shall be diligently prosecuted to completion before the expiration of the Time of Contract shown on the cover of the Project Manual.

The Contractor shall notify the Engineer, in writing, of the Contractor's intent to begin work at least 72 hours before work is begun. The notice shall be delivered to the Engineer and shall specify the date the Contractor intends to start.

4-3 LIQUIDATED DAMAGES.

It is agreed by the parties to the contract that in case all the work called for under the contract in all parts and requirements is not finished or completed within the number of working days expressed in the contract, damage will be sustained by the City, and that it is and will be impracticable and extremely difficult to ascertain and determine the actual damage which the City will sustain in the event of and by reason of the delay; and it is therefore agreed that the Contractor will pay to the City, the sum of **\$1,500.00 per day**, for each and every calendar day delay in finishing the work in excess of the number of working days prescribed above; and the Contractor agrees to pay the liquidated damages herein provided for, and further agrees that the City may deduct the amount thereof from any moneys due or that may become due the Contractor under the contract.

It is further agreed that in case the work called for under the contract is not finished and completed in all parts and requirements within the number of working days specified, the Engineer shall have the right to increase the number of working days or not, as the Engineer may deem best to serve the interest of the City, and if the Engineer decides to increase the number of working days, the Engineer shall further have the right to charge to the Contractor, or the Contractor's heirs, assigns or sureties and to deduct from the final payment for the work all or any part, as the Engineer may deem proper, of the actual cost of engineering, inspection, superintendence, and other overhead expenses which are directly chargeable to the contract, and which accrue during the period of the extension, except that cost of final surveys and preparation of final estimate shall not be included in the charges.

No extension of time will be granted for a delay caused by a shortage of materials unless the Contractor furnishes to the Engineer documentary proof that the Contractor has made every effort to obtain the materials from all known sources within reasonable reach of the work in a diligent and timely manner, and further proof in the form of supplementary progress schedules, that the inability to obtain the materials when originally planned, did in fact cause a delay in final completion of the entire work which could not be compensated for by revising the sequence of the Contractor's operations. The term "shortage of materials," as used in this section, shall apply only to materials, articles, parts or equipment that are standard items and are to be incorporated in the work. The term "shortage of materials," shall not apply to materials, parts, articles or equipment that are processed, made, constructed, fabricated or manufactured to meet the specific requirements of the contract. Only the physical shortage of material will be considered under these provisions as a cause for extension of time. Delays in obtaining materials due to priority in filling orders will not constitute a shortage of materials.

If the Contractor is delayed in completion of the work by reason of changes made under Section 5, "Control of the Work," of the Standard Specifications, or by any act of the Engineer or of the City, not contemplated by the contract, an extension of time commensurate with the delay in completion of the work thus caused will be granted and the Contractor shall be relieved from any claim for liquidated damages, or engineering and inspection charges or other

penalties for the period covered by that extension of time; provided that the Contractor shall notify the Engineer in writing of the causes of delay within 15 days from the beginning of the delay. The Engineer shall ascertain the facts and the extent of the delay, and the Engineer's findings thereon shall be final and conclusive.

It is the intention of the above provisions that the Contractor shall not be relieved of liability for liquidated damages or engineering and inspection charges for any period of delay in completion of the work in excess of that expressly provided for in this Section 4-3.

4-4 PRE-CONSTRUCTION CONFERENCE.

Prior to the issuance of the Notice to Proceed, a pre-construction conference may be held at the discretion of the City Engineer at Guadalupe City Hall for the purpose of discussing with the Contractor the scope of work, Plans, Specifications, existing conditions, materials to be ordered, equipment to be used, and all essential matters pertaining to the prosecution of and the satisfactory completion of the project as required. The Contractor's representative at this conference shall include all major superintendents for the work and may include major sub-contractors.

4-5 PROGRESS SCHEDULE

The Contractor shall submit a detailed CPM schedule to the Engineer one week before the Pre-Construction Meeting. The Contractor shall make revisions as required by the Engineer. Upon acceptance by the Engineer the schedule will become the accepted Construction Schedule. An accepted schedule is required before work may proceed. The schedule shall show the Work spread over the entire contract time available for construction.

The Contractor shall revise and update the Construction Schedule on or before the twentieth of each month showing the status of work actually completed during the preceding estimate period. The Contractor shall submit to the Engineer one (1) printed copy of the revised Construction Schedule with his/her monthly progress payment request for that period. The schedule shall indicate the controlling items of work for each phase of the project. Preparation and updating of Construction Schedule shall be performed at Contractor's sole expense.

Failure by the Contractor to submit updated or revised Construction Schedules when required may prevent acceptance of progress payment requests by the Engineer until such updated or revised Construction Schedules have been submitted for review and have been accepted by the Engineer.

If the Contractor has fallen behind the accepted Construction Schedule by more than fifteen (15) percentage points based on earned progress payments, the Contractor shall take steps, including, but not limited to, increasing the number of personnel, shifts, and/or overtime operations, days of work, and/or amount of construction equipment until such time as the Work is back on schedule. He/she shall also submit for review no later than the next request for partial payment, such supplementary schedule or schedules as may be deemed necessary to demonstrate the manner in which the rate of progress will be regained. All cost required to bring the Project back on schedule shall be borne by the Contractor without additional cost to the Agency.

If the Contractor falls behind the accepted construction schedule, as modified by such time extensions as may have been granted by the City for unavoidable delays, by more than thirty-five (35) percentage points based on earned progress payments, he/she shall be deemed in material breach of Contract and the Work may be turned over to the surety for completion within the scheduled time.

4-6 DISPUTES AND CLAIMS

GENERAL

Any and all decisions made on appeal pursuant to this Subsection 4-6 shall be in writing. Any "decision" purportedly made pursuant to this Subsection 4-6 which is not in writing shall not be binding upon the Agency and should not be relied upon the Contractor.

Nothing in this subsection shall be considered as relieving the Contractor from his duty to file the notice required under this Subsection or other duties required by the contract documents.

NOTICE OF POTENTIAL CLAIM

The Contractor shall not be entitled to the payment of any additional compensation for any cause, including any act, or failure to act, by the Engineer, or the happening of any event, thing or occurrence, unless he shall have given the Engineer due written notice of potential claim as hereinafter specified, provided, however, that compliance with this Subsection shall not be a prerequisite as to any claim which is based on differences in measurements or errors of computation as to contract quantities.

The written notice of potential claim shall set forth the reasons for which the Contractor believes additional compensation will or may be due, the nature of the costs involved, and, insofar as possible, the amount of the potential claim. The said notice as above required must have been given to the Engineer prior to the time that the Contractor shall have performed the work giving rise to the potential claim for additional compensation, if based on an act or for additional compensation, if based on an act or failure to act by the Engineer, or in all other cases within 15 days after the happening of the event, thing or occurrence giving rise to the potential claim.

It is the intention of this Subsection that differences between the parties arising under and by the virtue of the contract be brought to the attention of the Engineer at the earliest possible time in order that such matters may be settled, if possible, or other appropriate action promptly taken. The Contractor hereby agrees that he shall have no right to additional compensation for any claim that may be based on any such act, failure to act, event, thing or occurrence for which no written notice of potential claim as herein required was filed.

SECTION 5 (Not Used)

SECTION 6 ADDITIONAL PROVISIONS AND NOTICES REQUIRED BY STATE LAW

6-1 GENERAL.

This section contains additional provisions and notices required to be included in contracts for public works projects entered into by the City that are not covered in other sections of these special provisions.

6-2 WORKING HOURS.

The Contractor shall comply with all applicable provisions of Section 1810 to 1815, inclusive, of the California Labor Code relating to working hours. The Contractor shall as a penalty to the City, forfeit \$50.00 for each worker employed in the execution of the Contract by the Contractor or by any subcontractor for each calendar day during which such worker is required or permitted to work more than 8 hours in any one calendar day and 40 hours in any one calendar week, unless such worker receives compensation for all hours worked in excess of 8 hours at not less than 1-1/2 times the basic rate of pay.

6-3 TRAVEL AND SUBSISTENCE PAY.

- (a) As required by Section 1773.1 of the California Labor Code the Contractor shall pay travel and subsistence payments to each workman needed to execute the Work, as such travel and subsistence payments are defined in the applicable collective bargaining agreements filed in accordance with this Section.
- (b) To establish such travel and subsistence payments, the representative of any craft, classification, or type of workman needed to execute the contracts shall file with the Department of Industrial Relations fully executed copies of collective bargaining agreements for the particular craft, classification or type of work involved. Such agreements shall be filed within 10 days after their execution and thereafter shall establish such travel and subsistence payments whenever filed 30 days prior to the call for bids.

6-4 PROTECTION OF WORKERS IN TRENCH EXCAVATIONS.

As required by Section 6705 of the California Labor Code and in addition thereto, whenever work under the Contract involves the excavation of any trench or trenches 5 feet or more in depth, the Contractor shall submit for acceptance by the City or by a registered Civil or Structural Engineer, employed by the City, to whom authority to accept has been delegated, in advance of excavation, a detailed plan showing protection from the hazard of caving ground during the excavation of such trench or trenches. If such plan varies from the Construction Safety Orders of the Division of Industrial Safety, the plan shall be prepared by a registered Civil or Structural Engineer employed by the Contractor, and all costs shall be considered as included in the Contract items of work designated in the Engineer's Estimate and no other additional compensation shall be allowed therefor. Nothing in this Section shall be deemed to allow the use of a shoring, sloping, or other protective system less effective than that required by the Construction Safety Orders. Nothing in this Section shall be construed to impose tort liability on the City, the Architect, nor any of their officers, agents, representatives, or employees.

6-5 DAMAGE RESULTING FROM CERTAIN ACTS OF GOD.

As provided in Section 7105 of the California Public Contract Code, the Contractor shall not be responsible for the cost of repairing or restoring damage to the Work which damage is determined to have been proximately caused by an act of God, in excess of 5 percent of the contracted amount, provided, that the Work damaged was built in accordance with accepted and applicable building standards and the Plans and specifications of the City. The Contractor shall obtain insurance to indemnify the City for any damage to the Work caused by an act of God if the insurance premium is a separate bid item in the bidding schedule for the Work. For purposes of this section, the term "acts of God" shall include only the following occurrences or conditions and effects: earthquakes in excess of a magnitude of 3.5 on the Richter Scale, and tidal waves.

6-6 CONCRETE FORMS, FALSE WORK, AND SHORING.

The Contractor shall comply fully with the requirements of Section 1717 of the Construction Safety Orders, State of California, Department of Industrial Relations, regarding the design of concrete forms, FALSE WORK, and shoring and the inspection of same prior to placement of concrete. Where the said Section 1717 requires the services of a civil engineer registered in the State of California to approve design calculations and working drawings of the FALSE WORK or shoring system, or to inspect such system prior to placement of concrete, the Contractor shall employ a registered civil engineer for these purposes, and all costs therefor shall be included in the price named in the Contract for completion of the Work as set forth in the Contract Documents.

6-7 SUBMISSION OF BIDS; AGREEMENT TO ASSIGN.

In accordance with Section 4552 of the Government Code, the bidder shall conform to the following requirements. In submitting a bid to a public purchasing body, the bidder offers and agrees that if the bid is accepted, it will assign to the purchasing body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec.15) or under the Cartwright Act [Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code], arising from purchases of goods, materials, or services by the bidder for sale to the purchasing body pursuant to the bid. Such assignment shall be made and become effective at the time the purchasing body tenders final payment to the bidder.

6-8 PUBLIC WORKS CONTRACTS; ASSIGNMENT TO AWARDING BODY.

In accordance with Section 4551 of the Government Code, the Contractor and subcontractor shall conform to the following requirements. In entering into a public works contract or a subcontract to supply goods, services, or material pursuant to a public works contract, the Contractor or subcontractor offers and agrees to assign to the awarding body all rights, title and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act [Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code], arising from purchases of goods, services, or materials pursuant to the public works contract of the subcontract. This assignment shall be made and become effective at the time the awarding body tenders final payment to the Contractor, without further acknowledgment by the parties.

6-9 REMOVAL, RELOCATION OR PROTECTION OF EXISTING UTILITIES.

In accordance with the provisions of Section 4215 of the Government Code, the Contractor shall not be assessed liquidated damages for delay in completion of the project, when such delay was caused by failure of the public agency or owner of the utility to provide for the removal or relocation of such utility facilities.

6-10 SUBSTITUTION OF SECURITIES.

Retainage from Monthly Payments: Pursuant to Section 22300 of the Public Code, the Contractor may substitute securities for any money withheld by the Owner to insure performance under the contract. At the request and expense of the Contractor, securities equivalent to the amount withheld shall be deposited with the City or with a state or federally chartered bank as the escrow agent, who shall return such securities to the Contractor upon satisfactory completion of the contract. Deposit of securities with an escrow agent shall be subject to a written agreement between the escrow agent and the City in accordance with the provisions of Section 4590. The City will not certify that the contract has been satisfactorily completed until at least 50 calendar days after filing by the City of a Notice of Completion. Securities eligible for investment under Section 22300 of the Public Contract Code shall be limited to those listed in Section 16430 of the Government Code and to bank or savings and loan certificates of deposit, interest bearing demand deposit accounts, standby letters of credit, or any other security mutually agreed to by the Contractor and the City.

6-11 LISTING OF SUBCONTRACTORS.

As required under the provisions of Section 4104 et seq of the California Public Contract Code, any person making a bid or offer to perform the work, shall in his or her bid or offer, set forth: (a) the name and location of the place of

business of each subcontractor who will perform work or labor or render service to the prime contractor in or about the construction of the work or improvement in an amount in excess of one-half of 1 percent of the prime contractor's total bid; (b) the name and location of the place of business of each subcontractor licensed by the State of California who, under subcontract to the primary contractor specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in , in an amount in excess of one-half of 1 percent of the prime contractor's total bid; (c) The portion of the work which will be done by each such subcontractor under this act. The prime contractor shall list only one subcontractor for each such portion of the work as itemized on the "List of Subcontractors," included in the Proposal.

6-12 BIDS FOR TRENCHING AND EXCAVATION WORK.

In accordance with the provisions of Section 6707 of the California Labor Code, whenever the state, a county, city and county, or city issues a call for bids for the construction of a pipeline, sewer, sewage disposal system, boring or jacking pits, or similar trenches or open excavation, which are five feet deep or deeper, such call shall specify that each bid submitted in response thereto shall contain, as a bid item, adequate sheeting, shoring, and bracing or equipment method, for the protection of life or limb, which shall conform to applicable safety orders.

6-13 STATE WAGE DETERMINATION.

- (a) As required by Sections 1770 and following, of the California Labor Code, the Contractor 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 such prevailing rate of per diem wages are on file at the office of the City Engineer, which copies shall be made available to any interested party on request. The Contractor shall post a copy of such determination at each job site.
- (b) As provided in Section 1775 of the California Labor Code, the Contractor shall, as a penalty to the City, forfeit at least \$50.00 for each calendar day, or portion thereof, for each worker paid less than the State General Prevailing Wage Rates as determined by the Director of the Department of Industrial Relations or such work or craft in which such worker is employed for any public work done under the contract by it or by any subcontractor under it.

6-14 PAYROLL RECORDS; RETENTION; INSPECTION; NONCOMPLIANCE PENALTIES; RULES AND REGULATIONS.

- (a) As required under the provisions of Section 1776 of the California Labor Code, each Contractor and subcontractor shall keep an accurate payroll record, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by him or her in connection with the public work.
- (b) The payroll records enumerated herein, shall be certified and shall be available for inspection at all reasonable hours at the principal office of the Contractor on the following basis:

A certified copy of an employee's payroll record shall be made available for inspection or furnished to the employee or his or her authorized representative on request.

A certified copy of all payroll records enumerated herein, shall be made available for inspection or furnished upon request to a representative of the body awarding the contract, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the Department of Industrial Relations.

A certified copy of all payroll records enumerated herein, shall be made available upon request by the public for inspection or copies thereof made; provided, however, that a request by the public shall be made through either the body awarding the contract, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the requested payroll records have not been provided the requesting party shall, prior to being provided the records, reimburse the costs of preparation by the Contractor,

subcontractors, and the entity through which the request was made. The public shall not be given access to the records at the principal offices of the Contractor.

- (c) Each Contractor shall file a certified copy of the records, enumerated herein, with the entity that requested the records within 10 days after receipt of a written request.

Any copy of records made available for inspection and copies furnished upon request to the public or any public agency by the awarding body, the Division of Apprenticeship Standard, or the Division of Labor Standards Enforcement shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address, and social security number. The name and address of the Contractor awarded the contract or performing the contract shall not be marked or obliterated.

- (d) The Contractor shall inform the body awarding the Contract of the location of the records enumerated herein, including the street address, city and county, and shall, within 5 working days, provide a notice of change of location and address.
- (e) In the event of noncompliance with the requirements of this Article, the Contractor shall have 10 days in which to comply subsequent to receipt of written notice specifying in what respects the Contractor must comply with this Article. Should noncompliance still be evident after the 10-day period, the Contractor shall, as a penalty to the state or political subdivision on whose behalf the Contract is made or awarded, forfeit \$50.00 for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due. Responsibility for compliance with these Paragraphs lies with the Contractor.
- (f) 5% retention is to be subtracted from each invoice, to be paid to the contractor 35 days after the Notice of Completion is recorded with the County of Santa Barbara.

6-15 APPRENTICES.

Attention is directed to Sections 1777.5 and 1777.6 and 1777.7 of the California Labor Code and Title 8, California Administrative Code Section 200 et seq. To insure compliance and complete understanding of the law regarding apprentices, and specifically the required ratio thereunder, the Contractor (and subcontractor) should, where some question exists, contact the Division of Apprenticeship Standards prior to commencement of the work. Responsibility for compliance with this Paragraph lies with the Contractor. The Owner policy is to encourage the employment and training of apprentices on its construction contracts as may be permitted under local apprenticeship standards.

6-16 WORKERS COMPENSATION.

- (a) In accordance with the provisions of Section 1860 of the California Labor Code, the Contractor's attention is directed to the requirement that in accordance with the provisions of Section 3700 of the California Labor Code, every Contractor will be required to secure the payment of compensation of his or her employees.
- (b) In accordance with the provisions of Section 1861 of the California Labor Code, each contractor to whom a public works contract is awarded shall sign and file with the awarding body the following certification prior to performing the work of the contract: "I am aware of the provisions of Section 3700 of the Labor Code which requires every employer to be insured against liability for worker's compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract."

Full compensation for conforming to the provisions in Section 6, not otherwise provided for, shall be considered as included in prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

SECTION 7 MISCELLANEOUS

7-1 LABOR NON-DISCRIMINATION.

Attention is directed to Section 1735 of the Labor Code, which reads as follows:

“No discrimination shall be made in the employment of persons upon public works because of the race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status, or sex of such persons, except as provided in Section 12940 of the Government Code, and every contractor for public works violating this section is subject to all the penalties imposed for a violation of this chapter.”

7-2 NIGHT, SATURDAY, SUNDAY, AND HOLIDAY WORK.

No work shall be performed at night, on Saturdays, Sundays, or on legal holidays, except with the permission of the City Engineer and in accordance with such regulations, as they shall furnish in writing. Before performing any work at said times, the Contractor shall give written notice to the City Engineer so that proper inspection may be provided. "Night," as used in this paragraph, shall be deemed to include the hours from 5:00 p.m. to 7:00 a.m., of the next succeeding day.

7-3 (Not Used)

7-4 PARTIAL AND FINAL PAYMENT.

The retained percentage or security will be held by the City and will be due and payable to the Contractor fifty (50) days after final acceptance of the work by the City Council and/or City Administrator.

7-5 (Not Used)

7-6 HAZARDOUS WASTE IN EXCAVATION.

In accordance with Section 7104 of the Public Contract Code, the Contractor shall comply fully with the following requirements:

- (a) The Contractor shall promptly, and before the following conditions are disturbed, notify the City, in writing, of any:

Material encountered in excavation that the Contractor has reason to believe may be hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be moved to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.

Subsurface of any latent physical conditions at the site differing from those indicated.

Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.

- (b) That the City shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the work shall issue a change order under the procedures described in the Contract

- (c) That in the event that a dispute arises between the City and the Contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the work, the Contractor shall not be excused from any scheduled completion date provided for by the Contract, but shall proceed with all work to be performed under the Contract. The Contractor shall retain any and all rights provided either by Contract or by law that pertain to the resolution of disputes between the contracting parties.

7-7 PROJECT APPEARANCE.

The Contractor shall maintain a neat appearance to the work.

- (a) During construction, the Contractor shall keep the work site, areas adjacent to the work site, and streets and alleys in an orderly condition, free and clear from debris and discarded materials.
- (b) Broken concrete, trench spoil, or other debris developed during construction shall be disposed of concurrently with its removal. If stock piling is necessary it shall be done only at the approval of the City Engineer, but in no case shall the debris remain for more than one week.

7-8 DISPOSAL OF EXCESS MATERIAL.

All material determined to be excess by the Engineer becomes property of the Contractor, unless otherwise indicated in these special provisions. All material approved for disposal at the City's Sanitary Landfill is subject to payment of current fees.

The Contractor shall obtain all applicable permits from the County of Santa Barbara for the dumping of materials outside the City Limits of Guadalupe.

7-9 CLEANUP AND DUST CONTROL.

Cleanup and dust control shall conform to Standard Specifications and these special provisions.

- (a) The Contractor shall apply water in amounts and at intervals as directed by the Engineer. The water supply vehicle and an operator shall be available within one hour's notice on Saturdays, Sundays, and holidays to perform dust control work. If the Contractor is not available for dust control measures, the City of Guadalupe will arrange for the work to be performed by others and will deduct all equipment, labor, and material costs thereof from the Contract amount.

7-10 GUARANTEE.

The Contractor shall be responsible for the repair or replacement of latent defects in workmanship or materials for a period of one year from the date of filing of the Notice of Completion.

7-11 PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS.

- (a) The Contractor shall be responsible for the protection and the restoration or replacement of any improvements existing on public or private property at the start of work or placed there during the progress of work and not specified or shown on the Plans to be permanently removed. Existing improvements shall include, but are not limited to, curbs, gutters, cross-gutters, sidewalks, driveways, lawns, sprinkler systems, shrubs, trees, fences, and walls. All existing improvements shall be reconstructed to equal or better than the existing improvements removed.

In submitting a bid, the Contractor will be deemed to have carefully examined the site of the work and to have acquainted himself with all conditions relating to the protection and restoration of existing improvements. The City of Guadalupe does not guarantee that all improvements are shown on the Plans, and it shall be the

Contractor's responsibility to provide in his bid for the protection and restoration of all existing improvements except those otherwise specified herein.

- (b) All curbs, gutters, sidewalks, and driveways shall be removed and replaced to the next joint or score line beyond the actually damaged or broken sections; or in the event that joints or score lines do not exist or are three or more feet from the removed or damaged section, the damaged portions shall be removed and reconstructed to neat, plane faces. All new concrete shall match, as nearly as possible, the appearance of adjacent concrete improvements.

7-12 UTILITIES.

Utilities shall conform to the relevant provisions in the Standard Specifications and these special provisions.

- (a) Utilities for the purpose of these special provisions shall be considered as including, but not limited to: pipelines, conduits, transmission lines, and appurtenances of "Public Utilities" (as defined in the Public Utilities Act of the State of California) and those of private industry, businesses, or individuals solely for their own use or for use of their tenants; and storm drains, sanitary sewers, street lighting, and traffic signal systems. The City of Guadalupe has, by a search of known records, endeavored to locate and indicate on the Plans all utilities that exist within the limits of the work. However, the accuracy or completeness of the utilities indicated on the Plans is not guaranteed. Service connections to an adjacent property may or may not be shown on the Plans. It shall be the responsibility of the Contractor to determine the exact location of all utilities and their service connections. The Contractor shall make his own investigation as to the location, type, kind of material, age, and condition of existing utilities and their appurtenances and service connections which may be affected by the contract work; and, in addition, he shall notify the City as to any utilities, appurtenances, and service connections located by him which have been incorrectly shown on or omitted from the Plans.
- (b) The Contractor shall notify the owners of all utilities at least two working days in advance of excavation around any of their structures. At the completion of the contract work, the Contractor shall leave all utilities and appurtenances in a condition satisfactory to the owners and the City of Guadalupe.

7-13 (Not Used)

7-14 SUBMITTALS.

7-1.14.A GENERAL- Submittals covered by these requirements include manufacturers information, shop drawings, test procedures, test results, samples, requests for substitutions, and miscellaneous work-related submittals. Submittals shall also include, but not be limited to, all mechanical, electrical and electronic equipment and systems, materials, reinforcing steel, fabricated items, and piping and conduit details. The Contractor shall furnish all drawings, specifications, descriptive data, certificates, samples, tests, methods, schedules, and manufacturer's installation and other instructions as specifically required in the Contract Documents to demonstrate fully that the materials and equipment to be furnished and the methods of work comply with the provisions and intent of the Contract Documents.

7-1.14.B CONTRACTOR'S RESPONSIBILITIES-The Contractor shall be responsible for the accuracy and completeness of the information contained in each submittal and shall assure that the material, equipment or method of work shall be as described in the submittal. The Contractor shall verify that all features of all products conform to the specified requirements. Submittal documents shall be clearly edited to indicate only those items, models, or series of equipment, which are being submitted for review. All extraneous materials shall be crossed out or otherwise obliterated. The Contractor shall ensure that there is no conflict with other submittals and notify the Engineer in each case where his submittal may affect the work of another contractor or the City. The Contractor shall coordinate submittals among his subcontractors and suppliers

7-1.14.C The Contractor shall coordinate submittals with the work so that work will not be delayed. He shall coordinate and schedule different categories of submittals, so that one will not be delayed for lack of coordination with another. **No extension of time will be allowed because of failure to properly schedule submittals.** The Contractor shall not proceed with work related to a submittal until the submittal process is complete. This requires that submittals for review and comment shall be returned to the Contractor stamped "No Exceptions Taken" or "Make Corrections Noted."

7-1.14.D The Contractor shall certify on each submittal document that he has reviewed the submittal, verified field conditions, and complied with the Contract Documents

7-1.14.E The Contractor may authorize in writing a material or equipment supplier to deal directly with the Engineer or with the City with regard to a submittal. These dealings shall be limited to contract interpretations to clarify and expedite the work.

7-1.14.F CATEGORIES OF SUBMITTALS

7-1.14.F(1) GENERAL- Submittals fall into two general categories; submittals for review and comment, and submittals which are primarily for information only. Submittals that are for information only are generally specified as PRODUCT DATA in applicable specification sections.

7-1.14.F(2) SUBMITTALS FOR REVIEW AND COMMENT- All submittals except where specified to be submitted as product data for information only shall be submitted by the Contractor to the Engineer for review and comment

7-1.14.F(3) SUBMITTALS (PRODUCT DATA) FOR INFORMATION ONLY- Where specified, the Contractor shall furnish submittals (product data) to the Engineer for Information only.

7-1.14.G TRANSMITTAL

7-1.14.G(1) GENERAL- Unless otherwise specified, submittals regarding material and equipment shall be accompanied by a transmittal form approved by the Engineer. A separate transmittal form shall be used for each specific item, class of material, equipment, and items specified in separate, discrete sections, for which the submittal is required. Submittal documents common to more than one piece of equipment shall be identified with all the appropriate equipment numbers. Submittals for various items shall be made with a single form when the items taken together constitute a manufacturer's package or are so functionally related that expediency indicates checking or review of the group or package as a whole.

A unique number, sequentially assigned, shall be noted on the transmittal form accompanying each item submitted. Original submittal numbers shall have the following format: "XXX"; where "XXX" is the sequential number assigned by the Contractor. Re-submittals shall have the following format: "XXX-Y"; where "XXX" is the originally assigned submittal number and "Y" is a sequential letter assigned for re-submittals, i.e., A, B, or C being the 1st, 2nd, and 3rd re-submittals, respectively. Submittal 25B, for example, is the second re-submittal of submittal 25.

7-1.14.G(2) DEVIATION FROM CONTRACT- If the Contractor proposes to provide material, equipment, or method of work which deviates from these Special Provisions, he shall indicate so under "deviations" on the transmittal form accompanying the submittal copies.

7-1.14.G(3) SUBMITTAL COMPLETENESS- Submittals which do not have all the information required to be submitted, including deviations, are not acceptable and will be returned without review.

7-1.14.H REVIEW PROCEDURE

7-1.14.H(1) GENERAL- Submittals are specified for those features and characteristics of materials, equipment, and methods of operation which can be selected based on the Contractor's

judgment of their conformance to the specified requirements. Other features and characteristics are specified in a manner which enables the Contractor to determine acceptable options without submittals. The review procedure is based on the Contractor's guarantee that all features and characteristics not requiring submittals conform as specified. Review shall not extend to means, methods, techniques, sequences or procedures of construction, or to verifying quantities, dimensions, weights or gages, or fabrication processes (except where specifically indicated or required by these Special Provisions) or to safety precautions or programs incident thereto. Review of a separate item, as such, will not indicate approval of the assembly in which the item functions.

7-1.14.H(2) When the Contract Documents require a submittal, the Contractor shall submit 5 copies of all submitted information plus one reproducible original of all information shall be transmitted with submittals for review and comment.

7-1.14.H(3) SUBMITTALS FOR REVIEW AND COMMENT- Unless otherwise specified, within 10 calendar days after receipt of a submittal for review and comment, the Engineer shall review the submittal and return **3 copies** of the marked-up reproducible original noted in 1 above. The Engineer will retain the reproducible original. The returned submittal shall indicate one of the following actions:

7-1.14.H(3)a) If the review indicates that the material, equipment or work method complies with these Special Provisions, submittal copies will be marked "NO EXCEPTIONS TAKEN." In this event, the Contractor may begin to implement the work method or incorporate the material or equipment covered by the submittal.

7-1.14.H(3)b) If the review indicates limited corrections are required, copies will be marked "MAKE CORRECTIONS NOTED." The Contractor may begin implementing the work method or incorporating the material and equipment covered by the submittal in accordance with the noted corrections. Where submittal information will be incorporated in O&M data, a corrected copy shall be provided.

7-1.14.H(3)c) If the review reveals that the submittal is insufficient or contains incorrect data, copies will be marked "AMEND AND RESUBMIT." Except at his own risk, the Contractor shall not undertake work covered by this submittal until it has been revised, resubmitted and returned marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED."

7-1.14.H(3)d) If the review indicates that the material, equipment, or work method does not comply with these Special Provisions, copies of the submittal will be marked "Rejected - See Remarks." Submittals with deviations that have not been identified clearly may be rejected. Except at his own risk, the Contractor shall not undertake the work covered by such submittals until a new submittal is made and returned marked either "No Exceptions Taken" or "Make Corrections Noted."

7-1.14.H(4) SUBMITTALS (PRODUCT DATA) FOR INFORMATION ONLY- Such information is not subject to submittal review procedures and shall be provided as part of the work under this contract and its acceptability determined under normal inspection procedures.

7-1.14.I EFFECT OF REVIEW OF CONTRACTOR'S SUBMITTALS- review of contract drawings, methods of work, or information regarding materials or equipment the Contractor proposes to provide, shall not relieve the Contractor of his responsibility for errors therein and shall not be regarded as an assumption of risks or liability by the Engineer or the City, or by any officer or employee thereof, and the Contractor shall have no claim under the contract on account of the failure, or partial failure, of the method of work, material, or equipment so reviewed. A mark of "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED" shall mean that the City has no objection to the Contractor, upon his own responsibility, using the plan or method of work proposed, or providing the materials or equipment proposed.

SECTION 8 (Not Used)

SECTION 9 EXTRA WORK

9-1.01 EXTRA WORK.

Extra Work shall be paid in accordance with Section 9 of these Special Provisions.

9-1.02 GENERAL.

New or unforeseen work will be classified as "extra work" when the Engineer determines that it is not covered by Contract Unit Prices or Stipulated unit prices.

9-1.03 EXTRA WORK PAYMENT.

When extra work is to be paid for on a force account basis the labor, materials and equipment used in the performance of such work shall be subject to the approval of the Engineer and compensation will be determined as follows:

9-1.03A WORK PERFORMED BY CONTRACTOR. The Contractor will be paid the direct costs for labor, materials and equipment used in performing the work determined as hereinafter provided in Sections 9-1.03A(1), "Labor," 9-1.03A(2), "Materials," and 9-1.03A(3), "Equipment Rental," except where agreement has been reached to pay in accordance with Section 9-1.03B, "Work Performed by Special Forces or Other Special Services."

To the total of the direct costs computed as provided in Sections 9-1.03A(1), "Labor," 9-1.03A(2), "Materials," and 9-1.03A(3), "Equipment Rental," there will be added a markup of 33 percent to the cost of labor, 15 percent to the cost of materials, and 15 percent to the equipment rental. A markup for "Home Office Overhead" will not be allowed.

The above markups shall constitute full compensation for all overhead costs which shall be deemed to include all items of expense not specifically designated as cost or equipment rental in Sections 9-1.03A(1), "Labor," 9-1.03A(2), "Materials," and 9-1.03A(3), "Equipment Rental." The total payment made as provided above shall be deemed to be the actual cost of such work and shall constitute full compensation therefor.

When extra work is performed by a subcontractor, approved in accordance with the provisions in Section 2-3, "Subcontracts," of the Standard Specifications, an additional markup of 5 percent will be added to the total cost of said extra work including all markups specified in this Section 9-1.03A. Said additional 5 percent markup shall reimburse the Contractor for additional administrative costs, and no other additional payment will be made by reason of performance of the extra work by a subcontractor.

9-1.03A(1) LABOR. The Contractor will be paid the cost of labor for the workmen (including foremen when authorized by the Engineer), used in the actual and direct performance of the work. The cost of labor, whether the employer is the Contractor, subcontractor, or other forces, will be the sum of the following:

9-1.03A(1a) ACTUAL WAGES. The actual wages paid shall include any employer payments to or on behalf of the workmen for health and welfare, pension, vacation, and similar purposes.

9-1.03A(1b) LABOR SURCHARGE. To the actual wages, as defined in Section 9-1.03A(1a), will be added a labor surcharge set forth in the Department of Transportation publication entitled Labor Surcharge And Equipment Rental Rates, which is in effect on the date upon which the work is accomplished and which is a part of the contract. Said labor surcharge shall constitute full compensation for all payments imposed by State and Federal laws and for all other payments made to, or on behalf of, the workmen, other than actual wages as defined in Section 9-1.03A(1a) and subsistence and travel allowance as specified in Section 9-1.03A(1c). Indirect labor costs, including superintendence, shall be considered part of the markup in 9-1.03A.

9-1.03A(1c) SUBSISTENCE AND TRAVEL ALLOWANCE. The actual subsistence and travel allowance paid to such workmen.

9-1.03A(2) MATERIALS. The City reserves the right to furnish such materials as it deems advisable, and the Contractor shall have no claims for costs and markup on such materials.

Only materials furnished by the Contractor and necessarily used in the performance of the work will be paid for. The cost of such materials will be the cost to the purchaser, whether Contractor, subcontractor or other forces, from the supplier thereof, except as the following are applicable:

9-1.03A(2a) If a cash or trade discount by the actual supplier is offered or available to the purchaser, it shall be credited to the City notwithstanding the fact that such discount may not have been taken.

9-1.03A(2b) If materials are procured by the purchaser by any method which is not a direct purchase from and a direct billing by the actual supplier to such purchaser, the cost of such materials shall be deemed to be the price paid to the actual supplier as determined by the Engineer plus the actual costs, if any, incurred in the handling of such materials.

9-1.03A(2c) If the materials are obtained from a supply or source owned wholly or in part by the purchaser, the cost of such materials shall not exceed the price paid by the purchaser for similar materials furnished from said source on contract items or the current wholesale price for such materials delivered to the job site, whichever price is lower.

9-1.03A(2d) If the cost of such materials is, in the opinion of the Engineer, excessive, then the cost of such material shall be deemed to be the lowest current wholesale price at which such materials were available in the quantities concerned delivered to the job site, less any discounts as provided in Section 9-1.03A(2a).

9-1.03A(2e) If the Contractor does not furnish satisfactory evidence of the cost of such materials from the actual supplier thereof within 60 days after the date of delivery of the material or within 15 days after acceptance of the contract, whichever occurs first, the City reserves the right to establish the cost of such materials at the lowest current wholesale prices at which such materials were available in the quantities concerned delivered to the location of the work, less any discounts as provided in Section 9-1.03A(2a).

9-1.03A(3) EQUIPMENT RENTAL. The Contractor will be paid for the use of equipment at the rental rates listed for such equipment in the Department of Transportation publication entitled Labor Surcharge And Equipment Rental Rates, which is in effect on the date upon which the work is accomplished and which is a part of the contract, regardless of ownership and any rental or other agreement, if such may exist, for the use of such equipment entered into by the Contractor, except that for those pieces of equipment with a rental rate of \$10.00 per hour or less as listed in the Labor Surcharge And Equipment Rental Rates publication and which are rented from a local equipment agency, other than Contractor owned, the Contractor will be paid at the hourly rate shown on the rental agency invoice or agreement for the time used on force account work as provided in Section 9-1.03A(3a), "Equipment on the Work." If a minimum equipment rental amount is required by the local equipment rental agency, the actual amount charged will be paid to the Contractor.

If it is deemed necessary by the Engineer to use equipment not listed in the said publication, a suitable rental rate for such equipment will be established by the Engineer. The Contractor may furnish any cost data, which might assist the Engineer in the establishment of such rental rate. If the rental rate established by the Engineer is \$10.00 per hour or less, the provisions above concerning rental of equipment from a local equipment agency shall apply.

The rental rates paid as above provided shall include the cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals.

Operators of rented equipment will be paid for as provided in Section 9-1.03A(1), "Labor."

All equipment shall, in the opinion of the Engineer, be in good working condition and suitable for the purpose for which the equipment is to be used.

Unless otherwise specified, manufacturer's ratings and manufacturer approved modifications shall be used to classify equipment for the determination of applicable rental rates. Equipment which has no direct power unit shall be powered by a unit of at least the minimum rating recommended by the manufacturer.

Individual pieces of equipment or tools not listed in said publication and having a replacement value of \$500 or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made therefor.

Rental time will not be allowed while equipment is inoperative due to breakdowns.

9-1.03A(3a) EQUIPMENT ON THE WORK. The rental time to be paid for equipment on the work shall be the time the equipment is in operation on the extra work being performed, and in addition, shall include the time required to move the equipment to the location of the extra work and return it to the original location or to another location requiring no more time than that required to return it to its original location, except that moving time will not be paid for if the equipment is used at the site of the extra work on other than such extra work. Loading and transporting costs will be allowed, in lieu of moving time, when the equipment is moved by means other than its own power, except that no payment will be made if the equipment is used at the site of the extra work on other than such extra work.

The following shall be used in computing the rental time of equipment on the work:

- (1) When hourly rates are listed, less than 30 minutes of operation shall be considered to be 1/2 hour of operation.
- (2) When daily rates are listed, less than 4 hours of operation shall be considered to be 1/2 day of operation.

9-1.03A(3b) EQUIPMENT NOT ON THE WORK. For the use of equipment moved in on the work and used exclusively for extra work paid for on a force account basis, the Contractor will be paid the rental rates listed in the Department of Transportation publication entitled Labor Surcharge And Equipment Rental Rates, which is in effect on the date upon which the work is accomplished and which is a part of the contract, or determined as provided in Section 9-1.03A(3) and for the cost of transporting the equipment to the location of the work and its return to its original location, all in accordance with the following provisions:

- (1) The original location of the equipment to be hauled to the location of the work shall be agreed to by the Engineer in advance.
- (2) The State will pay the costs of loading and unloading such equipment.
- (3) The cost of transporting equipment in low bed trailers shall not exceed the hourly rates charged by established haulers.

(4) The cost of transporting equipment shall not exceed the applicable minimum established rates of the Public Utilities Commission.

(5) The rental period shall begin at the time the equipment is unloaded at the site of the extra work, shall include each day that the equipment is at the site of the extra work, excluding Saturdays, Sundays, and legal holidays unless the equipment is used to perform the extra work on such days, and shall terminate at the end of the day on which the Engineer directs the Contractor to discontinue the use of such equipment. The rental time to be paid per day will be in accordance with the following:

<i>Hours Equipment is in Operation</i>	<i>Hours to Be Paid</i>
0	4
0.5	4.25
1	4.5
1.5	4.75
2	5
2.5	5.25
3	5.5
3.5	5.75
4	6
4.5	6.25
5	6.5
5.5	6.75
6	7
6.5	7.25
7	7.5
7.5	7.75
8	8
Over 8	hours in operation

The hours to be paid for equipment, which is operated less than 8 hours due to breakdowns, shall not exceed 8 less the number of hours the equipment is inoperative due to breakdowns. When hourly rates are listed, less than 30 minutes of operation shall be considered to be 1/2 hour of operation. When daily rates are listed, payment for 1/2 day will be made if the equipment is not used. If the equipment is used, payment will be made for one day. The minimum rental time to be paid for the entire rental period on an hourly basis shall not be less than 8 hours or if on a daily basis shall not be less than one day.

(6) Should the Contractor desire the return of the equipment to a location other than its original location, the City will pay the cost of transportation in accordance with the above provisions, provided such payment shall not exceed the cost of moving the equipment to the work.

(7) Payment for transporting, and loading and unloading equipment, as above provided, will not be made if the equipment is used on the work in any other way than upon extra work paid for on a force account basis.

When extra work, other than work specifically designated as extra work in the plans and specifications, is to be paid for on a force account basis and the Engineer determines that such extra work requires the Contractor to move on to the work equipment which could not reasonably have been expected to be needed in the performance of the contract, the Engineer may authorize payment for the use of such

equipment at equipment rental rates in excess of those listed as applicable for the use of such equipment subject to the following additional conditions:

- (1) The Engineer shall specifically approve the necessity for the use of particular equipment on such work,
- (2) The Contractor shall establish to the satisfaction of the Engineer that such equipment cannot be obtained from his normal equipment source or sources and those of his subcontractors,
- (3) The Contractor shall establish to the satisfaction of the Engineer that the proposed equipment rental rate for such equipment from his proposed source is reasonable and appropriate for the expected period of use.
- (4) The Engineer shall approve the equipment source and the equipment rental rate to be paid by the City before the Contractor begins work involving the use of said equipment.

9-1.03A(3c) OWNER-OPERATED EQUIPMENT. When owner-operated equipment is used to perform extra work to be paid for on a force account basis, the Contractor will be paid for the equipment and operator, as follows:

Payment for the equipment will be made in accordance with the provisions in Section 9-1.03A(3), "Equipment Rental."

Payment for the cost of labor and subsistence or travel allowance will be made at the rates paid by the Contractor to other workmen operating similar equipment already on the project or, in the absence of such other workmen, at the rates for such labor established by collective bargaining agreements for the type of workman and location of the work, whether or not the owner-operator is actually covered by such an agreement. A labor surcharge will be added to the cost of labor described herein, in accordance with the provisions in Section 9-1.03A(1b), "Labor Surcharge."

To the direct cost of equipment rental and labor, computed as provided herein, will be added the markups for equipment rental and labor as provided in Section 9-1.03A, "Work Performed by Contractor."

9-1.03A(3d) DUMP TRUCK RENTAL. Dump truck rental shall conform to the provisions of Sections 9-1.03A(3), "Equipment Rental," 9-1.03A(3a), "Equipment on the Work," and 9-1.03A(3b), "Equipment not on the Work," except as follows:

Fully maintained and operated rental dump trucks used in the performance of extra work paid for on a force account basis will be paid for at the same hourly rate paid by the Contractor for use of fully maintained and operated rental dump trucks in performing contract item work.

In the absence of contract item work requiring dump truck rental, the Engineer will establish an hourly rental rate to be paid. The Contractor shall provide the Engineer with complete information on the hourly rental rates available for rental of fully maintained and operated dump trucks.

The provisions in Section 9-1.03A(1), "Labor," shall not apply to operators of rented dump trucks.

The rental rates listed for dump trucks in the Department of Transportation publication entitled Labor Surcharge And Equipment Rental Rates shall not apply.

To the total of the rental costs for fully maintained and operated dump trucks, including labor, there will be added a markup of 15 percent. An additional markup of 5 percent will be added by reason of performance of the work by a subcontractor. No separate markup will be made for labor.

The provisions of Section 9-1.03A(3c), "Owner-Operated Equipment," shall not apply to dump truck rentals.

9-1.03B WORK PERFORMED BY SPECIAL FORCES OR OTHER SPECIAL SERVICES. When the Engineer and the Contractor, by agreement, determine that a special service or an item of extra work cannot be performed by the forces of the Contractor or those of any of his subcontractors, such service or extra work item may be performed by a specialist. Invoices for such service or item of extra work on the basis of the current market price thereof may be accepted without complete itemization of labor, material, and equipment rental costs when it is impracticable and not in accordance with the established practice of the special service industry to provide such complete itemization.

In those instances wherein a Contractor is required to perform extra work necessitating a fabrication or machining process in a fabrication or machine shop facility away from the jobsite, the charges for that portion of the extra work performed in such facility may, by agreement, be accepted as a specialist billing.

To the specialist invoice price, less a credit to the State for any cash or trade discount offered or available, whether or not such discount may have been taken, will be added 15 percent in lieu of the percentages provided in Section 9-1.03A, "Work Performed by Contractor."

9-1.03C RECORDS. The Contractor shall maintain his records in such a manner as to provide a clear distinction between the direct costs of extra work paid for on a force account basis and the costs of other operations.

From the above records, the Contractor shall furnish the Engineer completed daily extra work reports, either on forms furnished by the City or on computerized facsimiles of the City's forms acceptable to the Engineer, for each day's extra work to be paid for on a force account basis. The daily extra work reports shall itemize the materials used, and shall cover the direct cost of labor and the charges for equipment rental, whether furnished by the Contractor, subcontractor, or other forces, except for charges described in Section 9-1.03B, "Work Performed by Special Forces or Other Special Services." The daily extra work reports shall provide names or identifications and classifications of workmen, the hourly rate of pay and hours worked, and also the size, type and identification number of equipment, and hours operated.

Material charges shall be substantiated by valid copies of vendor's invoices. Such invoices shall be submitted with the daily extra work reports, or if not available, they shall be submitted with subsequent daily extra work reports. Should said vendor's invoices not be submitted within 60 days after the date of delivery of the material or within 15 days after the acceptance of the contract, whichever occurs first, the City reserves the right to establish the cost of such materials at the lowest current wholesale prices at which said materials were available in the quantities concerned delivered to the location of work less any discounts as provided in Section 9-1.03A(2a).

Said daily extra work reports shall be signed by the Contractor or his authorized representative.

The Engineer will compare his records with the completed daily extra work reports furnished by the Contractor and make any necessary adjustments. When these daily extra work reports are agreed upon and signed by both parties, said reports shall become the basis of payment for the work performed, but shall not preclude subsequent adjustment based on a later audit by the City.

The Contractor's cost records pertaining to work paid for on a force account basis shall be open to inspection or audit by representatives of the City, during the life of the contract and for a period of not less than 3 years after the date of acceptance thereof, and the Contractor shall retain such records for that period. Where payment for materials or labor is based on the cost thereof to forces other than the Contractor, the Contractor shall make every reasonable effort to ensure that the cost records of such other forces will be open to inspection and audit by representatives of the City on the same terms and conditions as the cost records of the Contractor. If an audit is to be commenced more than 60 days after the acceptance date of the contract, the Contractor will be given a reasonable notice of the time when such audit is to begin.

9-1.04 PAYMENT

Payment as provided in Sections 9-1.03A, "Work Performed by Contractor," and 9-1.03B, "Work Performed by Special Forces or Other Special Services," shall constitute full compensation to the Contractor for performance of work paid for on a force account basis and no additional compensation will be allowed therefor.

SECTION 10
TECHNICAL SPECIFICATIONS

TABLE OF CONTENTS

DIVISION01 - GENERAL REQUIREMENTS

00 00 00	TABLE OF CONTENTS
01 10 00	SUMMARY
01 20 00	MEASUREMENT AND PAYMENT
01 25 00	SUBSTITUTION PROCEDURES
01 31 00	PROJECT MANAGEMENT AND COORDINATION
01 45 00	QUALITY CONTROL
01 48 00	SKATE PARK CONTRACTOR QUALIFICATIONS
01 49 00	SKATE PARK GENERAL NOTES
01 50 00	TEMPORARY FACILITIES AND CONTROLS
01 55 26	TRAFFIC CONTROL
01 56 00	TEMPORARY ENVIRONMENTAL CONTROLS
01 57 23	TEMPORARY WATER POLLUTION CONTROL
01 58 00	PROJECT IDENTIFICATION
01 71 13	MOBILIZATION
01 71 33	PROTECTION OF EXISTING FACILITIES
01 73 00	EXECUTION
01 74 10	CLEANING DURING CONSTRUCTION AND FINAL CLEANING
01 74 19	CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
01 77 00	CLOSEOUT PROCEDURES
01 78 39	PROJECT RECORD DOCUMENTS
01 93 10	OPERATION AND MAINTENANCE MANUALS

DIVISION02 - EXISTING CONDITIONS

02 01 20	PROTECTING EXISTING UNDERGROUND UTILITIES
02 32 19	POTHOLING
02 41 00	SITE DEMOLITION
02 41 19	SELECTIVE DEMOLITION

DIVISION03 - CONCRETE

03 10 00	CONCRETE FORMING AND ACCESSORIES
03 20 00	CONCRETE REINFORCING
03 30 00	CAST-IN-PLACE CONCRETE
03 31 00	SKATE PARK CONCRETE PAVING
03 37 00	SKATE PARK SHOTCRETE
03 40 00	SKATE PARK CONCRETE COLOR

DIVISION04 - MASONRY

04 22 00	CONCRETE UNIT MASONRY

DIVISION05 - METALS

05 50 00	METAL FABRICATIONS
05 51 00	SKATE PARK METAL FABRICATION

DIVISION09 - FINISHES

09 91 13	EXT & INT PAINT AND COATINGS

DIVISION11 - EQUIPMENT

11 68 13	PLAYGROUND EQUIPMENT AND STRUCTURES
11 68 23	OUTDOOR EXERCISE EQUIPMENT

DIVISION13 - SPECIAL CONSTRUCTION

13 34 00	FABRICATED ENGINEERED STRUCTURES

DIVISION22 - PLUMBING

22 47 13	DRINKING FOUNTAINS

DIVISION26 - ELECTRICAL

26 00 00	ELECTRICAL

DIVISION27 - COMMUNICATIONS

27 15 13	COMMUNICATIONS HORIZONTAL CABLING
27 21 00	DATA COMMUNICATION NETWORK EQUIPMENT

DIVISION28 - ELECTRONIC SAFETY AND SECURITY

28 23 29	VIDEO SURVEILLANCE

DIVISION31 - EARTHWORK

31 10 00	SITE CLEARING
31 20 00	EARTHWORK
31 23 33	TRENCHING AND BACKFILLING

DIVISION32 - EXTERIOR IMPROVEMENTS

32 01 91	TREE PROTECTION ROOT PRUNING
32 11 23	AGGREGATE BASE COURSES
32 12 16	ASPHALT CONCRETE PAVING
32 14 00	UNIT PAVING
32 15 40	AGGREGATE PAVING
32 16 00	CURBS, GUTTERS, SIDEWALKS
32 17 23	PAVEMENT MARKINGS
32 17 26	TACTILE WARNING SURFACING
32 18 16.13	PLAYGROUND PROTECTIVE SURFACING
32 18 23.43	RECREATIONAL COURT SURFACING
32 31 13	CHAIN LINK FENCES AND GATES
32 31 32	WOOD COMPOSITE FENCES AND GATES
32 33 00	SITE FURNISHINGS
32 35 00	SITE SCREENING DEVICES
32 84 00	PLANTING IRRIGATION
32 91 15	SOIL PREPARATION (PERFORMANCE SPECIFICATION)
32 92 00	TURF AND GRASSES
32 93 00	PLANTS
32 94 00	LANDSCAPE PLANTING ACCESSORIES
32 94 43	TREE GRATES AND TREE GUARDS
32 98 13	LANDSCAPE MAINTENANCE & ESTABLISHMENT PERIOD

DIVISION33 - UTILITIES

33 10 00	WATER UTILITIES
33 30 00	SANITARY SEWERAGE UTILITIES
33 40 00	STORM DRAINAGE UTILITIES

END OF TABLE OF CONTENTS

SECTION 01 10 00

SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Contractor's use of site and premises.
4. Coordination with occupants.
5. Work restrictions.
6. Specification and Drawing conventions.
7. Miscellaneous provisions.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of City's facilities.

1.2 DEFINITIONS

A. Project Roles:

1. City: For the purposes of this project, the term City refers to the City of Guadalupe and may be interchangeable with the terms:
 - a. Owner
 - b. City
 - c. City Engineer
 - d. Inspector
 - e. Construction Manager
2. Architect: For the purposes of this project, the term Architect refers to the Landscape Architect prime design consultant, Pacific Coast Land Design, Inc. and may be interchangeable with the terms:
 - a. Landscape Architect

1.3 PROJECT INFORMATION

A. Project Identification: Las Mujeres Park (formerly Central Park).

1. Project Location: 4543 Pacheco St, Guadalupe, CA 93434

B. City: City of Guadalupe

1. City Engineer/City's Representative: Jeff van den Eikhof, PE
 - a. E-mail: jeff@eikhofdesigngroup.com
 - b. Phone: (805) 470-1910
 - c. 918 Obispo Street, Guadalupe, CA 93434
2. Inspector: TBD

C. Architect/Landscape Architect: Pacific Coast Land Design.

1. Architect's Representative: Eric Berg,
 - a. e-mail: eric@pc-ld.com
 - b. phone: (805) 715-4175.

D. Architect's Consultants: Architect has retained the following design professionals, who have prepared designated portions of the Contract Documents:

1. Civil Engineer and Survey: Encompass Consultant Group.
 - a. Civil Engineer Representative: Jose Ascencio
 - b. e-mail: jose.ascencio@ecgcivil.com
 - c. phone: (805) 416-8704
2. Electrical Engineer: ANE, Inc.
 - a. Electrical Engineer Representative: Alan Noelle
 - b. e-mail: alan@aneng.com
 - c. phone: (805) 570-0360
3. Skatepark: SITE Design Group
 - a. Skatepark Representative: Jaxon Statzell
 - b. e-mail: jaxon@sitedesigngroup.com
 - c. phone: (877) 734-7275
4. Structural Engineer: Buehler
 - a. Structural Engineer Representative: Michael E. Parolini
 - b. e-mail: mparolini@buehlerengineering.com
 - c. phone: (805) 439-2110
5. Geotechnical Engineer: Earth Systems
 - a. Geotechnical Engineer Representative: Robert Down
 - b. Email: rdown@earthsystems.com
 - c. phone: (805) 544-3276

E. Web-Based Project Software: Project software will be used for purposes of managing communication and documents during the construction stage.

1. See Section 013100 "Project Management and Coordination." for requirements for using web-based Project software.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and includes, but is not limited to, the following:

1. The Work to be constructed is located at Las Mujeres Park (formerly Central Park) at 4543 Pacheco St, Guadalupe, CA 93434 and includes approximately 1.3-acres of park renovation. Renovations will include the parking lot, sidewalk, walls/fencing, addition of a dog park, basketball court, skatepark, playground, picnic area, exercise equipment, game tables, bocce ball court, pre-fabricated restroom, park lighting, security cameras, irrigation and landscaping. Additional work will include utility relocation, abandonment and capping of an existing well, and electrical panel and utility work.
 - a. Base Bid Items 1 through 108, as listed in Section 01 22 00 "Measurement and Payment"
 - b. Bid Alternative No. 1, Bid Item A1, as listed in Section 01 22 00 "Measurement and Payment"
 - c. Work identified in the Contract Plans and Specifications herein.

B. Type of Contract:

1. Project will be constructed under a single prime, unit-price contract.
2. The Contractor shall include all the requirements of the General Conditions and Special Conditions of the Contract as a part of all of its subcontract agreements.

1.5 BEGINNING AND COMPLETION OF THE WORK

A. Time is the essence of the Contract. In accordance with the provisions of Section 1 of the Agreement, the Contractor shall commence the Work on the date specified in the written Notice to Proceed from the City, and shall furnish sufficient forces and equipment, including extra shifts and overtime to prosecute all of the Construction Work included in the Contract within 140

working days after the commencement date specified in the Notice to Proceed followed by 90 calendar days for Landscape Maintenance and Establishment Period. Time stated for completion shall include final cleanup of the premises.

The schedule shall allow enough time for inclement weather. Contractor shall include and factor in for a total of 5 lost days due to inclement weather and/or rain within the base schedule duration of the project. No request for an extension of contract time due to such weather delays will be considered until the actual number of such inclement weather days exceeds 5 days. The Construction Schedule required by the General Requirements shall also include the milestone deliverables per this section.

1.6 ORDER OF THE WORK

- A. The Work shall be carried on at such places on the project and also in such order or precedence as may be found necessary by the City to expedite completion of the Project. After work has begun on any portion of a designated part of the Project, it shall be carried forward to its final completion as rapidly as practicable. The order and time to complete shall conform to the requirements of the approved Contractor's schedule as submitted under the provisions for Section 01 31 00 "Project Management and Coordination" and Section 01 33 00 "Submittal Procedures".

1.7 WORK BY OTHERS

- A. General: The Contractor's attention is directed to the fact that work may be conducted at the site by other contractors during the performance of the Work under this Contract. The Contractor shall conduct its operations so as to cause a minimum of interference with the Work of such other contractors, and shall cooperate fully with such contractors to provide continued safe access to their respective portions of the site, as required to perform their respective contracts.
- B. Interference With Work on Utilities: The Contractor shall cooperate fully with all utility forces of the City or forces of other public or private agencies engaged in the relocation, altering, or otherwise rearranging of any facilities which interfere with the progress of the Work, and shall schedule the Work so as to minimize interference with said relocation, altering, or other rearranging of facilities.

1.8 WORK SEQUENCE

- A. Duration: The total duration for the work shall be 140 working days for Construction followed by 90 calendar days for Landscape Maintenance and Establishment Work, (which includes 5 Rain/Inclement Weather days as well as all holidays that fall within that overall duration). No additional contract time will be granted to the contractor unless the actual amount of inclement weather days exceeds the specified allocation.
- B. Coordination:
 - 1. Contractor to coordinate final work hours and access where the Contract Drawings show work to be performed.
 - 2. Contractor shall coordinate with Inspector/City Engineer on a daily basis, including all schedule changes
 - 3. Contractor is required to submit 3-week lookahead schedules at each weekly progress meeting, or as otherwise directed.
- C. Performance: It shall be the sole responsibility of the Contractor to schedule the implementation of the Work to meet the Project Milestones.
- D. Sequence:
 - 1. The following parameters shall govern the sequence and scheduling of the project:
 - a. Contractor to commence the Work with the following sequencing elements

prioritized at the beginning of the construction phase:

- 1) Contractor's Public Notification using City approved notices.
- 2) Contractor Submittals
- 3) Traffic Control
- 4) Erosion Control
- 5) Demolition.
- 6) Construction
- 7) Plant Establishment and Maintenance
- 8) Project Closeout.

1.9 CONTRACTOR'S USE OF SITE AND PREMISES

- A. Limits on Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
1. Limits on Use of Site: Confine construction operations to areas within the perimeter fencing to remain and behind the back-of-sidewalk to remain.
 2. Driveways, Walkways and Entrances: Keep driveways and entrances serving premises clear and available to City, City's employees, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- B. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.10 CITY USE OF THE PROJECT SITE

- A. The City and their authorized representatives shall be allowed access to the project site at all times during the period of construction. The Contractor shall cooperate with the City Engineer to minimize interference with the Contractor's operations and to facilitate the City's operations. In any event, the City and the City Engineer and their authorized representatives shall be allowed access to the project site at all times during the period of construction.

1.11 PERMITS

- A. Contractor shall obtain a no-cost encroachment permit from the City of Guadalupe.
- B. Obtain and pay the fees for the following permits:

Name or Type of Permit	Name, Address, Telephone Number of Permitting Agency
Permit for Trenching/Excavations exceeding 5-feet depth	CAL/OSHA Field Office Ventura County 1655 Mesa Verde, Room 125 Ventura, CA 93003 (805) 656-4581
No Fee Encroachment Permit	City of Guadalupe 918 Obispo Street Guadalupe, CA 93434
Building Permit	City of Guadalupe 918 Obispo Street Guadalupe, CA 93434
Construction Water Permit for water obtained from City-owned fire hydrants	City of Guadalupe 918 Obispo Street

- C. The permits contain requirements that affect the cost of project work and some permanent permits require supplementary work permits and fees to execute construction. Comply with the permit requirements and obtain and pay the fees involved with the supplementary work permits.

1.12 WORK RESTRICTIONS

- A. Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work to between 7:00 a.m. to 4:00 p.m., Monday through Friday, unless otherwise indicated. Work hours may be modified to meet Project requirements if approved by City and authorities having jurisdiction.
 - 1. Contractor shall refer to Section 7-2 for provisions regarding night, Saturday, Sunday, and holiday work.
 - 2. All additional work hour requests shall be considered at the sole discretion of the City based on factors such as availability and community impact. The City shall have the authority to deduct the cost of all such inspection and testing from any partial payments otherwise due the Contractor
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by City or others unless permitted under the following conditions and then only after arranging for temporary utility services according to requirements indicated:
 - 1. Notify City Engineer not less than two days in advance of proposed utility interruptions.
 - 2. Obtain City Engineer's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, Dust, and Odors: Coordinate operations that may result in high levels of noise and vibration, dust, odors, or other disruption to City occupancy with City.
 - 1. Notify City Engineer not less than two days in advance of proposed disruptive operations.
 - 2. Obtain City Engineer's written permission before proceeding with disruptive operations.
- E. Smoking and Controlled Substance Restrictions: Use of tobacco products, alcoholic beverages, and other controlled substances on Project site is not permitted.

1.13 NOTICE TO PROPERTY OWNERS OR BUSINESSES

- A. The Contractor shall submit a schedule, sample notice letter and map of areas affected by construction to the City Engineer and City for approval, indicating which property and business owners will be affected by the proposed construction and when they shall be notified, and the Contractor shall notify the property owners or (using the approved notice letter) occupants of affected properties by written notice seven days prior to the beginning of construction. Construction may not begin until proper notice has been posted for a minimum of seven calendar days.

1.14 PRECONSTRUCTION SITE VIDEO

- A. The Contractor shall video record and document the pre-existing conditions of the job site and properties adjacent to the project and submit the recording to the City prior to the start of construction.

1.15 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 2. Text Color: Text used in the Specifications, including units of measure, manufacturer and product names, and other text may appear in multiple colors or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.
 3. Hypertext: Text used in the Specifications may contain hyperlinks. Hyperlinks may allow for access to linked information that is not residing in the Specifications. Unless otherwise indicated, linked information is not part of the Contract Documents.
 4. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings, and, published as part of the U.S. National CAD Standard.

PART 2 - PRODUCTS- NOT A PART
PART 3 - EXECUTION- NOT A PART

END OF SECTION 01 10 00

SECTION 01 20 00

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.
- B. Payment for the various items of the Bid Sheets, as further specified herein, shall include all compensation to be received by the Contractor for furnishing all tools, equipment, supplies, and manufactured articles, and for all labor, operations, and incidentals appurtenant to the items of work being described, as necessary to complete the various items of work as specified and shown on the drawings, including all appurtenances thereto, and including all costs of compliance with the regulations of public agencies having jurisdiction, including Safety and Health Requirements of the California Division of Industrial Safety and the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA). No separate payment will be made for any item that is not specifically set forth in the Bid Sheet(s), and all costs therefor shall be included in the prices named in the Bid Sheet(s) for the various appurtenant items of work.

1.02 DEFINITIONS

- A. Unit price is an amount incorporated into the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.03 GENERAL

- A. All pay line items will be paid for at the unit prices named in the Bid Sheets for the respective items of work. The quantities of work or material stated as unit price items on the Bid Sheets are supplied only to give an indication of the general scope of the Work; the City does not expressly, or by implication, agree that the actual amount of work or material will correspond therewith, and reserves the right after award to increase or decrease the quantity of any unit price item of work by an amount up to and including 25 percent of any bid item, without a change in the unit price, and shall have the right to delete any bid item in its entirety, or to add additional bid items up to and including an aggregate total amount not to exceed 25 percent of the contract price.
- B. Bid items quantified as lump sum items are required to submit a schedule of values. The schedule of values must be authorized by the Engineer prior to progress payments
 - 1. Schedule of Values:
 - a. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
 - 1) Coordinate line items in the schedule of values with items required to be indicated as separate activities in Contractor's construction schedule.
 - 2) Submit the schedule of values to City Engineer at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
 - 3) Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values coordinated with each phase of payment.
 - 4) Subschedules for Separate Elements of Work: Where the Contractor's

- construction schedule defines separate elements of the Work, provide subschedules showing values coordinated with each element.
- 5) Subschedules for Separate Design Contracts: Where the Owner has retained design professionals under separate contracts who will each provide certification of payment requests, provide subschedules showing values coordinated with the scope of each design services contract, as described in Section 011000 "Summary."
- b. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
- 1) Identification: Include the following Project identification on the schedule of values:
 - a) Project name and location.
 - b) Owner's name.
 - c) Owner's Project number.
 - d) Name of Architect.
 - e) Architect's Project number.
 - f) Contractor's name and address.
 - g) Date of submittal.
 - 2) Arrange schedule of values consistent with format of AIA Document G703
 - 3) Arrange the schedule of values in tabular form, with separate columns to indicate the following for each item listed:
 - a) Related Specification Section or division.
 - b) Description of the Work.
 - c) Name of subcontractor.
 - d) Name of manufacturer or fabricator.
 - e) Name of supplier.
 - f) Change Orders (numbers) that affect value.
 - g) Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent. Round dollar amounts to whole dollars, with total equal to Contract Sum.
 - 4) Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide multiple line items for principal subcontract amounts in excess of [five]<Insert number> percent of the Contract Sum.
 - 5) Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a) Differentiate between items stored on-site and items stored off-site.
 - 6) Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
 - 7) Purchase Contracts: Provide a separate line item in the schedule of values for each Purchase contract. Show line-item value of Purchase contract. Indicate Owner payments or deposits, if any, and balance to be paid by Contractor.
 - 8) Overhead Costs, Proportional Distribution: Include total cost and proportionate share of general overhead and profit for each line item.
 - 9) Overhead Costs, Separate Line Items: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
 - 10) Temporary Facilities: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
 - 11) Closeout Costs. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling five

- percent of the Contract Sum and subcontract amount.
- 12) Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

- C. Bid Items of work shown on the plans or indicated on the specifications or miscellaneous items of work which are not specifically identified in the bid item descriptions or bid schedules are included in lump sum items of work and must be identified in the Schedule of Values submittal by the Contractor and no additional payment will be made.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 BID ITEM 1 – MOBILIZATION

- A. Measurement and Payment for Mobilization shall be paid as Lump Sum (LS).
- B. Comply with Section 01 71 13 of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.02 BID ITEM 2 – SWPPP AND BMP'S

- A. Measurement and Payment for SWPPP and BMP's shall be paid as Lump Sum (LS).
- B. Comply with Section 01 57 23 "Temporary Water Pollution Control" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.03 BID ITEM 3 – TRAFFIC CONTROL

- A. Measurement and Payment for Traffic Control shall be paid as Lump Sum (LS).
- B. Comply with Section 01 55 26 "Traffic Control" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.04 BID ITEM 4 – DEMOLITION

- A. Measurement and Payment for Demolition shall be paid as Lump Sum (LS).
- B. Comply with Section 02 41 00 "Site Demolition"; Section 02 41 19 "Selective Demolition" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.05 BID ITEM 5 – REMOVE EXISTING WATER LINE

- A. Measurement and Payment for Remove Existing Water Line shall be paid as Linear Feet (LF).

- B. Comply with Section 02 41 00 "Site Demolition" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.06 BID ITEM 6 – CAP AND ABANDON EXISTING WELL
- A. Measurement and Payment for Cap And Abandon Existing Well shall be paid as Lump Sum (LS).
 - B. Comply with Section 02 41 00 "Site Demolition" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.07 BID ITEM 7 – EXISTING TREES PROTECT IN PLACE-TREE PROTECTION FENCING
- A. Measurement and Payment for Existing Trees Protect In Place-Tree Protection Fencing shall be paid as Each (EA).
 - B. Comply with Section 32 01 91 "Tree Protection Root Pruning" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.08 BID ITEM 8 – SALVAGE AND RELOCATE EXISTING BUS STOP
- A. Measurement and Payment for Salvage And Relocate Existing Bus Stop shall be paid as Lump Sum (LS).
 - B. Comply with Section 02 41 19 "Selective Demolition" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.09 BID ITEM 9 – CLEARING AND GRUBBING
- A. Measurement and Payment for Clearing And Grubbing shall be paid as Square Feet (SF).
 - B. Comply with Section 31 10 00 "Site Clearing" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.10 BID ITEM 10 – STORM DRAIN UTILITIES
- A. Measurement and Payment for Storm Drain Utilities shall be paid as Lump Sum (LS).
 - B. Comply with Section 33 40 00 "Storm Drainage Utilities" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.11 BID ITEM 11 – DETENTION/BIORETENTION MEDIA
- A. Measurement and Payment for Detention/Bioretenion Media shall be paid as Lump Sum (LS).
 - B. Comply with Section 32 91 15 "Soil Preparation (Performance Specification)" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

- 3.12 BID ITEM 12 – ROUGH GRADING (INCLUDING EXPORT)
- A. Measurement and Payment for Rough Grading (Including Export) shall be paid as Cubic Yard (CY).
 - B. Comply with Section 31 20 00 "Earthwork" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.13 BID ITEM 13 – 1-1/2" WATER SERVICE LINE
- A. Measurement and Payment for 1-1/2" Water Service Line shall be paid as Lump Sum (LS).
 - B. Comply with Section 33 10 00 "Water Utilities" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.14 BID ITEM 14 – 1-1/2" WATER METER AND METER BOX
- A. Measurement and Payment for 1-1/2" Water Meter And Meter Box shall be paid as Lump Sum (LS).
 - B. Comply with Section 33 10 00 "Water Utilities" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.15 BID ITEM 15 – 1-1/2" SCHEDULE 80 PVC WATER LINE
- A. Measurement and Payment for 1-1/2" Schedule 80 PVC Water Line shall be paid as Linear Feet (LF).
 - B. Comply with Section 33 10 00 "Water Utilities" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.16 BID ITEM 16 – 1-1/2" DOMESTIC WATER SERVICE BACKFLOW PREVENTER AND ENCLOSURE
- A. Measurement and Payment for 1-1/2" Domestic Water Service Backflow Preventer And Enclosure shall be paid as Each (EA).
 - B. Comply with Section 33 10 00 "Water Utilities" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.17 BID ITEM 17 – 1-1/2" IRRIGATION WATER SERVICE BACKFLOW PREVENTER AND ENCLOSURE
- A. Measurement and Payment for 1-1/2" Irrigation Water Service Backflow Preventer And Enclosure shall be paid as Each (EA).
 - B. Comply with Section 32 84 00 "Planting Irrigation" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

- 3.18 BID ITEM 18 – 8" CL 205 DR 14 C900 PVC WATER LINE
- A. Measurement and Payment for 8" CL 205 DR 14 C900 Pvc Water Line shall be paid as Linear Feet (LF).
 - B. Comply with Section 33 10 00 "Water Utilities" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.19 BID ITEM 19 – 8" DUCTILE IRON GATE VALVE AND THRUST
- A. Measurement and Payment for 8" Ductile Iron Gate Valve And Thrust shall be paid as Each (EA).
 - B. Comply with Section 33 10 00 "Water Utilities" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.20 BID ITEM 20 – DUCTILE IRON BEND WITH THRUST BLOCK
- A. Measurement and Payment for Ductile Iron Bend With Thrust Block shall be paid as Each (EA).
 - B. Comply with Section 33 10 00 "Water Utilities" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.21 BID ITEM 21 – 1-1/2" WATER BLOW OFF
- A. Measurement and Payment for 1-1/2" Water Blow Off shall be paid as Each (EA).
 - B. Comply with Section 33 10 00 "Water Utilities" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.22 BID ITEM 22 – 4" PVC SDR 35 SEWER LATERAL
- A. Measurement and Payment for 4" PVC SDR 35 Sewer Lateral shall be paid as Linear Feet (LF).
 - B. Comply with Section 33 30 00 "Sanitary Sewerage Utilities" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.23 BID ITEM 23 – SEWER CLEANOUT
- A. Measurement and Payment for Sewer Cleanout shall be paid as Each (EA).
 - B. Comply with Section 33 30 00 "Sanitary Sewerage Utilities" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.24 BID ITEM 24 – SEWER CONNECTION
- A. Measurement and Payment for Sewer Connection shall be paid as Lump Sum (LS).

- B. Comply with Section 33 30 00 "Sanitary Sewerage Utilities" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.25 BID ITEM 25 – CONCRETE PAVING

- A. Measurement and Payment for Concrete Paving shall be paid as Square Feet (SF).
- B. Comply with Section 32 16 00 "Curbs, Gutters, Sidewalks" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.26 BID ITEM 26 – CONCRETE HEADER

- A. Measurement and Payment for Concrete Header shall be paid as Linear Feet (LF).
- B. Comply with Section 32 16 00 "Curbs, Gutters, Sidewalks" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.27 BID ITEM 27 – ALUMINUM HEADER

- A. Measurement and Payment for Aluminum Header shall be paid as Linear Feet (LF).
- B. Comply with Section 32 94 00 "Landscape Planting Accessories" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.28 BID ITEM 28 – CONCRETE CURB RAMP (INCLUDES DETECTABLE WARNING SURFACE)

- A. Measurement and Payment for Concrete Curb Ramp (Includes Detectable Warning Surface) shall be paid as Each (EA).
- B. Comply with Section 32 16 00 "Curbs, Gutters, Sidewalks"; Section 32 17 26 "Tactile Warning Surfacing" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.29 BID ITEM 29 – CONCRETE CURB

- A. Measurement and Payment for Concrete Curb shall be paid as Linear Feet (LF).
- B. Comply with Section 32 16 00 "Curbs, Gutters, Sidewalks" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.30 BID ITEM 30 – DECOMPOSED GRANITE PAVING

- A. Measurement and Payment for Decomposed Granite Paving shall be paid as Square Feet (SF).
- B. Comply with Section 32 15 40 "Aggregate Paving" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.31 BID ITEM 31 – PEA GRAVEL DOG PARK SURFACING

- A. Measurement and Payment for Pea Gravel Dog Park Surfacing shall be paid as Cubic Yard (CY).
 - B. Comply with Section 32 15 40 "Aggregate Paving" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.32 BID ITEM 32 – RECYCLED CONCRETE SLOPE
- A. Measurement and Payment for Recycled Concrete Slope shall be paid as Square Feet (SF).
 - B. Comply with Section 32 14 00 "Unit Paving" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.33 BID ITEM 33 – ASPHALT CONCRETE PAVEMENT
- A. Measurement and Payment for Asphalt Concrete Pavement shall be paid as Square Feet (SF).
 - B. Comply with Section 32 12 16 "Asphalt Concrete Paving" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.34 BID ITEM 34 – PARKING LOT STRIPING AND SIGNAGE
- A. Measurement and Payment for Parking Lot Striping and Signage shall be paid as Lump Sum (LS).
 - B. Comply with Section 32 17 23 "Pavement Markings" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.35 BID ITEM 35 – BOCCE COURT SURFACING
- A. Measurement and Payment for Bocce Court Surfacing shall be paid as Ton (TON).
 - B. Comply with Section 32 15 40 "Aggregate Paving" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.36 BID ITEM 36 – CAST-IN-PLACE CONCRETE BOCCE SIDEWALL/HEADER
- A. Measurement and Payment for Cast-In-Place Concrete Bocce Sidewall/Header shall be paid as Linear Feet (LF).
 - B. Comply with Section 32 16 00 "Curbs, Gutters, Sidewalks" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.37 BID ITEM 37 – BASKETBALL COURT SURFACING AND STRIPING
- A. Measurement and Payment for Basketball Court Surfacing And Striping shall be paid as Square Feet (SF).

- B. Comply with Section 32 18 23.43 "Recreational Court Surfacing" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.38 BID ITEM 38 – PIP RUBBERIZED PLAY SURFACING
- A. Measurement and Payment for Pip Rubberized Play Surfacing shall be paid as Square Feet (SF).
 - B. Comply with Section 32 18 16.13 "Playground Protective Surfacing" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.39 BID ITEM 39 – ORCHARD PARKING PAVERS AND GRATE
- A. Measurement and Payment for Orchard Parking Pavers And Grate shall be paid as Each (EA).
 - B. Comply with Section 32 16 00 "Curbs, Gutters, Sidewalks"; Section 32 94 43 "Tree Grates And Tree Guards"; Section 32 14 00 "Unit Paving" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.40 BID ITEM 40 – CONCRETE UNIT PAVERS
- A. Measurement and Payment for Concrete Unit Pavers shall be paid as Square Feet (SF).
 - B. Comply with Section 32 14 00 "Unit Paving" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.41 BID ITEM 41 – SKATEPARK FINE GRADING
- A. Measurement and Payment for Skatepark Fine Grading shall be paid as Square Feet (SF).
 - B. Comply with Section 02520 of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.42 BID ITEM 42 – SKATEPARK FLATWORK
- A. Measurement and Payment for Skatepark Flatwork shall be paid as Square Feet (SF).
 - B. Comply with Section 02520; Section 09930 of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.43 BID ITEM 43 – SKATEPARK SHOTCRETE
- A. Measurement and Payment for Skatepark Shotcrete shall be paid as Square Feet (SF).
 - B. Comply with Section 03370; Section 09930 of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.44 BID ITEM 44 – SKATEPARK WALLS

- A. Measurement and Payment for Skatepark Walls shall be paid as Linear Feet (LF).
- B. Comply with Section 02520; Section 09930 of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.45 BID ITEM 45 – SKATEPARK FORMWORK

- A. Measurement and Payment for Skatepark Formwork shall be paid as Linear Feet (LF).
- B. Comply with Section 02520 of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.46 BID ITEM 46 – SKATEPARK METALS AND RAILS

- A. Measurement and Payment for Skatepark Metals and Rails shall be paid as Linear Feet (LF).
- B. Comply with Section 05510 of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.47 BID ITEM 47 – BENCH

- A. Measurement and Payment for Bench shall be paid as Each (EA).
- B. Comply with Section 32 33 00 "Site Furnishings" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.48 BID ITEM 48 – TRASH/RECYCLING RECEPTACLES

- A. Measurement and Payment for Trash/Recycling Receptacles shall be paid as Each (EA).
- B. Comply with Section 32 33 00 "Site Furnishings" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.49 BID ITEM 49 – CHARCOAL ASH RECEPTACLE

- A. Measurement and Payment for Charcoal Ash Receptacle shall be paid as Each (EA).
- B. Comply with Section 32 33 00 "Site Furnishings" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.50 BID ITEM 50 – BBQ

- A. Measurement and Payment for BBQ shall be paid as Each (EA).
- B. Comply with Section 32 33 00 "Site Furnishings" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.51 BID ITEM 51 – PICNIC TABLE

- A. Measurement and Payment for Picnic Table shall be paid as Each (EA).
- B. Comply with Section 32 33 00 "Site Furnishings" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.52 BID ITEM 52 – GAMEBOARD TABLE

- A. Measurement and Payment for Gameboard Table shall be paid as Each (EA).
- B. Comply with Section 32 33 00 "Site Furnishings" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.53 BID ITEM 53 – BIKE RACK

- A. Measurement and Payment for Bike Rack shall be paid as Each (EA).
- B. Comply with Section 32 33 00 "Site Furnishings" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.54 BID ITEM 54 – SWINGS

- A. Measurement and Payment for Swings shall be paid as Lump Sum (LS).
- B. Comply with Section 11 68 13 "Playground Equipment And Structures" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.55 BID ITEM 55 – CLIMBER

- A. Measurement and Payment for Climber shall be paid as Each (EA).
- B. Comply with Section 11 68 13 "Playground Equipment And Structures" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.56 BID ITEM 56 – STANDING SPINNER

- A. Measurement and Payment for Standing Spinner shall be paid as Each (EA).
- B. Comply with Section 11 68 13 "Playground Equipment And Structures" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.57 BID ITEM 57 – SPRING BOUNCER

- A. Measurement and Payment for Spring Bouncer shall be paid as Each (EA).
- B. Comply with Section 11 68 13 "Playground Equipment And Structures" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools,

equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.58 BID ITEM 58 – EXERCISE EQUIPMENT-2-PERSON LEG PRESS

- A. Measurement and Payment for Exercise Equipment-2-Person Leg Press shall be paid as Each (EA).
- B. Comply with Section 11 68 23 "Outdoor Exercise Equipment" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.59 BID ITEM 59 – EXERCISE EQUIPMENT-ACCESSIBLE CHEST PRESS

- A. Measurement and Payment for Exercise Equipment-Accessible Chest Press shall be paid as Lump Sum (LS).
- B. Comply with Section 11 68 23 "Outdoor Exercise Equipment" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.60 BID ITEM 60 – EXERCISE EQUIPMENT-ELLIPTICAL

- A. Measurement and Payment for Exercise Equipment-Elliptical shall be paid as Lump Sum (LS).
- B. Comply with Section 11 68 23 "Outdoor Exercise Equipment" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.61 BID ITEM 61 – DRINKING FOUNTAIN WITH PET FOUNTAIN

- A. Measurement and Payment for Drinking Fountain With Pet Fountain shall be paid as Each (EA).
- B. Comply with Section 22 47 13 "Drinking Fountains" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.62 BID ITEM 62 – DRINKING FOUNTAIN WITH BOTTLE FILLER

- A. Measurement and Payment for Drinking Fountain With Bottle Filler shall be paid as Each (EA).
- B. Comply with Section 22 47 13 "Drinking Fountains" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.63 BID ITEM 63 – REMOVABLE BOLLARD

- A. Measurement and Payment for Removable Bollard shall be paid as Each (EA).
- B. Comply with Section 32 33 00 "Site Furnishings" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.64 BID ITEM 64 – PET WASTE BAG STATION

- A. Measurement and Payment for Pet Waste Bag Station shall be paid as Each (EA).
 - B. Comply with Section 32 33 00 "Site Furnishings" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.65 BID ITEM 65 – BASKETBALL HOOP
- A. Measurement and Payment for Basketball Hoop shall be paid as Each (EA).
 - B. Comply with Section 11 68 23 "Outdoor Exercise Equipment" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.66 BID ITEM 66 – MONUMENT SIGN
- A. Measurement and Payment for Monument Sign shall be paid as Each (EA).
 - B. Comply with Section 32 33 00 "Site Furnishings" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.67 BID ITEM 67 – PROP 68 SIGN
- A. Measurement and Payment for Prop 68 Sign shall be paid as Each (EA).
 - B. Comply with Section 32 33 00 "Site Furnishings" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.68 BID ITEM 68 – RESTROOM (PORTLAND LOO)
- A. Measurement and Payment for Restroom (Portland Loo) shall be paid as Each (EA).
 - B. Comply with Section 13 34 00 "Fabricated Engineered Structures" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.69 BID ITEM 69 – RESTROOM FOUNDATION
- A. Measurement and Payment for Restroom Foundation shall be paid as Lump Sum (LS).
 - B. Comply with Section 03 30 00 "Cast-In-Place Concrete]" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.70 BID ITEM 70 – MASONRY PUBLIC ART WALL (H=4'-8")
- A. Measurement and Payment for Masonry Public Art Wall (H=4'-8") shall be paid as Linear Feet (LF).
 - B. Comply with Section 04 22 00 "Concrete Unit Masonry" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

- 3.71 BID ITEM 71 – MASONRY PUBLIC ART WALL AT SKATEPARK (H=5'-6")
- A. Measurement and Payment for Masonry Public Art Wall at Skatepark (H=5'-6") shall be paid as Linear Feet (LF).
 - B. Comply with Section 04 22 00 "Concrete Unit Masonry" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.72 BID ITEM 72 – SKATEPARK DUNE RETAINING WALL
- A. Measurement and Payment for Skatepark Dune Retaining Wall shall be paid as Linear Feet (LF).
 - B. Comply with Section 02520; Section 09930 of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.73 BID ITEM 73 – BLACK VINYL CHAIN LINK DOG PARK FENCE (H=4'-0")
- A. Measurement and Payment for Black Vinyl Chain Link Dog Park Fence (H=4'-0") shall be paid as Linear Feet (LF).
 - B. Comply with Section 32 31 13 "Chain Link Fences And Gates " of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.74 BID ITEM 74 – DOG PARK FENCE GATE (H=4'-0")
- A. Measurement and Payment for Dog Park Fence Gate (H=4'-0") shall be paid as Each (EA).
 - B. Comply with Section 32 31 13 "Chain Link Fences And Gates " of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.75 BID ITEM 75 – COMPOSITE FENCE (H=6'-0")
- A. Measurement and Payment for Composite Fence (H=6'-0") shall be paid as Linear Feet (LF).
 - B. Comply with Section 32 31 32 "Wood Composite Fences And Gates" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.76 BID ITEM 76 – ELECTRICAL METER ENCLOSURE
- A. Measurement and Payment for Electrical Meter Enclosure shall be paid as Lump Sum (LS).
 - B. Comply with Section 32 35 00 "Site Screening Devices" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.77 BID ITEM 77 – BLACK VINYL CHAIN LINK FENCE (H=6'-0")

- A. Measurement and Payment for Black Vinyl Chain Link Fence (H=6'-0") shall be paid as Linear Feet (LF).
 - B. Comply with Section 32 31 13 "Chain Link Fences And Gates " of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.78 BID ITEM 78 – BLACK VINYL CHAIN LINK FENCE WITH PRIVACY SLATS (H=6'-0")
- A. Measurement and Payment for Black Vinyl Chain Link Fence with Privacy Slats (H=6'-0") shall be paid as Linear Feet (LF).
 - B. Comply with Section 32 31 13 "Chain Link Fences And Gates " of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.79 BID ITEM 79 – NEW ELECTRICAL METER/MAIN
- A. Measurement and Payment for New Electrical Meter/Main shall be paid as Lump Sum (LS).
 - B. Comply with Section 26 00 00 "Electrical" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.80 BID ITEM 80 – LIGHT FIXTURE A
- A. Measurement and Payment for Light Fixture A shall be paid as Each (EA).
 - B. Comply with Section 26 00 00 "Electrical" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.81 BID ITEM 81 – LIGHT FIXTURE A1
- A. Measurement and Payment for Light Fixture A1 shall be paid as Each (EA).
 - B. Comply with Section 26 00 00 "Electrical" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.82 BID ITEM 82 – LIGHT FIXTURE A2
- A. Measurement and Payment for Light Fixture A2 shall be paid as Each (EA).
 - B. Comply with Section 26 00 00 "Electrical" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.83 BID ITEM 83 – LIGHT FIXTURE A3
- A. Measurement and Payment for Light Fixture A3 shall be paid as Each (EA).
 - B. Comply with Section 26 00 00 "Electrical" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

- 3.84 BID ITEM 84 – LIGHT FIXTURE B (BOLLARD LIGHT)
- A. Measurement and Payment for Light Fixture B (Bollard Light) shall be paid as Each (EA).
 - B. Comply with Section 26 00 00 "Electrical" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.85 BID ITEM 85 – RESTROOM LOCKABLE DISCONNECT
- A. Measurement and Payment for Restroom Lockable Disconnect shall be paid as Each (EA).
 - B. Comply with Section 26 00 00 "Electrical" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.86 BID ITEM 86 – CONDUIT AND WIRING
- A. Measurement and Payment for Conduit And Wiring shall be paid as Lump Sum (LS).
 - B. Comply with Section 26 00 00 "Electrical" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.87 BID ITEM 87 – ELECTRICAL PULL BOX
- A. Measurement and Payment for Electrical Pull Box shall be paid as Each (EA).
 - B. Comply with Section 26 00 00 "Electrical" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.88 BID ITEM 88 – POST-MOUNTED WEATHERPROOF DUPLEX OUTLET
- A. Measurement and Payment for Post-Mounted Weatherproof Duplex Outlet shall be paid as Lump Sum (LS).
 - B. Comply with Section 26 00 00 "Electrical" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.89 BID ITEM 89 – FLUSH LANDSCAPE RECEPTACLE BOX WITH LOCKING COVER
- A. Measurement and Payment for Flush Landscape Receptacle Box with Locking Cover shall be paid as Each (EA).
 - B. Comply with Section 26 00 00 "Electrical" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.90 BID ITEM 90 – NEMA 3R JUNCTION BOX
- A. Measurement and Payment for NEMA 3R Junction Box shall be paid as Each (EA).

- B. Comply with Section 26 00 00 "Electrical" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.91 BID ITEM 91 – LOW VOLTAGE CONDUIT AND WIRING
- A. Measurement and Payment for Low Voltage Conduit and Wiring shall be paid as Lump Sum (LS).
 - B. Comply with Section 27 15 13 "Communications Horizontal Cabling" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.92 BID ITEM 92 – WEATHERPROOF IDF ENCLOSURE
- A. Measurement and Payment for Weatherproof IDF Enclosure shall be paid as Each (EA).
 - B. Comply with Section 26 00 00 "Electrical" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.93 BID ITEM 93 – RUGGEDIZED CELLULAR ROUTER
- A. Measurement and Payment for Ruggedized Cellular Router shall be paid as Each (EA).
 - B. Comply with Section 27 21 00 "Data Communication Network Equipment" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.94 BID ITEM 94 – HARDENED POE+ MANAGED SWITCH
- A. Measurement and Payment for Hardened PoE+ Managed Switch shall be paid as Each (EA).
 - B. Comply with Section 27 21 00 "Data Communication Network Equipment" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.95 BID ITEM 95 – SECURITY CAMERAS
- A. Measurement and Payment for Security Cameras shall be paid as Each (EA).
 - B. Comply with Section 28 23 29 "Video Surveillance" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.96 BID ITEM 96 – PLANTING IRRIGATION
- A. Measurement and Payment for Planting Irrigation shall be paid as Lump Sum (LS).
 - B. Comply with Section 32 84 00 "Planting Irrigation" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.97 BID ITEM 97 – ROOT BARRIER

- A. Measurement and Payment for Root Barrier (10' per trees within 5' of pavement) shall be paid as Linear Feet (LF).
- B. Comply with Section 32 93 00 "Plants" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.98 BID ITEM 98 – PLANTING AREA SOIL PREPARATION & AMENDMENTS

- A. Measurement and Payment for Planting Area Soil Preparation & Amendments shall be paid as Square Feet (SF).
- B. Comply with Section 32 91 15 "Soil Preparation (Performance Specification)" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.99 BID ITEM 99 – ORGANIC MULCH

- A. Measurement and Payment for 3" Depth of Organic Mulch shall be paid as Cubic Yard (CY).
- B. Comply with Section 32 94 00 "Landscape Planting Accessories" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.100 BID ITEM 100 – PLANTING AREA FINE GRADING

- A. Measurement and Payment for Planting Area Fine Grading shall be paid as Square Feet (SF).
- B. Comply with Section 32 91 15 "Soil Preparation (Performance Specification)" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.101 BID ITEM 101 – SHRUBS - 1 GALLON

- A. Measurement and Payment for Shrubs - 1 gallon shall be paid as Each (EA).
- B. Comply with Section 32 93 00 "Plants" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.102 BID ITEM 102 – SHRUBS - 5 GALLON

- A. Measurement and Payment for Shrubs - 5 gallon shall be paid as Each (EA).
- B. Comply with Section 32 93 00 "Plants" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

3.103 BID ITEM 103 – SHRUBS - 15 GALLON

- A. Measurement and Payment for Shrubs - 15 gallon shall be paid as Each (EA).

- B. Comply with Section 32 93 00 "Plants" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.104 BID ITEM 104 – TREES - 24" BOX
- A. Measurement and Payment for Trees - 24" box shall be paid as Each (EA).
 - B. Comply with Section 32 93 00 "Plants" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.105 BID ITEM 105 – TREES - 15 GALLON
- A. Measurement and Payment for Trees - 15 gallon shall be paid as Each (EA).
 - B. Comply with Section 32 93 00 "Plants" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.106 BID ITEM 106 – BIORETENTION BASIN (SOD)
- A. Measurement and Payment for Bioretention Basin (sod) shall be paid as Square Feet (SF).
 - B. Comply with Section 32 92 00 "Turf And Grasses" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.107 BID ITEM 107 – TURF (SOD)
- A. Measurement and Payment for Turf (sod) shall be paid as Square Feet (SF).
 - B. Comply with Section 32 92 00 "Turf And Grasses" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.108 BID ITEM 108 – 90 DAY PLANT ESTABLISHMENT AND MAINTENANCE PERIOD
- A. Measurement and Payment for 90 Day Plant Establishment and Maintenance Period shall be paid as Square Feet (SF).
 - B. Comply with Section 32 98 13 "Landscape Maintenance_Establishment Period" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.
- 3.109 BID ITEM A1 – EXTERIOR PAINTING OF HISTORIC JAIL (ADD ALTERNATE NO. 1)
- A. Bid item A1 is an additive bid alternative.
 - B. Measurement and Payment for Exterior Painting of Historic Jail shall be paid as Square Feet (SF).

- C. Comply with Section 09 91 13 "Ext & Int Paint And Coatings" of the Technical Provisions. Payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to complete the work as shown on the plans and as specified.

END OF SECTION 01 11 00

SECTION 01 25 00

SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Document 002600 "Procurement Substitution Procedures" for requirements for substitution requests prior to award of Contract.
 - 2. Section 012100 "Allowances" for products selected under an allowance.
 - 3. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.2 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required to meet other Project requirements but may offer advantage to Contractor or Owner.

1.3 ACTION SUBMITTALS

- A. Substitution Requests: Submit documentation identifying product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use form acceptable to Architect.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
 - b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and

- installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from State of California.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
- 3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor through Construction Manager of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
 - a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.4 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.5 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.6 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.

- 1. Conditions: Architect will consider Contractor's request for substitution when the following

conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

- a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
- b. Substitution request is fully documented and properly submitted.
- c. Requested substitution will not adversely affect Contractor's construction schedule.
- d. Requested substitution has received necessary approvals of authorities having jurisdiction.
- e. Requested substitution is compatible with other portions of the Work.
- f. Requested substitution has been coordinated with other portions of the Work.
- g. Requested substitution provides specified warranty.
- h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience:

1. Not allowed unless otherwise indicated.
2. Architect will consider requests for substitution if received within 30 days after the Notice of Award. Requests received after that time may be considered or rejected at discretion of Architect.
 - a. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - 1) Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - 2) Requested substitution does not require extensive revisions to the Contract Documents.
 - 3) Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - 4) Substitution request is fully documented and properly submitted.
 - 5) Requested substitution will not adversely affect Contractor's construction schedule.
 - 6) Requested substitution has received necessary approvals of authorities having jurisdiction.
 - 7) Requested substitution is compatible with other portions of the Work.
 - 8) Requested substitution has been coordinated with other portions of the Work.
 - 9) Requested substitution provides specified warranty.
 - 10) If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 2 - PRODUCTS- NOT A PART
PART 3 - EXECUTION- NOT A PART

END OF SECTION 02 41 19

SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project, including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Arrangements for temporary construction facilities
 - 3. RFIs.
 - 4. Digital project management procedures.
 - 5. Web-based Project management software package.
 - 6. Project Meetings
- B. The Contractor shall be responsible for all Project coordination and the coordination of the work of all subcontractors, fabricators, utility agencies, inspectors and suppliers. Coordination, as referred to herein, shall include the establishment of on-site lines of authority and communication and the scheduling of and conducting of progress meetings between the Construction Manager and the Contractor and its subcontractors, fabricators, utility agencies, inspectors and suppliers. The Contractor's onsite supervisory person shall be present and shall represent the General Contractor whenever a meeting is held that involves any interface between the Construction Manager or the City and any subcontractors, fabricators, or suppliers.
- C. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- D. The Contractor, along with the Contractor's Superintendent or on-site Project Manager and its safety representative, as a minimum, shall attend all meetings scheduled by the City Engineer for coordination and collection and dissemination of information related to the Work.
- E. The City Engineer will prepare the minutes of each meeting and will distribute them to each of the participants.
- F. The Contractor shall notify the City Engineer of all proposed safety meetings. The City Engineer will advise the Contractor about contract-related safety information, safety meetings, and safety-related issues.
- G. Related Requirements:
 - 1. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 2. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

1.2 DEFINITIONS

- A. RFI: Request for Information. Request from City, Construction Manager, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.3 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.
- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses, cellular telephone numbers, and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
 - 1. Post copies of list in in web-based Project software directory. Keep list current at all times.

1.4 GENERAL COORDINATION PROCEDURES

- A. Cost Control
 - 1. The Contractor shall review and refine the approved estimate of construction cost and shall monitor and record actual costs and estimates for uncompleted Work, including that of all subcontractors, fabricators, and suppliers. All approved changes shall be incorporated as they occur.
 - 2. In addition, the Contractor shall be responsible for the following:
 - a. Maintain cost accounting records for authorized Work performed under unit costs, actual costs for labor and materials, and other basis requiring accounting records.
 - b. Develop and implement procedure for review and processing of applications for progress and final payments: Submit recommendations to the Construction Manager for certification to the City for Payment.
- B. General Coordination
 - 1. All Work covered in the Contract Documents shall be coordinated as a part of the Contractor's obligations under the Contract.
 - 2. The Contractor shall assure timely fabrication of work, erection of work, and completion of closeout items and the timely preparation of shop drawings and other submittals in conformance with the approved construction schedule.
 - 3. The Contractor shall coordinate the efforts of all individuals and subcontractors in the execution of the Work.
 - 4. City shall not be responsible for any lost/waiting time costs or schedule impacts resulting from lack of timely coordination by Contractor
- C. Special Coordination
 - 1. Drawings showing the location of equipment, piping, ducts, etc., are diagrammatic only. Even though every effort has been made to provide adequate routing and placement, job conditions will not always permit their locations in the field where indicated on the drawings. Whenever this condition is encountered by the Contractor, he or she shall

notify the Construction Manager immediately to obtain the Construction Manager's determination of any necessary relocation. Minor adjustments in locations, or rerouting due to ill-timed or improper sequence of trades shall be the responsibility of the Contractor and shall be performed at no additional cost to the City.

2. The Contractor shall provide advance notification to the Construction Manager of specific tasks and inspections specified. Failure to provide such advance notification may be cause for rejection of the Work.
3. Wherever prefabricated items are to be incorporated into the Work, the Contractor shall use templates and shall set fasteners accurately to the templates.
4. Contractor shall coordinate with the existing property owners and tenants for those properties where the Contract Documents show work to be performed on private property. The City will secure the permanent utility easements required for said locations, however it is the Contractor's responsibility to coordinate for onsite access and scheduling to minimize impact with said properties.
5. All dimensions shall be verified to assure that all components will fit together properly. Particular care shall be exercised to assure workability, access, symmetry, and alignment of components. Whenever the Contractor is in doubt of the intended effect of the Contract Documents, a request for information or clarification shall be tendered in writing to the Construction Manager prior to layout of building elements.

D. Coordination of Subcontractor Responsibilities

1. The Contractor shall be responsible for coordination of the work of each of its subcontractors and suppliers. Special attention is directed to the following obligations of the Contractor:
 - a. Verify that subcontractors have obtained permits for inspections.
 - b. Review all subcontractor shop drawings, product data, and sample submittals for compliance with Contract Documents prior to submittal to the Construction Manager for general review for compliance with design intent.
 - c. Maintain onsite documentation and keep current record drawing set at Project site.
 - d. Verify that specified cleaning is done during progress of Work and at completion of each subcontract.

E. Clearances for Equipment and Systems

1. Adequate clearance shall be provided by the Contractor between structural, storm drain, electrical, and other utility systems.
2. Drawings shall be reviewed by the Contractor for possible conflicts.
3. The Contractor shall be responsible for verification that equipment and systems will fit in the spaces provided. All conflicts shall be resolved in cooperation with the Construction Manager.
4. Work already installed that requires re-routing or modification due to conflicts with other work shall be corrected at the Contractor's expense.

1.5 ARRANGEMENTS FOR TEMPORARY CONSTRUCTION FACILITIES

- A. The Contractor shall be responsible for the allocation of space for temporary structures furnished by its subcontractors; monitoring the use of temporary utilities; verification that adequate services are provided to comply with requirements for Work and climatic conditions; and the administration of traffic and parking controls. All such work shall be in strict conformance with all applicable requirements of the Contract Documents.

1.6 REQUEST FOR INFORMATION (RFI)

- A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
 2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
 2. City name.
 3. City's Project number.
 4. Name of Architect and Construction Manager.
 5. Architect's Project number.
 6. Date.
 7. Name of Contractor.
 8. RFI number, numbered sequentially.
 9. RFI subject.
 10. Specification Section number and title and related paragraphs, as appropriate.
 11. Drawing number and detail references, as appropriate.
 12. Field dimensions and conditions, as appropriate.
 13. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 14. Contractor's signature.
 15. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to Architect.
1. Attachments shall be electronic files in PDF format.
- D. Architect's and Construction Manager's Action: Architect and Construction Manager will review each RFI, determine action required, and respond. Allow five days for Architect's response for each RFI. RFIs received by Architect or Construction Manager after 1:00 p.m. will be considered as received the following working day.
1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect's actions on submittals.

communication and documentation until Final Completion.

1. Web-based Project management software includes, at a minimum, the following features:
 - a. Compilation of Project data, including Contractor, subcontractors, Architect, Architect's consultants, City, and other entities involved in Project. Include names of individuals and contact information.
 - b. Access control for each entity for each workflow process, to determine entity's digital rights to create, modify, view, and print documents.
 - c. Document workflow planning, allowing customization of workflow between project entities.
 - d. Creation, logging, tracking, and notification for Project communications required in other Specification Sections, including, but not limited to, RFIs, submittals, Minor Changes in the Work, Construction Change Directives, and Change Orders.
 - e. Track status of each Project communication in real time, and log time and date when responses are provided.
 - f. Procedures for handling PDFs or similar file formats, allowing markups by each entity. Provide security features to lock markups against changes once submitted.
 - g. Processing and tracking of payment applications.
 - h. Processing and tracking of contract modifications.
 - i. Creating and distributing meeting minutes.
 - j. Document management for Drawings, Specifications, and coordination drawings, including revision control.
 - k. Management of construction progress photographs.
 - l. Mobile device compatibility, including smartphones and tablets.
2. Provide up to seven Project management software user licenses for use of City, Construction Manager, Landscape Architect, and Landscape Architect's consultants.
3. At completion of Project, provide digital archive in format that is readable by common desktop software applications in format acceptable to Architect. Provide data in locked format to prevent further changes.
4. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Procore Technologies, Inc.
 - b. Autodesk, Inc.
 - c. Deltek Inc.
 - d. Viewpoint, Inc.; a Trimble Company.

C. PDF Document Preparation: Where PDFs are required to be submitted to Architect, prepare as follows:

1. Assemble complete submittal package into a single indexed file, incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.
3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

1.8 PROJECT MEETINGS

- A. General: City Engineer will schedule and conduct meetings and conferences at Project site unless otherwise indicated.

- B. Preconstruction Conference: Prior to the commencement of Work at the site, a Preconstruction conference will be held at a mutually agreed upon time and place which shall be attended by the Contractor, its superintendent, and its subcontractors as appropriate.
1. Other attendees will be:
 - a. City Engineer and the City's Project Representative / Inspector.
 - b. Landscape Architect.
 - c. Representatives of City.
 - d. Governmental representatives as appropriate.
 - e. Utility Agencies, as required
 - f. Others as requested by Contractor, City, or City Engineer.
 2. Unless previously submitted to the City Engineer, the Contractor shall bring to the conference one copy each of the following:
 - a. Tentative Construction Schedule.
 - b. Procurement schedule of major equipment and materials and items requiring long lead-time.
 - c. Shop Drawing/Sample/Substitute or "Or Equal" submittal schedule.
 - d. Schedule of values (lump sum price breakdown) for progress payment purposes.
 3. The purpose of the conference is to designate responsible personnel and establish a working relationship. Matters requiring coordination will be discussed and procedures for handling such matters established. The complete agenda will be furnished to the Contractor prior to the meeting date, which may include the following:
 - a. Contractor's tentative schedules.
 - b. Transmittal, review, and distribution of Contractor's submittals.
 - c. Processing applications for payment.
 - d. Maintaining of record documents.
 - e. Critical work sequencing.
 - f. Field decisions and Change Orders.
 - g. Use of project site, office and storage areas, security, housekeeping, and City's needs.
 - h. Major equipment deliveries and priorities.
 - i. Contractor's assignments for safety and first aid.
 4. The City Engineer will preside at the preconstruction conference and will arrange for keeping the minutes and distributing the minutes to all persons in attendance.
 - a. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including City, City Engineer, and Architect, within three days of the meeting.
- C. Progress Meetings: The Contractor shall attend and participate in regular onsite progress meetings at least weekly and at other times or frequencies as determined by City Engineer. The Contractor, City Engineer, and all subcontractors active and soon to be active on the site shall be represented at each meeting. Contractor may, at its discretion, request attendance by representatives of its suppliers, manufacturer's, and other subcontractors.
1. The purpose of the meetings will be to review the progress of the Work maintain coordination of efforts, discuss changes in scheduling, and resolve other problems which may develop.

2. Attendees: In addition to representatives of City, City Engineer, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Location: Progress meetings shall be on-site, but a virtual conference option call shall be available for Architect and other participants as needed.
 - a. Contractor shall make available virtual conference call capabilities and extend invitations to parties necessary.
4. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Contractor is required to submit the 3-week lookahead schedule no later than 24 hours prior to the weekly progress meeting. The 3-week lookahead schedule shall at a minimum show actual performance for the previous week, as well as planned work for the current week and planned work for the two successive weeks following the current week.
 - 2) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site use.
 - 8) Temporary facilities and controls.
 - 9) Progress cleaning.
 - 10) Quality and work standards.
 - 11) Status of correction of deficient items.
 - 12) Field observations.
 - 13) Status of RFIs.
 - 14) Status of Proposal Requests.
 - 15) Pending changes.
 - 16) Status of Change Orders.
 - 17) Pending claims and disputes.
 - 18) Documentation of information for payment requests.
5. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting, where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

- D. Project Closeout Conference: City Engineer will schedule and conduct a project closeout conference, at a time convenient to City, City Engineer, and Architect, but no later than 30 days prior to the scheduled date of Substantial Completion.
1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 2. Attendees: Authorized representatives of City, City Engineer, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of Record Documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Procedures for completing and archiving web-based Project software data files.
 - d. Submittal of written warranties.
 - e. Requirements for preparing operations and maintenance data.
 - f. Requirements for delivery of material samples, attic stock, and spare parts.
 - g. Requirements for demonstration and training.
 - h. Preparation of Contractor's punch list.
 - i. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - j. Submittal procedures.
 - k. City's partial occupancy requirements.
 - l. Installation of City's furniture, fixtures, and equipment.
 - m. Responsibility for removing temporary facilities and controls.
 4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

PART 2 - PRODUCTS- NOT A PART
PART 3 - EXECUTION- NOT A PART

END OF SECTION 01 31 00

SECTION 024119

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Site Investigation and Control
 - 2. Inspection of the Work
 - 3. Sampling and Testing
 - 4. Time of Inspections and Tests

1.2 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification Data: For Contractor's quality-control personnel.
- C. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Entity responsible for performing tests and inspections.
 - 3. Description of test and inspection.
 - 4. Identification of applicable standards.
 - 5. Identification of test and inspection methods.
 - 6. Number of tests and inspections required.
 - 7. Time schedule or time span for tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.
- D. Reports: Prepare and submit certified written reports and documents as specified.
- E. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.3 SITE INVESTIGATION AND CONTROL

- A. The Contractor shall verify all dimensions in the field and shall check all field conditions continuously during construction. The Contractor shall be solely responsible for any inaccuracies built into the Work.
- B. The Contractor shall inspect related and appurtenant work and shall report in writing to the City Engineer any conditions that will prevent proper completion of the Work. Any required removal, repair, or replacement caused by unsuitable conditions shall be done by the Contractor at its sole cost and expense.

1.4 INSPECTION OF THE WORK

- A. General: The Work shall be conducted under the general observation of the City Inspector and shall be subject to intermittent inspection by representatives of the City to assure strict compliance with the requirements of the Contract Documents.
- B. The authorized representative of the City on the project site shall be the City Engineer acting directly and through various inspectors at the site. The presence of the Inspectors, however, shall not relieve the Contractor of the responsibility for the proper execution of the Work in accordance with all requirements of the Contract Documents. Compliance is distinctly a duty of the Contractor, and said duty shall not be avoided by any act or omission on the part of the inspector(s).
- C. All materials and articles furnished by the Contractor shall be subject to rigid inspection, and no material or articles shall be used in the Work until it has been inspected and accepted by the City Engineer or the City.
- D. Inspection at Place of Manufacture: Unless otherwise specified, all products, materials, and equipment shall be subject to inspection by the City Engineer at the place of manufacture.
- E. The presence of the City Engineer at the place of manufacture, however, shall not relieve the Contractor of the responsibility for furnishing products, materials, and equipment that comply with all requirements of the Contract Documents.

1.5 SAMPLING AND TESTING

- A. Unless otherwise specified, all sampling and testing shall be in accordance with the methods prescribed in the current standards of the ASTM or other specified published standards, as applicable to the class and nature of the article or materials considered; however, the City reserves the right to use any generally accepted system of sampling and testing which, in the opinion of the City Engineer, will assure the City that the quality of the workmanship is in full accord with the Contract Documents.
- B. Any waiver by the City of any specific testing or other quality assurance measures, whether or not such waiver is accompanied by a guarantee of substantial performance as a relief from the specified testing or other quality assurance requirements as originally specified, and whether or not such guarantee is accompanied by a performance bond to assure execution of any necessary corrective or remedial Work, shall not be construed as a waiver of any prescriptive or performance requirements of the Contract Documents.
- C. Notwithstanding the existence of such waiver, and in addition to any testing and inspection performed by any other inspector on behalf of the City or any other public agency having jurisdiction, the City Engineer shall have the right to make independent investigations and tests, and failure of any portion of the Work to meet any of the requirements of the Contract Documents, shall be reasonable cause for the City Engineer to require the removal or correction and reconstruction of any such work in accordance with the General Conditions.

1.6 TIME OF INSPECTIONS AND TESTS

- A. Samples and test specimens required under the Contract Documents shall be furnished by the Contractor and prepared for testing in ample time for the completion of the necessary tests and analyses before the subject materials or articles are to be used. The Contractor shall furnish all required test specimens that are selected or required by the City or the City's testing lab. Except

as otherwise provided in the Contract Documents, performance of the required tests will be by the City, and all costs therefor will be borne by the City, except the cost of any test which shows unsatisfactory results shall be borne by the Contractor.

- B. Whenever the Contractor is ready to backfill, bury, cast in concrete, hide, or otherwise cover or make inaccessible any work under the Contract, the Contractor shall notify the City Engineer not less than 48 hours in advance of beginning any such work of backfilling, burying, casting in concrete, hiding, covering, or making inaccessible any portion of the Work to be inspected, so that the required inspections can be scheduled and performed. Failure of the Contractor to notify the City Engineer at least 48 hours in advance of any such inspections shall be reasonable cause for the City Engineer to require sufficient delay in the Contractor's schedule to allow time for such inspections and any remedial or corrective work required, and all costs of such delays, including its impact or effect upon other portions of the Work, shall be borne by the Contractor.

PART 2 - PRODUCTS- NOT A PART
PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 - 1. Date test or inspection was conducted.
 - 2. Description of the Work tested or inspected.
 - 3. Date test or inspection results were transmitted to Architect.
 - 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect and City Engineer's and authorities' having jurisdiction] reference during normal working hours.
 - 1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspection, sample-taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 45 00

SECTION 01 48 00

SKATE PARK SPECIALTY WORK QUALIFICATIONS

PART 1 - GENERAL

1.01 CRITERIA

Skate Park Specialty Work Contractor Qualifications: Proposed skate park construction is considered technical and specialized. Since this is a unique type of construction requiring specialized experience and equipment, only skate park contractors having prior experience on skate park projects will be considered. Qualifying Skate Park Builders shall have completed the construction of eight (8) similar skate park projects within the last five (5) years. Similar projects include custom concrete skateparks of similar size and feature types (depths, configurations, material types, finishes).

1.02 DOCUMENTATION

Information to be submitted with bids:

1. Statement the company has a minimum 5 years doing business under its present business name, providing similar services.
2. List of eight (8) similar skate park projects in the past five (5) years the contractor has successfully completed. Include project location, name, size, year built and contact.

1.03 TERMINATION OR CANCELLATION OF BID

If it is determined or discovered, that the Contractor has provided false or misleading documentation, their bid can and may be rejected.

END OF SECTION 01 48 00

SECTION 01 49 00

SKATE PARK CONSTRUCTION GENERAL NOTES

1. The Contractor shall be responsible to confirm the ground elevations and overall topography of the site, as well as, all site dimensions prior to the start of construction. The Contractor shall immediately notify the Owner's Representative in writing of any differences in topography or site dimensions from that shown on the plans which may require changes in design.
2. The Contractor shall estimate the earthwork quantities to her or his satisfaction prior to the start of construction and shall arrange for the disposal of excess material or import material as required to complete the grading as shown on the plans. No additional compensation shall be made for any export or import required.
3. The Contractor is responsible for matching existing improvements with a smooth transition to existing grades and to avoid any abrupt or apparent changes in grades or cross slopes, low spots, or hazardous conditions.
4. Any changes or deviations in these plans without written approval of Site Design Group shall absolve the Site Design Group of any and all responsibility of said change or deviation.
5. Written dimensions shall take precedence over scaled dimensions. Immediately notify Site Design Group in writing of any discrepancies found in the field.

COPYRIGHT NOTICE

The specifications contained herein are provided for use solely with respect to the referenced vans pro skate park series project and unless otherwise provided, may not be used or published in whole or in part without written consent from Site Design Group. As author of the specifications Site Design Group retains all common law, statutory and other reserved rights including United States and international copyright. © 2023 Site Design Group

END OF SECTION 01 49 00

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.
- C. It shall be the Contractor's responsibility to provide plant and equipment that is adequate for the performance of the Work under this Contract within the time specified. All plant and equipment shall be kept in satisfactory operating condition, shall be capable of safely and efficiently performing the required Work, and shall be subject to inspection and approval by the City's representative at any time within the duration of the Contract. All work hereunder shall conform to the applicable requirements of Cal-OSHA Construction Safety Orders.

1.2 USE CHARGES

- A. Installation, removal, and use charges for temporary facilities to be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the project to use temporary services and facilities without cost, including, but not limited to, Architect, testing agencies, and authorities having jurisdiction.
- B. Water Service: Pay water-service use charges for water used by all entities for construction operations. Contractor shall procure a water meter with the local water agency. All costs associated with this are borne by the contractor
- C. Electric Power Service: Pay electric-power-service use charges for electricity used by all entities for construction operations.

1.3 INFORMATIONAL SUBMITTALS

- A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.
- B. Implementation and Termination Schedule: Within 15 days of date established for commencement of the Work, submit schedule indicating implementation and termination dates of each temporary utility.
- C. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.
- D. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

1.4 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.5 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Portable Chain-Link Fencing: Minimum **2-inch, 0.148-inch-** thick, galvanized-steel, chain-link fabric fencing; minimum **6 feet** high with galvanized-steel pipe posts; minimum **2-3/8-inch-** OD line posts and **2-7/8-inch-** OD corner and pull posts, with **1-5/8-inch-** OD top and bottom rails. Provide galvanized-steel bases for supporting posts.
- B. Fencing Windscreen Privacy Screen: Polyester fabric scrim with grommets for attachment to chain-link fence, sized to height of fence, in color selected by Architect from manufacturer's standard colors.

2.2 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

- A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
 - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

3.2 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference

with performance of the Work. Relocate and modify facilities as required by progress of the Work.

1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.3 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 1. Arrange with utility company, City, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Water Service:
 1. General: Contractor shall be responsible for providing construction water. The Contractor shall provide all facilities necessary to convey the water from the water source to the points of use in accordance with the requirements of the Contract Documents.
 - a. Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to the Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
 - b. Contractor shall be solely responsible for the adequate functioning of its water supply system and shall be solely liable for any claims arising from the use of same, including discharge or waste of water therefrom.
 - c. The Contractor shall provide and operate all pumping facilities, pipelines, valves, hydrants, storage tanks, and all other equipment necessary for the adequate development and operation of its water supply system. The Contractor shall be solely responsible for the adequate functioning of its water supply system and shall be solely liable for any claims arising from the use of same, including discharge or waste of water therefrom.
 - d. Potable Water: All drinking water on the site during construction shall be furnished by the Contractor and shall be bottled water or water furnished in approved metal dispensers. Notices shall be posted conspicuously throughout the site warning the Contractor's personnel that piped water may be contaminated.
 - e. Fire Hydrant Water Connections: If the Contractor intends to use water from the Water Provider's fire hydrants, the Contractor will be required to apply for a water construction meter and pay for all charges required by the Water Provider.
 - 1) The Contractor shall not make connection to, or draw water from, any fire hydrant or pipeline without first obtaining permission of the City or other authority having jurisdiction over the use of said fire hydrant or pipeline, and from the agency owning the affected water system.
 - f. For each such connection made, the Contractor shall first attach to the fire hydrant or pipeline a valve and a meter, if required by the City or other authority, of a size and type acceptable to the City or said other authority and agency.
 2. The Contractor shall contact the Water Provider for specific requirements for water usage and charges.
 3. Removal of Water Connections: Before Final Completion of the Work on the project, all temporary connections and piping installed by the Contractor shall be entirely removed,

and all affected improvements shall be restored to their original condition, or better, to the satisfaction of City Engineer, the City, and/or other agency owning the affected utility.

C. Sanitary Facilities:

1. Toilet Facilities: The Contractor shall provide sanitary temporary toilet buildings for the use of all workers. All toilets shall comply with local codes and ordinances. Toilets shall be kept supplied with toilet paper and shall have workable door fasteners. Toilets shall be serviced no less than once weekly and shall be present in a quantity of not less than 1 per 20 workers or as required by CAL-OSHA regulation. The toilets shall be maintained in a sanitary condition at all times. Use of toilet facilities in the Work under construction shall not be permitted. Any other Sanitary Facilities required by CAL-OSHA shall be the responsibility of the Contractor.
2. Sanitary and Other Organic Wastes: The Contractor shall establish a regular daily collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities provided by the Contractor or organic material wastes from any other source related to the Contractor's operations shall be disposed of away from the site in a manner satisfactory to the City Engineer and in accordance with all laws and regulations pertaining thereto.

D. Electric Power Service:

1. Power: The Contractor shall provide all necessary temporary power required for its operations under the Contract, and shall provide and maintain all temporary power lines required to perform the Work in a safe and satisfactory manner.
2. Approval of Electrical Connections: All temporary connections for electricity shall be subject to approval of the City Engineer and the power company representative, and shall be removed in like manner at the Contractor's expense prior to the City's issuance of Notice of Completion of the Work.
3. Separation of Circuits: Unless otherwise permitted by the City Engineer, circuits separate from lighting circuits shall be used for all power purposes.
4. Construction Wiring: All wiring for temporary electric light and power shall be properly installed and maintained and shall be securely fastened in place. All electrical facilities shall conform to the requirements of Title 8, Industrial Relations, Subchapter 5, Electrical Safety Orders, California Administrative Code; and Subpart K of the OSHA Safety and Health Standards for Construction.

E. Construction Lighting: All Work conducted at night or under conditions of deficient daylight shall be suitably lighted to insure proper Work and to afford adequate facilities for inspection and safe working conditions.

F. Communications:

1. Telephone/Internet Services: The Contractor shall provide and maintain, at all times during the progress of the Work, not less than one telephone and Internet / WIFI service in good working order.
2. Telephone Use: The Contractor shall permit the City Engineer, the City, and their authorized representatives or employees free and unlimited use of said telephone facilities for all calls that do not involve published toll charges. Calls originated by the City Engineer, the City, and their authorized representatives or employees who involve toll or message unit charges shall be billed to the City by the Contractor at the rates charged by the telephone company.

3.4 SUPPORT FACILITIES INSTALLATION

- A. Traffic Controls: Comply with requirements of authorities having jurisdiction and Section 01 55 26.
 - 1. Protect existing site improvements to remain, including curbs, pavement, and utilities.
 - 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- B. Storage and Staging: **Use designated areas of Project site** for storage and staging needs. If Contractor wants additional storage and staging, Contractor shall identify and procure leases, easements, and other means or storage and staging at no additional expense to the City.
- C. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
 - 1. Identification Signs: Provide Project identification signs as indicated on Drawings.
 - 2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
 - a. See Section 01 58 00 "Project Identification"
 - b. Provide temporary, directional signs for construction personnel and visitors.
 - 3. Maintain and touch up signs, so they are legible at all times.
- D. Waste Disposal Facilities:
 - 1. Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."
 - 2. Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 01 73 00 "Execution."

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
 - 1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
 - 1. Comply with work restrictions specified in Section 011000 "Summary."
- C. Temporary Erosion and Sedimentation Control: Comply with requirements of authorities having jurisdiction and Section 31 10 00 "Site Clearing," whichever is more stringent.
- D. Stormwater Control: Comply with requirements of authorities having jurisdiction and Section 31 10 00 "Site Clearing," whichever is more stringent.
- E. Tree and Plant Protection:

1. Comply with requirements specified in Section 01 56 39 "Temporary Tree and Plant Protection."
 2. Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- F. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people from easily entering site except by entrance gates.
1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.
 3. Removal of Site Enclosure Fence: Upon Final Completion of the Work on the project and completion of the Landscape Maintenance and Establishment Period, or at an alternative date as determined by the City, whichever is sooner, all Site Enclosure Fence shall be removed by the Contractor to the satisfaction of City Engineer.
- G. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.
- H. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- I. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program. The construction site and all other parts of the Work shall be connected with the Contractor's water supply system and shall be adequately protected against damage by fire. Hose connections and hose, water casks, chemical equipment, or other sufficient means shall be provided for fighting fires in the temporary structures and other portions of the Work, and responsible persons shall be designated and instructed in the operation of such fire apparatus so as to prevent or minimize the hazard of fire. The Contractor's fire protection program shall conform to the requirements of Article 36 of Cal-OSHA Construction Safety Orders.
1. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition in accordance with requirements of authorities having jurisdiction.
 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.6 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 01 50 00

SECTION 01 55 26

TRAFFIC CONTROL

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section describes procedures for traffic regulation during construction in public streets.

1.2 STANDARD SPECIFICATIONS

- A. Wherever reference is made to the State Specifications and Plans, such reference shall mean the State of California, Business, Transportation, and Housing Agency, Department of Transportation current edition Standard Specifications and Standard Plans.

1.3 SUBMITTALS

- A. The Contractor shall submit, not less than 14 working days prior to start of construction operations, a plan, prepared, signed, and sealed by a California licensed traffic engineer to the City of Guadalupe. Preparation of any additional traffic control plans or detail that may be required by the City of Guadalupe during the course of the work shall be the Contractor's responsibility. No work shall begin involving or requiring traffic control until a traffic control plan is approved by the City.

1.4 GENERAL

- A. Provide safe and continuous passage for pedestrian and vehicular traffic at all times.
- B. Control traffic at those locations indicated and in conformance with the approved traffic control plans and specifications.
- C. Furnish, construct, maintain, and remove detours, road closures, traffic signal equipment, lights, signs, barricades, fences, K-rail, flares, solar-powered flashing arrow signs, miscellaneous traffic devices, flagmen, drainage facilities, paving, and such other items and services as are necessary to adequately safeguard the public from hazard and inconvenience. All such work shall comply with the ordinances, directives, and regulations of authorities with jurisdiction over the public roads in which the construction takes place and over which detoured traffic is routed by the Contractor. After devices have been installed, maintain and keep them in good repair and working order until no longer required. Replace such devices that are lost or damaged, to such an extent as to require replacement, regardless of the cause of such loss or damage.
- D. Prior to the start of construction operations, notify the police and fire department in whose jurisdiction the project lies, giving the expected starting date, completion date, and the names and telephone numbers of two responsible persons who may be contacted at any hour in the event of a condition requiring immediate emergency service to remove, install, relocate, and maintain warning devices. In the event these persons do not promptly respond or the authority deems it necessary to call out other forces to accomplish emergency service, the Contractor will be held responsible for the cost of such emergency service.
- E. Post temporary "No Parking - Tow Away" signs 48 hours prior to work in areas where parking is normally permitted. The City of Guadalupe Police Department shall be notified 48 hours prior to the posting of any temporary parking restrictions along the work area.
- F. Coordinate the relocation of public bus and school bus routes, bus stops, and trash collection services with the agencies in advance of construction activity.

1.5 TRAFFIC CONTROL DEVICES AND SIGNS

- A. Traffic control devices and temporary striping shall conform to the California Manual of Uniform Traffic Control Devices (California MUTCD). Construction signs shall conform to the latest

edition of the FHA publication "Standard Highway Signs" and the State of California Sign Specification Sheets.

- B. The placement of construction signing, striping, barricades, and other traffic control devices used for handling traffic and public convenience shall conform to the California MUTCD and City of Guadalupe Standards.
- C. Signs shall be illuminated or reflectorized when they are used during hours of darkness. Cones and portable delineators used for night lane closures shall have reflective sleeves. Equip barricades used in the diversion of traffic with flashers if in place during hours of darkness.
- D. During the duration of a detour, cover existing signs not in accordance with the traffic control plan. Relocate existing signs that are in force to provide visibility from all relocated traffic lanes.

1.6 VEHICULAR TRAFFIC CONTROL

- A. Shoring members, beams, or other obstructions shall not be permitted within a 2-foot clearance between the edge of excavation and the edge of any traffic lane. At construction areas where an open trench exists and/or where traffic detour will be in existence during night hours, replace delineators with barricades or K-rail.
- B. Accomplish construction in phases by detouring traffic from its normal patterns. Restore traffic to normal patterns in each phase before proceeding to the next phase.
- C. Transition traffic lane transitions from permanent lanes to construction zone patterns in accordance with the requirements for the normal posted speed limit.
- D. Limit construction activities as allowed by the City. Return roadways and sidewalks to unrestricted vehicle and pedestrian usage when construction is not underway.
- E. During the peak traffic volume hours of the day, from 6:00 a.m. to 8:30 a.m. and 3:30 p.m. to 7:00 p.m. on weekdays only, limit construction activities within the construction zone to those which will not impact the free movement of vehicular traffic in its detoured pattern. Construction equipment or trucks shall not use or travel adjacent to traffic lanes during these time periods. Truck operations in and out of construction and staging areas shall be controlled by flagmen at all times.

1.7 PEDESTRIAN TRAFFIC CONTROL

- A. Maintain and delineate a minimum of one 4-foot-wide pedestrian walkway along each public street at all times during construction. Maintain existing pedestrian accesses at intersections at all times. When existing crosswalks are blocked by construction activity, install signs directing pedestrian traffic to the nearest alternative crosswalk.
 - 1. Maintain pedestrian access to existing Ninth Street pedestrian bridge
- B. Erect a fence or provide other means of securement to preclude unauthorized entry to any excavation during all nonworking hours on a 24-hour basis including weekends and holidays. Said fence shall be a minimum of 7 feet high around the entire excavation, consisting of a minimum 9-gauge chain-link type fence fabric and shall be sturdy enough to prohibit toppling by children or adults. There shall be no openings under the wire large enough for any child to crawl through. Lock any gates if no adult is in attendance.

1.8 ACCESS TO ADJACENT PROPERTIES

- A. Maintain reasonable access from public streets to adjacent properties at all times during construction. Prior to restricting normal access from public streets to adjacent properties, notify each property owner or responsible person informing him of the nature of the access restriction, the approximate duration of the restriction, and the best alternate access route for that particular property.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 55 26

SECTION 01 56 00

TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 - GENERAL

1.1 EXPLOSIVES AND BLASTING

- A. The use of explosives on the Work will **NOT** be permitted.

1.2 DUST ABATEMENT

- A. The Contractor shall furnish all labor, equipment, and means required and shall carry out effective measures wherever and as often as necessary to prevent its operation from producing dust in amounts damaging to property, cultivated vegetation, or domestic animals, or causing a nuisance to persons living in or occupying buildings in the vicinity. The Contractor shall be responsible for any damage resulting from any dust originating from its operations. The dust abatement measures shall be continued until the Contractor is relieved of further responsibility by the Construction Manager.

1.3 RUBBISH CONTROL

- A. During the progress of the Work, the Contractor shall keep the site of the Work and other areas used by it in a neat and clean condition, and free from any accumulation of rubbish. The Contractor shall dispose of all rubbish and waste materials of any nature occurring at the Work site, and shall establish regular intervals of collection and disposal of such materials and waste. The Contractor shall also keep its haul roads free from dirt, rubbish, and unnecessary obstructions resulting from its operations. Disposal of all rubbish and surplus materials shall be off the site of construction in accordance with local codes and ordinances governing locations and methods of disposal, and in conformance with all applicable safety laws, and to particular requirements of Article 3 of Cal-OSHA Construction Safety Orders.
- B. See Section 01 74 19, Construction Waste Management for related requirements

1.4 SANITATION

- A. Toilet Facilities: Fixed or portable chemical toilets shall be provided wherever needed for the use of employees. Toilets at construction job sites shall conform to the requirements of Article 3 of Cal-OSHA Construction Safety Orders.
- B. Sanitary and Other Organic Wastes: The Contractor shall establish a regular daily collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities provided by the Contractor or organic material wastes from any other source related to the Contractor's operations shall be disposed of away from the site in a manner satisfactory to the Construction Manager and in accordance with all laws and regulations pertaining thereto.

1.5 FEDERAL WATER POLLUTION CONTROL ACT

- A. The Contractor's attention is directed to the Federal Water Pollution Control Act amendments of 1972 (Public Law 92-500), which require an Army Corps of Construction Managers permit under

Section 404 of the Act, for the discharge of one cubic yard or more of any dredged or fill material into "navigable waters" as defined in "Permits for Activities in Navigable Waters or Ocean Waters, Paragraph (d)(2), Federal Register of 25 July 1975, page 3134.

1.6 CHEMICALS

- A. All chemicals used during project construction or furnished for project operation, whether defoliant, soil sterilant, herbicide, pesticide, disinfectant, polymer, reactant or of other classification, shall show approval of either the U.S. Environmental Protection Agency or the U.S. Department of Agriculture. Use of all such chemicals and disposal of residues shall be in strict accordance with the printed instructions of the manufacturer.

1.7 FEDERAL CLEAN AIR ACT

- A. The Contractor agrees to comply applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq.
- B. The contractor agrees to report each violation to the District of Thousand Oaks and understands and agrees that the District of Thousand Oaks will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency (FEMA) and the appropriate Environmental Protection Agency Regional Office.
- C. The contractor agrees to include these requirements to each subcontract exceeding \$150,000 financed in whole or in part with federal assistance provided by FEMA.

PART 2 - PRODUCTS- NOT A PART

PART 3 - EXECUTION- NOT A PART

END OF SECTION 01 56 00

SECTION 01 57 23

TEMPORARY WATER POLLUTION CONTROL

PART 1 - GENERAL

1.01 SUMMARY

- A. Work in this section includes furnishing all labor, equipment and materials necessary for the implementation, maintenance, monitoring, and reporting as required by the OWNER provided Storm Water Pollution Prevention Plan (SWPPP) and the Construction General Permit.
- B. This is a Risk Level 1 Traditional Construction project.
- C. Contractor shall provide:
 - 1. Project SWPPP, prepared and certified by a Qualified SWPPP Developer (QSD)
 - 2. Qualified SWPPP Practitioner (QSP) to oversee permit compliance during construction.
 - 3. QSD if SWPPP amendments are required
 - 4. Water Pollution Control Manager (WPCM) E. Principal items of work include:
 - 5. SWPPP administration and maintenance
 - 6. Training employees and subcontractors in stormwater Best Management Practices (BMPs)
 - 7. Stormwater site inspections
 - 8. Stormwater sampling and numeric analysis if the project is Risk Level 2 or 3.
 - 9. Reporting and recordkeeping
 - 10. Implementing and maintaining BMPs, and removing BMPs when no longer needed.
 - 11. Non-stormwater management and good housekeeping practices
 - 12. Final site cleanup and SWPPP close-out

1.02 REFERENCES

- A. Construction General Permit: "Storm Water Discharges Associated with Construction and Land Disturbance Activities," SWRCB Order No. 2009-0009-DWQ, NPDES General Permit No. CAS000002, with amendments 2010-0014-DWQ and 2012-0006-DWQ
- B. Standard Specifications, State of California, Department of Transportation (Caltrans), 2018 edition
- C. Standard Plans, State of California, Department of Transportation (Caltrans), 2018 edition
- D. Construction Site Best Management Practices Manual (BMP Manual), State of California, Department of Transportation (Caltrans), 2015 edition

1.03 QUALITY ASSURANCE

- A. Qualified SWPPP Practitioner (QSP) shall hold a current QSD or QSP certification from the State of California / CASQA.
- B. Qualified SWPPP Developer (QSD) shall hold a current QSD certification from the State of California / CASQA.
- C. Water Pollution Control Manager (WPCM) shall be appropriately trained and thoroughly familiar with the project SWPPP and Construction General Permit. The WPCM is responsible for overseeing the implementation of the SWPPP on a day-to-day basis. The WPCM shall be an employee of the Contractor and shall be on site regularly.

- D. The WPCM shall educate, direct and enforce compliance with the requirements of the SWPPP by all employees and subcontractors.
- E. All contractor employees, subcontractors, and heavy equipment operators shall attend a pre-construction water pollution control training session conducted by the Contractor's WPCM.

1.04 GENERAL PERFORMANCE REQUIREMENTS

- A. All storm water and non-storm water discharges shall be in compliance with all applicable federal, state, and local requirements.
- B. This Section and the SWPPP outline the contract minimum requirements, and do not relieve the Contractor of his responsibilities for protection of water quality in accordance with all federal, state, and local requirements.
- C. Additional BMPs shall be required if the BMPs which are utilized are not adequately protecting water quality.
- D. The Contractor shall update the Water Pollution Control Drawings to indicate current operations, equipment used, sequence of work, and other aspects of the project.
- E. Contractor and all subcontractors shall be thoroughly familiar with all of the requirements of the SWPPP and Construction General Permit. Contractor is responsible for the performance of subcontractors. Contractor's WPCM shall inspect and monitor all subcontractors' work and storage areas for compliance with this Section.

1.05 FINES AND PENALTIES

- A. Contractor shall pay any fines and be liable for any other penalties that may be imposed by any federal, state, or local regulatory agency for non-compliance with any water quality requirement during the course of work.
- B. Contractor is responsible for implementing any and all BMP corrective measures, at his own expense, as may be directed by the regulatory agencies.

PART 2 - PRODUCTS

2.01 CONCRETE, GENERAL

- A. Provide all temporary and permanent water pollution control measures, equipment and materials as required by this Section and the Construction Drawings.
- B. Materials shall conform to the Caltrans Standard Specifications and Caltrans Standard Plans including Standard Specifications sections:
 - 1. 13-4 Job Site Management
 - 2. 13-5 Temporary Soil Stabilization
 - 3. 13-6 Temporary Sediment Control
 - 4. 13-7 Temporary Tracking Control
 - 5. 13-8 Temporary Active Treatment System
 - 6. 13-9 Temporary Concrete Washouts
 - 7. 13-10 Temporary Linear Sediment Barriers
 - 8. 14-9 Air Quality
 - 9. 14-10 Solid Waste Disposal and Recycling
 - 10. 14-11 Hazardous Waste and Contamination

PART 3 - EXECUTION

3.01 GENERAL

- A. Complete all required information in the SWPPP, to identify the first proposed stage of construction, and to identify personnel involved in WPC work.
- B. Provide documentation for WPCM, employee and subcontractor training, including preconstruction BMP training.
- C. The Contractor's WPCM shall maintain the field-copy SWPPP up-to-date throughout Construction.

3.02 MONITORING, INSPECTIONS AND REPORTING

- A. Contractor's WPCM shall:
 - 1. Conduct daily inspections of adjoining public roadways, material storage areas, and vehicle and equipment areas
- B. Contractor's QSP shall:
 - 1. Monitor the National Weather Service (NWS) forecast on a daily basis.
 - 2. Conduct inspections:
 - a. Within 72 hours prior to predicted rain events to ensure that the site is prepared for the rain event
 - b. At 24-hour intervals during Potential QREs
 - c. Within 48 hours after each QRE
 - 3. Prepare and submit:
 - a. Weekly BMP Inspection Reports
 - b. Quarterly Non-Stormwater Inspection Reports
 - c. Pre-Rain Event BMP Inspection Reports
 - d. During-rain event Inspection Reports
 - e. Post-Rain Event Inspection Reports
 - f. NAL Exceedance Reports and NEL Violation Reports, if required
 - g. Annual Reports
 - h. Site map and photographs required for the Notice of Termination application.
 - 4. Develop and implement REAPs if project is Risk Level 2 or 3.
 - 5. Serve as OWNER's Data Submitter for document submission on the SMARTS website
 - 6. Generally assist the OWNER in filing reports on the SMARTS website
- C. All reports shall be in a format acceptable to OWNER. Reports shall be submitted within one week of the inspection.
- D. Implement identified corrective actions within 72 hours, unless a later date is authorized.
- E. Notify the OWNER of any site visits by or correspondence received from any federal, state, or local agency, which are related to activities under this Section.

3.03 BEST MANAGEMENT PRACTICES

- A. Implement Best Management Practices as required by Sections 13 and 14 of the Caltrans Standard Specifications.
- B. Work shall comply with the following Caltrans Standard Specifications Sections, as applicable:
 - 1. 13-4 Job Site Management
 - 2. 13-5 Temporary Soil Stabilization
 - 3. 13-6 Temporary Sediment Control
 - 4. 13-7 Temporary Tracking Control

5. 13-8 Temporary Active Treatment System
6. 13-9 Temporary Concrete Washouts
7. 13-10 Temporary Linear Sediment Barriers
8. 14-9 Air Quality
9. 14-10 Solid Waste Disposal and Recycling
10. 14-11 Hazardous Waste and Contamination

- C. Best Management Practices shall be implemented concurrent with the commencement of construction, shall be maintained throughout construction, and shall be removed when no longer required.

3.04 COMPLETION OF WORK

- A. Final site cleanup and stabilization shall be considered complete when all of the following have been achieved:

1. The site will not pose any additional sediment discharge risk than it did prior to the commencement of construction activity;
2. There is no potential for construction-related storm water pollutants to be discharged into site runoff;
3. Final stabilization has been reached;
4. Construction materials and wastes have been disposed of properly;
5. Post-construction storm water management measures have been installed;
6. All construction-related equipment, materials and any temporary BMPs no longer needed are removed from the site.

- B. Final stabilization shall be determined by one of the following methods:

1. 70% of the disturbed soil on each individual parcel is uniformly covered by live, actively growing plant matter in contact with the soil;
2. Alternately, 70% of the disturbed soil on each individual parcel may be uniformly covered in another manner acceptable to the Engineer and the RWQCB.
3. RUSLE or RUSLE2 method, as outlined in the Permit; computational proof is required;
4. A custom method. The Contractor shall demonstrate compliance with the final stabilization requirements in the Permit, in some other manner than a or b, above.
5. At completion of work Contractor and Owner shall inspect the site, and Contractor shall present the currently implemented SWPPP with all backup records to the Owner.

END OF SECTION 01 57 23

SECTION 01 58 00

PROJECT IDENTIFICATION

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall construct, erect, and maintain a grant required (3 ft. by 4 ft.) rectangular, construction sign prominently displayed at the front of the project site. Said sign shall be up in full color and include up to two logos. Sign shall be installed within 15 days of receipt of the Notice to Proceed, and the Contractor shall maintain the sign in good condition until the execution of the Notice of Completion.
 - 1. A sign must acknowledge the California Drought, Water, Parks, Climate, Coastal Protection, and Outdoor Access for All Act of 2018 as the funding source for the project must be installed during construction and at completion.
 - 2. The sign must be available during construction, at the final inspection of the PROJECT.

1.2 GRAPHICS

- A. Sign graphics are pre-approved and are required as part of the District's grant. Graphics are available in the project plans
- B. The design of the sign shall be provided electronically by the city for the Contractor to include on the sign. At the completion of the project, the signs shall be removed.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each different sign.
 - 1. Include plans and attachment details.

PART 2 - PRODUCTS

2.1 SIGN MATERIALS

- A. Signboard: The signboard shall be constructed of 18 oz. blockout matte, tear-resistant vinyl. Signboard shall be waterproof and fade resistant.
 - 1. Hemmed edges with grommets at 2' O.C. maximum

2.2 GRAPHICS

- A. Graphics shall be digitally printed with high-resolution images (greater than 300 ppi) and CMYK
 - 1. All signs must display the Parks and Water Bond Act. Display the logo to maximize visibility and durability. Each edge of the logo must be a minimum of 24" x 24". No exceptions shall be approved.

- a. Download the logo at <https://resources.ca.gov/grants/Grant-Program-Resources>.

2.3 PROTECTIVE COVERING

- A. The sign shall include an anti-graffiti coating or film.

PART 3 - EXECUTION

3.1 ERECTION

- A. The sign shall be erected in a prominent location at the front edge of the project property, and shall be located such that it will not be subject to damage from equipment or vehicles working at the project site.
- B. Mounting: Sign shall be mounted on the exterior of the contractor's temporary construction fencing. The signboard shall be mounted so that the lower edge will be a minimum of three-feet above the ground. Sign shall be fastened so that it is secure from wind and theft.

3.2 SIGN MAINTENANCE

- A. Project sign shall be maintained in good condition by the Contractor at all times during the entire construction time. In case of damage to the sign from any cause, including environmental conditions and fading, the Contractor shall repair, re-erect, and/or repaint the sign, as required. All such repair or maintenance shall be completed promptly within five days of any such damage to the full satisfaction of the Construction Manager.

END OF SECTION 02 41 19

SECTION 01 71 13

MOBILIZATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Contractor shall be responsible for all preparatory work and operations required prior to beginning the Work.

1.2 GENERAL

- A. Mobilization shall include, but not be limited to, the following:
 - 1. Movement of personnel, tools, equipment, materials, supplies, and incidentals to the PROJECT site and all preparatory work
 - 2. Establishment of all necessary facilities, including acquisition of easements for the Contractor's convenience.
 - 3. Erection of temporary buildings and facilities as required for field offices, staging, storage, and construction operations.
 - 4. Providing required bonds and proof of insurance.
 - 5. Upon completion of the Work, Contractor shall remove tools, equipment, and unused materials and supplies from the Project site and restore all disturbed areas outside the Project area to their pre-construction condition.
- B. Mobilization shall also include assembly and delivery to the Project site of plant, equipment, tools, materials, and supplies necessary for the prosecution of work which are not intended to be incorporated in the Work; the clearing of and preparation of the Contractor's work area; the complete assembly, in working order, of equipment necessary to perform the required work; personnel services preparatory to commencing actual work; and all other preparatory work required to permit commencement of the actual work on construction items for which payment is provided under the Contract.
- C. City has the right to reject construction tools, equipment, materials, and supplies which are, in City's opinion, unsafe, improper, or inadequate.

1.3 RELATED SECTIONS

- 1. Section 013100 "Project Management and Coordination"
- 2. Section 015000 "Temporary Facilities and Controls"
- 3. Section 015600 "Temporary Environmental Controls"
- 4. Section 015800 "Project Identification"
- 5. Section 017133 "Protection of Existing Facilities"
- 6. Section 017300 "Execution"
- 7. Section 017410 "Cleaning During Construction and Final Cleaning"
- 8. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract
- 9. Section 017839 "Project Record Documents"
- 10. Section 019310 "Operations and Maintenance Manual"

1.4 SUBMITTALS

- A. Submit a plan of the proposed layout of the construction site, including fences, roads, parking, bond act sign, buildings, staging, and storage areas, within seven Days after the effective date of the Notice to Proceed.

1.5 DELIVERY

- A. Delivery to the Project site of construction tools, equipment, plant, temporary buildings, materials, and supplies shall be accomplished in conformance with local governing ordinances and regulations.

1.6 TOOLS AND SUPPLIES

- A. Provide construction tools, equipment, materials, and supplies of the types and quantities necessary to facilitate the timely execution of the Work.
- B. Provide personnel, products, construction materials, equipment, tools, and supplies at the Project site at the time they are scheduled to be installed or utilized.

1.7 DEMOBILIZATION

- A. Upon completion of the Work, remove construction tools, apparatus, equipment mobile units and buildings, unused materials and supplies, and personnel from the Project site.
- B. Restore all areas utilized for mobilization to their original, natural state or, when called for in the Contract Documents, complete such areas indicated.

PART 2 - PRODUCTS- NOT A PART

PART 3 - EXECUTION- NOT A PART

END OF SECTION 01 71 13

SECTION 01 71 33

PROTECTION OF EXISTING FACILITIES

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall protect all existing utilities and improvements not designated for removal and shall restore damaged or temporarily relocated utilities and improvements to a condition equal to or better than they were prior to such damage or temporary relocation, all in accordance with requirements of the Contract Documents.
- B. The Contractor shall verify the exact locations and depths of all utilities shown and the Contractor shall make exploratory excavations of all utilities that may interfere with the Work. All such exploratory excavations shall be performed as soon as practicable after award of contract and, in any event, in sufficient time in advance of construction to avoid possible delays to the Contractor's work. When such exploratory excavations show the utility location as shown to be in error, the Contractor shall so notify the Construction Manager.
- C. The number of exploratory excavations required shall be that number which is sufficient to determine the alignment and grade of the utility.

1.2 RIGHTS OF WAY

- A. The Contractor shall not do any work that would affect any oil, gas, sewer, or water pipeline; any telephone, telegraph, or electric transmission line; any fence; or any other structure, nor shall the Contractor enter upon the rights-of-way involved until notified by the Construction Manager that the District has secured authority therefor from the proper party. After authority has been obtained, the Contractor shall give said party due notice of its intention to begin work and shall give said party convenient access and every facility for removing, shoring, supporting, or otherwise protecting such pipeline, transmission line, ditch, fence, or structure, and for replacing same. When two or more contracts are being executed at one time on the same or adjacent land in such manner that work on one contract may interfere with that of another, the District shall determine the sequence and order of the Work. When the territory of one contract is the necessary or convenient means of access for the execution of another contract, such privilege of access or any other reasonable privilege may be granted by the District to the Contractor so desiring, to the extent, amount, in the manner, and at the times permitted. No such decisions as to the method or time of conducting the Work or the use of territory shall be made on the basis of any claim for delay or damage, except as provided for Changes in Article 43 of the General Conditions of the Contract

1.3 PROTECTION OF SURVEY MONUMENTS OR MARKERS

- A. The Contractor shall not destroy, remove, or otherwise disturb any existing survey markers or other existing street or roadway markers without proper authorization. No pavement breaking or excavation shall be started until all survey or other permanent marker points that will be disturbed by the construction operations have been properly referenced for easy and accurate restoration. It shall be the Contractor's responsibility to notify the proper representatives of the District of the time and location that work will be done. Such notification shall be sufficiently in advance of construction so that there will be no delay due to waiting for survey points to be satisfactorily referenced for restoration. All survey markers or points disturbed by the Contractor without proper authorization by the Construction Manager, will be accurately restored by the District at the Contractor's expense after all street or roadway resurfacing has been completed. Contractor to refer to Specification 01 71 23 for additional information on survey monument preservation.

1.4 RESTORATION OF PAVEMENT

- A. General: All paved areas, including asphaltic concrete berms cut or damaged during construction, shall be replaced with similar materials and of equal thickness to match the existing adjacent undisturbed areas, except where specific resurfacing requirements have been called for in the Contract Documents or in the requirements of the agency issuing the permit. All temporary and permanent pavement shall conform to the requirements of the affected pavement owner. All pavements that are subject to partial removal shall be neatly saw-cut in straight lines:
- B. Temporary Resurfacing: Wherever required by the public authorities having jurisdiction, the Contractor shall place temporary surfacing promptly after backfilling, and shall maintain such surfacing for the period of time fixed by said authorities before proceeding with the final restoration of improvements.
- C. Permanent Resurfacing: In order to obtain a satisfactory junction with adjacent surfaces, the Contractor shall saw-cut back and trim the edge so as to provide a clean, sound, vertical joint before permanent replacement of an excavated or damaged portion of pavement. Damaged edges of pavement along excavations and elsewhere shall be trimmed back by saw-cutting in straight lines. All pavement restoration and other facilities restoration shall be constructed to finish grades compatible with adjacent undisturbed pavement.
- D. Restoration of Sidewalks or Private Driveways: Wherever sidewalks or private roads have been removed for purposes of construction, the Contractor shall place suitable temporary sidewalks or roadways promptly after backfilling and shall maintain them in satisfactory condition for the period of time fixed by the authorities having jurisdiction over the affected portions before proceeding with the final restoration or, if no such period of time is so fixed, the Contractor shall maintain said temporary sidewalks or roadways until the final restoration thereof has been made

1.5 RESTORATION OF LANDSCAPE HARDSCAPE

- A. General: All landscape and hardscape paved areas cut or damaged during construction, shall be replaced with similar materials and of equal quality and thickness to match the existing adjacent undisturbed areas, except where other specific resurfacing requirements have been called for in the Contract Documents or in the requirements of the agency issuing the permit. All temporary and permanent landscape and hardscape shall conform to the requirements of the affected pavement owner. All pavements that are subject to partial removal shall be neatly saw-cut in straight lines.
- B. Restoration of Turf: All turf and landscaped areas, cut, removed, or damaged during construction, shall be replaced with similar plants or turf and of equal type to match the existing adjacent undisturbed landscaped areas within the project's temporary construction easements, except where specific landscape requirements have been called for in the Contract Documents or in the requirements of the Agency issuing the permit.
- C. Temporary Landscaping: Wherever required by the District, the Contractor shall place temporary surfacing promptly after backfilling, and shall maintain such surfacing for the period of time fixed by said authorities before proceeding with the final restoration of landscape and hardscape improvements.
- D. Permanent Resurfacing: The Contractor shall install the permanent landscape and hardscape replacement for all affected areas within 15 calendar days of the initial removal. All restoration shall be constructed to finish grades compatible with adjacent undisturbed pavement

1.6 EXISTING UTILITIES AND IMPROVEMENTS

- A. General: The Contractor shall protect all Underground Utilities and other improvements that

may be impaired during construction operations. It shall be the Contractor's responsibility to ascertain the actual location of all existing utilities and other improvements that will be encountered in its construction operations, and to see that such utilities or other improvements are adequately protected from damage due to such operations. The Contractor shall take all possible precautions for the protection of unforeseen utility lines to provide for uninterrupted service and to provide such special protection as may be necessary.

- B. Utilities to be Moved: In case it shall be necessary to move the property of any public utility or franchise holder, such utility company or franchise holder will, upon request of the Contractor, be notified by the District to move such property within a specified reasonable time. When utility lines that are to be removed are encountered within the area of operations, the Contractor shall notify the Construction Manager in sufficient time in advance for the necessary measures to be taken to prevent interruption of service.
- C. Where the proper completion of the Work requires the temporary or permanent removal and/or relocation of an existing utility or other improvement which is shown the Contractor shall remove and, without unnecessary delay, temporarily replace or relocate such utility or the facility. In all cases of such temporary removal or relocation, restoration to former location shall be accomplished by the Contractor in a manner that will restore or replace the utility or improvement as nearly as possible to its former location and to as good or better condition than found prior to removal.
- D. District's Right of Access: The right is reserved to the District and to the owners of public utilities and franchises to enter at any time upon any public street, alley, right-of-way, or easement for the purpose of making changes in their property made necessary by the Work of this Contract.
- E. Underground Utilities Shown or Indicated: Existing utility lines that are shown or the locations of which are made known to the Contractor prior to excavation and that are to be retained, and all utility lines that are constructed during excavation operations shall be protected from damage during excavation and backfilling and, if damaged, shall be immediately repaired by the Contractor.
- F. Underground Utilities Not Shown or Indicated: In the event that the Contractor damages any existing utility lines that are not shown or the locations of which are not made known to the Contractor prior to excavation, a written report thereof shall be made immediately to the Construction Manager. If directed by the Construction Manager, repairs shall be made by the Contractor under the provisions for changes and extra work contained in Article 43 of the General Conditions.
- G. All costs of locating, repairing damage not due to failure of the Contractor to exercise reasonable care, and removing or relocating such utility facilities not shown in the Contract Documents with reasonable accuracy, and for equipment on the project which was actually working on that portion of the work which was interrupted or idled by removal or relocation of such utility facilities, and which was necessarily idled during such work will be paid for as extra work in accordance with the provisions of Article 43 of the General Conditions.
- H. Approval of Repairs: All repairs to a damaged improvement are subject to inspection and approval by an authorized representative of the improvement owner before being concealed by backfill or other work.
- I. Maintaining in Service: All oil and gasoline pipelines, power, and telephone or other communication cable ducts, gas and water mains, irrigation lines, sewer lines, storm drain lines, poles, and overhead power and communication wires and cables encountered along the line of the Work shall remain continuously in service during all the operations under the Contract, unless other arrangements satisfactory to the Construction Manager are made with the owner of said pipelines, duct, main, irrigation line, sewer, storm drain, pole, wire or cable. The Contractor

shall be responsible for and shall repair all damage due to its operations, and the provisions of this Section shall not be abated even in the event such damage occurs after backfilling or is not discovered until after completion of the backfilling

1.7 TREES WITHIN STREET RIGHTS-OF-WAY AND PROJECT LIMITS

- A. General: The Contractor shall exercise all necessary precautions so as not to damage or destroy any trees or shrubs, including those lying within street rights-of-way and project limits, and shall not trim or remove any trees unless such trees have been approved for trimming or removal by the District or other jurisdictional agency.

All existing trees and shrubs which are damaged during construction shall be trimmed or replaced by the Contractor or a certified tree company under permit from the District or other jurisdictional agency and to the satisfaction of said District and/or agency. Tree trimming and replacement shall be accomplished in accordance with the following paragraphs

- B. Trimming: The natural shape and form of the tree shall be preserved and enhanced; no stubs or splits or torn branches left; no topping or drop crotching; and clean cuts shall be made close to the trunk or large branches.
- C. Replacement: The Contractor shall immediately notify the District and/or other jurisdictional agency if any tree is damaged by the Contractor's operations. If, in the opinion of the District or said other agency, the damage is such that replacement is necessary, the Contractor shall replace the tree at its own expense. The tree shall be of a like size and variety as the tree damaged or, if of a smaller size, the Contractor shall pay to the owner of said tree a compensatory payment acceptable to the tree owner, subject to the approval of the District or other jurisdictional agency. The size of the trees shall be not less than 25 mm (1-inch) diameter or less than 1.8 meters (6 feet) in height. Fines will be assessed against the Contractor for trees removed without the District's prior written approval. The minimum amount of fine or restitution to the District will be the replacement of the tree removed, with one of equal or greater size and maturity and as approved by the District. Larger fines may be assessed against the Contractor depending upon the circumstances and type of tree removed, especially in the case of oak trees.

1.8 NOTIFICATION BY THE CONTRACTOR

- A. Prior to any excavation in the vicinity of any existing underground facilities, including all water, sewer, storm drain, gas, petroleum products, or other pipelines; all buried electric power, communications, or television cables; all traffic signal and street lighting facilities; and all roadway and state highway rights-of-way, the Contractor shall notify the Underground Service Alert agency, and the respective authorities representing the owners or agencies responsible for such underground facilities, not less than 2 days or more than 7 days prior to excavation so that a representative of said owners or agencies can be present during such work if they so desire.

PART 2 - PRODUCTS- NOT A PART

PART 3 - EXECUTION- NOT A PART

END OF SECTION 01 71 33

SECTION 01 73 00

EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work, including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering.
 - 3. Installation.
 - 4. Cutting and patching.
 - 5. Coordination of Owner's portion of the Work.
 - 6. Progress cleaning.
 - 7. Starting and adjusting.
 - 8. Protection of installed construction.
 - 9. Correction of the Work.
- B. Related Requirements:
 - 1. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.
 - 2. Section 024119 "Selective Demolition" for demolition and removal of selected portions of the site.

1.2 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.3 PREINSTALLATION MEETINGS

- A. Cutting and Patching Conference: Conduct conference at Project site.
 - 1. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For land surveyor.
- B. Certified Surveys: Submit two copies signed by land surveyor.
- C. Certificates: Submit certificate signed by land surveyor, certifying that location and elevation of improvements comply with requirements.
- D. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:

1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
3. Products: List products to be used for patching and firms or entities that will perform patching work.
4. Dates: Indicate when cutting and patching will be performed.
5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
 - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.

- E. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

1.5 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
- B. Professional Engineer Qualifications: Refer to Section 014000 "Quality Requirements."
- C. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
 1. Structural Elements: When cutting and patching structural elements, or when encountering the need for cutting and patching of elements whose structural function is not known, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:
 - a. Primary operational systems and equipment.
 - b. Control systems.
 - c. Communication systems.
 - d. Conveying systems.
 - e. Electrical wiring systems.
 - f. Water utilities.
 - g. Electrical utilities
 3. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- D. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials. Use materials that are not considered hazardous.
- B. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, gas service piping, and water-service piping; underground electrical services; and other utilities.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - 1. Description of the Work, including Specification Section number and paragraph, and Drawing sheet number and detail, where applicable.
 - 2. List of detrimental conditions, including substrates.
 - 3. List of unacceptable installation tolerances.
 - 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Engineer in accordance with requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks and existing conditions. If discrepancies are discovered, notify Architect promptly.
- B. Engage a land surveyor experienced in laying out the Work, using the following accepted surveying practices:
 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 2. Establish limits on use of Project site.
 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 4. Inform installers of lines and levels to which they must comply.
 5. Check the location, level and plumb, of every major element as the Work progresses.
 6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, and floor levels. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by City Engineer, Inspector, and Architect.

3.4 FIELD ENGINEERING

- A. Identification: Owner will identify existing benchmarks, control points, and property corners.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of City Engineer. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to City Engineer and Inspector before proceeding.
 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- ### 3.5 INSTALLATION
- A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
1. Make vertical work plumb, and make horizontal work level.
 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure satisfactory results as judged by Architect. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations, so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy of type expected for Project.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.
- F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions with manufacturer.
1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.

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

- I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Architect. Fit exposed connections together to form hairline joints.

3.6 CUTTING AND PATCHING

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of Work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements in Section 011000 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to **[minimize][prevent]** interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. **[Concrete][and][Masonry]**: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 6. Proceed with patching after construction operations requiring cutting are complete.

- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as practicable, as judged by Architect. Provide materials and comply with installation requirements specified in other Sections, where applicable.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch, corner to corner of wall and edge to edge of ceiling. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 PROGRESS CLEANING

- A. Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above **80 deg F**.
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, in accordance with regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where Work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces in accordance with written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 017419 "Construction Waste Management and Disposal."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.9 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.

- C. Comply with manufacturer's written instructions for temperature and relative humidity.

3.10 CORRECTION OF THE WORK

- A. Repair or remove and replace damaged, defective, or nonconforming Work. Restore damaged substrates and finishes.
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.
- C. Restore permanent facilities used during construction to their specified condition.
- D. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- E. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- F. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01 73 00

SECTION 01 74 10

CLEANING DURING CONSTRUCTION AND FINAL CLEANING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section includes cleaning during construction and final cleaning on completion of the work.
- B. At all times maintain areas covered by the contract and adjacent properties, sidewalks and public access roads free from accumulations of waste, debris, and rubbish caused by construction operations.
- C. Conduct cleaning and disposal operations to comply with local ordinances and antipollution laws. Do not burn or bury rubbish or waste materials on project site. Do not dispose of volatile wastes, such as mineral spirits, oil, or paint thinner, in storm or sanitary drains. Do not dispose of wastes into streams or waterways.
- D. Use only cleaning materials recommended by manufacturer of surface to be cleaned.

1.2 CLEANING DURING CONSTRUCTION

- A. During execution of work, clean site, adjacent properties, sidewalks and public access roads and dispose of waste materials, debris, and rubbish to assure that buildings, grounds, and public properties are maintained free from accumulations of waste materials and rubbish.
- B. Wet down dry materials and rubbish to lay dust and prevent blowing dust.
- C. Provide containers for collection and disposal of waste materials, debris, and rubbish.
- D. Cover or wet excavated material leaving and arriving at the site to prevent blowing dust. Clean the public access roads to the site of any material falling from the haul trucks.

1.3 FINAL CLEANING

- A. At the completion of work and immediately prior to final inspection, clean the entire project site as follows.
- B. Clean, sweep, wash, and polish all work and equipment including finishes.
- C. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed interior and exterior finished surfaces; polish surfaces.
- D. Repair, patch, and touch up marred surfaces to match adjacent surfaces.
- E. Broom clean paved surfaces; rake clean landscaped areas.
- F. Remove from the site temporary structures and materials, equipment, and appurtenances not required as a part of, or appurtenant to, the completed work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 74 10

SECTION 01 74 19

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Recycling nonhazardous demolition, and, construction waste.
 - 2. Disposing of nonhazardous demolition, and, construction waste.
- B. Related Requirements:
 - 1. Project is subject to all requirements of authorities having jurisdiction, including, but not limited to City of Guadalupe.
 - 2. Section 311000 "Site Clearing" for disposition of waste resulting from site clearing and removal of above- and below-grade improvements.
- C. The contractor shall follow the requirements and procedures for ensuring optimal diversion of construction waste materials generated by the Work from landfill disposal within the limits of the Construction Schedule and Contract Sum.
- D. The Work of this Contract requires that a minimum percentage of the construction and demolition waste materials generated (by weight) in the Work be diverted from landfill disposal through a combination of re-use and recycling activities by diversion to recycling centers. This diversion percentage must meet or exceed the most current CalGreen and County of Santa Barbara requirements, as herein.

1.2 DEFINITIONS

- A. Construction Waste: Building, structure, and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Construction Waste Management Plan (CWM): A formalized framework outlining the waste that is generated during a construction project from start to finish. The plan targets key people, areas, and vital metrics necessary for the process to run smoothly while simultaneously auditing duties and objectives.
- C. Demolition Waste: Building, structure, and site improvement materials resulting from demolition operations.
- D. Disposal: Removal of demolition or construction waste and subsequent salvage, sale, recycling, or deposit in landfill, incinerator acceptable to authorities having jurisdiction, or designated spoil areas on Owner's property.
- E. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

1.3 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition and construction waste becomes property of Contractor.

- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

- 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.4 ACTION SUBMITTALS

- A. Construction Waste Management Plan: Submit plan within 7 days of date established for the Notice to Proceed.

1.5 INFORMATIONAL SUBMITTALS

- A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Use Form CWM-7 for construction waste. Include the following information:
 - 1. Material category.
 - 2. Generation point of waste.
 - 3. Total quantity of waste in **tons**.
 - 4. Quantity of waste salvaged, both estimated and actual in **tons**.
 - 5. Quantity of waste recycled, both estimated and actual in **tons**.
 - 6. Total quantity of waste recovered (salvaged plus recycled) in **tons**.
 - 7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- D. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. Final Construction Waste Management Report: The Final CWM Report must be submitted upon completion of the project before the contract retention money can be released. "Completion" means the earliest of the following dates: the date a certificate of occupancy is issued by the City for a covered project, the completion date of a covered project per final City inspection and approval, or, if no final approval is required, 30 calendar days following the date the work authorized by the permit(s) is completed, as determined by the Construction Manager. The Final C&D Recycling Report, and accompanying weight receipts/tickets, shall be submitted to the Construction Manager.

1.6 WASTE MANAGEMENT PLAN

- A. Develop a waste management plan in compliance with California Green Building Code 2022, Section 5.408 Construction Waste Reduction, Disposal and Recycling
 - 1. It is the Contractor's responsibility to ensure that waste diversion meets the applicable standards and regulations.

PART 2 - PRODUCTS

2.1 RECYCLING RECEIVERS AND PROCESSORS

- A. An approved county sorting/recycling facility must be utilized for construction waste management to comply with construction waste reduction, disposal and recycling provisions of California Green Building Standards Code Section 4.408.1 (minimum 65% non-hazardous materials recycled and/or salvaged for re-use).
 - 1. AGS Recycling Inc
 - a. Address: 770 Guadalupe Street, Guadalupe, CA 93434
 - b. Phone: (805) 598-6285
 - c. Website: <https://agsrecycling.com/guadalupe>
 - 2. Roxsand
 - a. Address: 2280 Hutton Road, Nipomo, California 93444
 - b. Phone: (805) 357-2288
 - c. Website: <https://roxsand.net/>
 - d. Accepts asphalt and concrete materials without steel reinforcement
 - 3. SA Recycling
 - a. Address: 1599 Betteravia Rd, Santa Maria, CA 93455
 - b. Phone: (805) 925-0145
 - c. Website: <https://www.sarecycling.com/yard/sa-recycling-santa-maria/>
 - d. Accepts scrap metal recycling

2.2 PERFORMANCE REQUIREMENTS

- A. General: Achieve end-of-Project rates for salvage/recycling of **65** percent by weight of total nonhazardous solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials, including, but not limited to, the following:
 - 1. Demolition Waste:
 - a. Asphalt paving.
 - b. Concrete.
 - c. Concrete reinforcing steel.
 - d. Brick.
 - e. Concrete masonry units.
 - f. Wood studs.
 - g. Wood joists.

- h. Plywood and oriented strand board.
- i. Wood paneling.
- j. Wood trim.
- k. Structural and miscellaneous steel.
- l. Rough hardware.
- m. Roofing.
- n. Insulation.
- o. Doors and frames.
- p. Door hardware.
- q. Windows.
- r. Glazing.
- s. Metal studs.
- t. Gypsum board.
- u. Acoustical tile and panels.
- v. Carpet.
- w. Carpet pad.
- x. Demountable partitions.
- y. Equipment.
- z. Cabinets.
- aa. Plumbing fixtures.
- bb. Piping.
- cc. Supports and hangers.
- dd. Valves.
- ee. Sprinklers.
- ff. Mechanical equipment.
- gg. Refrigerants.
- hh. Electrical conduit.
- ii. Copper wiring.
- jj. Lighting fixtures.
- kk. Lamps.
- ll. Ballasts.
- mm. Electrical devices.
- nn. Switchgear and panelboards.
- oo. Transformers.

2. Construction Waste:

- a. Masonry and CMU.
- b. Lumber.
- c. Wood sheet materials.
- d. Wood trim.
- e. Metals.
- f. Roofing.
- g. Insulation.
- h. Carpet and pad.
- i. Gypsum board.
- j. Piping.
- k. Electrical conduit.
- l. Packaging: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
 - 1) Paper.
 - 2) Cardboard.
 - 3) Boxes.
 - 4) Plastic sheet and film.

- 5) Polystyrene packaging.
- 6) Wood crates.
- 7) Wood pallets.
- 8) Plastic pails.

m. Construction Office Waste: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following construction office waste materials:

- 1) Paper.
- 2) Aluminum cans.
- 3) Glass containers.

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 1. Comply with operation, termination, and removal requirements in Section 015000 "Temporary Facilities and Controls."
- B. Waste Management Coordinator: Engage or designate a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator shall be present at Project site as required for duration of Project.
- C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
 1. Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 2. Distribute waste management plan to everyone concerned within three days of submittal return.
 3. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 1. Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 2. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 3. Control dust and dirt and provide environmental protection and noise control.

3.2 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum

contamination, and other substances deleterious to the recycling process.

- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
 - 1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.
 - 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - 4. Store components off the ground and protect from the weather.
 - 5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor as often as required to prevent overfilling bins.

3.3 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged or recycled, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 1. Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 2. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 - 3. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Burning of waste materials is not permitted.
- C. Disposal: Transport waste materials and dispose of at designated spoil areas on Owner's property or transport waste materials off Owner's property and legally dispose of them at a facility licensed to accept them. The Contractor shall comply with safety standards established within the CAL-OSHA CCR Construction Safety Orders (CSO), General Industry Safety Orders (GISO), and Electrical Safety Orders (ESO) that are applicable to the work. The Contractor shall have a complete copy of the CSO, GISO, and ESO at the work site.

END OF SECTION 01 74 19

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for Contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final Completion procedures.
 - 3. List of incomplete items.
 - 4. Submittal of Project warranties.
 - 5. Final cleaning.
- B. Related Requirements:
 - 1. Section 01 20 00 "Measurement and Payment" for requirements for Applications for Payment for Substantial Completion and Final Completion.
 - 2. Section 01 93 10 "Operation and Maintenance Manuals" for additional operation and maintenance manual requirements.
 - 3. Section 01 78 39 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.

1.2 DEFINITIONS

- A. List of Incomplete Items (Punch List): List of items to be completed or corrected, prepared for the Architect's and Construction Manager's use prior to Architect's inspection, to determine if the Work is substantially complete.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of cleaning agent.
- B. Contractor's List of Incomplete Items (Punch List): Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.
- D. The Contractor, prior to the City's issuance of the Notice of Completion, shall submit the following items to the Resident Project Representative for transmittal to the City Engineer:
 - 1. Written guarantees or warranties
 - 2. Technical and/or Operation and Maintenance manuals and instructions.
 - 3. Keys and keying schedule.
 - 4. Maintenance stock items, spare parts, special tools.
 - 5. Certificates of inspection and acceptance by other local governing agencies having jurisdiction.
 - 6. Final Construction Waste Management Report, including copies of weight receipts from disposal/recycling facilities, including certified weights for all recycled, reused or diverted materials.
 - 7. Final approved copy of the clearly marked redline field copy of as-built record drawings, incorporating all field changes and modifications from the original design drawings.
 - 8. Releases executed by property owners adjacent to the project site or property owners for any staging or laydown areas attesting that the Contractor has restored any damage done to their property during construction.
 - 9. Releases from all parties who are entitled to claims against the subject project, property, or improvement or have submitted stop notices pursuant to the provisions of law.

10. Post Construction photo and videos, as specified in the Section titled "Contractor Submittals".
11. Proper completion & closeout of all Submittals as referenced in Section 7-14 "Submittals".
12. Handover of all required concrete/slurry delivery tickets and any required reinforcement mill certificates.
13. Final cleanup of the project site and laydown area as deemed acceptable by the City.
14. Acceptance & completion of all Punch List Items in their entirety. The Contractor shall schedule and incorporate sufficient time at the end for final closeout and completion of punch list, as part of the base duration within the specified overall duration of the project
15. Replacement of any lost or disturbed survey monuments.
16. Satisfactory submission of final progress payment.
17. Submission, filing and completion of all applicable Federal Reporting Requirements, as listed in the Special Conditions.

1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items required by other Sections.

1.6 COMPLETION OF THE WORK

- A. Completion of the Work, as the term is used in this Contract shall mean full completion of the Work as defined by the contract documents and as described in the section above.
- B. The date of completion of the Project shall be the date when the construction and all bid items are fully completed, in accordance with the Contract Documents, as modified by any change orders agreed to by the parties, so that the City can occupy or utilize the project for the use for which it was intended, and the City has accepted the Project as evidenced by recording of a Notice of Completion.

1.7 CORRECTION AND REPAIR

- A. Replacement of earth fill or backfill, where it has settled below the required finish elevations, shall be considered as a part of such required repair work, and any repair or resurfacing constructed by the Contractor which becomes necessary by reason of such settlement shall likewise be considered as a part of such required repair work unless the Contractor shall have obtained a statement in writing from the affected private owner or public agency releasing the City from further responsibility and liability in connection with such repair or resurfacing.
- B. The Contractor shall make all repairs and replacements promptly upon receipt of written order from the City or Construction Manager. If the Contractor fails to make such repairs or replacements promptly, the City reserves the right to do the work or to have the work done by others and the Contractor and its Surety shall be liable to the City for the cost thereof.

1.8 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's "punch list"), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 5 days prior to

requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction, permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 2. Submit closeout submittals specified in other Division 01 Sections, including Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Construction Manager. Label with manufacturer's name and model number.
 - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Owner's signature for receipt of submittals.
 5. Submit testing, adjusting, and balancing records.
 6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 5 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise Owner of pending insurance changeover requirements.
 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 3. Complete startup and testing of systems and equipment.
 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
 6. Advise Owner of changeover in utility services.
 7. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 8. Complete final cleaning requirements.
 9. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 5 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect and Construction Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for Final Completion.

1.9 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining Final Completion, complete the following:
1. Submit a final Application for Payment.
 2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial

- Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list will state that each item has been completed or otherwise resolved for acceptance.
- 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect and Construction Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Construction Manager will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
 - 1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.10 LIST OF INCOMPLETE ITEMS

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 - 1. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect and Construction Manager.
 - d. Name of Contractor.
 - e. Page number.
 - 2. Submit list of incomplete items in the following format:
 - a. MS Excel Electronic File: Architect[, through Construction Manager,] will return annotated file.
 - b. Web-Based Project Software Upload: Utilize software feature for creating and updating list of incomplete items (punch list).

1.11 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
- D. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
 - 1. Submit by uploading to web-based project software site.
- E. Warranties in Paper Form:
 - 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
- F. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Construction Waste Disposal: Comply with waste-disposal requirements in Section 01 74 19 "Construction Waste Management and Disposal."

3.2 CORRECTION OF THE WORK

- A. Complete repair and restoration operations required by "Correction of the Work" Article in Section 017300 "Execution" before requesting inspection for determination of Substantial Completion.

END OF SECTION 01 77 00

SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for Project Record Documents, including the following:
 - 1. Record Drawings/ As-built Drawings.
 - 2. Record specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Section 017700 "Closeout Procedures" for general closeout procedures.

1.2 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit copies of Record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit PDF electronic files of scanned record prints .
 - 2) Submit Record Digital Data Files .
 - 3) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal:
 - 1) Submit Record Digital Data Files .
- B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and Contract modifications.
- C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.
 - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.
- E. Reports: Submit written report monthly indicating items incorporated into Project Record Documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

1.3 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
 - 1. Preparation: Mark record prints to show the actual installation, where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.

- d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding photographic documentation.
- 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Locations of concealed internal utilities.
 - i. Changes made by Change Order or Construction Change Directive.
 - j. Changes made following Architect's written orders.
 - k. Details not on the original Contract Drawings.
 - l. Field records for variable and concealed conditions.
 - m. Record information on the Work that is shown only schematically.
- 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
- 4. Mark record prints with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
- 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
- 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
 - 1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 - 2. Format: Annotated PDF electronic file with comment function enabled.
 - 3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
 - 4. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect and Construction Manager.
 - e. Name of Contractor.

1.4 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation, where installation varies from that indicated in Specifications, addenda, and Contract modifications.
 - 1. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 - 2. Note related Change Orders, Record Product Data, and Record Drawings where applicable.
- B. Format: Submit record specifications as annotated PDF electronic file.

1.5 RECORD PRODUCT DATA

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and revisions to Project Record Documents as they occur; do not wait until end of Project.

- B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 - 3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.
- C. Format: Submit Record Product Data as annotated PDF electronic file.
 - 1. Include Record Product Data directory organized by Specification Section number and title, electronically linked to each item of Record Product Data.

1.6 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as PDF electronic file.
 - 1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

1.7 MAINTENANCE OF RECORD DOCUMENTS

- A. Maintenance of Record Documents: Store Record Documents in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's and Construction Manager's reference during normal working hours.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 78 39

SECTION 01 93 10

OPERATION AND MAINTENANCE MANUALS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Submit two copies of all manufacturer's operation and maintenance manuals and data pertinent to equipment supplied for the project. Prepare and organize the material in three-ring binders with divider tabs and labels. Include a table of contents. Include a flash drive of all catalog data in pdf format and all drawings in both pdf and CAD formats. All pdf files shall be formatted to allow word search.

1.2 SUBMITTALS

- A. Submittals shall include:
 - 1. List of equipment furnished for project with name, address, and telephone number of each vendor.
 - 2. List of serial numbers of equipment furnished.
 - 3. A copy of shop drawings for equipment in final form.
 - 4. Manufacturer's operation and maintenance instructions and parts lists.
- B. Provide manuals for each piece of equipment including individual components and subsystems of complete assemblies. Strike out nonapplicable text and illustrations. The section of the manual on operation shall describe the functions and limitations of each component and its relationship to the system of which it is a part. Where several models, options, or styles are described, the manual shall identify the items actually provided.
- C. Each manual shall contain the following:
 - 1. Manufacturer's identification, including order number, model, and serial number.
 - 2. Blue line prints or reviewed shop drawings and diagrams of all systems.
 - 3. Certified equipment drawings or reviewed shop drawing data clearly marked for equipment furnished.
 - 4. Complete operating and maintenance instructions for each and every item of equipment, setting forth in detail and step-by-step the procedure for starting, stopping, operating, and maintaining the entire system as installed. Include a schedule of recommended maintenance intervals.
 - 5. Complete parts list of replaceable parts, their part numbers, and the name and address of their nearest vendor.
 - 6. Copy of manufacturer's equipment guarantees and warranties.
- D. Brochures shall be loose leaf with durable plastic or fiberboard covers. Each sheet shall be reinforced to prevent tearing from continued use, and each brochure shall have the following information clearly printed on its cover:
 - 1. Project name, name of Owner, and address.
 - 2. Name and address of Owner's Representative.
 - 3. Name and addresses of contractors and subcontractors and department to contact.
 - 4. Telephone number of contractors, including night and emergency numbers.

- 5. Major equipment vendors' names and telephone numbers.
- E. Submit complete manuals at least four weeks before the date of the instructions required by the subsections on "Manufacturer's Services" in the various specification sections.
- F. Operation and maintenance manuals specified herein are in addition to any operation, maintenance, or installation instructions required by the Contractor to install, test, and start up equipment.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 93 10

SECTION 02 01 20

PROTECTING EXISTING UNDERGROUND UTILITIES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section includes materials and procedures for protecting existing underground utilities.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Trenching and Backfilling: 31 23 33.
- B. Subsurface Utility Locating (Potholing): 02 32 19.

PART 2 - MATERIALS

2.1 REPLACEMENT IN KIND

- A. Except as indicated below or as specifically authorized by the Owner's Representative, reconstruct utilities with new material of the same size, type, and quality as that removed.

PART 3 - EXECUTION

3.1 GENERAL

- A. Replace in kind street improvements, such as curbs and gutters, barricades, signalization, fences, signs, etc., that are cut, removed, damaged, or otherwise disturbed by the construction.
- B. Where utilities are parallel to or cross the construction but do not conflict with the permanent work to be constructed, follow the procedures given below. Notify the utility owner 48 hours in advance of the crossing construction and coordinate the construction schedule with the utility owner's requirements. For utility crossings not shown in the drawings, refer to the General Conditions and the instructions of the Owner's Representative for guidance.
- C. Determine the true location and depth of utilities and service connections which may be affected by or affect the work. Determine the type, material, and condition of these utilities. In order to provide sufficient lead-time to resolve unforeseen conflicts, order materials and take appropriate measures to ensure that there is no delay in work.

3.2 PROCEDURES

- A. Protect in Place: Protect utilities in place, unless abandoned, and maintain the utility in service, unless otherwise specified in the drawings or in the specifications.
- B. Remove and Reconstruct: Where so indicated in the drawings or as required by the Owner's Representative, remove the utility and, after passage, reconstruct it with new materials. Provide temporary service for the disconnected utility.

3.3 COMPACTION

- A. Utilities Protected in Place: Backfill and compact under and around the utility so that no voids are left.
- B. Utilities Reconstructed: Prior to replacement of the utility, backfill the trench and compact to an elevation 1 foot above the top of the ends of the utility. Excavate a cross trench of the proper width for the utility and lay, backfill, and compact.
- C. Alternative Construction--Sand-Cement Slurry: Sand-cement slurry consisting of one sack (94 pounds) of portland cement per cubic yard of sand and sufficient moisture for workability may be substituted for other backfill materials to aid in reducing compaction difficulties. Submit specific methods and procedures for the review of the Owner's Representative prior to construction.

END OF SECTION 02 01 20

SECTION 02 32 19

POTHOLING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section includes materials and procedures for performing pothole operations to locate existing underground utilities.

1.2 SUBMITTALS

- A. Submit request for premarking of pothole locations at least five calendar days prior to the commencement of field activities.
- B. Submit a traffic control/protection plan per Specification Section 01 55 26.
- C. Submit proposed method of potholing, including description of equipment to be used, and schedule for potholing for approval at least seven calendar days prior to the commencement of field activities. Obtain Owner's approval of pothole locations prior to commencement of field activities.
- D. Submit field logs to the Owner within two working days after the completion of pothole excavations in each area. Include dates of potholing operations and any additional discovered information or pertinent data. Include for each pothole excavation field log:
 - 1. Pothole number.
 - 2. Date of pothole.
 - 3. Depths to top and bottom of utility (measured from existing grade over utility at pothole).
 - 4. Miscellaneous Contractor's notes.
- E. Submit temporary steel cap and/or steel plate bridging shop drawings at least seven calendar days prior to the commencement of field activities.
- F. Submit sand-cement slurry mix design at least seven calendar days prior to the commencement of field activities.
- G. Submit asphalt concrete mix design at least seven calendar days prior to the commencement of field activities.

1.3 PROCEDURES

- A. Subsurface utility-locating (potholing) services shall conform to CI/ASCE 38-02. For the purpose of this scope, "locate" means to obtain the horizontal and vertical position of the utility line by excavating a circular test hole or narrow trench (where approved of and/or requested by the Owner). Construct test holes using vacuum excavation or comparable nondestructive equipment in a manner that will cause no damage to the utility.
- B. Subsurface utility locating shall consist of test hole excavations at locations indicated on the pothole plans as approved by the Owner. Narrow trench excavations (slot potholes) may be required at locations approved by the Owner or to locate multiple parallel utilities.

1.4 STATE STANDARD SPECIFICATIONS

- A. Wherever reference is made to the State Specifications such reference shall mean the State of California, Business, Transportation, and Housing Agency, Department of Transportation Standard Specifications, current edition.

PART 2 - MATERIALS

3.1 SAND-CEMENT SLURRY BACKFILL AT TEST HOLES AND EXPLORATORY TRENCHES

- A. Sand-cement slurry backfill shall consist of two sacks of Type I or II Portland cement added per cubic yard of imported sand and sufficient water for workability.

3.2 ASPHALT CONCRETE PAVEMENT REPAIR AT TEST HOLES

- A. Asphalt concrete paving shall conform to Type B ½ inch in Section 39 of the State Specifications.
- B. Asphalt shall be Performance Grade PG 64-10. Asphalt content in the pavement shall be 5.5% to 6.0%.
- C. Aggregate shall be Type A or B per Section 39-2.02 in the State Specifications.
- D. Paving thickness shall match existing plus 1 inch.

PART 3 - EXECUTION

3.1 POTHOLING OPERATIONS

- A. Backfill and repair test hole excavations immediately after obtaining the measurement data. Backfill and repair trench excavations requiring use of temporary steel plate bridging within four working days. Advise Owner of number of pothole excavations completed and number remaining.
- B. Underground Service Alert Requirements: Comply with Underground Service Alert requirements for notification prior to excavation. Contact Underground Service Alert at 1-800-642-2444 (or dial 811) no less than two and no more than ten working days prior to the start of exploratory excavation. Verify whether or not a representative of each utility or agency will be present during excavation, and coordinate with said individual(s). Take any precautions required by the utility owner.
- C. Conduct potholing operations in a manner that minimizes the damage potential to existing underground utilities in order to ensure that the existing facilities will remain in operation without interruption.
- D. Pothole excavations shall sufficiently expose subsurface utilities to allow surveyor to easily determine and measure the following data:
 - 1. Elevation at top and bottom of utility.
 - 2. Elevation of existing grade over utility at pothole.
 - 3. Coordinates at surface.
 - 4. Outside diameter of utility or width of duct banks.
 - 5. Utility material and condition.
- E. Location and Depiction of Existing Utilities: Pothole maps for subsurface utility locating shall be present and utilized during potholing activities. The plans shall be compared to utility/agency paint markings following Underground Service Alert notification. If discrepancies are found between the plans and paint markings, promptly notify the Owner prior to commencement of any excavation.

3.2 EXCAVATION

- A. Protect utilities or underground structures from damage during potholing. Immediately report any damaged utilities to the affected utility's owner and the Owner. Repair immediately any damaged utilities in accordance with the respective utility owner's requirements. Neatly cut and remove existing pavement. Excavate test holes in such a manner as to prevent any damage to wrappings, coatings, or other protective coverings, utilizing vacuum excavation or hand digging.
- B. Methods: Backhoe excavation is not permitted except for trench excavations. Use the following methods for pothole excavations.
 - 1. Hand Digging: Hand digging is the method of excavating a pothole by manual means with hand-held, nonmechanical equipment such as a shovel.
 - 2. Vacuum Excavation: Vacuum excavation shall consist of air or water pressure to break up the soil and a vacuum device to collect the spoil. Determine if air or water vacuum excavation shall be used depending upon specific site and environmental characteristics.

Soil type such as heavy clay may require water vacuum excavation. Utilize air vacuum excavators if mud from water vacuum excavators cannot be disposed properly. Use air vacuum excavators if damage to utilities, such as cutting through cables, will occur with the use of water vacuum excavators. Limit vacuum pressure of equipment as to not cause damage to utilities.

- a. Air: Air vacuum excavators shall utilize a high velocity air stream to penetrate, expand, and break up the soil. Remove the loosened particles of soil and rock from the excavation through the use of a vacuum.
 - b. Water: Water vacuum excavation systems shall excavate the pothole using high-pressure water to reduce and loosen the soil. Remove the wet soil and mud slurry to a spoil tank using a vacuum.
- C. Size of Test Hole Excavation: Maximum test hole size shall be 8 inches in diameter at surface, unless indicated otherwise by Owner.
 - D. Size of Exploratory Trench Excavation: Trench width and length shall be as approved by the Owner. Trench depth shall be as required to accurately locate subsurface utilities.
- 3.3 TEMPORARY STEEL PLATE BRIDGING, WITH A NONSKID SURFACE (WHERE REQUIRED FOR APPROVED TRENCHES)
- A. Provide steel plate bridging with a nonskid surface and shoring to preserve unobstructed traffic flow. In such cases, the following conditions shall apply:
 1. Steel plates used for bridging shall extend a minimum of 12 inches beyond the edges of the trench.
 2. Install steel plate bridging to operate with minimum noise.
 3. Shore the trench to support the bridging and traffic loads.
 4. Use temporary paving with cold asphalt concrete to feather the edges of the plates.
 5. Secure bridging against displacement by using adjustable cleats, shims, or other devices.
 - B. Install steel plate bridging and shoring using the following method:
 1. Attach approach plate(s) and ending plate (if longitudinal placement) to the roadway by a minimum of two dowels predrilled into the corners of the plate and drilled 2 inches into the pavement. Butt subsequent plates to each other. Compact fine graded asphalt concrete to form ramps, maximum slope 8.5% with a minimum 12-inch taper to cover all edges of the steel plates. When steel plates are removed, backfill the dowel holes in the pavement with either graded fines of asphalt concrete mix or concrete slurry.
 - C. Maintain the steel plates, shoring, and asphalt concrete ramps.
 - D. Unless specified, use of steel plate bridging at any given location shall not exceed four consecutive working days in any given week. Cover backfilling of excavation with a minimum of 3 inches of temporary layer of cold mix asphalt concrete.
 - E. The following table shows the required minimal thickness of steel plate bridging required for a given trench width:

Trench Width (feet)	Minimum Plate Thickness (inches)
1	1/2
1 1/2	3/4

- F. The Contractor may use standard steel plate with known coefficient of friction equal or exceeding 0.35.
- G. Use a "Rough Road" sign (W8-8) with black lettering on an orange background in advanced of steel plate bridging. This is to be used along with any other required construction signing.

3.4 POTHOLE REPAIR

- A. Following data gathering, backfill excavation with approved material as follows:
 - 1. Test Hole Excavations: Sand-cement slurry backfill per Part 2 of this section. Bring to grade with asphalt cement pavement per Part 2 of this section. Match existing pavement thickness plus 1 inch.
 - 2. Exploratory Trenches: Backfill per Part 2 of this section. Match existing pavement thickness plus 1 inch.
- B. The finished surface of the repair shall be of like material and constructed to the same finished grade as the adjacent pavement. The finished surface shall be such that it does not allow water to pond. There shall be no discernable difference in surface level at the joint between the existing pavement and the completed repair.

3.5 DISPOSAL OF CUTTINGS

- A. Dispose of cuttings off-site. Transport and legally dispose of off site.

END OF SECTION 02 32 19

SECTION 02 41 00

SITE DEMOLITION

PART 1 - GENERAL

1.1 SCOPE

- A. The work of this section consists of furnishing all transportation, labor, materials, equipment and incidentals necessary to perform demolition, removal, and disposal (or salvage for reuse where specified) in accordance with the Contract Documents.
- B. The extent and location of the "Demolition" work is indicated on the Drawings, in the Specifications, and as outlined below:
 - 1. Removal and disposal, in whole or in part, of all items (demolition materials, debris, etc.) indicated in the Drawings and Specifications in compliance with the specifications and all agencies of jurisdiction. All items shall become the property of the Contractor unless otherwise noted.
 - 2. Payment of all costs required for disposal of items at legal disposal sites, including all permit fees and related costs.
 - 3. Salvaging items (including protecting and delivery to the City) as indicated on the Drawings and in the specifications.
- C. The demolition details shown on the Drawings are based upon information contained in the reference drawings. The details indicate typical features of the various structures and shall not be construed as complete or adequate to supplant actual on- site inspection, additional review, and interpretation of the reference drawings by the Contractor. The reference drawings shall be used by the Contractor to establish typical features and quantities for demolition.
- D. The contractor shall visit the site and become familiar with the quantity and character of all materials to be demolished, removed, and disposed at an appropriate upland landfill or recycled or salvaged for future use. Contractor agrees that the premises were made available for whatever inspections and tests Contractor deemed appropriate prior to submission of its bid.
- E. The Contractor shall furnish all labor, materials, tools, equipment, and supervision necessary to perform demolition work as described in the Drawings and these specifications.
- F. Comply with all applicable federal, state, and local permits, codes, ordinances, and regulations. Nothing in the Specifications or Drawings is to be construed to allow work not conforming to such codes. Contractor shall be responsible for enforcing the regulations and code requirements and for obtaining any necessary permits and approvals.
- G. The Contractor shall follow all Best Management Practices (BMPs) in addition to the requirements within this section.
- H. All demolition, staging, and construction activities shall be conducted within and confined to the limits of work shown on the project plans unless otherwise directed by the Owner's Representative.

1.2 REFERENCES

- A. All materials and workmanship shall conform to the Standard Specifications, by California State Transportation Agency (CALTRANS), Latest Edition; the California Building Code; Permit Conditions; and all other applicable codes, ordinances, standards, and policies. Where conflicts occur, the more stringent requirements shall apply.
- B. 29 CFR 1910 - Occupational Safety and Health Regulations.
- C. 29 CFR 1926 - Safety and Health Regulations for Construction.
- D. Cal/OSHA, Title 8 Regulations, Div 1, Ch 4, Art 6.
- E. Cal/OSHA, Title 8, CCR §1529.

1.3 DEFINITIONS

- A. Demolition:
 - 1. Complete removal and disposal of all items within the areas depicted on the Drawings, unless noted otherwise, by means such that surrounding structures are not damaged.
- B. Existing to Remain:
 - 1. Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or recycled.
 - 2. Contractor shall restore any damaged improvements to pre-construction condition at no additional cost to the Owner's Representative.

1.4 SITE CONDITIONS

- A. Las Mujeres Park is an existing public park. The work shall be completed in accordance with the constraints and access plans shown on the Drawings. Contractor operations shall be restricted to the designated areas and times.
- B. Coordinate and schedule, with the Owner's Representative, access to the site in advance.
- C. All demolition items not identified for salvage shall become the property of the Contractor. Disposal of all demolition items shall be in accordance with the specifications, local, state and Federal requirements.
- D. Long term storage of removed items or materials on-site is not permitted. Removed items shall not be stored on-site for more than fourteen (14) days without written approval of the Owner's Representative.

1.5 SUMMARY OF DEMOLITION ITEMS

- A. Items and material categories for demolition include, but are not limited to, the following:
 - 1. All concrete and bituminous pavements within the demolition limits indicated on the Drawings.
 - 2. Salvage and store existing bus shelter, bench and appurtenances.
 - 3. All fencing within the demolition limits indicated on the Drawings.
 - 4. All Miscellaneous items such as benches, bollards and light poles, etc. within the demolition limits and as indicated on the Drawings.
 - 5. Cap and abandonment of existing well as indicated on the Drawings.
 - 6. Removal of the existing water line to limits as indicated on the Drawings.
 - 7. Concrete sidewalk to be removed and salvaged for use in the project, as indicated on the Drawings.
- B. Any damage by the Contractor's operations to materials not identified to be removed shall be repaired or replaced, as determined by the Owner's Representative, by the Contractor and at the Contractor's expense.

1.6 SUBMITTALS

- A. Submittals shall be made in accordance with the requirements of Section 01 33 00, "Submittals" and include information specified herein.
- B. Demolition Management Plan (DMP) with documentation that includes and addresses the following:
 - 1. Worker safety and protection of the public and of workers or other persons in surrounding areas, and the demolition site.
 - 2. Work sequence and schedule. Include phased demolition requirements consistent with the overall project schedule and phasing.
 - 3. Protection of the environment, including implementation of water quality Best Management Practices (BMPs) noted on the Drawings or in the project permits and approvals.
 - 4. Activity-based schedule.
 - 5. List of equipment to be used for demolition operations.
 - 6. Means and methods for removing specified portions of existing structures as shown on the Drawings. This shall include descriptions of selective demolition at interface areas where existing structure will remain.

7. Means and methods to protect existing infrastructure, stockpile materials, and deliver salvaged material. Include the methods used to provide floats, false work, temporary supports, bracing, and shoring.
 8. Air quality control plan (dust control).
 9. Means and methods to prevent demolition materials, debris, water from construction activities, etc. from falling into or entering the water.
 10. Laydown areas for materials management.
 11. Means, methods, procedures, and controls for handling and disposal of Hazardous Material in accordance with all applicable local, state, and federal regulations.
 12. Utility disconnect schedule, if required.
 13. Disposal facilities to be used, subject to approval by the Owner's Representative, for waste disposal and material salvaging/recycling. Such facilities shall not be under current regulatory investigation or be a listed state or federal cleanup site. Include the name, location, and applicable state and federal identification numbers (as appropriate) of all of the offsite facilities to be used for recycling, salvaging, and disposal of material from this project, and this same information for all transporters and interim storage facilities. Also include a listing of materials proposed to be recycled, salvaged for appropriate reuse offsite, and landfilled at each of these facilities.
 14. Contingency plans and methods, to be implemented on demand, will preclude onsite spreading or offsite movement of demolition debris, and prevent damage to both onsite facilities and offsite property during demolition and disposal activities.
 15. Methods for shut-off, capping, and continuation (as needed) of existing utility conduits that may be affected by demolition activities.
 16. Trip Tickets: Submit trip tickets and receiver tickets for all material transported to approved landfills and recyclers.
- C. If the DMP is revised, resubmit with any proposed changes for review by the Owner's Representative prior to incorporating changes to means, methods, equipment, tools, temporary supports, etc.
- D. Prior to mobilization, submit two digital copies of video (DVD, thumb drive, downloadable files, etc., as approved by the Owner's Representative) documenting the existing conditions of surfaces, equipment, and adjacent structures and facilities that might be misconstrued as damaged due to Contractor's removal or construction activities. Undocumented damage will be considered to be caused by the Contractor's activities.

1.7 REGULATORY REQUIREMENTS

- A. Contractor may use any means, within application Permit limitations, at his disposal for the demolition, providing such means conform to all applicable federal, state, and local codes and regulations, and these specifications. The Contractor shall obtain all necessary permits for his selected means of demolition.
- B. Contractor shall obtain required permits from the appropriate regulatory agencies for the demolition, transportation, and disposal of materials not specified to be recycled on the Site.
- C. Contractor shall notify affected utility companies before starting work and comply with their requirements.
- D. Contractor shall not obstruct roadways, sidewalks, and hydrants without obtaining the appropriate permits. Coordinate such closure with the appropriate parties and the Owner's Representative.
- E. Contractor shall conform to regulatory procedures when hazardous materials and contaminated materials are encountered. See Section 01 57 23, "Environmental Protection."

PART 2 - MATERIALS

2.1 MATERIALS AND EQUIPMENT

- A. Contractor shall be responsible for selection and sizing of all construction equipment required to complete the work in this Section, subject to the approval of the Owner's Representative.

- B. Provide all necessary labor, materials, and equipment required to accomplish controlled demolition, material handling, material salvaging, and transportation and offsite disposal activities in accordance with the approved demolition plan, and in conformance with applicable OSHA standards and all applicable federal, state, and local waste disposal regulations.

PART 3 - EXECUTION

3.1 PREPARATION

- A. A minimum of 14 calendar days before demolition of any utilities, advise the Owner's Representative and appropriate agencies of the impending action and arrange with each utility for Work required by that utility under this Contract. Special conditions required by utility shall be the sole responsibility of the Contractor. Contact utilities for bond requirements, if any, prior to bid.
- B. Contact the Owner's Representative immediately if unknown existing embedded utilities are discovered and create an obstruction for the Work required by the contract.
- C. Utility locates, including potholing, shall be performed prior to start of demolition. Coordinate and resolve with the Owner's Representative to turn off or de-energize affected services before starting demolition if required.
- D. Verify all items for demolition, disposal, and salvage as early as practicable prior to start of the work. Notify the Owner's Representative immediately if observed conditions differ from anticipated conditions.
- E. Contractor shall coordinate demolition work with the Owner's Representative and perform demolition activities in a manner that minimizes impact to terminal operations.
- F. The Contractor shall conform to Section 01 35 29, "Worksite Safety Requirements," and Section 01 57 23 "Environmental Protection."
- G. Remove debris from the site daily, unless otherwise directed. Do not allow debris accumulations inside or outside project boundaries. Store materials, which cannot be removed daily, in areas, approved by the Owner's Representative.

3.2 DEMOLITION GENERAL

- A. General: Demolish indicated existing structures, and site improvements completely, and dispose of off-site unless noted otherwise on the Drawings.
- B. Work shall be sequenced in accordance with the approved demolition management plan submitted to the Owner's Representative.
- C. Contractor shall cease operations if public safety is threatened. Operations shall not resume until public safety has been secured.
- D. Contractor shall plan, coordinate, and conduct operations to minimize inconvenience and interference with traffic and any roads utilized by the Contractor. The Contractor shall not interfere with traffic, and shall stop work as requested to allow for traffic to pass. The Contractor shall provide and maintain the necessary traffic controls to ensure public safety. The Contractor shall adhere to Section 01 31 13, "Project Coordination" to coordinate construction activities.
- E. Contractor shall employ necessary controls to prevent the tracking of materials from the site onto terminal pavement and public streets and roads. Vacuum street sweepers that meet PM10 and PM 2.5 requirements established by SCAQMD shall be employed to clean up the areas, if tracking occurs. See Section 01 57 23, "Environmental Protection," for additional requirements.
- F. After removal of structures, utilities, and topside features, the Contractor shall clean areas to prevent conditions that impede subsequent work at the site. There shall be no debris, no rubble, and no litter left at the site from the demolition activities.
- G. Where portions of existing facilities are to remain, removals shall be done so as to leave the remaining portions structurally sound.
- H. Site Access and Temporary Controls: Conduct site demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from the Owner's Representative and authorities having

jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

2. Dust shall be controlled at all times. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

3.3 DEMOLITION OF STRUCTURES

- A. All demolition work shall be coordinated and performed in strict accordance with the permit requirements. This specification section does not include all required protection measures, and BMPs associated with this project. The Contractor shall pay particular attention to the conditions of issued permits and applicable regulations and authorizations associated with this project. All protection measures, mitigation measures, and BMPs included in these documents shall be implemented by the Contractor.
- B. Completely remove and dispose of all designated items. Infrastructure or materials designated to remain that are damaged by Contractor activities shall be replaced or repaired at the Contractor's expense by means approved by the Owner's Representative.
- C. Do not damage existing pavement or concrete which is to remain in place. Concrete demolition shall be accomplished by making neat vertical saw cuts at the boundaries of areas to be removed.
- D. Unless otherwise shown, 1-inch minimum deep saw cuts shall be used at the interface of demolished concrete areas and areas to remain. Full-depth saw cuts shall be used where full-depth demolition is shown in the Drawings, except at areas where existing reinforcing to remain crosses the plane of demolition where selective demolition is required. Concrete edges to remain shall be cut back and squared off to eliminate feather edges in abutting concrete.
- E. Some areas of selective demolition will be required at the interface between existing structures to be demolished and existing structures to remain. For areas of selective demolition, techniques and tools shall be employed that do not damage the existing concrete and reinforcing steel for areas to remain. Use small hand tools as appropriate for the task at hand and additional care for areas of select demolition and where existing reinforcing steel is to remain as part of the completed structure. All exposed existing reinforcing steel to remain shall be protected and cleaned by sandblasting or other approved methods to remove old concrete, surface rust, and other contaminants.
- F. Blasting or burning shall not be used.
- G. Disposal of all concrete (plain and reinforced) shall be at a Contractor-selected recycle site.

3.4 HANDLING AND DISPOSAL

- A. Demolition debris shall be disposed of promptly and shall not be stored on site without the written approval of the Owner's Representative.
- B. Materials, except those indicated as salvage to the City and except those materials containing substances classified as hazardous or potentially hazardous by local, state or federal regulating agencies, shall become the property of the Contractor upon their demolition. All such material, including those containing hazardous or potentially hazardous substances shall be removed and promptly disposed of away from site and on property not owned by the City, except as otherwise provided in these Specifications. The Contractor is responsible for the proper disposal of all demolition materials under this Contract in a manner that meets the requirements of federal, state, and local regulations for protecting the health and safety of employees, the public, and for protecting the environment. Mist with water if necessary.
- C. Construct temporary material stockpiling areas within demolition limits as approved by the Owner's Representative. Line, berm, and cover material stockpiling areas as necessary to protect the environment and prevent the spread of debris during material handling and disposal/salvaging activities. Handle and load debris in a manner that is least likely to generate dust emissions and result in spillage. Mist with water if necessary.
- D. Cut or break up demolition debris to a size that is appropriate for its ultimate disposal, using methods that minimize disturbance to the underlying ground surface.

- E. Load, transport, and dispose of demolition debris at permitted municipal solid waste landfill. Waste materials shall become property of Contractor to be legally disposed of at no cost to the City.
- F. Transportation work shall be performed by properly licensed, insured, and registered waste haulers that are acceptable to the Owner's Representative. Transportation contractor(s) shall submit documentation that demonstrates it is properly licensed and in compliance with applicable DOT regulations, as well as a copy of its contingency and spill control plans describing measures to be implemented in the event of spills or discharges during material handling and transporting. Provide, install, and maintain any truck or container liners, covers, and placards as required by DOT, and the state in which the disposal facility is located.
- G. Supply and prepare any required waste profile forms and manifest documents and obtain the necessary waste disposal approvals prior to removal of demolition materials from the site. The Owner's Representative will be responsible for signing waste disposal forms/documents.
- H. Obtain and provide to the Owner's Representative the weight and/or volume receipts and waste manifests or certificates of disposal from the disposal facilities for all quantities of material sent offsite for landfilling and/or recycling.
- I. The City encourages the salvage and recycling of materials from demolished structures. The Contractor is encouraged to salvage or recycle materials designated for disposal.

3.5 DISCONNECTION OF UTILITIES

- A. Coordinate disconnection and removal of utility service connections with the Owner's Representative 14 days prior to starting demolition. Disconnect utility service connections to building to be demolished in accordance with the regulations of the appropriate utility.
- B. Where repairs to existing surfaces are required, patch to restore surface to original or better condition
- C. Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

3.6 REPAIRS

- A. General: Promptly repair and restore any damage to adjacent improvements caused by any demolition operations to pre-construction condition using materials and procedures approved by the Owner's Representative at no additional cost to the City.
- B. Where repairs to existing surfaces are required, patch to restore surface to original or better condition.
- C. Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

3.7 CLEANUP

- A. After removal of all items to be demolished, clean up affected areas so that there is no debris, rubble, or litter left at the site due to the demolition and disposal work.

END OF SECTION 02 41 00

SECTION 02 41 19

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. The Work of this Section Includes:
 - 1. Removal and salvage of existing sidewalk for use in recycled concrete slope and removal and reinstallation of existing Bus Stop for reinstallation per contract drawings.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for restrictions on use of the premises, Owner-occupancy requirements, and phasing requirements.
 - 2. Section 015639 "Temporary Tree and Plant Protection" for temporary protection of existing trees and plants that are affected by selective demolition.
 - 3. Section 017300 "Execution" for cutting and patching procedures.
 - 4. Section 311000 "Site Clearing" for site clearing and removal of above- and below-grade improvements not part of selective demolition.
 - 5. Section 321400 "Unit Paving" for salvaged concrete paving installation

1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner as indicated.
- C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage; prepare for reuse; and reinstall where indicated.
- D. Existing to Remain: Existing items of construction that are not to be removed.

1.3 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.4 COORDINATION

- A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

1.5 PREINSTALLATION MEETINGS

- A. Predemolition Conference: Conduct conference at Project site.
 - 1. Inspect and discuss condition of construction to be selectively demolished.
 - 2. Review and finalize selective demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
 - 4. Review areas where existing construction is to remain and require protection.
 - 5. Review and finalize protection requirements.
 - 6. Review procedures for noise control, and dust control.
 - 7. Review storage, protection, and accounting for items to be removed for salvage or reinstallation.

1.6 INFORMATIONAL SUBMITTALS

- A. Schedule of Selective Demolition Activities: Indicate the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.

1.7 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.

1.8 FIELD CONDITIONS

- A. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- B. Notify Landscape Architect and Owner's Representative of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- C. Hazardous Materials:
 - 1. It is not expected that hazardous materials will be encountered in the Work.

PART 2 - PRODUCTS- NOT A PART

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
- C. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or video. Comply with Section 013233 "Photographic Documentation."
 - 1. Inventory and record the condition of items to be removed for salvage or reinstallation. Photograph or video conditions that might be misconstrued as damage caused by removal.
 - 2. Photograph or video existing conditions of adjoining construction including finish surfaces, that might be misconstrued as damage caused by selective demolition operations or removal of items for salvage or reinstallation.

3.2 PREPARATION

- A. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the Owner's Representative, items may be removed to a suitable, protected storage location and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.3 UTILITY SERVICES AND BUILDING SYSTEMS

- A. Existing Services/Systems to Remain: Maintain utilities and equipment to remain and protect against damage during selective demolition operations.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utilities serving areas to be selectively demolished.
 - 1. Arrange to shut off utilities with utility companies.
 - 2. Abandon existing equipment, and components indicated on Drawings to be abandoned in place.
 - a. Piping to Be Abandoned in Place: Cap or plug piping/conduit with same or compatible piping material and leave in place.

3.4 SALVAGE/REINSTALL

- A. Removed and Salvaged Items:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to Owner's storage area designated by Owner.
 - 5. Protect items from damage during transport and storage.
- B. Removed and Reinstalled Items:
 - 1. Clean and repair items to functional condition adequate for intended reuse.
 - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.

3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, support, and miscellaneous materials necessary to make item functional for use indicated.

3.5 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping.
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed trafficways if required by authorities having jurisdiction.
 2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete:
 1. Demolish in sections. Cut concrete full depth at existing score lines or expansion joints, if possible, and at regular intervals using power-driven saw, and then remove concrete between saw cuts. Salvage concrete in square footage amount as indicated on contract drawings.
 2. Stockpile salvaged concrete on site for reuse.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and recycle or dispose of them in accordance with Section 017419 "Construction Waste Management and Disposal."
 1. Do not allow demolished materials to accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 3. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

3.8 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.9 SELECTIVE DEMOLITION SCHEDULE

- A. Remove and Salvage: Existing concrete sidewalk, salvage concrete in square footage amount as indicated on contract drawings for use in recycled concrete slopes.
- B. Remove and Reinstall: Existing Bust Stop, signage, and bench. Reinstall in location indicated on contract drawings.

END OF SECTION 02 41 19

SECTION 03 10 00

CONCRETE FORMING AND ACCESSORIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Form-facing material for cast-in-place concrete.
 - 2. Shoring, bracing, and anchoring.
- B. Related Requirements:
 - 1. Section 32 13 13 "Concrete Paving" for formwork related to concrete pavement and walks.
 - 2. Section 32 13 16 "Decorative Concrete Paving" for formwork related to decorative concrete pavement and walks.

1.03 DEFINITIONS

- A. Form-Facing Material: Temporary structure or mold for the support of concrete while the concrete is setting and gaining sufficient strength to be self-supporting.
- B. Formwork: The total system of support of freshly placed concrete, including the mold or sheathing that contacts the concrete, as well as supporting members, hardware, and necessary bracing.

1.04 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review the following:
 - a. Special inspection and testing and inspecting agency procedures for field quality control.
 - b. Construction, movement, contraction, and isolation joints
 - c. Forms and form-removal limitations.
 - d. Shoring and reshoring procedures.
 - e. Anchor rod and anchorage device installation tolerances.

1.05 ACTION SUBMITTALS

- A. Product Data: For each of the following:
 - 1. Exposed surface form-facing material.
 - 2. Form ties.
 - 3. Form-release agent.
- B. Shop Drawings: Prepared by, and signed and sealed by, a qualified professional engineer responsible for their preparation, detailing fabrication, assembly, and support of forms.
 - 1. For exposed vertical concrete walls, indicate dimensions and form tie locations.

2. Indicate dimension and locations of construction and movement joints required to construct the structure in accordance with ACI 301.
 - a. Location of construction joints is subject to approval of the Architect.
3. Indicate location of waterstops.
4. Indicate form liner layout and form line termination details.
5. Indicate proposed schedule and sequence of stripping of forms, shoring removal, and reshoring installation and removal.
6. Indicate layout of insulating concrete forms, dimensions, course heights, form types, and details.

1.06 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing and inspection agency.
- B. Field quality-control reports.
- C. Minutes of preinstallation conference.

1.07 QUALITY ASSURANCE

- A. Testing and Inspection Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Form Liners: Store form liners under cover to protect from sunlight.
- B. Insulating Concrete Forms: Store forms off ground and under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.
- C. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Concrete Formwork: Design, engineer, erect, shore, brace, and maintain formwork, shores, and reshores in accordance with ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads, so that resulting concrete conforms to the required shapes, lines, and dimensions.
 1. Design wood panel forms in accordance with APA's "Concrete Forming Design/Construction Guide."
 2. Design formwork to limit deflection of form-facing material to 1/240 of center-to-center spacing of supports.
 - a. For architectural concrete specified in Section 03 33 00 "Architectural Concrete," limit deflection of form-facing material, studs, and walers to 0.0025 times their respective clear spans (L/400).
- B. Design, engineer, erect, shore, brace, and maintain insulating concrete forms in accordance with ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads, so that resulting concrete conforms to the required shapes, lines, and dimensions.
 1. Design cross ties to transfer the effects of the following loads to the cast-in-place concrete core:

- a. Wind Loads: As indicated on Drawings.
 - 1) Horizontal Deflection Limit: Not more than 1/240 of the wall height.

2.02 FORM-FACING MATERIALS

A. As-Cast Surface Form-Facing Material:

- 1. Provide continuous, true, and smooth concrete surfaces.
- 2. Furnish in largest practicable sizes to minimize number of joints.
- 3. Acceptable Materials: As required to comply with Surface Finish designations specified in Section 03 30 00 "Cast-In-Place Concrete, and as follows:
 - a. Plywood, metal, or other approved panel materials.
 - b. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - 1) APA HDO (high-density overlay).
 - 2) APA MDO (medium-density overlay); mill-release agent treated and edge sealed.
 - 3) APA Structural 1 Plyform, B-B or better; mill oiled and edge sealed.
 - 4) APA Plyform Class I, B-B or better; mill oiled and edge sealed.

2.03 RELATED MATERIALS

- A. Reglets: Fabricate reglets of not less than 0.022-inch- thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.
- B. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.
- C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.
- D. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- E. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.
 - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
 - 2. Form release agent for form liners shall be acceptable to form liner manufacturer.
- F. Form Ties: Factory-fabricated, removable or snap-off, glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 - 1. Furnish units that leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
 - 2. Furnish ties that, when removed, leave holes no larger than 1 inch in diameter in concrete surface.
 - 3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

PART 3 - EXECUTION

3.01 INSTALLATION OF FORMWORK

- A. Comply with ACI 301.

- B. Construct formwork, so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117 and to comply with the Surface Finish designations specified in Section 03 30 00 "Cast-In-Place Concrete" for as-cast finishes .
- C. Limit concrete surface irregularities as follows:
 - 1. Surface Finish-1.0: ACI 117 Class D, 1 inch.
 - 2. Surface Finish-2.0: ACI 117 Class B, 1/4 inch.
 - 3. Surface Finish-3.0: ACI 117 Class A, 1/8 inch.
- D. Construct forms tight enough to prevent loss of concrete mortar.
 - 1. Minimize joints.
 - 2. Exposed Concrete: Symmetrically align joints in forms.
- E. Construct removable forms for easy removal without hammering or prying against concrete surfaces.
 - 1. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces.
 - 2. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 - 3. Install keyways, reglets, recesses, and other accessories, for easy removal.
- F. Do not use rust-stained, steel, form-facing material.
- G. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces.
 - 1. Provide and secure units to support screed strips
 - 2. Use strike-off templates or compacting-type screeds.
- H. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible.
 - 1. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar.
 - 2. Locate temporary openings in forms at inconspicuous locations.
- I. Chamfer exterior corners and edges of permanently exposed concrete.
- J. At construction joints, overlap forms onto previously placed concrete not less than 12 inches.
- K. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work.
 - 1. Determine sizes and locations from trades providing such items.
 - 2. Obtain written approval of Architect prior to forming openings not indicated on Drawings.
- L. Construction and Movement Joints:
 - 1. Construct joints true to line with faces perpendicular to surface plane of concrete.
 - 2. Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
 - 3. Place joints perpendicular to main reinforcement.
 - 4. Locate joints for beams, slabs, joists, and girders in the middle third of spans.
 - a. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 - 5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.

6. Space vertical joints in walls as indicated on Drawings .
 - a. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
 - M. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection.
 1. Locate ports and openings in bottom of vertical forms, in inconspicuous location, to allow flushing water to drain.
 2. Close temporary ports and openings with tight-fitting panels, flush with inside face of form, and neatly fitted, so joints will not be apparent in exposed concrete surfaces.
 - N. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
 - O. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
 - P. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.
- 3.02 INSTALLATION OF EMBEDDED ITEMS
- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete.
 1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.
 3. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
 4. Install dovetail anchor slots in concrete structures, as indicated on Drawings.
 5. Clean embedded items immediately prior to concrete placement.
- 3.03 REMOVING AND REUSING FORMS
- A. Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations, and curing and protection operations need to be maintained.
 1. Leave formwork for beam soffits, joists, slabs, and other structural elements that support weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.
 2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
 - B. Clean and repair surfaces of forms to be reused in the Work.
 1. Split, frayed, delaminated, or otherwise damaged form-facing material are unacceptable for exposed surfaces.
 2. Apply new form-release agent.
 - C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints.
 1. Align and secure joints to avoid offsets.

2. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.04 SHORING AND RESHORING INSTALLATION

- A. Comply with ACI 318 and ACI 301 for design, installation, and removal of shoring and reshoring.
 1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.
- B. In multistory construction, extend shoring or reshoring over a sufficient number of stories to distribute loads in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members without sufficient steel reinforcement.
- C. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.05 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Inspections:
 1. Inspect formwork for shape, location, and dimensions of the concrete member being formed.
 2. Inspect insulating concrete forms for shape, location, and dimensions of the concrete member being formed.

END OF SECTION 03 10 00

SECTION 03 20 00

CONCRETE REINFORCING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Steel reinforcement bars.

1.02 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review the following:
 - a. Special inspection and testing and inspecting agency procedures for field quality control.
 - b. Construction contraction and isolation joints.
 - c. Steel-reinforcement installation.

1.03 ACTION SUBMITTALS

A. Product Data: For the following:

1. Each type of steel reinforcement.

B. Shop Drawings: Comply with ACI SP-066:

1. Include placing drawings that detail fabrication, bending, and placement.
2. Include bar sizes, lengths, materials, grades, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, location of splices, lengths of lap splices, details of mechanical splice couplers, details of welding splices, tie spacing, hoop spacing, and supports for concrete reinforcement.
3. For structural thermal break insulated connection system, indicate general configuration, insulation dimensions, tension bars, compression pads, shear bars, and dimensions.

C. Construction Joint Layout: Indicate proposed construction joints required to build the structure.

1. Location of construction joints is subject to approval of Architect.

1.04 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each of the following, signed by manufacturers:

1. Epoxy-Coated Reinforcement: CRSI's "Epoxy Coating Plant Certification."
2. Dual-Coated Reinforcement: CRSI's "Epoxy Coating Plant Certification."

B. Material Test Reports: For the following, from a qualified testing agency:

1. Steel Reinforcement:
 - a. For reinforcement to be welded, mill test analysis for chemical composition and carbon equivalent of the steel in accordance with ASTM A706/A706M.

1.05 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage and to avoid damaging coatings on steel reinforcement.
 - 1. Store reinforcement to avoid contact with earth.
 - 2. Do not allow epoxy-coated reinforcement to be stored outdoors for more than 60 days without being stored under an opaque covering.
 - 3. Do not allow dual-coated reinforcement to be stored outdoors for more than 60 days without being stored under an opaque covering.
 - 4. Do not allow stainless steel reinforcement to come into contact with uncoated reinforcement.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

2.02 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed.

2.03 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A615/A615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.

2.04 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

PART 3 - EXECUTION

3.01 PREPARATION

- A. Protection of In-Place Conditions:
 - 1. Do not cut or puncture vapor retarder.
 - 2. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

3.02 INSTALLATION OF STEEL REINFORCEMENT

- A. Comply with CRSI's "Manual of Standard Practice" for placing and supporting reinforcement.
- B. Accurately position, support, and secure reinforcement against displacement.
 - 1. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
 - 2. Do not tack weld crossing reinforcing bars.
- C. Preserve clearance between bars of not less than 1 inch, not less than one bar diameter, or not less than 1-1/3 times size of large aggregate, whichever is greater.
- D. Provide concrete coverage in accordance with ACI 318.

- E. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- F. Splices: Lap splices as indicated on Drawings.
 - 1. Bars indicated to be continuous, and all vertical bars to be lapped not less than 36 bar diameters at splices, or 24 inches, whichever is greater.
 - 2. Stagger splices in accordance with ACI 318.
 - 3. Weld reinforcing bars in accordance with AWS D1.4/D 1.4M, where indicated on Drawings.

3.03 JOINTS

- A. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
 - 1. Place joints perpendicular to main reinforcement.
 - 2. Continue reinforcement across construction joints unless otherwise indicated.
 - 3. Do not continue reinforcement through sides of strip placements of floors and slabs.
- B. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length, to prevent concrete bonding to one side of joint.

3.04 INSTALLATION TOLERANCES

- A. Comply with ACI 117.

3.05 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare test reports.
- B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- C. Inspections:
 - 1. Steel-reinforcement placement.
- D. Manufacturer's Inspections: Engage manufacturer of structural thermal break insulated connection system to inspect completed installations prior to placement of concrete, and to provide written report that installation complies with manufacturer's written instructions.

END OF SECTION 03 20 00

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

B. Related Requirements:

1. Section 03 10 00 "Concrete Forming and Accessories" for form-facing materials, form liners, insulating concrete forms, and waterstops.
2. Section 03 20 00 "Concrete Reinforcing" for steel reinforcing bars and welded-wire reinforcement.

1.02 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

- B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.03 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixtures.
 - c. Ready-mix concrete manufacturer.
 - d. Concrete Subcontractor.
 - e. Special concrete finish Subcontractor.
2. Review the following:
 - a. Special inspection and testing and inspecting agency procedures for field quality control.
 - b. Construction joints, control joints, isolation joints, and joint-filler strips.
 - c. Semirigid joint fillers.
 - d. Vapor-retarder installation.
 - e. Anchor rod and anchorage device installation tolerances.
 - f. Cold and hot weather concreting procedures.
 - g. Concrete finishes and finishing.
 - h. Curing procedures.
 - i. Forms and form-removal limitations.
 - j. Shoring and reshoring procedures.
 - k. Methods for achieving specified floor and slab flatness and levelness.
 - l. Floor and slab flatness and levelness measurements.
 - m. Concrete repair procedures.
 - n. Concrete protection.
 - o. Initial curing and field curing of field test cylinders (ASTM C31/C31M.)
 - p. Protection of field cured field test cylinders.

1.04 ACTION SUBMITTALS

A. Product Data: For each of the following.

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Aggregates.
5. Admixtures:
 - a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.
6. Joint fillers.
7. Repair materials.

B. Design Mixtures: For each concrete mixture, include the following:

1. Mixture identification.
2. Minimum 28-day compressive strength.
3. Durability exposure class.
4. Maximum w/cm.
5. Calculated equilibrium unit weight, for lightweight concrete.
6. Slump limit.
7. Air content.
8. Nominal maximum aggregate size.
9. Steel-fiber reinforcement content.
10. Synthetic micro-fiber content.
11. Indicate amounts of mixing water to be withheld for later addition at Project site if permitted.
12. Include manufacturer's certification that permeability-reducing admixture is compatible with mix design.
13. Include certification that dosage rate for permeability-reducing admixture matches dosage rate used in performance compliance test.
14. Intended placement method.
15. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

C. Shop Drawings:

1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
 - a. Location of construction joints is subject to approval of the Architect.

D. Concrete Schedule: For each location of each Class of concrete indicated in "Concrete Mixtures" Article, including the following:

1. Concrete Class designation.
2. Location within Project.
3. Exposure Class designation.
4. Formed Surface Finish designation and final finish.
5. Final finish for floors.
6. Curing process.
7. Floor treatment if any.

1.05 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.

2. Admixtures.
3. Bonding agents.
4. Adhesives.
5. Vapor retarders.
6. Semirigid joint filler.
7. Joint-filler strips.
8. Repair materials.

B. Material Test Reports: For the following, from a qualified testing agency:

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Aggregates.
5. Admixtures:
 - a. Permeability-Reducing Admixture: Include independent test reports, indicating compliance with specified requirements, including dosage rate used in test.

C. Field quality-control reports.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs Project personnel qualified as an ACI-certified Flatwork Technician and Finisher and a supervisor who is a certified ACI Flatwork Concrete Finisher/Technician or an ACI Concrete Flatwork Technician with experience installing and finishing concrete, incorporating permeability-reducing admixtures.

1. Post-Installed Concrete Anchors Installers: ACI-certified Adhesive Anchor Installer.

B. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

1. Manufacturer certified in accordance with NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated and employing an ACI-certified Concrete Quality Control Technical Manager.

1. Personnel performing laboratory tests to be an ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor to be an ACI-certified Concrete Laboratory Testing Technician, Grade II.

D. Field Quality-Control Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

1. Personnel conducting field tests to be qualified as an ACI Concrete Field Testing Technician, Grade 1, in accordance with ACI CPP 610.1 or an equivalent certification program.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Comply with ASTM C94/C94M and ACI 301.

1.08 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 301 and ACI 306.1 and as follows.
1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 2. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
 3. Do not use frozen materials or materials containing ice or snow.
 4. Do not place concrete in contact with surfaces less than 35 deg F, other than reinforcing steel.
 5. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1, and as follows:
1. Maintain concrete temperature at time of discharge to not exceed 95 deg F.
 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

1.09 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to furnish replacement sheet vapor retarder/termite barrier material and accessories for sheet vapor retarder/ termite barrier and accessories that do not comply with requirements or that fail to resist penetration by termites within specified warranty period.
1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 CONCRETE, GENERAL

- A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.

2.02 CONCRETE MATERIALS

- A. Cementitious Materials:
1. Portland Cement: ASTM C150/C150M, Type II/V , .
 2. Fly Ash: ASTM C618, Class C or F.
 3. Slag Cement: ASTM C989/C989M, Grade 100 or 120.
 4. Silica Fume: ASTM C1240 amorphous silica.
- B. Normal-Weight Aggregates: ASTM C33/C33M, coarse aggregate or better, graded. Provide aggregates from a single source.
1. Alkali-Silica Reaction: Comply with one of the following:
 - a. Expansion Result of Aggregate: Not more than 0.04 percent at one-year when tested in accordance with ASTM C1293.
 - b. Expansion Results of Aggregate and Cementitious Materials in Combination: Not more than 0.10 percent at an age of 16 days when tested in accordance with ASTM C1567.
 - c. Alkali Content in Concrete: Not more than 4 lb./cu. yd. for moderately reactive aggregate or 3 lb./cu. yd. for highly reactive aggregate, when tested in accordance with ASTM C1293 and categorized in accordance with ASTM C1778, based on alkali content being calculated in accordance with ACI 301.
 2. Maximum Coarse-Aggregate Size: 1-1/2 inches nominal.

3. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Air-Entraining Admixture: ASTM C260/C260M.

D. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride in steel-reinforced concrete.

1. Water-Reducing Admixture: ASTM C494/C494M, Type A.

E. Water and Water Used to Make Ice: ASTM C94/C94M, potable

2.03 REPAIR MATERIALS

A. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.

1. Cement Binder: ASTM C150/C150M portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi at 28 days when tested in accordance with ASTM C109/C109M.

2.04 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301.

1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash or Other Pozzolans: 25 percent by mass.
2. Slag Cement: 50 percent by mass.
3. Total of Fly Ash or Other Pozzolans, Slag Cement, and Silica Fume: 50 percent by mass, with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.
4. Total of Fly Ash or Other Pozzolans and Silica Fume: 35 percent by mass with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.

C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.

1. Use water-reducing admixture in concrete, as required, for placement and workability.
2. Use water-reducing admixture in pumped concrete, and concrete with a w/cm below 0.50.

2.05 CONCRETE MIXTURES

A. Class A : Normal-weight concrete used for footings, slab on grade, and walls.

1. Exposure Class: ACI 318 F0 S0 C1 .
2. Minimum Compressive Strength: 4000 psi at 28 days.

3. Maximum w/cm: 0.45 .
4. Slump Limit: 4 inches , plus or minus 1 inch .
5. Slump Flow Limit: 22 inches , plus or minus 1.5 inches .
6. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.

2.06 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M, and furnish batch ticket information.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions:
 1. Before placing concrete, verify that installation of concrete forms, accessories, and reinforcement, and embedded items is complete and that required inspections have been performed.
 2. Do not proceed until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Provide reasonable auxiliary services to accommodate field testing and inspections, acceptable to testing agency, including the following:
 1. Daily access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Secure space for storage, initial curing, and field curing of test samples, including source of water and continuous electrical power at Project site during site curing period for test samples.
 4. Security and protection for test samples and for testing and inspection equipment at Project site.

3.03 INSTALLATION OF EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.
 1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of ANSI/AISC 303.
 3. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3.04 JOINTS

- A. Construct joints true to line, with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.
 1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect.
 2. Place joints perpendicular to main reinforcement.
 - a. Continue reinforcement across construction joints unless otherwise indicated.

- b. Do not continue reinforcement through sides of strip placements of floors and slabs.
 - 3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
 - 4. Locate joints for beams, slabs, joists, and girders at third points of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 - 5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
 - 6. Space vertical joints in walls as indicated on Drawings . Unless otherwise indicated on Drawings, locate vertical joints beside piers integral with walls, near corners, and in concealed locations where possible.
 - 7. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 - 8. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of concrete thickness as follows:
- 1. Grooved Joints: Form control joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of control joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 - 2. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.
- D. Dowel Plates: Install dowel plates at joints where indicated on Drawings.

3.05 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.
 - 1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
 - 2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.
- B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.
- C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect in writing, but not to exceed the amount indicated on the concrete delivery ticket.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301, but not to exceed the amount indicated on the concrete delivery ticket.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- E. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.
 - 1. If a section cannot be placed continuously, provide construction joints as indicated.
 - 2. Deposit concrete to avoid segregation.

3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
 4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301.
 - a. Do not use vibrators to transport concrete inside forms.
 - b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.
 - c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
 - d. At each insertion, limit duration of vibration to time necessary to consolidate concrete, and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- F. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
1. Do not place concrete floors and slabs in a checkerboard sequence.
 2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 3. Maintain reinforcement in position on chairs during concrete placement.
 4. Screed slab surfaces with a straightedge and strike off to correct elevations.
 5. Level concrete, cut high areas, and fill low areas.
 6. Slope surfaces uniformly to drains where required.
 7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
 8. Do not further disturb slab surfaces before starting finishing operations.

3.06 FINISHING FORMED SURFACES

A. As-Cast Surface Finishes:

1. ACI 301 Surface Finish SF-1.0: As-cast concrete texture imparted by form-facing material.
 - a. Patch voids larger than 1-1/2 inches wide or 1/2 inch deep.
 - b. Remove projections larger than 1 inch.
 - c. Tie holes do not require patching.
 - d. Surface Tolerance: ACI 117 Class D.
 - e. Apply to concrete surfaces not exposed to public view.
2. ACI 301 Surface Finish SF-2.0: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams.
 - a. Patch voids larger than 3/4 inch wide or 1/2 inch deep.
 - b. Remove projections larger than 1/4 inch.
 - c. Patch tie holes.
 - d. Surface Tolerance: ACI 117 Class B.
 - e. Locations: Apply to concrete surfaces exposed to public view.
3. ACI 301 Surface Finish SF-3.0:
 - a. Patch voids larger than 3/4 inch wide or 1/2 inch deep.
 - b. Remove projections larger than 1/8 inch.
 - c. Patch tie holes.
 - d. Surface Tolerance: ACI 117 Class A.
 - e. Locations: Apply to concrete surfaces exposed to public view, .

B. Related Unformed Surfaces:

1. At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a color and texture matching adjacent formed surfaces.
2. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.07 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

- A. Filling In:
 - 1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
 - 2. Mix, place, and cure concrete, as specified, to blend with in-place construction.
 - 3. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

3.08 TOLERANCES

- A. Conform to ACI 117.

3.09 JOINT FILLING

- A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.
 - 1. Defer joint filling until concrete has aged at least one month(s).
 - 2. Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.
- C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints.
- D. Overfill joint, and trim joint filler flush with top of joint after hardening.

3.10 CONCRETE SURFACE REPAIRS

- A. Defective Concrete:
 - 1. Repair and patch defective areas when approved by Architect.
 - 2. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 - 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete.
 - a. Limit cut depth to 3/4 inch.
 - b. Make edges of cuts perpendicular to concrete surface.
 - c. Clean, dampen with water, and brush-coat holes and voids with bonding agent.
 - d. Fill and compact with patching mortar before bonding agent has dried.
 - e. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
 - 2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement, so that, when dry, patching mortar matches surrounding color.
 - a. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching.
 - b. Compact mortar in place and strike off slightly higher than surrounding surface.
 - 3. Repair defects on concealed formed surfaces that will affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces:

1. Test unformed surfaces, such as floors and slabs, for finish, and verify surface tolerances specified for each surface.
 - a. Correct low and high areas.
 - b. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
2. Repair finished surfaces containing surface defects, including spalls, popouts, honeycombs, rock pockets, crazing, and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
3. After concrete has cured at least 14 days, correct high areas by grinding.
4. Correct localized low areas during, or immediately after, completing surface-finishing operations by cutting out low areas and replacing with patching mortar.
 - a. Finish repaired areas to blend into adjacent concrete.
5. Correct other low areas scheduled to receive floor coverings with a repair underlayment.
 - a. Prepare, mix, and apply repair underlayment and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 - b. Feather edges to match adjacent floor elevations.
6. Correct other low areas scheduled to remain exposed with repair topping.
 - a. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations.
 - b. Prepare, mix, and apply repair topping and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
7. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete.
 - a. Remove defective areas with clean, square cuts, and expose steel reinforcement with at least a 3/4-inch clearance all around.
 - b. Dampen concrete surfaces in contact with patching concrete and apply bonding agent.
 - c. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate.
 - d. Place, compact, and finish to blend with adjacent finished concrete.
 - e. Cure in same manner as adjacent concrete.
8. Repair random cracks and single holes 1 inch or less in diameter with patching mortar.
 - a. Groove top of cracks and cut out holes to sound concrete, and clean off dust, dirt, and loose particles.
 - b. Dampen cleaned concrete surfaces and apply bonding agent.
 - c. Place patching mortar before bonding agent has dried.
 - d. Compact patching mortar and finish to match adjacent concrete.
 - e. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.11 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare testing and inspection reports.

B. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

1. Testing agency to be responsible for providing curing container for composite samples on Site and verifying that field-cured composite samples are cured in accordance with ASTM C31/C31M.

2. Testing agency to immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
3. Testing agency to report results of tests and inspections, in writing, to Owner, Architect, Contractor, and concrete manufacturer within 48 hours of inspections and tests.
 - a. Test reports to include reporting requirements of ASTM C31/C31M, ASTM C39/C39M, and ACI 301, including the following as applicable to each test and inspection:
 - 1) Project name.
 - 2) Name of testing agency.
 - 3) Names and certification numbers of field and laboratory technicians performing inspections and testing.
 - 4) Name of concrete manufacturer.
 - 5) Date and time of inspection, sampling, and field testing.
 - 6) Date and time of concrete placement.
 - 7) Location in Work of concrete represented by samples.
 - 8) Date and time sample was obtained.
 - 9) Truck and batch ticket numbers.
 - 10) Design compressive strength at 28 days.
 - 11) Concrete mixture designation, proportions, and materials.
 - 12) Field test results.
 - 13) Information on storage and curing of samples before testing, including curing method and maximum and minimum temperatures during initial curing period.
 - 14) Type of fracture and compressive break strengths at seven days and 28 days.
- C. Batch Tickets: For each load delivered, submit three copies of batch delivery ticket to testing agency, indicating quantity, mix identification, admixtures, design strength, aggregate size, design air content, design slump at time of batching, and amount of water that can be added at Project site.
- D. Inspections:
 1. Headed bolts and studs.
 2. Verification of use of required design mixture.
 3. Concrete placement, including conveying and depositing.
 4. Curing procedures and maintenance of curing temperature.
 5. Verification of concrete strength before removal of shores and forms from beams and slabs.
 6. Batch Plant Inspections: On a random basis, as determined by Architect.
- E. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M to be performed in accordance with the following requirements:
 1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
 - a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing to be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 2. Slump: ASTM C143/C143M:
 - a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - b. Perform additional tests when concrete consistency appears to change.
 3. Slump Flow: ASTM C1611/C1611M:
 - a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - b. Perform additional tests when concrete consistency appears to change.
 4. Air Content: ASTM C231/C231M pressure method, for normal-weight concrete; .
 - a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

5. Concrete Temperature: ASTM C1064/C1064M:
 - a. One test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.
6. Unit Weight: ASTM C567/C567M fresh unit weight of structural lightweight concrete.
 - a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
7. Compression Test Specimens: ASTM C31/C31M:
 - a. Cast and laboratory cure two sets of three 6-inch by 12-inch or 4-inch by 8-inch cylinder specimens for each composite sample.
 - b. Cast, initial cure, and field cure two sets of three standard cylinder specimens for each composite sample.
8. Compressive-Strength Tests: ASTM C39/C39M.
 - a. Test one set of three laboratory-cured specimens at seven days and one set of two specimens at 28 days.
 - b. Test one set of three field-cured specimens at seven days and one set of two specimens at 28 days.
 - c. A compressive-strength test to be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
9. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor to evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
10. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi if specified compressive strength is 5000 psi, or no compressive strength test value is less than 10 percent of specified compressive strength if specified compressive strength is greater than 5000 psi.
11. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
12. Additional Tests:
 - a. Testing and inspecting agency to make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.
 - b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect.
 - 1) Acceptance criteria for concrete strength to be in accordance with ACI 301, Section 1.6.6.3.
13. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
14. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

F. Measure floor and slab flatness and levelness in accordance with ASTM E1155 within 24 hours of completion of floor finishing and promptly report test results to Architect.

3.12 PROTECTION

A. Protect concrete surfaces as follows:

1. Protect from petroleum stains.
2. Diaper hydraulic equipment used over concrete surfaces.
3. Prohibit vehicles from interior concrete slabs.
4. Prohibit use of pipe-cutting machinery over concrete surfaces.
5. Prohibit placement of steel items on concrete surfaces.
6. Prohibit use of acids or acidic detergents over concrete surfaces.

7. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.
8. Protect concrete surfaces scheduled to receive surface hardener or polished concrete finish using Floor Slab Protective Covering.

END OF SECTION 03 30 00

SECTION 03 31 00

SKATE PARK STRUCTURE CONCRETE PAVING

PART 1 GENERAL

1.01 SUMMARY

- A. This Section includes exterior concrete pavement for the following:
 - 1. Slabs on grade.
 - 2. Vertical walls and footings.
 - 3. Flatwork

1.02 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, expansive hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume.

1.03 SUBMITTALS

- A. Submit to Construction Manager; concrete mix design and letters from material suppliers certifying that materials comply with the standards referenced herein.
- B. Submit to Construction Manager; shop drawings for all fabricated steel edging and steel accessories.
- C. Submit to Construction Manager: Cut sheets for Evaporation Retardant and Finishing Aid.

1.04 QUALITY ASSURANCE

- A. Comply with provisions of the following standards, except where more stringent requirements are indicated.
 - 1. Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice".
 - 2. American Concrete Institute (ACI) "Manual of Standard Practice".
- B. Installer Qualifications: The Contractor or an experienced skate park installer who has completed eight (8) skate park projects within the past five (5) years of work similar in material, design, and extent to that indicated for this Contract.
- C. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
- D. Concrete Testing: The Owner's Independent Testing Agency shall perform material evaluation tests.

1.05 PROJECT CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.
- B. Do not install concrete work over wet, saturated, muddy or frozen subgrade.

1.06 QUALITY INSURANCE

- A. Perform all work in accordance with all rules and standards as required by the Construction Manager.

PART 2 PRODUCTS

2.01 EDGE FORMS AND SCREED CONSTRUCTION

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.
 - 1. Use flexible or curved forms for horizontal curves of a radius 100-feet or less.

- B. Form-Release Agent: Commercially formulated form-release agent with a maximum of 350 mg/L volatile organic compounds (VOCS) that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
- C. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24-hours after concrete placement. Forms shall provide a continuous straight, smooth surface. Forms shall be of sufficient thickness to withstand pressure of newly placed concrete without bowing or deflecting.
- D. Clean forms after each use and coat with form release agent to ensure separation from concrete without damage.
- E. Check completed formwork and screeds for grade and alignment to the following Tolerances:
 - 1. Top of Forms: Not more than 1/8-inch in ten feet.
 - 2. Vertical Face on Longitudinal Axis: Not more than 1/8-inch in 10-feet.
- F. Moisten wood forms immediately prior to placing concrete.

2.02 STEEL REINFORCEMENT MATERIALS

- A. Reinforcement Bars shall be Number 4, Grade 40, deformed or per the plan details.
- B. General: Comply with CRSI's "Manual of Standard Practice" for fabricating reinforcement.
- C. Clean reinforcement of loose rust, oil and mill scale, earth, ice, or other bond-reducing materials.
- D. Deformed steel bars shall be located at 12-inches on center, both directions, continuous throughout the entire structure and as indicated on the plan details. Steel rebars shall extend out from the features for 24-inches, 2-inches above base rock. (Rebars for the flat work shall tie onto the rebars extending for 24-inches from the features.) Lap rebars 24-inches and tie. Stagger joints. Do not heat to bend.
- E. Provide adobe supports for rebars at 36-inches on center. Supports must keep the rebars at 2-inches above base rock and 2-inches below finish surfaces of concrete. Rebars shall be 2-inches away from outside surfaces of concrete in all locations. Rebars shall be free of rust, oil and other deleterious conditions.

2.03 FABRICATED STEEL EDGING (COPING)

- A. All pipe coping shall be per the plan details with all connections welded and ground smooth, see Metal Specifications

2.04 CONCRETE MATERIALS

- A. Portland Type II Cement.
- B. Fly Ash: ASTM C 618, Class F or C.
- C. Aggregate: ASTM C 33, Class 4, from a single source, with coarse aggregate as follows:
Aggregate Size: 3/4-inch min.; 1-1/2-inches max. nominal. Do not use fine or coarse aggregates containing substances that cause spalling.
- D. Water: Fresh, clean, potable water free of foreign materials.

2.05 REQUIRED CURING AND FINISHING MATERIALS

- A. Non-permeable Burleen™ curing blankets or approved equal; ASTM C 171.
- B. Water: Potable.
- C. Evaporation Retardant and Finishing Aid: Burke Film Concentrate – Available from WhiteCap Inc. Burke Film Concentrate shall be used in accordance with the manufacture recommendations. All finishing of concrete surfaces must be completed with this product, finishing with water is not allowed.

2.06 CONCRETE MIXES

- A. Prepare design mixes, proportioned according to ACI 211.1 and ACI 301, for each type and strength of normal-weight concrete determined by either laboratory trial mixes or field experience.
- B. Proportion mixes to provide concrete with the following properties:
 - 1. Compressive Strength (28-Days): 4000-psi (6.5 sac min.)
 - 2. Slump Limit: no less than 2-inch and no more than 4-inch.
- C. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having air content as follows within a tolerance of plus or minus 1.5-4.0 percent.
- D. Ready-Mixed Concrete: Comply with requirements and with ASTM C 94 and ASTM C 1116.
- E. When air temperature is between 85-degrees Fahrenheit and 90-degrees Fahrenheit, reduce mixing and delivery time from 1-1/2-hours to 75-minutes; when air temperature is above 90-degrees Fahrenheit, reduce mixing and delivery time to 60-minutes. Do not use concrete that has been in transport or pump hoses for more than 90-minutes from time of initial mix.
- F. Concrete mix design shall be submitted to Construction Manager for review and approval.

PART 3 EXECUTION

3.01 PREPARATION

- A. Proof-roll prepared subbase surface to check for unstable areas and verify need for additional compaction. (Crushed rock base shall be 3/4-inch: Class II Aggregate Base placed at a minimum depth of 6-inches in all locations to receive concrete or as noted otherwise. Proceed with pavement only after nonconforming conditions have been corrected and subgrade is ready to receive pavement and sample pour has been approved.
- B. Remove loose material from compacted subbase surface immediately before placing concrete.
- C. The Contractor shall keep the project area as clean as possible during construction. The Contractor shall be responsible to clean up and remove all spillage, overpour, discarded forming material, rejected work or material and all refuse or debris resulting from the installation work.

3.02 JOINTS

- A. Cold Joints: Construct true to line with faces perpendicular to surface planes of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.
- B. Sawcut Joints: Form weakened-plane contraction joints, sectioning concrete into areas of approximately 200-square feet. See Sawcut Plan for locations. Construct Sawcut joints to a depth of 1-1/2-inches and as follows:
 - 1. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades within 48-hours of any said pour. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.

3.03 CONCRETE PLACEMENT

- A. Inspection: Before placing any transitional concrete, the Construction Manager will inspect the completed formwork installation, screed forms, templates, reinforcement steel, and any other items to be embedded or cast in place.
- B. Remove snow, ice, frost or standing water from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.
- C. Moisten subbase to provide a uniform dampened condition at the time concrete is placed. Do not place concrete around manholes or other structures until they are at the required finish elevation and alignment.
- D. Deposit and spread concrete in a continuous operation between transverse joints. When concrete placing is interrupted more than two hours, place a cold joint.

- E. Consolidate concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures to consolidate concrete according to recommendations in ACI 309R.
Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand-spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels and joint devices.
- F. Screed pavement surfaces with a straightedge and strike off. Commence initial floating using bull floats or darbies to form an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations.
- G. Concrete paving shall be a minimum of five 5-inches thick in all locations or as indicated per the plan details.

3.04 CONCRETE FINISHING

- A. General: Wetting of concrete surfaces during screeding, initial floating, or finishing operations is prohibited.
- B. Finish: The finished surface of all concrete shall be a hard troweled, smooth finish.
- C. All horizontal and vertical edges of concrete shall have 1/2-inch radii.
- D. All connections between pours must be absolutely flush and smooth.
- E. Grinding finished concrete to achieve the specified finishes will not be accepted.

3.05 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.
- D. Apply curing blankets 2-hours after finishing concrete. Overlap blankets two 2-feet all sides.
- E. Maintain ongoing moisture of concrete by drip irrigation lines located under curing blankets. Provide ongoing moisture for a minimum of 14-days per finished area of concrete.
- F. Concrete shall be protected from any traffic for 30-days.
- G. The Contractor shall take necessary actions to protect the concrete from any vandalism or damage that may occur as a result of trespassing.

3.06 PAVEMENT TOLERANCES

Comply with tolerances of ACI 117 and as follows:

1. Elevation: 1/8-inch.
2. Thickness: minus 1/4-inch.
3. Surface: Gap below 10-foot-long, unleveled straightedge not to exceed 1/4-inch.
4. Lateral Alignment and Spacing of Tie Bars and Dowels: 1-inch.
5. Vertical Alignment of Tie Bars and Dowels: 1/4-inch.
6. Alignment of Tie-Bar End Relative to Line Perpendicular to Pavement Edge: 1/2-inch.
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge.
8. Length of dowel 1/4-inch per 12-inches.
9. Joint Spacing: 3-inches.
10. Contraction Joint Depth: Plus 1/4-inch, no minus.
11. Joint Width: Plus 1/8-inch, no minus.
12. Plan Dimension 1-inch.
13. Vertical Radii: 1/4-inch over length of transition as checked with true template.

3.07 FIELD QUALITY CONTROL

- A. Independent Testing Agency: The Owner's Independent Testing Agency shall sample materials, perform tests, and submit test reports during concrete placement according to requirements specified.
- B. Testing Services: Testing will be performed according to the following requirements:
 - 1. Sampling Fresh Concrete: Representative samples of fresh concrete shall be obtained according to ASTM C172, except modified for slump to comply with ASTM C94.
 - 2. Slump: AASHTO T119; one test at point of placement for each compressive-strength test, but not less than one test for each day's pour of each type of concrete. Additional tests will be required when concrete consistency changes.
 - 3. Air Content: ASTM C173 or AASHTO T152, pressure method; one test for each compressive-strength test, but not less than one test for each day's pour of each type of air- entrained concrete.
 - 4. Concrete Temperature: ASTM C1064; one test hourly when air temperature is 40-degrees Fahrenheit and below and when 80-degrees Fahrenheit and above, and one test for each set of compressive- strength specimens.
 - 5. Compression Test Specimens: ASTM C31; 1 set of 4-standard cylinders for each compressive-strength test, unless otherwise indicated. Cylinders shall be molded and stored for laboratory-cured test specimens unless field-cured test specimens are required.
 - 6. Compressive-Strength Tests: ASTM C39; one set for each day's pour of each concrete class exceeding 5-cubic yards, but less than 25-cubic yards, plus 1-set for each additional 50-cubic yard. 1-specimen shall be tested at 7-days and 2-specimens at 28-days; one specimen shall be retained in reserve for later testing if required.
- C. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by the Construction Manager, but will not be used as the sole basis for approval or rejection.
- D. Additional Tests: Testing agency shall make additional tests of the concrete when test results indicate slump, air entrainment, concrete strengths, or other requirements have not been met, as directed by Construction Manager. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with AASHTO 501.24(b), or by other methods as directed.

3.08 REPAIRS AND PROTECTION

- A. Remove and replace concrete pavement that is broken, under strength, spalling, damaged, or defective, or does not meet requirements in this Section.
- B. Drill test cores where directed by Testing Agency when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with Portland concrete bonded to pavement with epoxy adhesive.
- C. Protect concrete from damage. Exclude traffic from pavement for at least 14-days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material.
- E. The Contractor shall remove the curing blankets and the temporary drip irrigation system, as well as hose and sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.
- F. Grinding concrete to achieve specified finishes will not be allowed.

END OF SECTION 03 31 00

SECTION 03 37 00

SHOTCRETE

PART 1 GENERAL

1.01 SUMMARY

- A. Work included: Provide sprayed-on concrete (concrete conveyed into place by air pressure through a flexible tube or gun with controlled nozzle) referred to herein as shotcrete, complete as shown and as specified for skate park radius and banked transition work only.
- B. Related Work: Skate Park Structure Concrete Paving Section 03 31 00

1.02 QUALITY ASSURANCE

- A. Standards: Comply with the requirements of the current edition of the following codes and standards, except as herein modified:
 - 1. Current UBC "Uniform Building Code".
 - 2. American Concrete Institute (ACI): 506, Chapter 13, Wet Method; Chapter 5, Shotcrete Crew.
 - 3. American Concrete Institute (ACI) "Manual of Standard Practice" Concrete Reinforcing.
 - 4. Steel Institute (CRSI) "Manual of Standard Practice".
 - 5. American Society for Testing Materials (ASTM).
 - a. Concrete Testing:
 - i. Prepare test specimens by each application crew using the equipment materials and mix proportions proposed for the Project. Construction Manager shall observe preparation of test panels noting placement of shotcrete by applications crew.
 - b. Maintain and protect sample transition during construction and test for compliance with Specifications.
 - c. Test strength of the shotcrete as work progresses as follows:
 - i. Provide test panels and test in accordance with ASTM42. Test panels shall be taken not less than once each shift or less than one for each 50-cubic yards of shotcrete placed through the nozzle.
 - d. Shotcrete core grade-2 required.
- B. Installer Qualifications: The Contractor or an experienced skate park installer who has completed eight (8) skate park projects within the past five (5) years of work similar in material, design, and extent to that indicated for this Contract.
- C. Acceptance: Final acceptance of the shotcrete will be based upon the results obtained from testing.
- D. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
- E. Shotcrete Nozzleman shall be certified in accordance with ACI 5063.R. Shotcrete operations shall not be permitted without certified nozzleman present.
- F. Do not install concrete work over wet, saturated, muddy or frozen subgrade.
- G. No trucks shall be allowed within the areas that have been graded.

1.03 SUBMITTALS

- A. Manufacturer's Data: Current printed specifications with application and installation instruction for proprietary materials including concrete admixtures such as finishing agents/hardener.
- B. Shop Drawings: shop drawings for all fabricated steel edging and steel accessories.
- C. Mix Design: Submit to Construction Manager; concrete mix design and letters from material suppliers certifying that materials comply with the standards referenced herein.
- D. Pour Schedule: Contractor to indicate on plans locations to be shot within a day's work and sequence of pours for review by Construction Manager.

PART 2 PRODUCTS

2.01 CONCRETE MATERIALS

- A. Portland Cement: ASTM C150, Types I or II, one brand only.
- B. Fly Ash: ASTM C618
- C. Normal Weight Aggregates: ASTM C33 and herein specified. Aggregate shall comply with gradation No. 2 as shown in ACI 506R Table 2.1 if the contractor can show satisfactory performance of an alternate grading under similar conditions of use, the engineer may waive the requirement for gradation No. 2.

1. Combined gradation of coarse and fine aggregate as follows:

Sieve Size U.S. Standard Square Mesh	Percent by Weight Passing Individual Sieves
3/8 in	90-100
No. 4	70-85
No. 8	50-70
No. 16	35-55
No. 30	20-35
No. 50	8-20
No. 100	2-10

2. Batch fine coarse aggregates separately to avoid segregation.
3. Aggregates shall be free from clay, mud, loam, or other deleterious substances.
4. Dune sand, bank run sand, and manufactured sand are not acceptable for fine aggregate. Use one source of sand only for entire project.
5. Coarse aggregate shall be clean, un-coated, heavy media processed aggregate of crushed stone or river washed aggregate.

2.02 ACCESSORIES

- A. Water: Fresh, clean, potable, and free of deleterious acids, mixing, and curing water, as available from Construction Manager. Transport as required. Water shall not be used to finish, see admixtures.
- B. Admixtures: Use only accepted admixtures meeting the following requirements:
 1. Chemical Admixtures: ASTM C494.
 2. Evaporation Retardant and Finishing Aid: Burke Film Concentrate – Available from Whitecap Inc. Burk Film Concentrate shall be used in accordance with the manufacture recommendations. All finishing of concrete surfaces must be completed with this product, finishing with water is not allowed.
 3. Air-entraining Admixtures: ASTM C1141. Air entraining prior to shooting shall be 1.5-percent to 3.0-percent with a plus-or-minus 1-percent tolerance.
 4. Contractor shall submit cut sheets for all proposed admixtures with the concrete mix design.

2.03 PROPORTIONING AND DESIGN OF CONCRETE MIXES

- A. Mix: Prepare design mix to achieve an in-place 28 day compressive strength of 4,000-pounds per square inch and an air content of 4-percent at 28-days. Maximum aggregate size shall not exceed 3/8-inch. Unit weight of in-place shotcrete shall be 494-pounds per cubic yard. Owner will test the proposed mix designs at his/her expense.
- B. Test Data: Submit for acceptance proportioning and test data from prior experience if available. If data from prior experience are not available or accepted, make and have tested specimens from three or more different mix proportions in accordance with pre-construction testing requirements of this Specification.
- C. Strength: Selected mix proportions on the basis of compressive strength tests of specimens shall be cut from the shotcreted sample transition not earlier than 5-days after shotcreting. For

mix acceptance purposed, average core strengths shall be at least equal to f'_c for cores with L/D of 2.0. For cores with L/D between 1.0 and 2.0, use correction factors given in ASTM C42.

- D. Review: Mix design shall be reviewed for acceptance by Construction Manager.

2.04 CONCRETE APPLICATION EQUIPMENT

- A. For Wet Mix Shotcrete:
 - 1. Mixing Equipment: capable of thoroughly mixing aggregate, cement and water in sufficient quantity to maintain continuous placement.
 - 2. Air Supply: Clean air adequate for maintaining sufficient nozzle velocity for parts of work, and for simultaneous operation of blow pipe for cleaning away rebound.
 - 3. Delivery Equipment: capable of discharging aggregate-cement-water mixture accurately, uniformly, and continuously through delivery hose.

2.05 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.
 - 1. Use flexible or curved forms for horizontal curves of a radius 100-feet or less.
- B. Form-Release Agent: Commercially formulated form-release agent with a maximum of 350 mg/L volatile organic compounds (VOCS) that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
- C. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24-hours after concrete placement. Forms shall provide a continuous straight, smooth surface. Forms shall be of sufficient thickness to withstand pressure of newly placed concrete without bowing or deflecting.
- D. Clean forms after each use and coat with form release agent to ensure separation from concrete without damage.
- E. Check completed formwork and screeds for grade and alignment to the following Tolerances:
 - 1. Top of Forms: Not more than 1/8-inch in ten feet.
 - 2. Vertical Face on Longitudinal Axis: Not more than 1/8-inch in 10-feet.
- F. Moisten wood forms immediately prior to placing concrete.

2.06 STEEL REINFORCEMENT MATERIALS

- A. Reinforcement Bars shall be Number 4, Grade 40, deformed or per the plan details.
- B. General: Comply with CRSI's "Manual of Standard Practice" for fabricating reinforcement.
- C. Clean reinforcement of loose rust, oil and mill scale, earth, ice, or other bond-reducing materials.
- D. Deformed steel bars shall be located at 12-inches on center, both directions, continuous throughout the entire structure and as indicated on the plan details. Steel rebars shall extend out from the features for 24-inches, 2-inches above base rock. (Rebars for the flat work shall tie onto the rebars extending for 24-inches from the features.) Lap rebars 24-inches and tie. Stagger joints. Do not heat to bend.
- E. Provide adobe supports for rebars at 36-inches on center. Supports must keep the rebars at 2-inches above base rock and 2-inches below finish surfaces of concrete. Rebars shall be 2-inches away from outside surfaces of concrete in all locations. Rebars shall be free of rust, oil and other deleterious conditions.

2.07 REQUIRED CURING AND FINISHING MATERIALS

- A. Non-permeable Burleen™ curing blankets or approved equal; ASTM C 171.
- B. Water: Potable.

- C. Evaporation Retardant and Finishing Aid: Burke Film Concentrate – Available from WhiteCap Inc. Burk Film Concentrate shall be used in accordance with the manufacture recommendations. All finishing of concrete surfaces must be completed with this product, finishing with water is not allowed.

PART 3 EXECUTION

3.01 INSPECTION

- A. Examination: Construction Manager shall examine concrete formwork and verify that it is true to line and dimension, adequately braced against vibration, and constructed to permit escape of air and rebound but to prevent leakage during shotcreting.
- B. Inspection: construction Manager shall inspect reinforcement steel and items to be embedded in concrete. Correct any deviations from the accepted shop drawings.
- C. Notification: Notify other trades involved in ample time to permit the proper installation of their work.
- D. Existing Surfaces: Examine existing concrete surfaces for unsound material. Correct deficiencies.

3.02 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating reinforcement.
- B. Clean reinforcement of loose rust, oil and mill scale, earth, ice, or other bond-reducing materials.
- C. Deformed steel bars shall be located at 12-inches on center, both directions, continuous throughout the entire structure and as indicted on the plans. Steel rebar shall extend out from the features for 24-inches, 2-inches above base rock. (Rebar for the flat work shall tie onto the rebar extending for 24-inches from the features.) Lap rebar 24-inches and tie. Stagger joints. Do not heat to bend.
- D. Provide adobe supports for rebar at 36-inches on center. Supports must keep the rebar at 2-inches above base rock and 2-inches below finish surfaces of concrete. Rebar shall be 2-inches away from outside surfaces of concrete in all locations. Rebar shall be free of rust, oil and other deleterious conditions.

3.03 PREPARATION FOR INSTALLATION OF CONCRETE

Forms: Use a form-release agent on removable forms to prevent absorption of moisture and to prevent bond with shotcrete.

3.04 CONCRETE BATCHING AND MIXING

Proportions: Mix proportions shall be controlled by weight batching. Owner's Testing Laboratory shall maintain quality control records during shotcrete production.

3.05 CONCRETE PLACEMENT

- A. Placement: Use suitable delivery equipment and procedures that will result in shotcrete in place meeting the requirement of the Specification. Determine operation procedures for placement in extended distances, and around any obstructions where placement velocities and mix consistency must be adjusted.
- B. Placement Techniques: Do not place shotcrete if drying or stiffening of the mix takes place at any time prior to delivery to the nozzle.
 - 1. Control thickness, method of support, air pressure, and/or water content of shotcrete to preclude sagging or sloughing off. Discontinue shotcreting or provide suitable means to screen the nozzle stream if wind or air currents cause separation of the nozzle stream during placement.

2. Hold nozzle as perpendicular to surface as work will permit, to secure maximum compaction with minimum rebound.
3. In shotcreting walls, begin application at bottom. Ensure work does not sag.
4. Layering:
 - a. Build up layers by making several passes of nozzle over work area.
 - b. Broom or scarify the surface of freshly placed shotcrete to which, after hardening additional layers of shotcrete are to be bonded. Dampen surface just prior to application of succeeding layers.
 - c. Allow each layer of shotcrete to take initial set before applying succeeding layers.
 - d. Use templates fabricated to the specified finish surfaces to insure exact radii from flat bottom of Skate Park to face of coping. Template shall be fabricated from steel or ¾-inch Plywood. Check every horizontal foot when applying shotcrete for conformance of intended wall radii. Brace template and place levels at arc to tangent connections to insure no kinks will be formed. Kinks at the bottom of bowls will not be acceptable. Slumping of the shotcrete causing coping setback will not be acceptable.
5. Placement Around Reinforcement:
 - a. Hold the nozzle at such distance and angle to place materials behind reinforcement before any material is allowed to accumulate on its face.
 - b. Test to ascertain if any void or sand pockets have developed around or behind reinforcement by probing with an awl or other pointed tool after the shotcrete has achieved its initial set, by removal of randomly selected bars, or coring of other suitable standards.
- C. Finishing: Shotcrete installation crews must have appropriate scaffolding and radial ladders or equal to ensure access for application and finishing of shotcrete.

3.06 REMOVAL OF SURFACE DEFECTS IN CONCRETE

- A. General: Remove and replace shotcrete that lacks uniformity, exhibits segregation honeycombing, or lamination. Or which contains any dry patches, slugs, voids, or pockets. Remove defective areas.
- B. Sounding: Sound work with hammer for voids. Remove and replace damaged in-place shotcrete.

3.07 CONCRETE FINISH

- A. Finish-General: Smooth hard trowel finish that is uniform and free of kinks and irregularities.
- B. Transitions: Floated finish on radial face of wall shall consist of a smooth, hard, uniform surface of smooth trowel. Level the transition to a tolerance of ¼-inch in 10-feet when vertical with a radial template using the appropriate radii. If horizontal, use a straight edge. Grinding the surfaces will not be an acceptable means of achieving the intended radii.
- C. All horizontal and vertical edges of concrete shall have ½-inch radii.
- D. All connections between pours must be absolutely flush and smooth.
- E. Grinding finished concrete to achieve the specified finishes will not be accepted.

3.08 CONCRETE JOINTS

- A. Cold Joints: Construct true to line with faces perpendicular to surface planes of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.
- B. Sawcut Joints: Form weakened-plane contraction joints, sectioning concrete into areas of approximately 200-square feet. See Sawcut Plan for locations. Construct Sawcut joints to a depth of 1-1/2-inches and as follows:
 1. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades within 48-hours of any said pour. Cut 1/8-inch-wide joints into

concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.

2. Fill all joints flush with 'Sonner Borne' NPI Joint Sealant or approved equal.

3.09 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed shotcrete from premature drying and excessive cold or hot temperatures.
- B. Evaporation Retarder: Apply evaporation retarder according to manufacturer's written instructions after placing, screeding, and bull floating or darbying shotcrete, but before float finishing.
- C. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.
- D. Apply curing blankets 2-hours after finishing concrete. Overlap blankets 2-feet on all sides.
- E. Maintain ongoing moisture of concrete by drip irrigation lines located under curing blankets. Provide ongoing moisture for a minimum of 14-days per finished area of concrete.
- F. Concrete shall be protected from any traffic for 30-days.
- G. The Contractor shall take necessary actions to protect the concrete from any vandalism or damage that may occur as a result of trespassing.
- H. Remove and replace concrete pavement that is broken, under strength, spalling, damaged, or defective, or does not meet requirements in this Section.
- I. Drill test cores where directed by Testing Agency when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with Portland cement concrete bonded to pavement with epoxy adhesive.
- J. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material.
- K. The Contractor shall remove the curing blankets and the temporary drip irrigation system, as well as hose and sweep concrete pavement not more than 2- days before date scheduled for Substantial Completion inspections.
- L. Grinding concrete to achieve specified finishes will not be allowed.

3.10 PAVEMENT TOLERANCES

Comply with tolerances of ACI 117 and as follows:

1. Elevation: 1/8-inch.
2. Thickness: minus 1/4-inch.
3. Surface: Gap below 10-foot-long, unleveled straightedge not to exceed 1/4-inch.
4. Lateral Alignment and Spacing of Tie Bars and Dowels: 1-inch.
5. Vertical Alignment of Tie Bars and Dowels: 1/4-inch.
6. Alignment of Tie-Bar End Relative to Line Perpendicular to Pavement Edge: 1/2-inch.
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge.
8. Length of dowel 1/4-inch per 12-inches.
9. Joint Spacing: 3-inches.
10. Contraction Joint Depth: Plus 1/4-inch, no minus.
11. Joint Width: Plus 1/8-inch, no minus.
12. Plan Dimension 1-inch.
13. Vertical Radii: 1/4-inch over length of transition as checked with true template.

3.11 FIELD QUALITY CONTROL

- A. Independent Testing Agency: The Owner's Independent Testing Agency shall sample materials, perform tests, and submit test reports during concrete placement according to requirements specified.
- B. Testing Services: Testing will be performed according to the following requirements:
 1. Sampling Fresh Concrete: Representative samples of fresh concrete shall be obtained according to ASTM C172, except modified for slump to comply with ASTM C94.
 2. Slump: AASHTO T119; one test at point of placement for each compressive-strength test, but not less than one test for each day's pour of each type of concrete. Additional tests will be required when concrete consistency changes.

3. Air Content: ASTM C173 or AASHTO T152, pressure method; one test for each compressive-strength test, but not less than one test for each day's pour of each type of air- entrained concrete.
 4. Concrete Temperature: ASTM C1064; one test hourly when air temperature is 40-degrees Fahrenheit and below and when 80-degrees Fahrenheit and above, and one test for each set of compressive- strength specimens.
 5. Compression Test Specimens: ASTM C31; 1 set of 4-standard cylinders for each compressive-strength test, unless otherwise indicated. Cylinders shall be molded and stored for laboratory-cured test specimens unless field-cured test specimens are required.
 6. Compressive-Strength Tests: ASTM C39; one set for each day's pour of each concrete class exceeding 5-cubic yards, but less than 25-cubic yards, plus 1-set for each additional 50-cubic yard. 1-specimen shall be tested at 7-days and 2-specimens at 28-days; one specimen shall be retained in reserve for later testing if required.
- C. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by the Construction Manager, but will not be used as the sole basis for approval or rejection.
- D. Additional Tests: Testing agency shall make additional tests of the concrete when test results indicate slump, air entrainment, concrete strengths, or other requirements have not been met, as directed by Construction Manager. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with AASHTO 501.24(b), or by other methods as directed.

END OF SECTION 03 37 00

SECTION 03 40 00

SKATE PARK CONCRETE STAIN

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete stain work for concrete surfaces of the skate park structure.

1.02 RELATED SECTIONS

- A. Skate Park Structure Concrete Paving Section 03 31 00.
- B. Skate Park Shotcrete Section 03 37 00.

1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, including surface preparation and application instructions.
- B. Color Samples: Submit manufacturer's standard color chart.
- C. Applicator's Project References: Submit list of successfully completed projects, including project name and location, name of architect, and type and quantity of concrete floor stain applied.
- D. Maintenance Instructions: Submit manufacturer's maintenance and cleaning instructions.

1.04 QUALITY ASSURANCE

- A. Applicator's Qualifications:
 - 1. Successful experience in application of similar concrete floor stains.
 - 2. Employ persons trained for application of concrete floor stains.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying manufacturer, product name, and color.
- B. Storage:
 - 1. Store materials in clean, dry area indoors in accordance with manufacturer's instructions.
 - 2. Keep containers sealed until ready for use.
 - 3. Concrete Cleaner: Keep from freezing.
- C. Handling: Protect materials during handling and application to prevent damage or contamination.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Apply concrete floor stain when air and surface temperatures are between 40 degrees Fahrenheit and 90 degrees Fahrenheit during application and a minimum of 48 hours after application.
- B. Exterior Surfaces: Do not apply materials in wet weather.

1.07 SEQUENCING

- A. Prepare surface and apply concrete floor stain after skate park concrete has been installed.

PART 2 PRODUCTS

2.01 MANUFACTURER

- A. LM Scofield CO, or approved equal.

2.02 CONCRETE FLOOR STAIN

- A. Concrete Floor Stain: LM Scofield CO. or approved equal.
 - 1. Description: Ready-to-use, penetrating, acid base stain that chemically reacts with cement on surface to permanently stain concrete to create transparent appearance.
 - 2. Color: See material plan.
 - 3. Final color selection and locations to be confirmed with Site Design Group.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine surfaces to receive concrete floor stain. Notify Construction Inspector if surfaces are not acceptable. Do not begin surface preparation or application until unacceptable conditions have been corrected.

3.02 SURFACE PREPARATION

- A. Protection: Protect walls, adjacent surfaces, surrounding areas, and vegetation from overspray, runoff, and contact with concrete floor stain.
- B. Prepare concrete floor surface in accordance with manufacturer's instructions.
- C. New Concrete:
 - 1. Concrete shall be as specified.
 - 2. Do not apply curing compounds, sealers, or water repellents.
 - 3. Remove excess release agents.
 - 4. Allow concrete to cure a minimum of [30] days.
- D. Ensure concrete surface is clean, dry, structurally sound, and free from dirt, dust, debris, oil, grease, tar, tire marks, adhesive, paint, curing compounds, sealers, wax, and other surface coatings.
- E. Pre-Cleaning Concrete: Do not use acid to pre-clean concrete.

3.03 APPLICATION

- A. Apply concrete floor stain in accordance with manufacturer's instructions at locations herein and in coordination with Construction Inspector.
- B. Keep material containers closed when not in use to avoid contamination.
- C. Apply 2-coats of undiluted stain.
- D. Dilute stain with clear stain reducer if colors are too strong as approved Skate Park Designer.
- E. Allow first coat of stain to dry before applying second coat.
- F. Allow second coat of stain to dry overnight before neutralizing and washing surface to remove stain residue.

3.04 FIELD QUALITY CONTROL

- A. Test inconspicuous area of concrete for color and reactivity of concrete floor stain for approval by Architect.
- B. Test concrete surface after surface preparation and before application.

3.05 PROTECTION

- A. Protect stained concrete floor from damage during construction.
- B. Protect concrete surfaces from foot traffic for a minimum of 24 hours after application of concrete floor sealer and wax.

END OF SECTION 03 40 00

SECTION 04 22 00

CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Concrete masonry units.
 - 2. Decorative concrete masonry units.
 - 3. Mortar and grout.
 - 4. Steel reinforcing bars.
 - 5. Miscellaneous masonry accessories.

1.03 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.04 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.05 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For the following:
 - 1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
 - 2. Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315. Show elevations of reinforced walls.

1.06 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Material Certificates: For each type and size of the following:
 - 1. Masonry units.
 - a. Include material test reports substantiating compliance with requirements.
 - b. For masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.
 - 2. Cementitious materials. Include name of manufacturer, brand name, and type.
 - 3. Mortar admixtures.
 - 4. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
 - 5. Grout mixes. Include description of type and proportions of ingredients.
 - 6. Reinforcing bars.
 - 7. Joint reinforcement.
 - 8. Anchors, ties, and metal accessories.
- C. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
 - 1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C109/C109M for compressive strength, ASTM C1506 for water retention, and ASTM C91/C91M for air content.

- 2. Include test reports, according to ASTM C1019, for grout mixes required to comply with compressive strength requirement.
- D. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to TMS 602/ACI 530.1/ASCE 6.
- E. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.07 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C1093 for testing indicated.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained, and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.09 FIELD CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 - 1. Extend cover a minimum of 24 inches down both sides of walls, and hold cover securely in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.
- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 - 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
 - 2. Protect sills, ledges, and projections from mortar droppings.
 - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.
 - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

2.02 UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6 except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units in the completed Work.
- C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.
 - 1. Where fire-resistance-rated construction is indicated, units shall be listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

2.03 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
 - 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
 - 2. Provide square-edged units for outside corners unless otherwise indicated.
- B. CMUs: ASTM C90.
 - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2000 psi.
 - 2. Density Classification: Normal weight.
 - 3. Size (Width): Manufactured to dimensions 3/8 inch less-than-nominal dimensions.
 - 4. Exposed Faces: Provide color and texture matching existing walls.
- C. Decorative CMUs: ASTM C90.
 - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2150 psi 2800 psi 3050 psi 2000 psi.
 - 2. Density Classification: Normal weight.
 - 3. Size (Width): Manufactured to dimensions specified in "CMUs" Paragraph.
 - 4. Pattern and Texture:
 - a. Standard pattern, split-face finish.
 - 5. Colors: Match existing.

2.04 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C150/C150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
 - 1. Alkali content shall not be more than 0.1 percent when tested according to ASTM C114.
- B. Hydrated Lime: ASTM C207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Masonry Cement: ASTM C91/C91M.
- E. Mortar Cement: ASTM C1329/C1329M.
- F. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C979/C979M. Use only pigments with a record of satisfactory performance in masonry mortar.
- G. Colored Cement Products: Packaged blend made from portland cement and hydrated lime masonry cement or mortar cement and mortar pigments, all complying with specified requirements, and containing no other ingredients.
 - 1. Formulate blend as required to produce color indicated or, if not indicated, as selected from manufacturer's standard colors.

2. Pigments shall not exceed 10 percent of portland cement by weight.
 3. Pigments shall not exceed 5 percent of masonry cement or mortar cement by weight.
- H. Aggregate for Mortar: ASTM C144.
1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
 2. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
 3. White-Mortar Aggregates: Natural white sand or crushed white stone.
 4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
- I. Aggregate for Grout: ASTM C404.
- J. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C494/C494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
- K. Water: Potable.

2.05 REINFORCEMENT

- A. Uncoated Steel Reinforcing Bars: ASTM A615/A615M or ASTM A996/A996M, Grade 60.
- B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from 0.148-inch steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.

2.06 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene, urethane or PVC.
- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D2000, Designation M2AA-805 or PVC, complying with ASTM D2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

2.07 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
1. Do not use calcium chloride in mortar or grout.
 2. Use portland cement-lime masonry cement mortar cement mortar unless otherwise indicated.
 3. For exterior masonry, use portland cement-lime masonry cement or mortar cement mortar.
 4. For reinforced masonry, use portland cement-lime masonry cement or mortar cement mortar.
 5. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated.
1. For reinforced masonry, use Type S.
- D. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.
1. Pigments shall not exceed 10 percent of portland cement by weight.
 2. Pigments shall not exceed 5 percent of masonry cement or mortar cement by weight.
 3. Mix to match Architect's sample.
 4. Application: Use pigmented mortar for exposed mortar joints with the following units:
 - a. Decorative CMUs.

- b. Cast-stone trim units.
- E. Colored-Aggregate Mortar: Produce required mortar color by using colored aggregates and natural color or white cement as necessary to produce required mortar color.
 - 1. Mix to match Architect's sample.
 - 2. Application: Use colored-aggregate mortar for exposed mortar joints with the following units:
 - a. Decorative CMUs.
 - b. Cast-stone trim units.
- F. Grout for Unit Masonry: Comply with ASTM C476.
 - 1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
 - 2. Proportion grout in accordance with ASTM C476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.
 - 3. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C143/C143M.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
 - 2. Verify that foundations are within tolerances specified.
 - 3. Verify that reinforcing dowels are properly placed.
 - 4. Verify that substrates are free of substances that would impair mortar bond.
- B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION, GENERAL

- A. Build chases and recesses to accommodate items specified in this and other Sections.
- B. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.
- C. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

3.03 TOLERANCES

- A. Dimensions and Locations of Elements:
 - 1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch or minus 1/4 inch.
 - 2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.
 - 3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2-inch total.
- B. Lines and Levels:
 - 1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet, or 1/2-inch maximum.
 - 2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
 - 3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.

4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
 5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
 6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, or 1/2-inch maximum.
 7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch.
- C. Joints:
1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.
 2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
 3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
 4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch.

3.04 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.
- C. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
- D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- E. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
- F. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.

3.05 MORTAR BEDDING AND JOINTING

- A. Lay hollow CMUs as follows:
 1. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
- B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
- C. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.
- D. Cut joints flush where indicated to receive waterproofing unless otherwise indicated.

3.06 MASONRY-JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.
- B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
- C. Provide continuity at wall intersections by using prefabricated T-shaped units.
- D. Provide continuity at corners by using prefabricated L-shaped units.
- E. Cut and bend reinforcing units as directed by manufacturer for continuity at corners, returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.07 CONTROL AND EXPANSION JOINTS

- A. General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.
- B. Form control joints in concrete masonry using one of the following methods:
 - 1. Fit bond-breaker strips into hollow contour in ends of CMUs on one side of control joint. Fill resultant core with grout and rake out joints in exposed faces for application of sealant.
 - 2. Install preformed control-joint gaskets designed to fit standard sash block.
 - 3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar or rake out joint for application of sealant.
 - 4. Install temporary foam-plastic filler in head joints and remove filler when unit masonry is complete for application of sealant.

3.08 REINFORCED UNIT MASONRY

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
 - 1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
 - 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
 - 1. Comply with requirements in TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
 - 2. Grout shall not be handled nor pumped utilizing aluminum equipment unless it can be demonstrated with the materials and equipment to be used that there will be no deleterious effect on the strength of the grout.
 - 3. Low Lift Grouting shall be employed: Units shall be laid a maximum of 4 feet (1220 mm) before grouting, and all over-hanging mortar and mortar droppings shall be removed. Grouting shall follow each 4 feet (1220 mm) of construction laid and shall be consolidated so as to completely fill all voids and embed all reinforcing steel. When grouting is stopped for 1 hour or longer, horizontal construction joints shall be formed by stopping the pour of grout not less than 1/2 inch (13 mm) or more than 2 inches (51 mm) below the top of the uppermost unit grouted. Horizontal steel shall be fully embedded in grout in an uninterrupted pour.
 - 4. Where High-Lift Grouting is proposed to be used, the method shall be approved by the enforcement agency. Cleanout openings shall be provided in every cell at the bottom of each pour of grout. Alternatively, if the course at the bottom of the pour is constructed entirely of inverted open-end bond beam units, cleanout openings need only be provided in every reinforced cell at the bottom of each pour of grout. The foundation or other horizontal construction joints shall be cleaned of all loose material and mortar droppings before each pour. The cleanouts shall be sealed before grouting. An approved admixture that reduces early water loss and produces an expansive action shall be used in the grout. Vertical barriers of masonry may be built across the grout space. The grouting of any section of wall between barriers shall be completed in one day with no interruption longer than one hour.

3.09 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.

- B. Inspections: Special inspections according to Level B in TMS 402/ACI 530/ASCE 5.
 - 1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
 - 2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
 - 3. Place grout only after inspectors have verified proportions of site-prepared grout.
- C. Testing Prior to Construction: One set of tests.
- D. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.
- E. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C140 for compressive strength.
- F. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C780.
- G. Grout Test (Compressive Strength): For each mix provided, according to ASTM C1019.
- H. Prism Test: For each type of construction provided, according to ASTM C1314 at 7 days and at 28 days.

3.10 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
 - 3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
 - 4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
 - 5. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.

3.11 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
- B. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
 - 1. Crush masonry waste to less than 4 inches in each dimension.
 - 2. Mix masonry waste with at least two parts of specified fill material for each part of masonry waste. Fill material is specified in Section 31 20 00 "Earth Moving."
 - 3. Do not dispose of masonry waste as fill within 18 inches of finished grade.
- C. Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.
- D. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 04 22 00

SECTION 05 50 00

METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Miscellaneous steel sitework fabrications
- B. Products furnished, but not installed, under this Section include the following:
 - 1. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.
- C. Related Requirements:
 - 1. Section 042000 "Unit Masonry" for installing loose lintels, anchor bolts, and other items built into unit masonry.
 - 2. Section 051200 "Structural Steel Framing" for steel framing, supports, elevator machine beams, hoist beams, divider beams, door frames, and other steel items attached to the structural-steel framing.
 - 3. Section 329443 "Tree Grates" for tree grates and frames.
 - 4. Section 329443 "Tree Grates" for tree guards.

1.3 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.4 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Fasteners.
 - 2. Shop primers.
- B. Sustainable Design Submittals:
 - 1. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.
 - 2. Environmental product declaration.
 - 3. Product Certificates: For regional materials, indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include distance to Project and cost for each regional material.
- C. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for the following:
 - 1. Steel framing and supports for applications where framing and supports are not specified in other Sections.
 - 2. Miscellaneous steel sitework fabrications.

1.5 INFORMATIONAL SUBMITTALS

- A. Mill Certificates: Signed by stainless steel manufacturers, certifying that products furnished comply with requirements.

- B. Welding certificates.

1.6 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
 - 3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.7 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls, floor slabs, decks, and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- C. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- D. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.
- E. Aluminum Plate and Sheet: ASTM B209, Alloy 6061-T6.
- F. Nickel Silver Extrusions: ASTM B151/B151M, Alloy UNS No. C74500.

2.2 FASTENERS

- A. General: Unless otherwise indicated, provide galvanized steel fasteners for exterior use. Select fasteners for type, grade, and class required.
 - 1. Provide Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.
 - 2. Provide stainless steel fasteners for fastening stainless steel.
 - 3. Provide bronze fasteners for fastening bronze.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A563; and, where indicated, flat washers.
- C. High-Strength Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 3, heavy-hex steel structural bolts; ASTM A563, Grade DH3, heavy-hex carbon-steel nuts; and where indicated, flat washers.
- D. Stainless Steel Bolts and Nuts: Regular hexagon-head annealed stainless steel bolts, ASTM F593; with hex nuts, ASTM F594; and, where indicated, flat washers; Alloy.
- E. Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, ASTM A563; and, where indicated, flat washers.
 - 1. Hot dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.
- F. Anchors, General: Capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing in accordance with ASTM E488/E488M, conducted by a qualified independent testing agency.
- G. Cast-in-Place Anchors in Concrete: Either threaded or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A47/A47M malleable iron or ASTM A27/A27M cast steel. Provide bolts, washers, and shims as needed, all hot dip galvanized per ASTM F2329/F2329M.
- H. Post-Installed Anchors: Torque-controlled expansion anchors.
 - 1. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy stainless steel bolts, ASTM F593, and nuts, ASTM F594.

2.3 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches, with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

2.4 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
 - 1. Furnish inserts for units installed after concrete is placed.
- C. Fabricate steel pipe columns for supporting wood frame construction from steel pipe with steel baseplates and top plates as indicated. Drill or punch baseplates and top plates for anchor and connection bolts and weld to pipe with fillet welds all around. Make welds the same size as pipe wall thickness unless otherwise indicated.
 - 1. Unless otherwise indicated, provide 1/2-inch baseplates with four 5/8-inch anchor bolts and 1/4-inch top plates.
- D. Galvanize miscellaneous framing and supports where indicated.
- E. Prime miscellaneous framing and supports with zinc-rich primer where indicated.

2.5 STEEL WELD PLATES AND ANGLES

- A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

2.6 GENERAL FINISH REQUIREMENTS

- A. Finish metal fabrications after assembly.

- B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.7 STEEL AND IRON FINISHES

- A. Galvanizing: Hot dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.
 - 1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
- B. Preparation for Shop Priming Galvanized Items: After galvanizing, thoroughly clean galvanized surfaces of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.
- C. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
 - 1. Shop prime with universal shop primer unless zinc-rich primer is indicated.
- D. Preparation for Shop Priming: Prepare surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 1. Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 2. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 3. Items Indicated to Receive Primers Specified in Section 099600 "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 4. Other Steel Items: SSPC-SP 3, "Power Tool Cleaning."
 - 5. Galvanized-Steel Items: SSPC-SP 16, "Brush-off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals."
- E. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
 - 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

3.2 INSTALLATION OF MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.
- B. Install pipe columns on concrete footings with grouted baseplates. Position and grout column baseplates as specified in "Installation of Bearing and Leveling Plates" Article.
 - 1. Grout baseplates of columns supporting steel girders after girders are installed and leveled.

3.3 INSTALLATION OF BEARING AND LEVELING PLATES

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of plates.
- B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with shrinkage-resistant grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.4 REPAIRS

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

END OF SECTION 05 50 00

SECTION 05 51 00

SKATE PARK METAL FABRICATION

PART 1 GENERAL

1.01 SCOPE

- A. Provide labor, material and equipment for the installation of the Skate Park Metal Work as shown on the drawings and as specified.

1.02 RELATED SECTIONS

- A. Skate Park Structure Cement Concrete Paving Section 03 31 00
- B. Skate Park Shotcrete Section 03 37 00

1.03 QUALITY ASSURANCE

- A. Qualification of Fabricators: Experienced in fabrication of miscellaneous metals.
- B. Qualifications of Welders: Welding shall be done only by certified welding operators currently qualified, according to AWS D1.1.
- C. Qualifications of Workmen: 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, the requirements of the Work, and who shall direct all work performed under this Section. Welds indicated may be made in shop or field with approval.
- D. Reference Standards:
 - 1. Steel: Meet requirements of AISC "Specifications of Architecturally Exposed Structural Steel," latest edition.
 - 2. Welding: Meet requirements of AWS "Structural Welding Code," D1.1, latest edition.

1.04 SUBMITTALS

- A. Shop Drawings:
 - 1. Submit shop drawings for all custom fabricated items under this section. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners and accessories. Indicate welded connections using standard AWS welding symbols.
 - 2. Verification: Verify all measurements at the job. Show dimension, sizes, thickness, gauges, finishes, joining, attachments, and relationship of work to adjoining construction. Where items must fit and coordinate with finished surfaces and/or constructed spaces, take measurements at site and not from drawings.
 - 3. Coordination: Coordinate with work of Cast-In-Place Concrete Section.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Coordination: Coordinate with work of Cast-In-Place Concrete Section.
- B. Storage of Materials: Materials which are stored at the project site shall be above ground on platforms, skids, or other supports. Protect steel from corrosion. Store other material in a weather-tight and dry place until ready for use.
- C. Protection:
 - 1. Use all means necessary to protect miscellaneous metal before, during and after installation and to protect the installed work and materials of all other trades.
 - 2. Protect any adjacent materials or areas below from damage due to weld splatter of sparks during field welding.

- D. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the City Engineer and at no additional cost to the Owner.

1.06 JOB CONDITIONS

- A. Examine existing conditions in which the work is to be installed. Notify the Owner's Representative if conditions are unacceptable to begin work.
- B. Do not proceed with the work until unsatisfactory conditions have been corrected.

1.07 COORDINATION

- A. Templates and Built-ins: Furnish all anchors, fastenings, sleeves, setting templates and layouts affecting or installed in the work of other trades.
- B. Delivery: Where items must be incorporated or built into adjacent work, deliver to trade responsible for such work in sufficient time that progress of work is not delayed. Be responsible for proper location of such items.
- C. Approved sample(s) shall be used as the standard of workmanship and shall remain on site until work has been completed and approved by the City Engineer.

PART 2 PRODUCTS

2.01 MATERIALS

- A. See plan details.
- B. WELDING RODS: E-70 series low hydrogen unless otherwise noted on drawings.

2.02 GROUT

- A. Non-shrinking Master Builder's "Embedco", Conrad Sovig's "metel-Mxs Grout", Sonneborn's "Ferrolith G Redi-Mixed Grout" or approved equal.

2.03 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation for miscellaneous metals, shall be new, first quality of their respective kinds and subject to the approval of the City Engineer.

PART 3 EXECUTION

3.01 EXISTING CONDITIONS

- A. Inspection: Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- B. Discrepancies: In the event of discrepancy, immediately notify the Owner's Representative.

3.02 COORDINATION

- A. General: Install metal fabrications in strict accordance with the Drawings, the approved Shop Drawings, and all pertinent codes, regulations and standards.
- B. Delivery: Insure timely delivery of all metal fabrications that must be installed in other work so as not to delay that work.

3.03 INSTALLATION

A. General:

1. Install metal fabrications in strict accordance with the drawings, the approved Shop Drawings, and all pertinent codes, regulations and standards.
2. Obtain Engineer review prior to site cutting or making adjustments which are not part of scheduled work.
3. Install items square and level, accurately fitted and free from distortion or defects.
4. Align all metal fabrications as shown on the Drawings, and where vertical or horizontal members are shown, align them straight, plumb and level within a tolerance of 1 in 500.
5. Make provisions for erection stresses by temporary bracing. Keep work in alignment.
6. Replace items damaged in course of installation.
7. Perform field welding in accordance with AWS D1.1
8. After installation, grind and touch-up field welds.

3.04 WORKMANSHIP

- A. Layout: Set all work plumb, true, rigid, and neatly trimmed out. Miter corners and angles of exposed molding and frames unless otherwise noted.
- B. Fitting: Fit exposed connections accurately together to form tight hairline joints.
- C. Labor: Employ only workmen specifically skilled in such work.

3.05 FABRICATION

- A. Shop assemble in largest practicable dimensions, making members true to length so assembling may be done without fillers.
- B. Provide all surfaces free of file marks, dents, hammer marks, wire edges or any unsightly surface defects.
- C. STEEL PIPE COPING: Roll pipe to conform to top radius curve of each bowl and ledge as shown on drawings. Refer to drawings for relational tolerance to concrete surface and other steel.

3.06 ATTACHMENTS AND REINFORCEMENTS

- A. Do all cutting, shearing, drilling, punching, threading, tapping, etc., required for site metalwork or for attachment of adjacent work. If applicable, drill or punch holes; do not use cutting torch.

3.07 OTHER CONNECTORS

- A. Make all permanent connections in ferrous metal surfaces using welds where at all possible; do not use bolts or screws.

3.08 WELDING

- A. Preparation: Remove all rust, paint, scale and other foreign matter. Wire-brush all flame-cut edges. Clamp members as required and alternate welds, all as necessary to prevent warping or misalignment.
- B. Exposed Welds: Uniformly grind smooth (no tolerance) all welds normally exposed to view and feel in the finished work.
- C. Faulty and Defective Welding: Chip out and replace all welding showing cracks, slag inclusion, lack of fusion, bad undercut or other defects ascertained by visual or other means of inspection. Replace and re-weld at no cost to Owner.
- D. Field Welding:

1. Procedure: Comply with AWS code of manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding work. Cold Spray Galvanize when complete.
2. Protection: Protect all adjacent surfaces from damage due to weld sparks, spatter, or tramp metal.

3.09 SURFACE TREATMENT AND PROTECTIVE COATINGS

- A. Cleaning:
 1. Thoroughly clean all mill scale, rust, dirt, grease and other foreign matter from ferrous metal prior to any galvanizing, or painting.
 2. Conditions that are too severe to be removed by hand cleaning, shall be cleaned using appropriate methods for solvent cleaning, power tool cleaning and brush-off blast cleaning.
- B. Exterior Ferrous Metal:
 1. Grind smooth all welds, burrs, and rough surfaces. Clean all coping from grease.
 2. Shop coat iron metal items; using anti-rust primer (red color).
 3. All welds to be painted with primer after appropriate connections and grinding has taken place. Touch-up all scratched primer prior to shotcrete application.

3.10 CLEAN-UP

- A. Keep all areas of work clean, neat and orderly at all times. Keep paved areas clean during installation.
- B. Clean up and remove all debris from the entire work area prior to Final Acceptance.

END OF SECTION 05 51 00

SECTION 09 91 00

EXTERIOR AND INTERIOR PAINTING, SEALERS AND COATINGS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes surface preparation and the application of paint, sealer and coating systems on the following exterior and interior substrates:
 - 1. Concrete.
 - 2. Concrete masonry units (CMU).
 - 3. Steel.
 - 4. Galvanized metal.
 - 5. Aluminum (not anodized or otherwise coated).
 - 7. Stucco.

1.3 DEFINITIONS

- A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. Gloss Level 2: Not more than 10 units at 60 degrees and 35 units at 85 degrees, according to ASTM D 523.
- C. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- D. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- E. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- F. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- G. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.
- H. EG: Ethylene Glycol. Ethylene glycol is listed as a hazardous air pollutant (HAP) by the U.S. EPA
- I. Blocking: Two painted surfaces sticking together such as a painted door sticking to a painted jamb.
- J. RAVOC: Reactivity adjusted VOC 'Reactivity' means the ability of a VOC to promote ozone formation.
- K. PDCA: Painting & Decorating Contractors of America www.pdca.org
- L. SSPC: Scopes of SSPC Surface Preparation Standards and Specifications. www.sspc.org.
- M. Green Wise: Green Wise products are tested in an ISO accredited laboratory to meet environmentally determined performance standards established by Coatings Research Group, Inc.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: For each type of product, include preparation requirements and application instructions.
- C. Verification Samples: For each type of paint system and each color and gloss of topcoat.
 - 1. Submit Samples on rigid backing, no smaller than 7 inches by 10 inches

(177.8 mm by 254 mm) or larger than 8.5 inches by 11 inches (215.9 mm by 279.4 mm).

2. Label each sample for project, architect, general contractor, painting contractor, paint color name and number, paint brand name, Color Schedule designation number as indicated on Drawings, and application area.

1.5 MAINTENANCE MATERIALS SUBMITTALS

- A. Furnish extra materials of each material and product applied, minimum 1 gallon, from the same product run that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1.6 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
 - b. Other Items: Architect will designate items or areas required.
 2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to site in manufacturer's unopened bundles with labels intact and legible.
- B. Store all products in manufacturer's unopened, labeled packaging until they are ready for installation.
- C. Handle and store materials on site to prevent damage. Store products in a covered, well-ventilated area, with ambient temperature continuously maintained not more than 110 degrees Fahrenheit (43 degrees Celsius) and not less than 45 deg F (7 deg C); do not store near steam pipes, radiators, or in direct sunlight.
- D. Maintain containers in clean condition, free of foreign materials and residue.
- E. Remove rags and waste from storage areas daily.

1.8 PROJECT FIELD CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install paint systems under environmental conditions outside manufacturer's recommended limits.
 1. Proceed with work only when existing and forecasted weather conditions will permit work to be performed in accordance with manufacturer's recommendations.
 2. Do not apply paints in snow, rain, fog or mist; when relative humidity exceeds 85%; at temperatures less than 5degF above the dew point; or to damp or wet surfaces.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Paint Products Basis-of-Design: Subject to compliance with requirements, provide products listed from Dunn-Edwards Corporation for the paint category indicated, or comparable products by one of the following:
 - 1. Sherwin Williams.
 - 2. Benjamin Moore.
- B. Sealer and Anti Graffiti Products Basis-of-Design: Subject to compliance with requirements, provide products listed from Coval Molecular Coatings for the coating category indicated.
- C. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed in other Part 2 articles for the paint category indicated.
- D. Requests for substitutions will be considered in accordance with provisions of Section 01300.

2.2 PAINT, GENERAL

- A. Material Compatibility
 - 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- B. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.
- C. LEED Credit: Products that meet LEED requirements are eligible for use on interior substrates. Incorporating LEED materials on exteriors will not contribute to points towards IEQ 4.2.
- D. Colorants: The use of colorants containing hazardous chemicals, such as ethylene glycol, is prohibited.
- E. Colors: As indicated in the Color Schedule on the Drawings.

2.3 BLOCK FILLERS

- A. Block Filler, Latex, Interior (except Garage) Precision and Slumpstone Block: Dunn-Edwards, Smooth Blocfil Select SBSL00 Smooth Block Filler, MPI #4.
 - 1.

<u>Physical Properties:</u>	<u>Spec:</u>
a. Resin Type:	Modified Copolymer
b. Solids by Volume:	50.5% +/-2%
c. Acrylic Resin:	7.8%
d. VOC:	50 g/L
e. RAVOC:	35 g/L
f. Conforms to:	LEED 2009 IEQ Credit 4.2
g. Certification:	Green Wise
 - 2.

<u>Testing:</u>	<u>Results:</u>
a. Topcoat Adhesion per ASTM D 3359 Method B:	Minimum #3
b. Alkali Resistance per MPI #4 Detailed Performance Standard:	No signs of blistering, lifting, wrinkling, disintegrating or more than slight color change compared to unexposed.

2.4 CMU PRIMERS / SEALERS

- A. Interior (except Garage): Dunn-Edwards
 - 1. Precision and Slumpstone Concrete Block:
 - a. Ultrashield Multi-Surface Primer ULMS00, single component, bonding water-based 100% acrylic primer, low sheen. Solids by Volume 40%, Acrylic Resin 43.3%, Prime pigment 13.7%, EG Free, 0 g/L VOC, 0 g/L RAVOC, Conforms to LEED 2009 IEQ Credit 4.2.
- B. Exterior: Dunn-Edwards
 - 1. New stucco:
 - a. EFF-Stop ESSL00 100% acrylic masonry primer/sealer, Solids by Volume 37% +/- 2%, Acrylic Resin 21%, EG Free, 50 g/L VOC, 30 g/L RAVOC, Conforms to LEED 2009 IEQ Credit 4.2, Green Wise Certification.
 - b. Ultrashield Multi-Surface Primer ULMS00, single component, bonding water-based 100% acrylic primer, low sheen. Solids by Volume 40%, Acrylic Resin 43.3%, Prime pigment 13.7%, EG Free, 0 g/L VOC, 0 g/L RAVOC, Conforms to LEED 2009 IEQ Credit 4.2.
- C. Raw Slumpstone Block sealer: Coval Concrete Coat, clear matte finish.
- D. Designated finished surfaces: Coval Anti Graffiti Coat, clear matte.

2.5 METAL PRIMERS

- A. Interior/Exterior: Dunn-Edwards
 - 1. New Galvanized Steel and Galvanized Sheet Metal
 - a. Pretreatment: Supreme Chemical Metal Clean & Etch ME01.
 - b. Ultrashield Multi-Surface Primer ULMS00, single component, bonding water-based 100% acrylic primer, low sheen. Solids by Volume 40%, Acrylic Resin 43.3%, Prime pigment 13.7%, EG Free, 0 g/L VOC, 0 g/L RAVOC, Conforms to LEED 2009 IEQ Credit 4.2.
 - 2. Previously Painted Metal
 - a. Ultrashield Multi-Surface Primer ULMS00, single component, bonding water-based 100% acrylic primer, low sheen. Solids by Volume 40%, Acrylic Resin 43.3%, Prime pigment 13.7%, EG Free, 0 g/L VOC, 0 g/L RAVOC, Conforms to LEED 2009 IEQ Credit 4.2.

2.6 WOOD PRIMERS

- A. Interior/Exterior: Dunn-Edwards
 - 1. Unpainted wood
 - a. EZ-Prime Premium EZPR00 exterior acrylic wood primer. Solids by Volume 41% +/- 2%, Acrylic Resin 23.7%, Prime Pigment 14.4%, EG Free, 50 g/L VOC, 20 g/L RAVOC, Conforms to LEED 2009 IEQ Credit 4.2, Green Wise Certification.
 - b. Ultrashield Multi-Surface Primer ULMS00, single component, bonding water-based 100% acrylic primer, low sheen. Solids by Volume 40%, Acrylic Resin 43.3%, Prime pigment 13.7%, EG Free, 0 g/L VOC, 0 g/L RAVOC, Conforms to LEED 2009 IEQ Credit 4.2.
 - c. Wood-Knot Sealer: Rust-Oleum Zinsser BIN, MPI#36, as distributed by Dunn-Edwards. Description: Pigmented shellac.
 - 2. Previously Painted Wood
 - a. Ultra-Grip Premium Primer UGPR00, bonding water-based acrylic primer, low sheen. Solids by Volume 41% +/- 2%, Acrylic Resin 22.8%, Prime Pigment 15.1%, EG Free, 50 g/L VOC, 20 g/L RAVOC, Conforms to LEED 2009 IEQ Credit 4.2, Green Wise Certification.

2.7 EPOXY PRIMERS (Not Used)

2.8 WATER-BASED PAINTS

A. Interior/Exterior: Dunn-Edwards

1. Ultrashield ULSH40 Series, High Performance Zero VOC Architectural Coating. Water Based, low sheen (Gloss Level 4)
 - a. Physical Properties: Acrylic Urethane Resin, Solids by Volume 33% +/- 3%, Acrylic Resin 51.6%, Prime Pigment 23.2%, EG Free, 0 g/L VOC, 0 g/L RAVOC, Conforms to LEED 2009 IEQ Credit 4.2.
 - b. Testing:
 - 1) Accelerated Weathering per ASTM D 4587 QUV Type A bulb, 450 hours. Results: 93% gloss retention (Gloss Black)
 - 2) Impact Resistance Per ASTM D2794. Results: >160 lbs (direct).
 - 3) Conical Flexibility per ASTM D522. Results: >33%.
 - 4) Pencil Hardness per ASTM D3363. Results: 3B.
2. Ultrashield ULSH50 Series, High Performance Zero VOC Architectural Coating, Water Based, Direct-To-Metal, Semi-Gloss (Gloss Level 4)
 - a. Physical Properties: Acrylic Urethane Resin, Solids by Volume 40% +/- 2%, Acrylic Resin 55.5%, Prime Pigment 19.4%, EG Free, 0 g/L VOC, 0 g/L RAVOC, Conforms to LEED 2009 IEQ Credit 4.2.
 - b. Testing:
 - 1) Cyclical Prohesion per ASTM D 5894, 2 cycles, 672 hours. Results: 10 per ASTM D714 for blistering, 10 per ASTM D1654 for corrosion, 10 per ASTM D610 for rusting. (Rating 1-10, 10= best)
 - 2) Crosshatch Adhesion per ASTM D3359-87. Results: 5A.
 - 3) Conical Flexibility per ASTM D522. Results: 180 deg on ½" Mandrel.
 - 4) Salt Spray Resistance per ASTM B117, CRS, 30 day cure. Results: >800 hours (@ 4 mils DFT).
3. Ultrashield ULSH60 Series, High Performance Zero VOC Architectural Coating, Water Based, Direct-To-Metal, Gloss (Gloss Level 6)
 - a. Physical Properties: Acrylic Urethane Resin, Solids by Volume 37% +/- 1%, Acrylic Resin 52.4%, Prime Pigment 23.2%, EG Free, 0 g/L VOC, 0 g/L RAVOC, Conforms to LEED 2009 IEQ Credit 4.2.
 - b. Testing:
 - 1) Accelerated Weathering per ASTM D 4587 QUV Type A bulb, 450 hours. Results: 93% gloss retention (Gloss Black)
 - 2) Impact Resistance Per ASTM D2794. Results: >160 lbs (direct).
 - 3) Conical Flexibility per ASTM D522. Results: >33%.
 - 4) Pencil Hardness per ASTM D3363. Results: 3B.
4. Spartshield SSSL20, velvet finish 5-9% on a 60 degree meter/ 10-15% on an 85 degree meter ASTM D 523, 45 g/L VOC, 100% acrylic waterborne exterior paint. 39% Solids by Volume ASTM D 2697. Film Thickness per coat: 3.9 mils wet, 1.5 mils dry.
5. Spartshield Spartshield SSSL40, low sheen finish ASTM D 523, 50 g/L VOC, 100% acrylic waterborne exterior paint. 37.8% Solids by Volume ASTM D 2697. Film Thickness per coat: 4.0 mils wet, 1.5 mils dry.

2.9 CONCRETE FLOOR SEALER AND ANTI GRAFFITI COATING FOR POROUS SURFACES

- ### A. Coval Concrete Coat, clear matte finish.
- 39.11 on ASTM Taber Abrasive test D-3363; 70-75 on the Rockwell Scale and 7-7.5 on the Mohs Scale means the coatings have a high resistance to usual wear and tear. Less than 100g/L VOC. Carcinogen free.

2.10 ANTI GRAFFITI COATING FOR NON-POROUS SURFACES

- A. Coval Anti Graffiti Coat, clear matte finish. 39.11 on ASTM Taber Abrasive test D-3363; 70-75 on the Rockwell Scale and 7-7.5 on the Mohs Scale means the coatings have a high resistance to usual wear and tear. Less than 100g/L VOC. Carcinogen free.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Concrete: 12 percent.
 - 2. Masonry (Clay and CMU): 12 percent.
 - 3. Wood: 15 percent.
 - 4. Portland Cement Plaster: 12 percent.
 - 5. Gypsum Board: 12 percent.
- C. Portland Cement Plaster Substrates: Verify that plaster is fully cured, including pH testing to determine that alkalinity is within limits established by the manufacturer.
- D. Exterior Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- E. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- F. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not seal or paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Masonry Substrates: Remove efflorescence and chalk. Do not seal or paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.
- F. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer[.] [but not less than the following:]
 - 1. SSPC-SP 1, "Solvent Cleaning."
 - 2. SSPC-SP 2, "Hand Tool Cleaning."
 - 3. SSPC-SP 3, "Power Tool Cleaning."
 - 4. SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 5. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."
 - 6. SPC-SP 11, "Power Tool Cleaning to Bare Metal."

- G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- I. Aluminum Substrates: Remove loose surface oxidation.
- J. Wood Substrates:
 - 1. Scrape and clean knots. Before applying primer, apply coat of knot sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.
 - 2. Sand surfaces that will be exposed to view, and dust off.
 - 3. Prime edges, ends, faces, undersides, and backsides of wood.
 - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. The number of coats scheduled is the minimum number of coats required. Additional coat(s) shall be applied at no additional cost to the Owner, to completely hide base material, provide uniform color, and to produce satisfactory finish results.
 - 3. Apply coatings without thinning except as specifically required by label directions, or required by these specifications. In such cases, thinning shall be the minimum reduction permitted.
 - 4. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
 - 5. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
 - 6. Paint entire exposed surface of window frames and sashes.
 - 7. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 8. Priming may not be required on items delivered with prime or shop coats, unless otherwise specified. Touch up prime coats applied by others as required ensuring an even primed surface before applying finish coat.
- B. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- C. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- D. Block Fillers: Provide block fill as scheduled to conform to the following: PDCA Standard P12-05.
 - 1. Level 3 - Premium fill: One or multiple coats of high performance block filler manufactured to be applied at a high dry film build. Block filler shall be back-rolled to eliminate voids and reduce the majority of the masonry profile depth.
- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 - 1. Paint the following work where exposed to view at exterior and public interior spaces:
 - a. Equipment, including panelboards and switch gear.
 - b. Uninsulated metal piping.

- c. Uninsulated plastic piping.
- d. Pipe hangers and supports.
- e. Metal conduit.
- f. Plastic conduit.
- g. Tanks that do not have factory-applied final finishes.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
 - 1. Contractor shall touch up and restore painted surfaces damaged by testing.
 - 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR AND INTERIOR PAINTING SCHEDULE

- A. MINIMUM COVERAGES (Color & Sheen as indicated on the Drawings)
 - 1. New Stucco:
 - a. 1 coat EFF-Stop ESSL00 acrylic masonry primer/sealer.
 - b. 2 coats of Spartashield SSHL20, exterior acrylic velvet paint.
 - c. 2 coats of Coval Anti Graffiti Coat, matte finish.
 - 2. New Concrete Block:
 - a. Clean dirt, dust, oil, etc. & dry.
 - b. Precision Block
 - 1) 1st coat: Smooth Blocfil Select SBSL00 Smooth Block Filler
 - 2) 2nd coat: Ultragrip Premium Primer UGPR00, tinted.
 - 3) 3rd coat: Mural by Public Artist, to be selected by Recreation & Parks Commission.
 - 4) Final Coat: 1 coat of Coval Anti Graffiti Coat, matte finish. (Anti-graffitti coating to be applied to non-mural side of block wall and public art (after mural is completed, coordinate application with public artist).
 - 3. Previously painted Stucco
 - a. Spot prime w/ EFF-Stop ESSL00 acrylic masonry primer
 - b. 2 coats of Spartashield SSHL20, exterior acrylic velvet paint.
 - c. 1 coat of Coval Anti-graffitti coat, clear matte finish.

END OF SECTION

SECTION 11 68 13

PLAYGROUND EQUIPMENT AND STRUCTURES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section includes playground equipment as follows:
 - 1. Playground equipment
- B. Related Requirements:
 - 1. Section 033000 "Cast-in-Place Concrete"
 - 2. Section 321816.13 "Playground Protective Surfacing"

1.03 DEFINITIONS

- A. Definitions in ASTM F1487 apply to Work of this Section.
- B. IPEMA: International Play Equipment Manufacturers Association.

1.04 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.05 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of playground equipment.
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Include fall heights and use zones for playground equipment, coordinated with the critical-height values of protective surfacing specified in Section 321816.13 "Playground Protective Surfacing."
- C. Samples for Initial Selection: For each type of exposed finish.
 - 1. Manufacturer's color charts.
 - 2. Include Samples of accessories involving color selection.

1.06 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer manufacturer and testing agency.
- B. Product Certificates: For each type of playground equipment.
- C. Sample Warranty: For manufacturer's special warranties.

1.07 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For playground equipment and finishes to include in maintenance manuals.

1.08 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm whose playground equipment components have been certified by IPEMA's third-party product certification service.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by the manufacturer.

1.09 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of playground equipment that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
 - 2. Warranty Period: Per specific manufacturer.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Source Limitations: Obtain playground equipment from single source from manufacturers shown per contract drawings.
- B. Playground equipment and components shall have the IPEMA Certification Seal.
- C. All playground equipment and components shall have the IPEMA Certification Seal:

2.02 PERFORMANCE REQUIREMENTS

- A. Safety Standard: Provide playground equipment according to ASTM F1487.

2.03 PLAYGROUND EQUIPMENT

- 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Landscape Structures Inc. – Available from Recwest Outdoor Products. Contact Nate Stutz at 818.735.3838. nate@recwest.com
 - b. Gametime- Available from Great Western Recreation. Contact Tyler Kyriopoulos at 435.760.5103. tyler@gwpark.com
- 2. 5–12-Year-Old Playground Products:
 - a. Swings: Landscape Structures Single Bay Arch Swing Frame with (1) one belt swing (#174018) and (1) one molded bucket seat w/ harness (#177351).
 - b. Climber: Landscape Structures Cascade Climber, 6-panel (#150976).
 - c. Standing Spinner: GameTime Shadowplay Sky Runner (#6237)
- 3. 2-5- & 5–12-Year-Old Playground Products:
 - a. Spring Bouncer: Landscape Structures ReviRock Bouncer (#295696).
- 4. Color Palette(s): As indicated per manufacturer custom drawing.
- 5. Substitutions: No substitutions

2.04 FABRICATION

- A. Provide sizes, strengths, thicknesses, wall thickness, and weights of components as required to comply with requirements in ASTM F1487. Factory drill components for field assembly. Unnecessary holes in components, not required for field assembly, are not permitted. Provide complete play structures, including supporting members and connections, means of access and egress, designated play surfaces, barriers, guardrails, handrails, handrails, handholds, and other components indicated or required for equipment indicated.
- B. Metal Frame: Fabricate main-frame upright support posts from metal pipe or tubing with cross-section profile and dimensions as required. Unless otherwise indicated, provide each pipe or tubing main-frame member with manufacturer's standard drainable bottom plate or support flange. Fabricate secondary frame members, bracing, and connections from either steel or aluminum.
- C. Wood Frame: Fabricate main-frame upright support posts from wood. Fabricate secondary frame members, bracing, and connections from wood, steel, or aluminum.
- D. Composite Frame: Fabricate main-frame upright support posts from metal and plastic. Fabricate secondary frame members, bracing, and connections from either steel or aluminum.
- E. Play Surfaces: Manufacturer's standard elevated drainable decks, platforms, landings, walkways, ramps, and similar transitional play surfaces, designed to withstand loads; fabricated from perforated or expanded metal molded plastic made into floor units with slip-resistant finish. Fabricate units in modular sizes and shapes to form assembled play surfaces indicated.
- F. Protective Barriers: Fabricate according to ASTM F1487 Extend barriers to height above the protected elevated surface according to requirements for use by age group indicated. Fabricate from one or more of the following:
 - 1. Welded-metal pipe or tubing with vertical bars.
 - 2. Steel sheet with openings for vision and ventilation.
 - 3. Metal-pipe or -tubing frame with wire-mesh infill panels.
 - 4. Plastic panels.

5. Vertical wood balusters with metal pipe or tubing or wood frame.
6. Wood panels with openings for vision and ventilation.
- G. Guardrails: Provide guardrails configured to completely surround the protected area, except for access openings. Fabricate from welded metal pipe or tubing. Extend guardrails according to requirements for use by age group indicated.
- H. Handrails: Welded metal pipe or tubing.
 1. Provide handrails at heights to comply with requirements for use by age group indicated according to ASTM F1487.
- I. Signs: Manufacturer's standard sign panels, fabricated from welded-metal pipe or tubing with opaque plastic with graphics.
 1. Text: Minimum informational content according to ASTM F1487
 2. Colors: Per color palette indicated on plans.

2.05 MATERIALS

- A. Steel: Material types, alloys, and forms recommended by manufacturer for type of use and finish.
- B. Certified Wood: Certify wood products as "FSC Pure" or "FSC Mixed Credit" in accordance with FSC STD-01-001 and FSC STD-40-004.
- C. Opaque Plastics: Color impregnated, UV stabilized, and mold resistant.
- D. Transparent Plastic: Abrasion-resistant, UV-stabilized polycarbonate sheet; not less than 3/16 inch thick.
- E. Suspension Chain and Fittings: ASTM A467/A467M, Class CS, 4/0 or 5/0, welded-straight-link coil chain; hot-dip galvanized, or PVC coated; with commercial-quality, hot-dip steel connectors and swing or ring hangers.
- F. Suspension Cable: Manufacturer's standard hot-dip galvanized or PVC-coated cable; with commercial-quality, hot-dip galvanized steel connectors and swing or ring hangers.
- G. Iron Castings and Hangers: Malleable iron, ASTM A47/A47M, Grade 32510, hot-dip galvanized.
- H. Post Caps: Cast aluminum or color-impregnated, UV-stabilized, mold-resistant polyethylene or polypropylene; color to match posts.
- I. Platform Clamps and Hangers: Cast aluminum Insert requirement.
- J. Hardware: Manufacturer's standard; commercial-quality; corrosion-resistant; hot-dip galvanized steel and iron, stainless steel, or aluminum; of a vandal-resistant design.
- K. Fasteners: Manufacturer's standard; corrosion-resistant; hot-dip galvanized or zinc-plated steel and iron, or stainless steel; permanently capped; and theft resistant.

2.06 CAST-IN-PLACE CONCRETE

- A. Concrete Materials and Properties: Comply with requirements for normal-weight concrete with minimum 28-day compressive strength of 4000 psi, 3-inch slump, and 1-1/2-inch-maximum-size aggregate.
- B. Concrete Materials and Properties: Dry-packaged concrete mix complying with ASTM C387/C387M and mixed at site with potable water, according to manufacturer's written instructions, for normal-weight concrete with minimum 28-day compressive strength of 4000 psi, 3-inch slump, and 1-1/2-inch-maximum-size aggregate.

2.07 IRON AND STEEL FINISHES

- A. Baked-Enamel or Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils. Comply with coating manufacturer's written instructions for pretreatment, applying, and baking.
- B. PVC Finish: UV-stabilized, mold-resistant, slip-resistant, matte-textured, dipped or sprayed-on PVC finish, with flame retardant added, and with minimum dry film thickness of 80 mils. Comply with coating manufacturer's written instructions for pretreatment and application.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for earthwork, subgrade elevations, surface and subgrade drainage, and other conditions affecting performance of the Work.
 - 1. Do not begin installation before final grading required for placing playground equipment and protective surfacing is completed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Comply with manufacturer's written installation instructions for each equipment type unless more stringent requirements are indicated. Anchor playground equipment securely, positioned at locations and elevations indicated.
 - 1. Maximum Equipment Height: Coordinate installed fall heights of equipment with finished elevations and critical-height values of protective surfacing. Set equipment so fall heights and elevation requirements for age group use and accessibility are within required limits. Verify that playground equipment elevations comply with requirements for each type and component of equipment.
- B. Post and Footing Excavation: Excavate holes for posts and footings as indicated in firm, undisturbed or compacted subgrade soil.
- C. Post Set with Concrete Footing: Comply with Section 033000 "Cast-in-Place Concrete" for measuring, batching, mixing, transporting, forming, and placing concrete.
 - 1. Set equipment posts in concrete footing. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at the correct angle, alignment, height, and spacing.
 - a. Place concrete around posts and vibrate or tamp for consolidation. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.
 - 2. Embedded Items: Follow equipment manufacturer's written instructions and drawings to ensure correct installation of anchorages for equipment.
 - 3. Finishing Footings: Smooth top, and shape to shed water.

3.03 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Playground equipment items will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.
- D. Notify Architect and Owner 48 hours in advance of date(s) and time(s) of testing and inspection.

END OF SECTION 11 68 13

SECTION 11 68 23

OUTDOOR EXERCISE EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section includes exercise equipment as follows:
 - 1. Outdoor Exercise Equipment
 - 2. Exterior Basketball Equipment
- B. Related Requirements:
 - 1. Section 033000 "Cast-in-Place Concrete"
 - 2. Section 321540 – "Stabilized Decomposed Granite Paving"
 - 3. Section 321313- "Concrete Paving"

1.03 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.04 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of exercise equipment.
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Include clear use zones for equipment.
- C. Samples for Initial Selection: For each type of exposed finish.
 - 1. Manufacturer's color charts.
 - 2. Include Samples of accessories involving color selection.

1.05 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer manufacturer and testing agency.
- B. Product Certificates: For each type of exercise equipment.
- C. Sample Warranty: For manufacturer's special warranties.

1.06 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For equipment and finishes to include in maintenance manuals.

1.07 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.08 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of exercise equipment that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Source Limitations: Obtain exercise equipment from single source from single manufacturer.

2.02 PERFORMANCE REQUIREMENTS

- A. Safety Standard: Exercise equipment and components shall meet ASTM F3101-15 Standard Specification for Unsupervised Public Use Outdoor Fitness Equipment.

2.03 EXERCISE EQUIPMENT

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Greenfields Outdoor Fitness – Contact Frank Vasquez at 949.424.8857, <https://gfoutdoorfitness.com/> or frank@greenfieldsfitness.com
2. Exercise Equipment:
 - a. Leg Press: Greenfields Outdoor Fitness - 2-Person Leg Press, Model #: SHP505-03.
 - b. Chest Press: Greenfields Outdoor Fitness – Accessible Chest Press, Model #: SGR048AW-03.
 - c. Elliptical: Greenfields Outdoor Fitness - Single Elliptical Cross Trainer, Model #: SHP503-03.
3. Color Palette: Standard green/tan color palette as supplied by manufacturer.
4. Substitutions: No substitutions.

2.04 BASKETBALL EQUIPMENT

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Gared Holdings, LLC 9200 E. 146th Street Bldg. A, Noblesville, IN 46060. Phone: 800-325-2682. Website: www.garedsports.com
2. Basketball Equipment
 - a. Gooseneck Backboard System Package #PK4560: Type- Front, Board: 1260B, Goal: 240, Brace: AAB35-12, Brace Kit: 15G453947, Post: GN45
3. Color Palette: Galvanized steel post, board and goal colors per manufacturer.
4. Substitutions: No substitutions.

2.05 FABRICATION

- A. Provide sizes, strengths, thicknesses, wall thickness, and weights of components as required to comply with requirements in ASTM F3101-15. Factory drill components for field assembly. Unnecessary holes in components, not required for field assembly, are not permitted. Provide complete exercise equipment structures, including supporting members and connections, means of access and egress, handholds, and other components indicated or required for equipment indicated.
- B. Signs: Manufacturer's standard sign panels, fabricated from welded-metal pipe or tubing with graphics.
 1. Text: Minimum informational content according to ASTM F3101-15.
 2. Colors: Per color palette indicated on plans.

2.06 MATERIALS

- A. Steel: Material types, alloys, and forms recommended by manufacturer for type of use and finish.
- B. Opaque Plastics: Color impregnated, UV stabilized, and mold resistant.
- C. Hardware: Manufacturer's standard; commercial-quality; corrosion-resistant; hot-dip galvanized steel and iron, stainless steel, or aluminum; of a vandal-resistant design.

- D. Fasteners: Manufacturer's standard; corrosion-resistant; hot-dip galvanized or zinc-plated steel and iron, or stainless steel; permanently capped; and theft resistant.

2.07 CAST-IN-PLACE CONCRETE

- A. Concrete Materials and Properties: Comply with requirements on structural drawings for normal-weight concrete with minimum 28-day compressive strength of 4000 psi, 3-inch slump, and 1-inch- maximum-size aggregate.
- B. Concrete Materials and Properties: Dry-packaged concrete mix complying with ASTM C387/C387M and mixed at site with potable water, according to manufacturer's written instructions, for normal-weight concrete with minimum 28-day compressive strength of 3200 psi, 3-inch slump, and 1-inch- maximum-size aggregate.

2.08 IRON AND STEEL FINISHES

- A. Baked-Enamel or Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils. Comply with coating manufacturer's written instructions for pretreatment, applying, and baking.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for earthwork, subgrade elevations, surface and subgrade drainage, and other conditions affecting performance of the Work.
 - 1. Do not begin installation before final grading required for placing exercise equipment and adjacent surfacing is completed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Comply with manufacturer's written installation instructions for each equipment type unless more stringent requirements are indicated. Anchor exercise equipment securely, positioned at locations and elevations indicated.
- B. Post and Footing Excavation: Excavate holes for posts and footings as indicated in firm, undisturbed or compacted subgrade soil.
- C. Post Set with Concrete Footing: Comply with Section 033000 "Cast-in-Place Concrete" for measuring, batching, mixing, transporting, forming, and placing concrete.
 - 1. Set equipment posts in concrete footing. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at the correct angle, alignment, height, and spacing.
 - a. Place concrete around posts and vibrate or tamp for consolidation. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.
 - 2. Embedded Items: Follow equipment manufacturer's written instructions and drawings to ensure correct installation of anchorages for equipment.
 - 3. Finishing Footings: Smooth top, and shape to shed water.

3.03 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Exercise equipment items will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.
- D. Notify Architect and Owner 48 hours in advance of date(s) and time(s) of testing and inspection.

END OF SECTION 11 68 23

SECTION 13 34 00

FABRICATED ENGINEERED STRUCTURES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This section includes all material and labor required in the fabrication and placement of the "Portland Loo" facility as shown in drawings.

1.02 SCOPE

- A. Building materials shall be supplied by Portland Loo Inc.
 - 1. Portland Loo Inc. 2550 NW 25th Place Portland, OR 97210. Phone: 503-226-3968; Fax: 503-242-2446, E-mail: emadden@theloo.biz or approved equal.
- B. Generally, work will include site preparation, installation of underground plumbing, foundation, and pad construction, and building placement.
- C. Requests for substitution shall be submitted to the Owner a minimum of 10 days prior to bid date. The request shall be a complete package as noted below:
 - 1. Documents to be in CSI Format.
 - 2. Product literature/or brochure illustrating appearance, layout, building shape, materials, and assembly manual.
 - 3. Certificate from manufacturer that the proposed substitution follows all provisions of this specification.
 - 4. List of five (minimum) completed projects, including contact names and phone numbers, that are similar in scope and magnitude.
 - 5. Proof of at least five years of experience as a pre-engineered building supplier.
 - 6. Building permit from the city building & safety division.

1.03 DOCUMENTATION

Provide all necessary documents for approval and installation.

- A. Construction documents include:
 - 1. Detailed plans
 - 2. Specifications
- B. Floor plan dimensions: 6'-4" W x 10'-7" L x 8'-9¹/₂" Tall

1.04 REFERENCES

- A. ASTM A-240.
- B. ASTM A-554.
- C. ASTM A650 Grade 60.
- D. ADAAG
- E. CBC
- F. CSFM
- G. ANSI
- H. ASME
- I. MILITARY SPECIFICATION V-29193

1.05 DESIGN CRITERIA

- A. Members to withstand dead load, design loads and wind loads as calculated in accordance with the latest version of state and local building codes.
- B. Portland Loo Inc. reserves the right to make substitutions of equivalent materials and items without notice.
- C. Design loads: Refer to drawings.

- D. Accessibility: Design shall meet the Americans with Disabilities Act Accessibility Guidelines (ADAAG) and California Building Codes.

1.06 SUBMITTALS

- A. Indicate profiles, sizes, spacing(s), location of structural members, connections, attachments, openings, fasteners, loads and reinforcements.
- B. Indicate wall and roof system dimensions, panel layout, general construction details, anchorages and method of anchorage, and method of installation.
- C. Submit manufacturer's installation instructions, manuals, and data sheets.
- D. The "Portland Loo Restroom" building, and all its associated components shall be warranted against defects in materials and workmanship for a period of one year from date of final acceptance.

1.07 WORK SUPPLIED BY INSTALLER

- A. The items noted as "*supplied by installer*" shall be supplied by the building installer.
- B. Refer to drawings for quantities, dimensions, locations, and installations methods for items described in this section.
- C. The installer shall supply any parts not listed in the Portland Loo Inc. submittal, including but not limited to items specified in the final plans and items required by building codes.
- D. The installer shall be responsible for ensuring that the concrete foundation and slab are adequate for the site conditions and the purpose for which the building and foundation/slab are intended.
- E. All equipment, labor, and trades to unload the building, excavate the site, install the underground plumbing, build concrete forms, supply, and install the reinforced concrete footings and slab, and install the building and fixtures.
- F. 1-1/2" minimum water line is required to supply the toilet and hand wash facility shall be included. At 1-1/2" the water line must have no longer that 100' run to the water meter. (All dimensions and will be site specific).
- G. 4" ABS sanitary sewer line is required to service the restroom shall be included.
- H. The building installer is responsible for the supply and installation of all other items indicated on final plans or required by building codes. Portland Loo Inc. does not supply these items.

PART 2 - PRODUCTS

2.01 CONCRETE

Slab and footings *supplied by installer* - 4000 psi strength at 28 days ii. ASTM A615 grade 60 rebar reinforcement.

2.02 STEEL

- A. Prefabricated building frame posts supplied by Portland Loo Inc. - The prefabricated steel frame is to be constructed of 3" ASTM 304L stainless tube steel.
- B. Prefabricated roof system supplied by Portland Loo Inc.
 - 1. The prefabricated roof will consist of 3/16" ASTM A304L Stainless Steel plate, with 1/4" ASTM A304L Stainless Steel plate formed around the exterior for fascia.
 - 2. The prefabricated roof system will include (4) 2000# lifting eyes that will act as pick points for the prefabricated roof system. In addition, (4) 1" x 3" slotted drains for water runoff shall be included.
- C. Wall panels supplied by Portland Loo Inc.
 - 1. The wall panels will be 3/16" ASTM A304 Stainless steel structural plate steel.
 - 2. All wall panels are channel formed around the perimeter and bolted to the prefabricated building frame.
 - 3. Water guards will be supplied to keep leaves and other debris from entering the loo from underneath the louvers.

2.03 OPENINGS

- A. Louvers supplied by Portland Loo Inc.
 - 1. The frame and louvers will be fabricated from 1/4" 304/304L ASTM A240A stainless steel plate. Louver panels will be bolted to steel fabricated frames and columns.
- B. Skylight supplied by Portland Loo Inc.
 - 1. Pre-assembled 304/304L ASTM A240A stainless steel frame with 1/8" translucent double pane 1/8" tempered glass. Base frame to be seal welded to roof and glass panel secured using 304/304L ASTM removable cover plate with drip edge.
- C. Main door supplied by Portland Loo Inc.
 - 1. 3/16" 5052 Aluminum ASTM B209-14- aluminum plate with formed edges around perimeter, 3/16" Formed channel stiffeners, and an integrated door louver fabricated from 3/16" 5052 Aluminum-Alloy plate.
 - 2. Door hinges shall be barrel hinges with zerk fittings welded to 1/4" x 3" x 5" plates. Hinges shall be attached with 3/8-16 vandal resistant security screws.
 - 3. Lever lock shall be Best HD door lever 9k series complies with ADA and California Fire Safety Code (CSFM). Dormitory locking feature to keep door from locking after departure. Satin Chrome finish. Installation onsite with supplied hardware.
 - 4. Door closer shall be Norton 9540 689 inside surface mounted door closer with fast power adjust, shall comply with ADA requirements. Door closer shall be tested and certified under ANSI Standard A156.4, grade one.
 - 5. Electric door lock shall be a HES 1006 Series Electric Strike 24 volt controlled by an INTERMATIC FM1D14 timer.
- D. Mechanical room doors supplied by Portland Loo Inc.
 - 1. 3/16" ASTM A304 Stainless Steel plate.
 - 2. Door hinges shall be type 304 stainless steel lift off hinges 1849A34.
 - 3. Locks to be (2) Stanley BEST 8T-2-7-L-STK-626 Grade 1 Cylinder/Blank Deadbolt with a 2-3/8 Backset in Satin Chrome. Cores passed ANSI/BHMA A156.11, grade 1 testing. Satin chrome finish to accept Best large format IC cores by installer. Qty 1 per door.

2.04 PLUMBING

- A. Toilet supplied by Portland Loo Inc.
 - 1. Acorn Dura-Ware 2105 Series wall hung, 16-ga. type 304 stainless steel. Seamlessly welded from a one-piece vandal resistant unit. Fully enclosed trap, Siphon Jet flushing action, and integral elongated seat. Designed for low consumption with appropriate flush valve.
 - 2. Designed to meet or exceed UPC 407.1 for hydraulic performance and physical dimensions.
 - 3. Exposed surfaces polished to a satin finish.
- B. Plumbing System.
 - 1. Plumbing manifold and vent will be constructed with PVC (Schedule 40) in accordance with UPC Code 604.1 and 701.2.
 - 2. Plumbing vent will be 4" wide to meet or exceed UPC 904.1 constructed out of Schedule 40 PVC.
- C. Exterior hand wash station supplied by Portland Loo Inc.
 - 1. Acorn BPH chrome plated brass filler spout with push button actuator and a pneumatic valve.
 - 2. Acorn 03-M pneumatic metering valve.
 - 3. Acorn PBH air-trol push button requires less than 5 lb force operation.
- D. Flushometer supplied by Portland Loo Inc.
 - 1. Sloan manual concealed flushometer for wall hung water closets, 14.5" rough in, rear spud, offset activation, 1.28 gpf/4.8 Lpf, wall box.
 - 2. Valve body, cover, tailpiece, and control stop shall be in conformance with ASTM alloy classification for semi-red brass.

3. Valve shall comply to the applicable sections of UPC 413.2, and military specification V-29193.
4. ADA compliant non-hold-open feature type actuator.

2.05 FURNISHINGS

- A. Grab bars supplied by Portland Loo Inc.
 1. WH Cress 6800 series stainless steel grab bars, 4-ga, satin finish 1-1/2" outside diameter 22-ga round snap on concealed mount.
- B. Toilet paper dispenser supplied by Portland Loo Inc.
 1. One, 4-roll 12ga 304 Stainless steel, rolling dispenser with 1" long, lockable.
- C. Hand sanitizer dispenser supplied by Portland Loo Inc.
 1. McMaster 2783K26 Chrome-plated Gravity-Flow Valve fed from interior reservoirs.
 2. High impact polystyrene soap vessel liner, chrome-plated brass soap valve with ABS mechanism that requires less than 5lbs of force.
 3. 32 oz. bottle soap reservoir secured inside locked back water closet space.
- D. Signs supplied by Portland Loo Inc.
 1. Restroom entry signs shall be fastened to exterior walls alongside entry doors to meet ADA requirements, Hand Sanitizer sign on inside above hand sanitizer pump, Hand Wash sign on outside above hand wash control valve.
 2. Graphics and grade 2 Braille on injection molded plastic signs, black or blue color. Unisex design.
 3. Dimensions: Qty (1) 9" wide by 8" tall by 1/8" thick.
 4. Dimensions: Qty (1) 8" wide by 2" tall by 1/8" thick "Hand Sanitizer" sign
 5. Dimensions: Qty (1) 8" wide by 2" tall by 1/8" thick "Hand Wash" sign.

2.06 FINISHES

- A. All exposed Stainless steel and steel surfaces are sandblast finish with powder coated using RAL 7037 for the tube, columns & stanchions.
- B. Panels, Door & Roof:
 1. Cardinals :S# 17187 P097- gray polyurethane powder coating semi-gloss gray charcoal (anti-graffiti).

2.07 ELECTRICAL

Electrical system and components Supplied by Portland Loo Inc. - Furnished and wired by electrical contractor licensed in the state of Oregon. Wiring, conduit, electrical enclosures are UL listed.

- A. Exterior lighting – LED Flexlight light rope, 3 Watts per foot. Blue lighting.
- B. Interior Lighting – Two 24 Inch Current USA TrueLumen Pro Deepwater Blue 453nm Actinic LED Strip Lights.
- C. Lighting control – Photoeye – 24 VDC Wattstopper Model #EM-24A2.
- D. Electrical heat trace and Thermostat – Heatline Kompensator heat trace with 6 watts per foot and 24V DC powered. Heat trace controlled by Engenity Solitat II Solid State DC thermostat set to close at 40 deg Fahrenheit or below, 6V to 24V operation and 20Amp load capability.
- E. Meter Panel (non-solar units if requested) – Cooper AW114TB UL 414 listed and complies with C12.7. Only on Non-solar Portland Loo.
- F. Sola 24 V DC power supply 110V AC input, 240 Watt- model SDN 10-24-100C. Only on non-solar Portland Loo.
- G. Electrical Enclosure - NEMA (include wording for grounding by others) Including breakers and fusing, wire terminations, Control relays and Sola 24V DC power supply (non-solar units).

PART 3 - EXECUTION

3.01 SITEWORK

- A. Refer to site plan.
 - 1. Structural fill per geotechnical reports (by others).
 - 2. Site grading and structural fill (by others).
 - 3. Building foundation structural fill (by others).
 - 4. Structural fill to bring the site to grade and compaction (by others).
 - 5. Structural fill for footing foundation and slab grading per plan (by installer).
 - 6. Sidewalks (by installer).

3.02 BUILDING ERECTION

- A. Verify site conditions are prepared for building installation.
- B. Do not field cut or alter structural members without approval of architect or engineer.
- C. Install in accordance with manufacturer's instructions.

END OF SECTION 13 34 00

SECTION 22 47 13

DRINKING FOUNTAINS

PART 1- GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Drinking Fountain with Bottle Filler
 - 2. Drinking Fountain with Pet Fountain

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of drinking fountain.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
 - 2. Include operating characteristics, and furnished specialties and accessories.
- B. Sustainable Design Submittal:
 - 1. Product Data: For water consumption.
 - 2. Any items for which substitutions are requested.
- C. Shop Drawings: Provide installation details for each drinking fountain.
- D. Substitutions: Products by other manufacturers that comply with specifications will be considered in accordance with Section 012500 – Substitution Procedures.

1.04 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For drinking fountains to include in maintenance manuals.

1.05 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Filter Cartridges: Equal to 100% of quantity installed for each type and size indicated, but no fewer than 2 of each.

1.06 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of units that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period:
 - a. For Drinking Fountains: One year from date of Substantial Completion.
 - b. For Bottle Fillers: One year from date of Substantial Completion.
 - c. For Pet Fountains: One year from date of Substantial Completion.

PART 2- PRODUCTS

2.01 DRINKING FOUNTAINS

- A. Drinking Fountains: Outdoor High-Low Accessible Fountain with Pet Fountain: Powder-coated Stainless Steel. Outdoor High-Low Accessible Fountain with Bottle Filler: Powder-coated Stainless Steel.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Most Dependable Fountains #2440 SMSS w/ Pet Fountain and #2440 SMSS w/ Bottle Filler as indicated on Drawings or comparable product by one of the following:
 - a. Most Dependable Fountains, Inc. 5705 Commander Dr. P.O. Box 587, Arlington, TN 38002-0587 Phone: 901-867-0039 Email: info@mostdependable.com. Website: www.mostdependable.com.
 - b. Haws Corporation 1455 Kleppe Lane, Sparks, NV 89431. Phone: 775-359-4712. Email: info@hawsco.com. Website: www.hawsco.com.
2. Standards:
 - a. Comply with NSF 61 and NSF 372.
 - b. Comply with ICC A117.1.
 - c. Comply with ASTM A312 17, ASME SA312 15, ASME A112.19.3/CSA B45.4.
3. Pedestal: Round, with offset receptor. One piece weld construction with MDF standard 304 schedule 10 stainless steel.
4. Receptors:
 - a. Number: Three.
 - b. Material: 18-gauge electro-polished stainless-steel bowl.
 - c. Shape: Round.
 - d. Bubbler: One for each receptor with adjustable stream regulator. Stainless steel anti-squirt head (weighing a pound and a half) mounted with a lock nut and washer to prevent tampering. Lock nut pin holds bubbler in locked position to prevent twisting and turning.
 - e. Drain: Open Hub Drain.
5. Maximum Water Flow: 0.5 gpm, laminar flow.
6. Controls: 304 stainless steel with circumference exceeding 8.6" Mushroom style push bar overlaps and prevents sand and other objects from sticking push bar in the ON position. Self-closing valve, non-cartridge O-ring valve delivers steady stream of water. Operating pressure: 30-80 PSI. Ideal pressure is 60 PSI.
7. Access to Internal Components: Working parts accessible through bowl of fountain. Supply and waste connections are through the above grade access door. All access plates, brackets, vandal resistant bolts and screws shall be stainless steel.
8. Supply Piping: Lead free, reinforced nylobraid (non-plastic) tubing. Supply with ½" MIP threaded inlet w/ stainless steel strainer. Union fittings at every connection. Supply line stops above grade.
9. Drain Piping: 1-1/2" schedule 40 PVC pipe. Drain line stops above grade.

PART 3- EXECUTION

3.01 EXAMINATION

- A. Examine roughing-in for water-supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before fixture installation.
- B. Examine walls and floors for suitable conditions where fixtures will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install fixtures level and plumb according to roughing-in drawings. For fixtures indicated for children, install at height required by authorities having jurisdiction.
- B. Set pedestal drinking fountains on floor/mounting slab using approved anchors.
- C. Install water-supply piping with shutoff valve on supply to each fixture to be connected to domestic-water distribution piping. Use ball or gate valve. Install valves in locations where they can be easily reached for operation.
- D. Install trap and waste piping on drain outlet of each fixture to be connected to gravel filled sump, as indicated on the Drawings.

3.03 CONNECTIONS

- A. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
- B. Comply with water piping requirements specified in Section 331000 " Water Utilities."
- C. Install ball or gate shutoff valve on water supply to each fixture.

3.04 ADJUSTING

- A. Adjust fixture flow regulators for proper flow and stream height.

3.05 CLEANING

- A. After installing fixtures, inspect unit. Remove paint splatters and other spots, dirt, and debris. Repair damaged finish to match original finish.
- B. Clean fixtures, on completion of installation, according to manufacturer's written instructions.
- C. Provide protective covering for installed fixtures.
- D. Do not allow use of fixtures for temporary facilities unless approved in writing by Owner.

END OF SECTION 22 47 13

SECTION 26 00 00

ELECTRICAL

PART 1 – GENERAL

1.01 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and supplementary Conditions and Division-1 Specifications sections, apply to work of this section.

1.02 DESCRIPTION OF WORK:

- A. All material, qualified workers, transportation, equipment, coordination and continuous supervision by a qualified electrical superintendent to provide complete electrical system installation shall be furnished as specified herein, as shown on the drawings, as implied and as required by serving utility companies and governing agencies.

1.03 SCOPE OF WORK:

- A. The work of this section includes, but shall not be limited to, provision of the following:
 - 1. Coordinate with serving utility companies for Power service. Applications for service including service charges are part of this contract.
 - 2. Underground power utility service system. Perform work in accordance with the requirements of the serving utilities companies.
 - 3. Meter/Main and Branch circuit panelboard and feeders.
 - 4. Branch circuit wiring, connections and devices for all equipment, outlets, and lighting systems.
 - 5. Lighting fixtures, lamps, ballasts, transformers, hangers, supports, standards, bases, and accessories.
 - 6. Lighting control equipment.
 - 7. Temporary power during construction.

1.04 LOCAL CONDITIONS:

- A. Visit the site area prior to bidding to determine all existing conditions in order to provide all work and materials necessary for a complete electrical system installation.

1.05 PERMITS AND INSPECTIONS FEES:

- A. Apply and pay for all necessary permits and inspection fees.

1.06 CODES AND REGULATIONS

- A. The electrical work of this section shall be installed in strict compliance with all current requirements of the National Electrical Code, Title 8, 19, and 24 of all State of California, the regulations of the State Fire Marshal, and applicable local codes or ordinances. The requirements of the aforementioned authorities or regulatory bodies shall be construed to be the acceptable minimum and more restrictive requirements may be imposed by either the drawings or hereinafter by these specifications. In case of conflict between codes, the more demanding shall apply, and in the event that the code requirements are ambiguous, the Owner's Representative shall be the sole judge as to the intent of the code.

1.07 TESTS AND GUARANTEES:

- A. If so requested by the Owner's Representative at any time prior to final acceptance, provide satisfactory evidence, including all testing deemed necessary to substantiate that equipment, materials, or installation methods are in conformance with the plans and specifications. Qualified representatives shall perform the tests under supervision of the Owner's Representative. Any equipment, materials, or installation methods failing to meet the required standards shall be immediately replaced at no cost to Owner.
- B. Upon job completion all electrical loads and controls shall be tested under full operating conditions and all defective materials, equipment, devices, or faulty workmanship shall immediately be repaired and/or replaced at no cost to Owner.

1.08 MATERIALS AND EQUIPMENT STANDARDS:

- A. All materials and equipment shall, where applicable, conform with standards promulgated by the latest publications of the following bodies:
 - 1. Underwriters Laboratories (UL).
 - 2. National Electrical Manufacturer's Association (NEMA).
 - 3. Electrical Testing Laboratories (ETL).
 - 4. American National Standards Institute (ANSI).
 - 5. Insulated Power Cable Engineers Association (IPCEA).
 - 6. Institute of Electrical and Electronic Engineers (IEEE).
- B. Order and obtain all equipment and materials in a timely manner so that no delays are caused. Special consideration shall be given to service and distribution equipment, major items of equipment and materials, lighting fixtures and all long lead time items. Order releases and expected delivery dates for all materials and equipment shall be posted in a written form with the project superintendent and shall be available to the Owner's Representative upon request.
- C. All materials shall be new and delivered to the job site in unbroken packages. Make all necessary arrangements for the storage and protection of equipment and materials in designated areas. Be responsible for all materials damaged during the period of storage, transportation, construction, or testing and immediately replace any equipment or materials which are damaged.

1.09 SUBSTITUTIONS:

- A. Reference to specific manufacturers and catalog numbers is intended to establish the required standard. Substitutions may be approved if submitted in accordance with bidding documents and if they are determined by the Owner's Representative to be equal to that specified in quality, performance, and appearance. If substitutions are accepted for use on this project, the requirements of the drawings and specifications shall not be relieved. Requests for substitutions must be accompanied by literature that completely describes the proposed substitution and clearly indicates all variances. Samples shall be furnished if requested.
- B. In addition to the test of "being equal", any approved substitution shall provide a substantial benefit to the Owner, as determined by the Owner's Representative. No approval of substitutions shall be provided before bid. As such, bid comparisons must be made based on specified equipment.

1.10 SHOP DRAWINGS:

- A. Submit (7) copies of fully descriptive manufacturer's literature and specifications to the Owner's Representative for all lighting fixtures, cables, mounting and termination hardware, devices, branch circuit components, electrical equipment, communications and control equipment, materials, raceway components and all accessories. Each copy shall be individually bound and provided with typewritten cover that lists the project title and describes the contents. Review and acceptance of each item of equipment shall be

obtained prior to release of any order and for installation on this project. Owner's Representative reserves the right to reject any submittal based on incompleteness of the submittal, as well as not meeting the requirements of the plans and specifications. Submittals must be provided for specified equipment, as well as any substitutions.

1.11 VERIFICATION OF DIMENSIONS:

- A. Throughout the entire course of the construction be responsible for the verification of the dimensions of available space for and access to electrical equipment.

1.12 IDENTIFICATION MARKINGS:

- A. Switchgear, switchboards, panelboards, terminal and control cabinets, motor starters, relays, contactors, control and disconnect switches, time switches and miscellaneous electrical equipment shall have laminated black on white machine engraved plastic nameplates properly identifying each item. Engraved plates shall match existing, where they occur. Use white letters on red background for plates marking equipment on emergency or standby power systems.
- B. All receptacle outlets, switchplates, and disconnects shall be labeled with their panel and circuit number. Labels shall be tape type, using an embossed, punchtape type, or a Kroy or Brother type labeling system. If existing outlets are labeled, new outlets shall use a labeling system to match the existing. Labels on normal power shall use white or black letters on a clear or colored background. The background shall not be red. Labels on back-up or emergency power systems shall use a red background.
- C. All pull and junction boxes that are in concealed or unfinished areas shall have their covers labeled with the circuits or feeder names that are contained in the box.

1.13 COOPERATION WITH OTHER CRAFTS:

- A. Coordinate work within this section and that of all other sections whose activities and work adjoin or are affected by this work. Study all pertinent documents, and consult with the affected sections in order avoid omissions, conflicts, errors or delays.

1.14 CLOSING-IN OF UNINSPECTED WORK:

- A. Do not permit work to be covered up or enclosed until it has been inspected, tested and approved by the Owner's Representative. Should any such work be enclosed before inspection, it shall be uncovered at no cost to Owner. After it has been tested and approved, make repairs with such materials as may be necessary to restore the work and that of the other trades to its original and proper condition.

1.15 SAFETY PRECAUTIONS:

- A. The responsibility for the safety and good condition of all materials and equipment for the entire installation, until completion of the work shall be included with the work of this contract. Erect and maintain approved and suitable barriers, protective devices and warning signs and be fully responsible for any loss or injury to persons or property resulting from neglect in maintaining and/or enforcing all safety precautions and warnings.

1.16 CLEANING AND PAINTING:

- A. All parts of the building and site shall be kept free from accumulations of rubbish or waste materials caused by this work and shall be removed from the building site.

- B. All parts of electrical equipment or apparatus which are not to be painted shall be thoroughly cleaned of plaster, cement and other foreign materials and left smooth, clean and dry. Finish painting is included in the painting contract.
- C. All plates, covers, and devices which are to retain the factory finish shall be removed and reinstalled after painting and plastering is completed.

1.17 OPERATING AND MAINTENANCE INSTRUCTIONS:

- A. Upon completion of the work, supply three copies of complete operating and/or maintenance information and instructions including wiring diagrams for all electrical and other equipment which can be reasonably expected to require such material for proper operation and care. This will include such items as switchgear, metering equipment, rotating electrical equipment, sound systems, signal and alarm systems, etc.

1.18 WATERPROOFING:

- A. Wherever any electrical work pierces any waterproofing or waterproofing membrane, it shall be installed in an approved watertight manner.

1.19 TRENCHING:

- A. This section shall be responsible for all trenching, sawcutting and patching for electrical conduits and ducts including backfilling, compaction and removal of excess earth. Determine the location of all buried pipes and underground systems before the ditching is started and be responsible for all damages to existing systems during the trenching process. Comply with excavation, backfill and compaction requirements in the EARTHWORK Section.

1.20 DRAWINGS:

- A. For the purpose of clearness and legibility the drawings are essentially schematic and although the size and location of equipment is shown to scale wherever possible, make use of all data in all contract documents and verify this information at the building. The exact location of all conduits, outlets and equipment shall be determined by details, shop drawings and/or as directed.
- B. The drawings show the required sizes and points of termination of the raceways, number and size of wires and suggest the proper routes to conform to the structure and avoid obstructions. However, it is not the intention of the drawings to show all necessary bends and offsets. It is the responsibility of this section to install the raceways in such a manner as to conform to the structure, avoid obstructions, preserve headroom, keep openings and passageways clear and be concealed within the building construction wherever possible.
- C. It is intended that outlets shall be located symmetrical with Owner's Representativeural elements notwithstanding the fact that locations shown on the drawings may be distorted for clearness in representation.
- D. Locations shown on Owner's Representativeural drawings take precedence over those shown on electrical drawings. Particular attention is directed to reflected ceiling plans and elevations.
- E. Before submitting the bid, examine all other pertinent drawings and specifications for electrical requirements which are not necessarily indicated on the electrical drawings and include a sum sufficient to cover the cost of these requirements.
- F. Upon job completion, deliver to Owner's Representative, one set of Record Documents which clearly indicates all variances from the specified systems and accurately locates all buried conduit and termination points of all stub-outs. These plans shall be delivered in both hardcopy and electronic format. Electronic format shall be in Autocad 2000 format or any version of Autocad previous to 2000.

PART 2 – PRODUCT AND EXECUTION

2.01 UTILITY SERVICES

- A. Finalize electrical service arrangements including verification of locations, coordination of the installation, and payment of accrued charges with local power company. Verify location of facilities and details with power, telephone, and cable T.V. companies. In addition to requirements shown on Drawings and Specifications, work shall comply with construction standards and service requirements of respective utilities, including any supplementary drawings issued by utilities; and shall be subject to inspection approval of these utilities.
- B. All service charges shall be paid for by this section.

2.02 METER/MAIN:

- A. All switchboard assemblies shall be built and tested to accordance with all applicable NEC, NEMA, ANSI, and Underwriter Laboratories standards.
- B. All connections, termination, grounding, and hardware assemblies shall be checked by an experienced switchboard installer prior to energization. Each connection point or fastener shall be aligned and torqued in accordance with the manufacturer's specifications. Anchor each section to floor and wall.

2.03 BRANCH CIRCUIT PANELBOARDS:

- A. Provide 120/240 Volt, 1-phase, 3-wire branch circuit load centers equal to Square D type "QO", complete with all circuit breakers, busing, and accessories as shown on the drawings.
- B. Panelboard trim fronts shall be flush for recessed locations. Recessed panelboards trim fronts shall have concealed hinges and trim clamps with master-keyed flush latches. All trim fronts shall be equipped with interior holders for circuit directory cards. Directory cards shall be neatly typed, listing description and location each circuit serves. Machine engraved nameplates are required for each panelboard.
- C. All circuit breakers shall be full size, thermal-magnetic, molded case types. Multi-pole breakers shall be supplied with common trip mechanisms with single toggle operators. Circuit breakers serving High Intensity Discharge (HID) light fixtures shall be designed and rated for operation with HID loads. Circuit breakers used to switch lighting circuits shall be approved and labeled for "SWD" loads. Approved locking devices shall be furnished for all circuit breakers controlling remote motor, lighting and special loads as shown and for all circuits as required by the inspection authorities.
- D. All recessed panelboards shall be provided with accessible empty conduit stubs to ceiling areas and to open areas under floors. Provide an 1" EMT conduit-only stub for five spares or spaces and a 3/4" EMT conduit-only stub for each additional four spares or spaces. These conduits shall be stubbed up for all panelboards and also stubbed down for panelboards located above floors with interstitial or open spaces below.

2.04 DISCONNECT (EXO) SWITCHES:

- A. Provide where shown on the drawings and where required by code for individual motors, equipment and appliances, general duty safety switches. Switches shall be motor rated complete with properly sized Buss "Low-Peak" dual element fuses. All switches shall be UL listed and provided with NEMA enclosures. Switches installed in outdoor or damp areas shall be NEMA class 3R. Fuses shall be sized to suit the equipment load requirements.
- B. Provide all required mounting and supporting hardware. Switches mounted at mechanical equipment shall be mounted on separate galvanized steel structures with engraved nameplates and with code required clearances.

2.05 CONDUITS AND FITTINGS:

Conduit for power, lighting, control and signal systems shall be as follows:

- A. PVC schedule 40 shall be used for "in-ground" or "in-slab" locations. Bonding conductors shall be installed in all electrical runs.
- B. Conduits installed within buildings construction (non-masonry areas) shall be steel type "EMT". Conduit runs above ceilings, and in attic spaces shall be type "EMT".
- C. Limited use of flexible, galvanized steel and non-metallic type "ENT" and "EFT" conduits are acceptable if installed concealed within plaster or plasterboard enclosed walls or joist spaces. Flexible conduit length shall be a maximum of 15'-0", be limited to a single change in direction of 90 degrees and a total directional changes of 270 degrees.
- D. Flexible galvanized steel, branch circuit conduits in excess of 6'-0" in length shall be provided with an approved bonding conductor. This is in addition to the required ground conductor within the conduit. Flex connections to non-liquid handling equipment are approved if installed in dry areas within equipment, storage rooms or in cabinet spaces.
- E. Type "ENT" conduits shall be UL approved for electrical wiring and shall be equal to Carlon "flex-plus". Branch circuit wiring shall be limited to 300 volts (phase to phase).
- F. Type "EFT" conduits shall be equal to Carlon "Carlex". "EFT" conduit use shall be limited to "low voltage" (30 volts or less) systems other than fire alarm or emergency signal systems.
- G. Liquid-tight flexible steel conduits shall be provided for all motor and liquid handling equipment connections (interior and exterior locations).
- H. All exposed conduits less than 6' above floor, or where exposed to potential physical damage, shall be rigid galvanized steel. Conduits in "above roof" areas shall be rigid galvanized steel.
- I. EMT fittings shall be steel set-screw or compression types only.
- J. All conduits shall be sized to accommodate the necessary wires as indicated on the drawings or oversized if so indicated. Pullcords of adequate size shall be installed in all empty conduits.
- K. Conduit raceway system shall be mechanically and electrically continuous throughout.
- L. Conduits shall be securely fastened to the building construction within three feet of each outlet or cabinet and within every ten feet thereafter.

2.06 CONDUCTORS:

- A. Wire shall be new in unbroken reels or containers and of recent manufacture. It shall bear the Underwriter's label, the manufacturer's trademark and type and size of wire. Conductors shall not be installed in any conduit system until the following has been performed:
 - 1. Conduit system has been inspected and approved.
 - 2. Plastering has been completed in respective areas.
 - 3. Conduit system is free of dirt and moisture.
- B. Conductors shall be continuous between outlets, without splices, except in outlets or junction boxes.
- C. Conductors shall be copper. Aluminum conductors are not allowed.
- D. All wire and cables for use on voltage up to 600 Volts shall conform to the following:
 - 1. Wire smaller than #12 AWG shall not be used except for signal or control circuits, and fixtures wire may be used as noted below.
 - 2. Sizes up to and including #6 shall be type THHN or type THWN in areas exposed to water. Sizes larger than #6 shall be type THW or THWN.
 - 3. Conductors installed within the channels of continuous fluorescent fixtures shall be of a type approved for this issue.
 - 4. Where abnormal temperature or conditions prevail, suitable conductors shall be provided in accordance with the code authority.

5. Fixture wire shall be of the size and type approved by ordinances and Underwriter's Laboratories for the fixture used. It shall be limited in length to factory installed pigtails except where otherwise required for recessed fixtures.
- E. Connections shall be made without strain on the conductors and all strands of wire shall be included in the splice or termination. Connections shall be made by one of the following methods:
 1. All taps to connections or conductors shall be made with compression type connectors except those smaller than #8 may have soldered connection. Solderless connectors for #10 or smaller, including fixture connectors, shall be equal to "Scotch Lok". For #8 or larger, connectors shall be equal to T & B "LockTite".
 2. All cable or conductor terminal lugs shall be of an approved type. Two piece stamped lugs and solderless connectors will not be approved.
- F. Splices of wire in the 600 Volt class shall be insulated with rubber tape, half lapped to a thickness of at least the thickness of the original insulation and then shall be wrapped with an equal number of turns of friction or plastic tape on the half lap. Splices in damp or outdoor locations shall be sealed in 3M Co. "Scotchcast" sealing packs.

2.07 BRANCH CIRCUITS:

- A. Provide all raceways, fittings, boxes, conductors, wiring devices and required accessories necessary for a complete and operating system of power, lighting, control, and signal systems as indicated on the drawings.
- B. Particular attention shall be given to the color coding of branch conduit power and lighting conductors. Coloring shall be (without exception) as required by the NEC. Provide special color coded conductors (colors not used in other areas of building) to identify lighting and power switch legs.

2.08 OUTLET AND JUNCTION BOXES:

- A. Boxes shall be of the size required by Code or larger, and unless otherwise noted, shall be pressed galvanized code gauge steel.
- B. Lighting outlet boxes shall be minimum 4" square by 1-1/2" deep. Flush outlets shall be provided with a flush raised ring with tapped ears. Outlets shall be flush, unless otherwise noted or shown.
- C. Outlet boxes for devices shall be 4" square by 1-1/2" minimum and shall be of proper size to accommodate the required devices. All wall mounted devices shall be flush mounted unless otherwise noted or shown, and boxes shall be fitted with the proper galvanized rings. Surface mounted boxes shall be of the threaded hub type and shall be provided with galvanized steel surface cover. Boxes and rings, in all cases, shall be deep enough to provide a minimum of 1/4" clearance between the device and the back of the box.
- D. Junction boxes shall be minimum of 4" square by 1-1/2" deep. Flush boxes in ceiling shall have flush ring with tapped ears and a flat white steel blank plate. Flush boxes in wall unless otherwise noted, shall have single device cover with blank flush plate to match other flush plates in the room. Exposed junction boxes to meet requirements of ordinances for through wiring whether such boxes are shown or not. If necessary for conductor installation, provide additional pull boxes in concealed but accessible locations.
- E. Where pull boxes larger than outlet boxes are required, galvanized code gauge sheet steel boxes may be used with covers attached by brass machine screw. Boxes exposed to weather shall be approved for the purpose and conduit entrances on the side or top shall be made by means of Square D Co. interchangeable hub with the gasket and adapter nut.
- F. For outlets exposed to the weather, or where noted cast iron outlet boxes shall be used equivalent to Crouse-Hind's FS or FD series. Boxes shall have proper number and size

hubs. Device plates, covers, adapters and boxes shall be as manufactured by Crouse-Hind Co.

2.09 WIRING DEVICES AND PLATES:

- A. Provide in a true and plumb fashion, all wiring devices and plates necessary to complete the intended installation. All devices shall be equal to those indicated on the drawings, or as listed below:
 - 1. Light switches; Hubbell #CS120 Series
 - 2. 120 Volt, 15 and 20 amp wall mounted receptacles; Hubbell #CRF20 Series.
 - 3. All other devices shall be as indicated on the drawings and as required for the equipment to be connected.
 - 4. Device coverplates: smooth plastic for all finished areas. Galvanized pressed steel coverplates for all other areas including equipment, storage, mechanical, etc. Exterior plates shall be weatherproof stainless steel. Coverplates in existing rooms shall match existing device plates. Where multiple plate types exist in an existing room, new coverplate types shall be as chosen by the Owner's Representative.
 - 5. The color or finish of devices and coverplates for each area shall be as directed by the Owner's Representative.

2.10 GROUNDING AND BONDING:

- A. All grounding and bonding shall be performed in accordance with the current NEC, State of California Title 24, requirements of the Service Utility Co. building authorities and as shown. The grounding system shall be as specified herein, as required for the services shown and as required by local conditions.
- B. All non-current carrying metallic parts of switchgear, transformers, panelboards, enclosures, conduits and other electrical equipment shall be effectively and permanently grounded.
- C. Connect the main service or derived system neutral conductor, equipment ground bus, main cold water line or other effectively grounded structural member and the building grounding electrode with a copper conductor in rigid conduit. The building electrode shall be as specified herein.
- D. Provide a building grounding electrode (UFER) system which consists of 20 feet minimum of code size copper conductor encased in the concrete foundation or footing of the structure. In the event the foundation is existing provide a building grounding electrode system which consists of at least one 5/8" x 96" long driven "Copperweld" ground rod.
- E. All grounding and bonding conductors shall be copper and solder tinned before being made into terminals or clamps. Conductors shall be continuous without joints or splices.
- F. Provide bond conductors at expansion joints, pullboxes, raceways, switchgear sections, etc. as required for complete and continuous ground path.
- G. Clean and brighten contact surfaces prior to making terminations. Clamps and terminals shall be bronze pressure type throughout.
- H. Test the complete installation for continuity and resistance to ground. Provide supplementary grounding as required to meet all requirements.

2.11 CONNECTION TO EQUIPMENT:

- A. All electrical outlets for mechanical systems, apparatus, motors, equipment fixtures, wiring devices, and appliances where they are installed under this contract for the electrical work or not, which require electrical connections shall be fully connected in an approved manner to corresponding system outlet.
- B. Where the work under this Section required connection to be made to equipment that is furnished and set in place under other sections of these specifications, obtain such

roughing in dimensions from the manufacturer or supplier of each item of equipment and assume full responsibility for the neat and workmanlike installation of the connections thereto.

- C. Provide type "SO" cords complete with strain relief devices and receptacle matching cord cap for equipment not furnished with cords but are assigned to a receptacle outlet on the drawings. The cords shall be of adequate length to connect and service the equipment and shall be rated to safely carry the load service.
- D. Provide conduit hubs and adapters for outlets and equipment not furnished in this section as required to facilitate the specified conduit type connections.

2.12 LUMINARIES, LAMPS AND STANDARDS:

- A. Provide all lighting fixtures with required lamps, reflectors, ballasts, housings, trims, bases, outlet boxes, accessories and mounting hardware to provide a complete and operable system.
- B. Fixtures shall be individually supported from building structural elements and aligned in a manner which is approved by the Owner's Representative.
- C. Refer to Owner's Representativeural reflected ceiling plans and elevations for exact location of all lighting fixtures. Fixture quantities shown on electrical drawings shall determine exact quantities required for this project.
- D. Coordinate installation of all ceiling mounted light fixtures with the ceiling system contractor and supplier to determine the exact trim requirement and finishes, mounting hardware, ceiling grid type and materials to be installed and extent of work to be provided by each.
- E. All fluorescent fixture lenses shall be acrylic with a nominal minimum thickness of 0.125 inch unless specifically noted otherwise.
- F. Fluorescent fixture ballasts shall be electronic, as manufactured by Advance, General Electric or Universal and shall be equipped with internal thermal protection. All ballasts shall be high power factor, Class "P" CBM certified, carry ETL and UL labels and have "A" sound ratings. Unless otherwise noted, all ballasts shall be designed for rapid start lamps. The one year guarantee for material and labor mentioned elsewhere in these specifications shall apply to the replacement of ballasts which, in the opinion of the Owner's Representative, develop excessive noise, heat or do not function properly. All fluorescent ballasts/luminaries shall be certified per section 2-5311 (b) California Administrative Code, Title 24, when these standards apply.
- G. High intensity discharge ballasts shall be high power factor, CBM certified and UL listed for use in the specified fixtures. Recessed fixtures in interior finished spaces shall have encased and potted type ballasts. Replace, at no cost to the owner, ballasts which in the opinion of the Owner's Representative develop excessive noise.
- H. Furnish and install all Fluorescent, Mercury Vapor, Metal Halide, High Pressure Sodium and Incadescent Lamps as indicated on the drawings, in accordance with the fixture manufacturer's specifications and as follows:
 - 1. Lamps shall be of first quality, equal to General Electric, Westinghouse or Sylvania.
 - 2. Fluorescent lamps shall be G.E. type SP35 unless noted otherwise.
 - 3. Mercury vapor lamps shall be deluxe white.
 - 4. Metal halide lamps shall be Sylvania Metal-Arc type "C".
 - 5. High pressure sodium lamps shall be provided with clear arc tubes.
- I. Recessed fixtures shall be provided with thermal protection by code.
- J. Provide approved enclosures for fixtures located within fire rated ceiling.

END OF SECTION 26 00 00

SECTION 27 15 13

COMMUNICATIONS HORIZONTAL CABLING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Category 6 twisted pair cable.
 - 2. Identification products.
 - 3. Conduits for Communications Systems

1.2 DEFINITIONS

- A. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.
- B. EMI: Electromagnetic interference.
- C. FTP: Shielded twisted pair.
- D. F/FTP: Overall foil screened cable with foil screened twisted pair.
- E. F/UTP: Overall foil screened cable with unscreened twisted pair.
- F. IDC: Insulation displacement connector.
- G. Jack: Also commonly called an "outlet," it is the fixed, female connector.
- H. LAN: Local area network.
- I. Plug: Also commonly called a "connector," it is the removable, male telecommunications connector.
- J. RCDD: Registered Communications Distribution Designer.
- K. Screen: A metallic layer, either a foil or braid, placed around a pair or group of conductors.
- L. Shield: A metallic layer, either a foil or braid, placed around a pair or group of conductors.
- M. S/FTP: Overall braid screened cable with foil screened twisted pair.
- N. S/UTP: Overall braid screened cable with unscreened twisted pairs.
- O. UTP: Unscreened (unshielded) twisted pair.

1.3 COPPER HORIZONTAL CABLING DESCRIPTION

- A. Horizontal cable cabling system shall provide interconnections between Distributor A, Distributor

B, or Distributor C, and the equipment outlet, otherwise known as "Cabling Subsystem 1," in the telecommunications cabling system structure. Cabling system consists of horizontal cables, intermediate and main cross-connects, mechanical terminations, and patch cords or jumpers used for horizontal-to-horizontal cross-connection.

1. TIA-568-C.1 requires that a minimum of two equipment outlets be installed for each work area.
2. Horizontal cabling shall contain no more than one transition point or consolidation point between the horizontal cross-connect and the telecommunications equipment outlet.
3. Bridged taps and splices shall not be installed in the horizontal cabling.

B. A work area is approximately **100 sq. ft.**, and includes the components that extend from the equipment outlets to the station equipment.

C. The maximum allowable horizontal cable length is **295 feet**. This maximum allowable length does not include an allowance for the length of **16 feet** to the workstation equipment or in the horizontal cross-connect.

1.4 CONDUITS FOR COMMUNICATIONS SYSTEMS

A. Conduits

1. PVC schedule 40 shall be used for "in-ground" or "in-slab" locations. Bonding conductors shall be installed in all electrical runs.
2. Electric metallic tubing
3. Flexible conduit shall not be used in lieu of conduit bends and offsets.
4. All outlet conduits shall have burrs and any other abrasive elements removed and an insulating bushing shall be installed on both ends.
5. No section of conduit shall be longer than 30 m (100 ft.) between pull points.
6. No more than 180 degrees of conduit bends shall be permitted between pull points.
7. The minimum inside radius for any bend of an outlet conduit shall be six times the inside diameter of that conduit.

B. Standards Compliance

1. General standards: Comply with current revision of TIA-569 as amended

1.5 ACTION SUBMITTALS

A. Product Data:

1. Category 6 twisted pair cable.
2. Identification products.

B. Shop Drawings:

1. Wiring diagrams and installation details of telecommunications equipment, to show location and layout of telecommunications equipment, including the following:
 - a. Telecommunications pathways.
 - b. Telecommunications system access points.
 - c. Telecommunications grounding system.

- C. Manufacturers cut sheets, specifications and installation instructions for all products

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer, installation supervisor, and field inspector.
- B. Product Certificates: For each type of product.
- C. Source quality-control reports.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For splices and connectors to include in maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: Cabling Installer must have personnel certified by BICSI on staff.
 - 1. Layout Responsibility: Preparation of Shop Drawings and cabling administration Drawings by an RCDD.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Test cables upon receipt at Project site.
 - 1. Test each pair of twisted pair cable for open and short circuits.
- B. Conduits
 - 1. Avoid breakage, denting and scoring finishes. Damaged products will not be installed. Store materials in original cartons and in a clean dry space; protect from weather and construction traffic. Wet materials will be unpacked and dried before storage.

1.10 COORDINATION

- A. Coordinate layout and installation of telecommunications pathways and cabling with Owner's telecommunications and LAN equipment and service suppliers.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Horizontal cabling system shall comply with transmission standards in TIA-568-C.1, when tested according to test procedures of this standard.
- B. Telecommunications Pathways and Spaces: Comply with TIA-569-D.
- C. Grounding: Comply with TIA-607-B.

2.2 CATEGORY 6 TWISTED PAIR CABLE

- A. Category 6 Twisted Pair Cable: Four-pair, balanced -twisted pair cable, with internal spline, certified to meet transmission characteristics of Category 6 cable at frequencies up to 250 MHz.
- B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. 3M
 - 2. Belden Inc.
 - 3. Berk-Tek, a Leviton Company
 - 4. Hitachi Cable America Inc.
 - 5. Superior Essex Inc.; subsidiary of LS Corp.
- C. Standard: Comply with NEMA WC 66/ICEA S-116-732 and TIA-568-C.2 for Category 6 cables.
- D. Conductors: 100-ohm, 23 AWG solid copper.
 - 1. Lead Content: Less than 300 parts per million.
- E. Shielding/Screening: Unshielded twisted pairs (UTP).
- F. Cable Rating: Riser.
- G. Jacket: Yellow thermoplastic.

2.3 IDENTIFICATION PRODUCTS

- A. Comply with TIA-606-B and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

2.4 CONDUITS

- A. PVC conduit: Comply with UL 651, listed for use with 90 degrees C conductors operating at 90 degrees C.
- B. Electric metallic tubing: Comply with UL 797. Tubing shall have hot dipped galvanized exterior, enamel-coated interior.

PART 3 - EXECUTION

3.1 WIRING METHODS

- A. Wiring within Enclosures: Bundle, lace, and train cables within enclosures. Connect to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools. Install conductors parallel with or at right angles to sides and back of enclosure.

3.2 CONDUIT INSTALLATION

- A. Drawings indicate general arrangement of conduits, pathways and fittings.
- B. Installation and configuration shall conform to the requirements of the current revision levels of TIA Standards 568 and 569, NFPA 70 (National Electrical Code), applicable local codes, and to the manufacturer's installation instructions.
- C. Install conduits using techniques, practices, and methods that are consistent with Category 6 or higher requirements and that supports Category 6 or higher performance of completed and linked signal paths, end to end.
- D. Follow manufacturer's recommendations for allowable fill capacity for each size noncontinuous cable support.

3.3 INSTALLATION OF TWISTED PAIR HORIZONTAL CABLES

- A. Comply with NECA 1 and NECA/BICSI 568.
- B. General Requirements for Cabling:
 - 1. Comply with TIA-568-C.0, TIA-568-C.1, and TIA-568-C.2.
 - 2. Comply with BICSI's "Information Transport Systems Installation Methods Manual (ITSIMM), Ch. 5, "Copper Structured Cabling Systems," "Cable Termination Practices" Section.
 - 3. Install 110-style IDC termination hardware unless otherwise indicated.
 - 4. Do not untwist twisted pair cables more than **1/2 inch** from the point of termination to maintain cable geometry.
 - 5. Terminate all conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.
 - 6. MUTOA shall not be used as a cross-connect point.
 - 7. Consolidation points may be used only for making a direct connection to equipment outlets:
 - a. Do not use consolidation point as a cross-connect point, as a patch connection, or for direct connection to workstation equipment.
 - 8. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI Information Transport Systems Installation Methods Manual, Ch. 5, "Copper Structured Cabling Systems," "Cable Termination Practices" Section. Use lacing bars and distribution spools.
 - 9. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation, and replace it with new cable.
 - 10. Pulling Cable: Comply with BICSI Information Transport Systems Installation Methods Manual, Ch. 5, "Copper Structured Cabling Systems," "Pulling and Installing Cable" Section. Monitor cable pull tensions.

3.4 GROUNDING

- A. Comply with requirements in Section 260526 "Grounding and Bonding for Electrical Systems" for grounding conductors and connectors.

- B. Install grounding according to the "Grounding, Bonding, and Electrical Protection" chapter in BICSI's "Telecommunications Distribution Methods Manual."
- C. Comply with TIA-607-B and NECA/BICSI-607.

3.5 IDENTIFICATION

- A. Identify system components, wiring, and cabling complying with TIA-606-B. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- B. Cable and Wire Identification:
 - 1. Label each cable within **4 inches** of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
 - 2. Each wire connected to building-mounted devices is not required to be numbered at the device if wire color is consistent with associated wire connected and numbered within panel or cabinet.
- C. Labels shall be preprinted or computer-printed type, with a printing area and font color that contrast with cable jacket color but still comply with TIA-606-B requirements for the following:
 - 1. Cables use flexible vinyl or polyester that flexes as cables are bent.

3.6 FIELD QUALITY CONTROL

- A. Field tests and inspections must be witnessed by authorities having jurisdiction , City Representative, and Police Department Representative.
- B. Tests and Inspections:
 - 1. Visually inspect jacket materials for NRTL certification markings. Inspect cabling terminations in communications equipment rooms for compliance with color-coding for pin assignments, and inspect cabling connections for compliance with TIA-568-C.1.
 - 2. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
- C. Nonconforming Work:
 - 1. End-to-end cabling will be considered defective if it does not pass tests and inspections.
 - 2. Remove and replace cabling where test results indicate that they do not comply with specified requirements.

END OF SECTION 27 15 13

SECTION 27 21 00

DATA COMMUNICATION NETWORK EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. The Work of this Section Includes:

1. 4+2+2-Port, L2+. 90W managed industrial network switch
2. Semi-ruggedized, cloud-managed LTE router
3. Cellular Antenna

B. Related Requirements:

1. 26 00 00 Electrical
2. 27 15 13 Communications Horizontal Cabling
3. 27 21 00 Data Communication Network Equipment

1.2 REFERENCES

- A. European Union Compliance (CE)
- B. Rohs
- C. WEEE
- D. UL – Underwriters Laboratory
- E. FCC

1.3 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide 8 ports for network switching and PoE, two combination ports for copper and fiber with an external power source.
- B. The system shall utilize TIA/EIA 568-B cable connected to an RJ-45 plug.

1.4 SUBMITTALS

- A. Manufacturer's Installation and Operation Manual: Printed Installation and Operation Information
- B. Warranty: Manufacturer's Printed Warranty

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store in original packaging in a climate-controlled environment.
- B. Storage temperature not to exceed: -40°C to +85°C

1.6 PROJECT/SITE CONDITIONS

- A. Temperature Requirements: Product shall operate in an environment with an ambient temperature range of -40°C to +70°C without the use of internal fans.
- B. Cold Start will be -40°C
- C. Humidity Requirements: Products shall operate in an environment with relative humidity of 0% to 90% (non-condensing).

1.7 WARRANTY

- A. Limited Lifetime Warranty: The time that product is in production plus 3 years from end of production.

PART 2 - PRODUCTS

2.1 4+2+2-PORT, L2+. 90W MANAGED INDUSTRIAL NETWORK SWITCH

- A. Basis-of-Design Product: Subject to compliance with requirements, provide the following or comparable product

- 1. Vigitron, Inc.: 7810 Trade Street Suite 100, San Diego, CA 92121, USA

- a. +1 (858) 484-5209
- b. support@vigitron.com

- 2. Model:

- a. Vi30208 4 + 2 +2-port PoE powered PoE Network Switch
- b. Vi1120 120W/54VDC Desktop PS Brick Power Supply

- B. General Specifications

- 1. The switch will contain 8 active copper ports.
- 2. Eight copper ports will provide PoE
- 3. Two combination copper and fiber ports will be used as uplinks
- 4. All ports will automatically detect network speeds of 100Mbps, 1,000Mbps and 2,500Mbps.
- 5. Copper ports will support network speeds up to 1,000Mbps
- 6. Fiber ports will support network speeds up to 2,500Mbps
- 7. The switch will support internal bandwidth up to ,500Mbps.
- 8. The switch will be model Vi30208
- 9. Standard Ethernet Ports:
 - a. The device shall have 6 standard Ethernet ports and 2 SFP port in a compact housing. The Ethernet port shall comply with:
 - 1) IEEE 802.3u 100BaseT
 - 2) IEEE 802.3az 1,000BaseT
 - 3) IEEE 802.3bz 2,500BaseT

- b. The SFP ports will comply with MSA standards.
 - c. The standard ports of device shall support standard Ethernet UTP connection with distances up to 100m.
 - d. The SFP port will be set at 100/1,000/2,500Mbps.
- 10. Port bandwidth settings will be done by automatically.
- 11. Port PoE can be up to 90W IEEE 802.3bt compliant
- 12. Port PoE allocations will be done automatically depending on port power requirements.
- 13. The switch will be powered by an external power supply up to 495W.
 - a. The maximum port power will be 90W
- 14. The Switch will provide for dual inputs.
 - a. Each power input will serve as a redundant input.
- 15. Each power input will serve as a redundant input.
- 16. The switch will have built-in smart PoE power allocation providing the required PoE powered devices up to 90W per port.
- 17. The switch will have programmable per port thermal protection up to 125°C, shutting down when temperature is exceeded,
- 18. The switch will have 6kV surge per port surge protection.
- 19. The switch will have two alarm inputs
- 20. The switch will have two alarm outputs:
 - a. Each will be programmable as Form C, N/O, N/C
- 21. The switch will provide for Rapid Ring features compliant to:
 - a. G.8032V1
 - b. G.8032V2

C. Data Specifications

- 1. Data Interface: Passage of Data Compliant to:
 - a. RFC 768 UDP
 - b. RFC 2068 HTTP
 - c. RFC 793 TCP
 - d. RFC 791 IP
 - e. RFC 1783 TFTP
 - f. RFC 894 IP over Ethernet
 - g. RFC 2544 TCP/IP Packet Transmission
- 2. Port Data Rate: 100/1000/2500Mbps
- 3. Packet handling up to 9600 bytes
- 4. Data Connections:
 - a. 10 Standard Ethernet Ports
 - b. 2 SFP Fiber ports
- 5. Port PoE Power Outputs:
 - a. 15.4W compliant to IEEE802.3af
 - b. 30W complaint to IEEE802.3at, Type 1 and Type 2

- c. Up to 90W Compliant to IEEE802.3bt standards
- 6. The DC input connector will be a pluggable terminal block
- D. Specifications And Feature Sets
 - 1. The Vi30208 transmits and receives data:
 - a. Internal bandwidth will be constant with no more than a 2% decrease, when the input signal varies from a size of 64 bytes to 9,600 bytes using bidirectional transmission.
 - b. Internal bandwidth will be constant over the quoted extended distance with no more than 2% decrease when:
 - 1) Bidirectional signals are transmitted with a packet size of 9,600 bytes.
 - 2) Unidirectional signals are transmitted with a packet size of 9,600 bytes.
 - 3) Bandwidth will remain the same for both upload and download operation.
 - 2. Packet losses will be at 2% or less at packet sizes, ranging from 64 bytes to 9,600 bytes bidirectional unidirectional at 2,500Mbps.
 - 3. Packets per second (PPS) will not vary more than 2% at packet sizes, ranging from 64 bytes to 9,600 bytes bidirectional transmission.
 - 4. Maximum distance from switch port to device will be 328 ft. (100m) for data and PoE.
 - 5. The switch will be compliant with IEEE 802.3az as detailed in the Energy Efficient Ethernet Task. It has the ability to automatically turn off PoE when link down is detected and/or idle, and resume without packet loss when link up is detected.
 - 6. Each port will be continuously monitored for potential overcurrent and thermal conditions.
 - 7. The device must have the ability for PoE functionality in compliance with IEEE802.3af/at/bt standards when communicating with a PD:
 - a. Will provide detection pulses to PD.
 - b. Will provide Classification pulses to PD and report via GUI.
 - c. Will provide IEEE802.3af/at/bt, Class 0 to Class 8 PoE power to PD, depending on the external power supply.
 - d. Will provide up to 90W per port PoE power.
 - e. Will provide auto-sensing for connected devices and individual port power up to 90W.
 - f. Will programming PoE delay up to 600 seconds
 - 8. The switch will provide for locking specific MAC addresses to specific ports, while user programming will limit the number of allowed 1K MAC addresses per port.
 - 9. The switch will allow firmware updates via HTTP/HTTPS and TFTP, in addition to directly via an on-board console port.
 - 10. The switch will support IEEE 802.1Q.
 - 11. Power consumption will be 12.3W for basic switch functions.
 - 12. Time and Date can be set using:
 - a. NTP reference to an NTP
 - b. RTC (Real Time Clock)
 - 1) Both clocks will have internal time day settings
 - 2) Clock will have 12 or 24 hours setting
 - 3) Date format will have the following option:
 - a) mm/dd/yyyy

- b) mm/yyyy/dd
- c) yyyy/dd/mm

E. Connectors

- 1. Power Inlet: Pluggable Terminal Block
- 2. Alarm input: Pluggable Terminal Block
- 3. Alarm output: Pluggable Terminal Block
- 4. Standard Ethernet: RJ-45, IEC 60603-7
- 5. Fiber: MSA Compliant

F. Electrical Specifications

- 1. External Power Supply:
 - a. Up to 495W @ 57VDC
- 2. PoE Output Power (depending on external power supply):
 - a. 15.4W compliant to IEEE802.3af
 - b. 30W complaint to IEEE802.3at, Type 1 and Type 2
 - c. Up to 90W Compliant to IEEE802.3bt standards

G. Mechanical Specifications

- 1. Dimensions (H x W x L): 2.6 x 6 x 4.4 inches (5 x 16.8 x 11 cm)
- 2. Finish: Device shall be constructed of a metal enclosure.
- 3. Weight: 1.9lb (862 g)

H. Environmental Specifications

- 1. Operating Temperature: -40°C to +70°C at 240W
- 2. Operating Temperature: -40°C to +55°C at 480W
- 3. Cold Start -40°C
- 4. Storage Temperature: -40°C to +85°C
- 5. Relative Humidity: 0% to 95% (non-condensing)

I. Regulatory Agencies/Approvals And Listings

- 1. FCC Part 15, Subpart A
- 2. Emission Standards:
 - a. FCC Part 15, Subpart B, Class A
 - b. EN 55022:2006+A1:2007
 - c. EN 61000-3-2:2006+A1:2009+A2:2009
 - d. EN 61000-3-3:2008
 - e. EN 55024:1998+A1:2001+A2:2003
 - f. EN55032
 - g. EN55035
 - h. EN50121
 - i. EN50155
- 3. RoHS
- 4. Environmental:

- a. EN 62368 (Replacing EN60950-1)
 - b. IEC60068-2-27 (Shock)
 - c. IEC60068-2-32 (Free Fall)
 - d. IEC60068-2-6 (Vibration)
- 5. CE
- 6. WEEE: Article 11 – Annex V Directive 2012 2012/19/EU
- J. Standard Accessories
 - 1. Operations Manual
- 2.2 SEMI-RUGGEDIZED, CLOUD-MANAGED LTE ROUTER
 - A. Basis-of-Design Product: Subject to compliance with requirements, provide the following or comparable product
 - 1. Manufacturer: Ericsson Enterprise Wireless Solutions, Inc.: 1100 W. Idaho Street Suite 800 Boise, ID 83702-5389 United States.
 - a. +1 (855) 813-3385
 - b. <https://cradlepoint.com/>
 - 2. Router Model:
 - a. Ericsson Cradlepoint TC05-R980-5GD-A
 - 1) AC Adapter: 170716-001
 - 3. Modem: Dual 5G modular modem slots supporting LTE and 5G Sub-6 / mmWave
 - 4. Ethernet: 10 x GbE (8 x LAN, 2 x WAN)
 - 5. Wi-Fi: Tri-radio Wi-Fi 6/6E (802.11ax); 2.4 GHz, 5 GHz, and 6 GHz bands; MU-MIMO support
 - 6. Expansion: 2 x USB 3.0 ports; GPIO port; Extensibility docking connector
 - 7. GNSS/GPS: Integrated high-sensitivity GNSS receiver with SMA connector
 - 8. Temperature: Operating: -30°C to 70°C (-22°F to 158°F); Storage: -40°C to 85°C (-40°F to 185°F)
 - 9. Humidity: Operating: 5% to 95% (non-condensing); Storage: 5% to 95%
 - 10. Ingress Protection: IP64-rated enclosure for dust and splash resistance
 - 11. Power - Required: 9-36 VDC input; Optional AC power adapter
 - 12. Power - Features: Reverse polarity and transient voltage protection; Ignition sense for automotive deployments
 - 13. Power - Consumption: Typical: 20 W; Peak: up to 60 W with dual 5G modems
 - 14. Physical Size: 240 x 210 x 50 mm (9.45 x 8.27 x 1.97 in)
 - 15. Weight: 2.0 kg (4.4 lb)
 - 16. Reliability: MTBF > 300,000 hours (Telcordia SR332 at 25°C)
 - 17. Certifications: FCC, IC, CE, RCM, CB Scheme, UL/cUL, RoHS, WEEE, MIL-STD-810G
 - 18. Wi-Fi Power: 2.4 GHz: up to 30 dBm; 5 GHz: up to 30 dBm; 6 GHz: up to 24 dBmEXECUTION
- 2.3 CELLULAR ANTENNA
 - A. Basis-of-Design Product: Subject to compliance with requirements, provide the following or

comparable product

1. Manufacturer: Taoglas, 4851 Paramount Drive, San Diego, CA 9212,
 - a. +1 858-450-0888
 - b. <https://www.taoglas.com/>
2. Model: MA1509 Synergy 9-in-1 Next Generation Combination Permanent Mount Antenna – GNSS, 4*5G/4G Cellular & 4*Wi-Fi® with 5m Braided Cable Assembly
 - a. Model # - MA1509.AK.005
3. IP Rating: IP67
4. Impedance: 50
5. Minimum Operating Temperature: -40
6. Maximum Operating Temperature: 85
7. Mounting Style: Screw
8. Termination Style: Connector
9. Antenna Connector Type: SMA
10. Length (mm): 160
11. Width (mm): 160
12. Height (mm): 57.47
13. Cable Type: TGC-200
14. Connector Body Style: Straight
15. Polarity: RHCP
16. Frequency Range: 600MHz - 6000MHz
17. Connector Polarity: Normal
18. Cable Length (mm): 5000
19. VSWR: 2:1
20. Weight (g): 2700
21. RoHS: Yes
22. Gain (Max): 4.44

2.4 INSTALLATION

A. Installer Qualifications:

1. Engage Installer with Low Voltage Systems (C-7) license as required by the State of California with demonstrated successful experience designing, installing, commissioning, training and servicing low voltage systems.

- B. Install the system in accordance with the equipment manufacturers recommended procedures
- C. Install system using generally acceptable industry practices for network appliances
- D. Ensure system and network configuration is fully coordinated with the Owner's Information Technology Department.

2.5 EXAMINATION

A. Verification of Conditions:

1. Ensure wiring cable chase requirements are available
2. Ensure substrate for physical mounting locations meet manufacturer recommendations

B. Examination and Assessment:

1. Coordinate with the Owner's Technology Department to examine and assess installation

and operation to Owner's satisfaction.

2.6 COMMISSIONING

- A. Testing: Ensure system operates to manufacturers specifications
- B. User/Owner Training:
 - a. Provide original manufacturers training for system administrators and operators designated by the Owner.
- C. Documentation: Provide 2 set(s) of manufacturers hardware installation and software user guides for each level of authorized users.

END OF SECTION 27 21 00

SECTION 28 00 00

VIDEO SURVEILLANCE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes: (4) 4x5MP, 360-degree IP67, vandal resistant camera to be mounted on light poles centrally located within the park per plan.
- B. Related Requirements:
 - 1. 26 00 00 Electrical
 - 2. 27 15 13 Communications Horizontal Cabling
 - 3. 27 21 00 Data Communication Network Equipment

1.2 ACTION SUBMITTALS

- A. Product and technical data:
 - 1. Manufacturers technical data sheets and bulletins
 - 2. Manufacturers installation and operation manuals
 - 3. Manufacturer Maintenance data
 - 4. Spare parts list and recommended hardware
 - a. Recommended maintenance contract
- B. Shop Drawings: For video surveillance. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 2. Functional Block Diagram: Show single-line interconnections between components for signal transmission and control. Show cable types and sizes.
 - 3. Dimensioned plan and elevations of equipment racks, control panels, and consoles. Show access and workspace requirements.
 - 4. UPS: Sizing calculations.
 - 5. Wiring Diagrams: For power, signal, and control wiring.
- C. Design Data: Include an equipment list consisting of every piece of equipment by model number, manufacturer, serial number, location, and date of original installation. Add pretesting record of each piece of equipment, listing name of person testing, date of test, set points of adjustments, name and description of the view of preset positions, description of alarms, and description of unit output responses to an alarm.

1.3 INFORMATIONAL SUBMITTALS

- A. Manufacturer's published instructions.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For cameras, power supplies, infrared illuminators, monitors, videotape recorders, digital video recorders, video switches, and control-station components to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
 - 1. Lists of spare parts and replacement components recommended to be stored at the site for ready access.

1.5 QUALIFICATIONS

- A. Security Design Professional: Design professional with active Physical Security Professional (PSP) certification issued by American Society for Industrial Security (ASIS) and with documented experience managing installation of security systems in similar size and complexity.
- B. Installer Qualifications:
 - 1. Engage Installer with Low Voltage Systems (C-7) license as required by the State of California with demonstrated successful experience designing, installing, commissioning, training and servicing closed circuit television systems
 - 2. Installer shall have completed factory approved training and be certified by the manufacturer as qualified to install, operate and maintain product(s) specified

1.6 DELIVERY, STORAGE AND HANDLING

- A. Storage and Protection: Store materials protected from exposure to extreme or harmful environmental conditions and at temperature and humidity levels recommended by the manufacturer:
 - 1. Deliver individual components in the manufacturers original packaging and labeling
 - 2. Prevent physical damage, soiling or wetting
 - 3. Provide secure storage prior to and during installation

1.7 PROJECT/SITE CONDITIONS

- A. Environmental Requirements:
 - 1. Site should be substantially enclosed and secure prior to installation of hardware
 - 2. Environmental systems should be in place and operational
 - 3. Deliver materials onsite at least 24 hours prior to installation to allow materials to reach temperature and humidity equilibrium

1.8 WARRANTY

- A. Provide original equipment manufacturers warranty documentation for acceptance by the Owner
 - 1. Warranty Period: 10-years commencing with the Date of Substantial Completion

PART 2 - PRODUCTS

2.1 INTERNET PROTOCOL CAMERA

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Verkada, Inc. CH52-E four-camera multisensory or comparable product.

1. Manufacturer:

- a. Verkada Inc. 406 E. 3rd Avenue, San Mateo, CA 94401; (650) 514-2500
<https://www.verkada.com/contact/>

2. Basis-of-Design Product: CH52-E four-camera multisensory. Features four independent sensors, providing expansive coverage from a single install point. Each sensor includes a 1 / 2.8" progressive CMOS image sensor, varifocal lens with 2.08x optical zoom, and 30 meters / 98 feet of IR range to provide clear and consistent image quality in any lighting condition. The CH52-E includes four onboard CV25S Ambarella processors to support advanced analytics like AI-powered search, Occupancy Trends, line crossing, loitering, and Person of Interest (POI) alerts. The CH52-E excels at covering hallway intersections and exterior corners of buildings, providing comprehensive visibility and eliminating blind spots while only requiring a single PoE++ cable

a. Camera Features:

- 1) Image Sensor: 4 x 1 / 2.8" Progressive CMOS
- 2) Shutter Speed: 1 / 5 sec. to 1 / 32,000 sec.
- 3) Sensor Resolution: 4 x 5MP (2688 x 1944)
- 4) Day/Night: IR-cut filter for day and night function
- 5) Lens Type: Varifocal; motorized zoom
- 6) IR Cut Filter: Yes
- 7) Focal Length: 3.7 - 7.7mm
- 8) IR Range: 30m / 98ft; non-adjustable
- 9) Aperture: F1.9 - F2.9
- 10) Minimum Illumination:
 - a) 0.009 lux @ F1.9 (color)
 - b) 0 lux with IR Illuminators on
- 11) Iris: N/A
- 12) Onboard Storage: 1TB to 8TB, MicroSD, SDXC
- 13) Field of View:
 - a) Horizontal: 89° - 37° (82° - 35°)
 - b) Vertical: 65° - 29° (60° - 26°)
 - c) Diagonal: 99° - 46° (92° - 43°)
- 14) CPU: 4 x Ambarella CV25S88
- 15) Sensor Movement:
 - a) Tilt: +0°-105°
 - b) Pan: +/- 90°
 - c) Rotation: +/- 90° (per lens)

b. Standard Video Settings:

- 1) Compression: H.265, H.264
- 2) Historical Video Settings: Adaptive quality
- 3) Frame Rate: 24fps / sensor
- 4) WDR Technology: 120dB dynamic range, true WDR, dual exposure
- 5) Live Streaming Settings:
 - a) HQ: Up to 3,000 Kbps
 - b) SQ: Up to 600 Kbps

c. Standard Audio Settings:

- 1) Audio: Not supported

d. Power and Network:

- 1) Power Input:
 - a) With IR: IEEE 802.3bt Type 3 PoE++
 - b) Without IR: IEEE 802.3at Type 2 PoE+
 - c) Extended temperature range:
 - d) IEEE 802.3bt Type 3 PoE++
- 2) Connectivity: RJ-45 cable connector for network/PoE connection; 10 / 100 Mbps
- 3) Power Consumption:
 - a) With IR: 43-57V, 0.65-0.49A, 27.7W
 - b) Without IR: 43-57V, 0.46-0.34A, 19.5W
 - c) Extended temperature range:
 - d) 43-57V, 0.91-0.68A, 38.7W
- 4) RTSP:
 - a) RTSP 1.0
 - b) RFC 2326
 - c) Max concurrent streams: 8 (2 per camera head)
 - d) Audio support: No

e. General:

- 1) Operating Temperature: -40°C to 50°C / -40°F to 122°F
- 2) LED Indicator: System power and status indicator
- 3) Humidity: 0 to 90%
- 4) Warranty: 10 Years
- 5) Certifications: FCC, ICES, CE, UKCA, RCM, VCCI, KCC, NOM, CB, NTRA, ICASA, UL/cUL/IEC 62368-1, IK10, IP66, NDAA
- 6) Included Accessories: IR cover, mounting template, screws, anchors, desiccants, screwdriver, wrench

f. Mechanical:

- 1) Weight:

- a) Camera: 2,900g
 - b) Mount plate: 536g
- 2) Body: Aluminum, plastic dome trim
- 3) Dimensions:
 - a) Ø: 275.0mm / 10.82in, H: 118.0mm / 4.65in with mount plate
 - b) Ø: 267.0mm / 10.51in, H: 114.0mm / 4.49in without mount plate
- g. Software Capabilities:
 - 1) Alerts: Camera status, motion detection, people detection, vehicle detection, Person of Interest detection, crowd detection, line-crossing detection, loitering detection, AI-powered alerts
 - 2) Streaming and Storage: Cloud backup, configurable retention days, selectable storage location, low bandwidth mode, timelapse, RTSP
 - 3) People Analytics: People search, attribute search, face search, Occupancy Trends, motion search, trajectory analysis, selective face blurring, AI-powered search
 - 4) Sharing and Privacy: Live Links, live face blur, privacy regions, audit log
 - 5) Vehicle Analysis: Vehicle search, attribute search, motion search, trajectory analysis, Occupancy Trends, AI-powered search

2.2 POWER SUPPLIES

- A. Low-voltage power supplies matched for voltage and current requirements of cameras and accessories, and of type as recommended by manufacturer of camera

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install the system in accordance with the equipment manufacturers recommended procedures
- B. Install system using generally acceptable industry practices for closed circuit television systems
- C. Install system using generally acceptable industry practices for network appliances
- D. Ensure system and network configuration is fully coordinated with the Owner's Information Technology Department.
- E. Install cameras and infrared illuminators level and plumb.
- F. Set pan unit and pan-and-tilt unit stops to suit final camera position and to obtain the field of view required for camera. Connect all controls and alarms, and adjust.
- G. Install power supplies and other auxiliary components at control stations unless otherwise indicated.
- H. Install tamper switches on components indicated to receive tamper switches, arranged to detect

unauthorized entry into system-component enclosures and mounted in self-protected, inconspicuous positions.

- I. Avoid ground loops by making ground connections only at the control station.
 - 1. For 12 and 24 V(dc) cameras, connect the coaxial cable shields only at the monitor end.
- J. Identify system components, wiring, cabling, and terminals according to Section 260553 "Identification for Electrical Systems" and Section 270528 "Pathways for Communications Systems."

3.2 EXAMINATION

- A. Verification of Conditions:
 - 1. Ensure wiring cable chase requirements are available
 - 2. Ensure substrate for physical mounting locations meet manufacturer recommendations
- B. Examination and Assessment:
 - 1. Coordinate with the Owner's Technology Department and Police Department to examine and assess installation and operation to Owner's satisfaction.
- C. Tests and Inspections:
 - 1. Inspection: Verify that units and controls are properly installed, connected, and labeled, and that interconnecting wires and terminals are identified.
 - 2. Pretesting: Align and adjust system and pretest components, wiring, and functions to verify that they comply with specified requirements. Conduct tests at varying lighting levels, including day and night scenes as applicable. Prepare video-surveillance equipment for acceptance and operational testing as follows:
 - a. Prepare equipment list described in "Informational Submittals" Article.
 - b. Verify operation of auto-iris lenses.
 - c. Set back-focus of fixed focal length lenses. At focus set to infinity, simulate nighttime lighting conditions by using a dark glass filter of a density that produces a clear image. Adjust until image is in focus with and without the filter.
 - d. Set back-focus of zoom lenses. At focus set to infinity, simulate nighttime lighting conditions by using a dark glass filter of a density that produces a clear image. Additionally, set zoom to full wide angle and aim camera at an object **50 to 75 ft** away. Adjust until image is in focus from full wide angle to full telephoto, with the filter in place.
 - e. Set and name all preset positions; consult Owner's personnel.
 - f. Set sensitivity of motion detection.
 - g. Connect and verify responses to alarms.
 - h. Verify operation of control-station equipment.
 - 3. Test Schedule: Schedule tests after pretesting has been successfully completed and system has been in normal functional operation for at least 14 days. Provide a minimum of 10 days' notice of test schedule.
 - 4. Operational Tests: Perform operational system tests to verify that system complies with Specifications. Include all modes of system operation. Test equipment for proper operation in all functional modes.

D. Nonconforming Work:

1. Video surveillance system will be considered defective if it does not pass tests and inspections.

3.3 CLEANING

- A. Clean installed items using methods and materials recommended in writing by manufacturer.
- B. Clean video-surveillance-system components, including camera-housing windows, lenses, and monitor screens.

3.4 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain video-surveillance equipment.

END OF SECTION 28 23 29

SECTION 31 10 00

SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section, along with Section 02 41 00 Site Demolition and Section 32 01 91 Tree Protection and Root Pruning. Standard Specifications for Public Works Construction (Green Book), latest edition.

1.2 SUMMARY

- A. Section Includes Removals for Landscape Improvements Only. For Items in addition to those listed below see 02 41 00 Site Demolition.
This Section Includes:
 - 1. Protecting existing vegetation to remain.
 - 2. Removing existing vegetation.
 - 3. Clearing and grubbing.
 - 4. Stripping and stockpiling rock.
 - 5. Removing existing irrigation appurtenances.
 - 6. All other removals which may or may not be shown on plans as required for the project construction.

1.3 DEFINITIONS

- A. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil; the zone where plant roots grow. Its appearance is generally 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 larger than 2 inches in diameter; and free of weeds, roots, toxic materials, or other non-soil materials.
- B. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.
- C. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and indicated on Drawings.
- D. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 MATERIAL OWNERSHIP

- A. Except for materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 INFORMATIONAL SUBMITTALS

- A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.
 - 1. Use sufficiently detailed photographs or video recordings.
 - 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plant designated to remain.
- B. Rock stockpiling program.

1.6 QUALITY ASSURANCE

- A. Rock Stockpiling Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work. Include dimensioned diagrams for placement and protection of stockpiles.

1.7 FIELD CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed trafficways if required by Owner or authorities having jurisdiction.
- B. Salvageable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises as directed by Owner.
- C. Utility Locator Service: Notify DigAlert for area where Project is located before site clearing.
- D. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant-protection measures are in place per the project Erosion Control Plans.
- E. Tree- and Plant-Protection Zones: Protect according to requirements defined in the project Plant Protection and Removal Plans.
- F. Protections: Contractor shall provide temporary barricades and other forms of protection to protect general public from injury due to demolition work.

PART 2 - EXECUTION

2.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Verify that trees, shrubs, and other vegetation to remain or to be relocated have been flagged and that protection zones have been identified and enclosed according to requirements in Plant Protection and Removal Plans.
- C. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to Owner.

2.2 DEMOLITION

- A. General: Perform demolition work in a systematic manner. Use such methods as required to complete work indicated on drawings in accordance with governing regulations.
- B. Provide services for effective air and water pollution controls as required by County Air Pollution Control District regulations.
- C. Prior to commencing grading operations, soil containing debris, organics, pavement, or other unsuitable materials, shall be stripped from the foundation and pavement areas. Demolition areas shall be cleared of old foundations, slabs, abandoned utilities, tree roots, and soil disturbed during the demolition process. Depressions or disturbed areas left from the removal of such material shall be replaced with compacted fill under observation by the Geotechnical representative.

2.3 TREE AND PLANT PROTECTION

- A. Protect trees and plants remaining on-site according to Plant Protection and Removal Plans.
- B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations.

2.4 EXISTING UTILITIES

- A. Coordinate with Owner per Project Demolition plans the disconnecting and sealing of utilities that serve existing structures before site clearing, when requested by Contractor.
 - 1. Verify that utilities have been disconnected and capped before proceeding with site clearing.
- B. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others.

2.5 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
 - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
 - 2. Grind down stumps and remove roots larger than 2 inches in diameter, obstructions, and debris to a depth of 24" below exposed subgrade.
 - 3. Use only hand methods or air spade for grubbing within protection zones.

4. Chip removed tree branches and dispose of off-site.
 - B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
 1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches and compact each layer to a density equal to adjacent original ground.
- 2.6 STOCKPILING ROCK
- A. Remove from construction area naturally formed rocks exceeding the dimensions noted in the Project Soils Report.
 1. Separate or wash off non-rock materials from rocks, including soil, clay lumps, gravel, and other objects larger than 2 inches in diameter; trash, debris, weeds, roots, and other waste materials.
 - B. Stockpile rock in location as directed by Owner without intermixing with other materials. Cover to prevent windblown debris from accumulating among rocks.
 1. Limit height of rock stockpiles to 48 inches.
 2. Do not stockpile rock within protection zones.
 3. Dispose of surplus rock. Surplus rock is that which exceeds quantity indicated to be stockpiled or reused.
 4. Stockpile surplus rock to allow later use by the Owner.
- 2.7 DISPOSAL OF SURPLUS AND WASTE MATERIALS
- A. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with other Project work.
 - B. Remove from Project site debris, rubbish, and other materials resulting from demolition operations. Transport and legal dispose of offsite.
 - C. If hazardous materials are encountered during demolition operations, contact Owner's Representative.
 - D. Burning of removed materials is not permitted on project site.
- 2.8 HAZARDOUS MATERIALS
- A. Except as otherwise specified, in the event Contractor encounters on the Project site material reasonably believed to be asbestos, polychlorinated biphenyl (PCB), or other hazardous materials which have not been rendered harmless, Contractor shall immediately stop Work in the area affected and report the condition to the District's Representative in writing. The Work in the affected area shall not thereafter be resumed except by written agreement of the Contractor if in fact the material is asbestos, PCB, or other hazardous materials and has not been rendered harmless. The Work in the affected area shall be resumed in the absence of asbestos, PCB, or other hazardous materials, or when such materials have been rendered harmless.
 - B. Construction involving asbestos cement (transite) pipe shall be performed by qualified personnel in accordance with the standards and specifications set forth by American Water Works Association (AWWA), the Occupational Safety and Health Act (OSHA) and the Environmental Protection Agency (EPA), as well as location jurisdictional codes.
- 2.9 CLEANUP AND REPAIR
- A. General: upon completion of demolition work, remove tools, equipment and demolished materials from site.
 - B. Repair demolition performed in excess of that required. Return elements of construction and surfaces to existing condition prior to start of operations. Repair adjacent construction or surfaces soiled or damaged by demolition work.

END OF SECTION 31 10 00

SECTION 31 20 00

EARTHWORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Geotechnical Report for City of Guadalupe Central Park Renovation, Guadalupe, California, by Earth Systems Pacific, Project No. 305572-001, Dated January 27, 2023, and any updates or addendums.

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Preparing and grading sub grades for slabs-on-grade, walks, pavements, skatepark and landscaping.
 - 2. Excavating and backfilling for buildings and structures.
 - 3. Drainage and moisture-control fill course for slabs-on-grade.
 - 4. Base course for walks and pavements.
 - 5. Subsurface drainage backfill for walls and trenches.
 - 6. Excavating and backfilling trenches within building lines.
 - 7. Excavating and backfilling for underground utilities and appurtenances outside building lines.
- B. Related Sections: The following Sections contain requirements that relate to this Section.
 - 1. Section 31 10 00 - Site Clearing for site stripping, grubbing, topsoil removal, and tree protection.
 - 2. "Landscape Work" for finish grading, including placing and preparing topsoil for lawns and planting.
 - 3. "Cast-In-Place Concrete" for concrete encasings, cradles, and appurtenances for utility systems.

1.03 REFERENCES

- A. Perform all work in accordance with applicable provisions of "Standard Specifications for Public Works Construction", Latest Edition. Unless otherwise noted, mention herein of section numbers refers to sections of the Reference Specification. Where Reference Specification refers to "Agency", substitute the word "Owner". Where Reference Specification is in conflict with these Specifications, these Specifications shall govern.

1.04 DEFINITIONS

- A. Excavation consists of the removal of material encountered to subgrade elevations and the re-use or disposal of materials removed.
- B. Subgrade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below aggregate base, drainage fill, or topsoil materials.
- C. Borrow: Soil material obtained off-site when sufficient approved soil material is not available from excavations.
- D. Base Course: The layer placed between the subgrade and surface pavement in a paving system.
- E. Drainage Fill: Course of washed granular material supporting slab-on-grade placed to cut off upward capillary flow of pore water.
- F. Unauthorized excavation consists of removing materials beyond indicated subgrade elevations or dimensions without direction by the Architect or Owner's Representative.

Unauthorized excavation, as well as remedial work directed by the Architect or Owner's Representative, shall be at the Contractor's expense.

- G. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below ground surface.
- H. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within building lines.
- I. Compaction: Any method of mechanically stabilizing a material by increasing its density at a controlled moisture condition. "Degree of Compaction" is expressed as a percentage of the maximum dry density obtained by the test procedure described in ASTM D 1557 for general soil types abbreviated in this Specification as "___ percent of maximum dry density".
- J. Hard Material: Weathered rock, dense consolidated deposits or conglomerate materials which are not included in the definition of "rock" but which usually require the use of heavy excavation equipment, ripper teeth, or jack hammers for removal.
- K. Lift: A layer or course of soil placed on top of previously prepared or placed soil in a fill or embankment.
- L. Unsatisfactory Material: Soil or other material identified as having insufficient strength or stability to carry intended loads without excessive consolidation or loss of stability.

1.05 SUBMITTALS

- A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.
 - 1. Location of borrow materials.
- B. Photographs or video tape of existing adjacent structures and site improvements.

1.06 QUALITY ASSURANCE

- A. Codes and Standards: Perform earthwork in compliance with applicable requirements of governing authorities having jurisdiction.
 - 1. Standard Specifications for Public Works Construction (SSPWC), latest edition.
 - 2. CAL/OSHA Construction Safety Order Requirements.
- B. Testing and Inspection Service: Employ a qualified independent geotechnical Owner's Representative testing agency to classify proposed on-site and borrow soils to verify that soils comply with specified requirements and to perform required field and laboratory testing.
 - 1. Samples of materials shall be furnished to the testing service by the Contractor at least one week before their anticipated use.
 - 2. Work of this Section includes smoothing out areas for density tests and otherwise facilitate testing work, as directed.
- C. Pre-installation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings."
 - 1. Before commencing earthwork, meet with representatives of the governing authorities, Owner, Architect, consultants, Geotechnical Owner's Representative, independent testing agency, and other concerned entities. Review earthwork procedures and responsibilities including testing and inspection procedures and requirements. Notify participants at least 3 working days prior to convening conference. Record discussions and agreements and furnish a copy to each participant.

1.07 PROJECT CONDITIONS

- A. The Contractor shall visit the site and familiarize himself with existing site conditions.
- B. Additional test borings and other exploratory operations may be made by the Contractor at no cost or liability to the Owner.

- C. Existing Utilities: Do not interrupt existing utilities except when permitted in writing by the utility owner and then only after acceptable temporary utility services have been provided.
 - 1. Provide a minimum 48-hours' notice to the utility owner and receive written notice to proceed before interrupting any utility.
 - 2. Where uncharted or incorrectly charted piping or other utilities are encountered during excavation, consult the Owner and Owner's Representative immediately for direction. Cooperate with the Owner and the Owner's Representative in keeping respective services and facilities in operation. Repair damaged utilities to the satisfaction of the Owner at no cost to the Owner.
 - 3. Contractor to coordinate with the District's Representative to obtain all required permits and schedule inspections.
- D. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shutoff services if lines are active.
- E. Groundwater elevations that may be indicated are those existing at the time that subsurface investigations were made and do not necessarily represent groundwater elevations at the time of construction.
- F. Protection of Subgrade: Do not allow equipment to pump, rut, or disturb subgrade, stripped areas, or other areas prepared for Project. If pumping soils are encountered, the Contractor shall be responsible for properly stabilizing the subgrade in accordance with the Geotechnical Report and at the direction of the Geotechnical representative.
- G. Contractor shall implement measures to prevent soil erosion, and where possible, sediment shall be retained onsite.
- H. Contractor shall implement all necessary recommendations contained in the referenced Geotechnical Report.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

- A. General: Provide approved borrow soil materials from off-site when sufficient approved soil materials are not available from excavations.
- B. Satisfactory Soil Materials: ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, and SM; free of rock or gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetation and other deleterious matter.
- C. Unsatisfactory Soil Materials: ASTM D 2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT.
- D. Backfill and Fill Materials: Satisfactory soil materials.
- E. Base Material: Shall conform to crushed aggregate base or crushed miscellaneous base in accordance with section 200-2.2 or 200-2.4, respectively, of SSPWC, and compacted to at least 95% of the maximum dry density as determined by ASTM Test Method D 1557.
- F. Owner's Representativee Fill: Well graded granular soil with an expansion index less than 20 and free of rock or gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetation and other deleterious matter.
- G. Bedding Material: Shall be base materials with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve; or clean sand classified in accordance with ASTM D 2487.
- H. Drainage Fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, ASTM D 448, coarse aggregate grading size 57, with 100 percent passing a 1-1/2-inch sieve and not more than 5 percent passing a No. 8 sieve.
- I. Filtering Material: Evenly graded mixture of natural or crushed gravel or crushed stone and natural sand, with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 50 sieve.
- J. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.02 ACCESSORIES

- A. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick minimum, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 2'-6" deep.
 - 1. Tape Colors: Provide tape colors to utilities as follows:
 - a. Red: Electric.
 - b. Yellow: Gas, oil, steam, and dangerous materials.
 - c. Orange: Telephone and other communications.
 - d. Blue: Water systems.
 - e. Green: Sewer systems.
 - f. White: Steam systems.

PART 3 - EXECUTION

3.01 GENERAL

- A. In order to protect from sediment transfer or contamination from urban run-off during construction, at a minimum, the following grading and erosion control practices shall be followed in accordance with Section 01 57 23:
 - 1. If grading occurs during the rainy season (November through April), sediment traps, barriers, covers or other methods shall be used to reduce erosion and sedimentation.
 - 2. Excavated materials shall not be deposited or stored where the material can be washed away by high water or storm run-off.
 - 3. Grading operations on site shall be conducted so as to prevent damaging effects of sediment production and dust on the site and on adjoining properties.
 - 4. When vegetation has to be removed on site, the methods shall be one that minimizes the erosive effects from the removal.
 - 5. Exposure of soil to erosion by removing vegetation shall be limited to the area required for construction operations. The construction area shall be fenced to define the project.
 - 6. Temporary mulching, seeding, or other suitable stabilization shall be used to protect areas during construction or other land disturbance activities on site.
 - 7. Topsoil, removed from the surface in preparation for grading and construction activities on site is to be stored on or near the site and protected from erosion while grading operations are underway, provided that such storage may not be located where it would cause suffocation of root systems of trees to be preserved. After completion of such grading, topsoil is to be restored to exposed cut and fill embankments of building pads so as to provide a suitable base of seeding and planting.
 - 8. Sediment basins, sediment traps, or similar control measures shall be installed before extensive clearing and grading operations begin for site development.
 - 9. Water or dust palliatives shall be applied to exposed earth services as necessary to control dust emissions.
 - 10. Re-vegetation or stabilization of exposed earth surfaces shall take place as soon as possible.

3.02 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Provide erosion control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Tree protection is specified in the "Site Clearing" section.

1. Carefully and cleanly cut roots and branches of trees indicated to be left standing, where such roots and branches obstruct new construction. Paint cuts over one inch in size with tree pruning compound. Care shall be taken so as not to scar any area of the tree's bark.

- D. Prepare subgrade and place base materials in accordance with sections 301-1.2 and 301-2, respectively, of the Reference Specification.

3.03 REMOVALS

- A. Clear the site of trees, shrubs, and other vegetation, which is indicated to be removed.
- B. Completely remove stumps, roots, and other debris to avoid problems with future utilities.
- C. Use only hand methods for grubbing inside the drip line of trees indicated to be left standing.
- D. Existing fills, soil containing debris, organics, pavement, or other unsuitable materials shall be excavated and removed prior to commencing grading operations. Demolition areas shall be cleared of old foundations, slabs, abandoned utilities, landscaping, and soils disturbed during the demolition process. Depressions or disturbed areas left from the removal of such material shall be replaced with compacted fill.
- E. The limits and depths for removal of existing fill materials shall be evaluated by project soils Owner's Representative during grading.
- F. Revegetation or stabilization of exposed earth surface shall take place as soon as possible.
- G. Remove above-grade and below-grade improvements necessary to permit construction and other work as indicated.
- H. Remove from site and legally dispose of off-site, existing fill materials, soil debris, or other unsuitable materials prior to commencing grading operations.

3.04 DEWATERING

- A. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

3.05 EXCAVATION

- A. General: Shall be to the contours and dimensions indicated. Keep excavations free from water and debris while construction is in progress. Notify the Owner immediately in writing where it becomes necessary to remove hard, soft, weak, or wet material to a depth greater than indicated. Unless otherwise indicated, concrete placed below grade will be formed and excavations shall allow for placement and removal of forms. Side cuts shall be cribbed and shored as required.
- B. Explosives: Do not use explosives.
- C. Unclassified Excavation: Excavation is unclassified and includes excavation to required subgrade elevations regardless of the character of materials and obstructions encountered.

3.05 STABILITY OF EXCAVATIONS

- A. Comply with local codes, ordinances, and requirements of authorities having jurisdiction to maintain stable excavations.
- B. Unshored Temporary Excavations: Unshored temporary excavations may be sloped back at 1 to 1 (horizontal to vertical) or flatter. Where sloped embankments are used, the tops of the slopes should be barricaded to prevent vehicles and storage loads within seven feet of the tops of the slopes. If the temporary construction slopes will be maintained during the rainy season, construct berms along the tops of the slopes where

necessary to prevent run-off water from entering the excavation and eroding the slope faces.

3.06 EXCAVATION FOR STRUCTURES

- A. Excavation Limits: Shall be to a tolerance of plus-or-minus 0.04 foot and shall extend at least five feet laterally beyond the building limits at the excavation level. The project Geotechnical Investigation identifies the onsite soils as generally Type C soils, therefore the excavation side slopes shall not exceed a slope ratio of 1.5 to 1, horizontal to vertical, unless they are positively retained by shoring or other approved methods. Over-excavation side slopes may be vertical where shown on the Grading Plan, as long as they are no higher than allowed by the State of California Construction Safety Orders. If cut below depths indicated, excavations shall be filled with concrete when the foundations or footings are placed.
 - 1. Excavations for Footings and Foundations:
 - a. Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
 - b. Excavations shall be such that all footings are founded on at least 3 feet of properly compacted soil. These 3 feet shall consist of compacted Owner's Representative fill. This determination shall be made in the field by the geotechnical Owner's Representative.
 - 2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Appurtenances: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 0.10 foot. Do not disturb bottom of excavations intended for bearing surface.

3.07 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements as necessary to permit placing of at least 2 feet under concrete pavement and at least 1 foot under asphalt concrete pavement of non-expansive soils (Expansion Index less than 20) Owner's Representative fill beneath indicated elevations, and grades.
- B. Cut surface under pavements to comply with cross-sections, elevations and grades as shown, within a tolerance of plus or minus 0.04 foot.

3.08 EXCAVATION FOR PLANTING AREAS

- A. Conform to cross-sections, elevations and dimensions shown, within a tolerance of plus or minus 0.10 foot.

3.09 EXCAVATION FOR UTILITY TRENCHES

- A. Excavation made with power-driven equipment is not permitted within two feet of any known utility or subsurface construction. For work immediately adjacent to or for excavations exposing a utility or other buried obstruction, use hand or light equipment excavation. 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. Support uncovered lines and other existing work affected by the excavation work of this Section until approval for backfill is granted by the geotechnical Owner's Representative. Immediately report damage to utility lines or subsurface construction to the Owner.
- B. Where unidentified existing utilities are encountered, determine whether these are active or abandoned. Remove interfering portions of abandoned utilities and cap or plug open ends of pipe to remain. The cap or plug must seal the opening in such a manner that would permit remaining portions of the utility to be reactivated. Notify Owner for instructions on utilities which are determined to be active. Do not proceed without instructions, except to correct an immediate hazard or emergency condition. Relocation

work performed on an active utility without obtaining prior approval from Owner shall be done at the Contractor's expense and liability.

- C. In areas where compacted backfill has been placed, additional consolidation may occur after completion due to changes in moisture content and surcharge. Utility connections crossing this backfill, and improvements adjoining the building at the backfill line shall be installed taking into account this additional consolidation, or sufficient time shall be scheduled between backfilling operations and such improvements to allow this consolidation to take place. Damage to utilities or other improvements due to Contractor's negligence in regard to this paragraph shall be repaired at the Contractor's expense.
- D. Protect newly backfilled areas and adjacent structures, slopes, or grades from traffic, erosion settlement, and any other damage. Repair and re-establish damaged or eroded grades and slopes and restore surface construction prior to acceptance.
- E. Cutting Pavement, Curbs, and Gutters: Saw cut with neat, parallel, straight lines one foot wider than trench width on each side of trenches and one foot beyond each edge of pits. If an existing pavement joint or cracked area is within two feet outside of a designated sawcut line shown on the Drawings, removal and resurfacing shall be to that joint, and/or shall include the crack or cracked area, unless otherwise approved by Architect or Owner's Representative.
- F. Contractor shall pothole at all identifiable crossings of existing utilities prior to any trenching operations and provide the Owner's Representative with a survey of the top elevations (and bottom elevations, if applicable), of possible interferences so that an evaluation of necessary adjustments to the current profile or alignment may be made. Additionally, the Owner's Representative shall be given the opportunity to view possible conflicts in the field prior to providing revised designs.
- G. Provide a minimum cover from grade of 3 feet for water mains and gas mains, unless otherwise noted. Storm drains and sewers shall be to the depths indicated. Where settlements greater than the tolerance allowed herein for grading occur in trenches and pits due to improper compaction, excavate to the depth necessary to rectify the problem, then backfill and compact the excavation as specified herein and restore the surface to the required elevation.
- H. Keep excavations free from water while construction is in progress.
- I. Notify the Owner immediately in writing if it becomes necessary to remove rock or hard, unstable, or otherwise unsatisfactory material to a depth greater than indicated. Excavate large rock, boulders, and other unyielding material to an overdepth at least 6 inches below the bottom of the pipe, conduit, duct and appurtenances, unless otherwise indicated or specified. Over-excavate soft, weak, or wet excavations to an overdepth at least 12 inches below the bottom of the pipe, conduit, duct or appurtenances unless otherwise indicated or specified.
- J. Excavate trenches to indicated slopes, lines, depths, and invert elevations.
- K. Excavate trenches to uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit, except where sloping of sides is allowed. Sides of trenches shall not be sloped from the bottom of the trench up to the elevation of the top of the pipe. See plans for detail.
- L. At the option of the Contractor, the excavations may be cut to an overdepth of not less than 4 inches and refilled to required grade as specified.
- M. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove stones and sharp objects to avoid point loading.
 - 1. For pipes or conduit less than 6 inches in nominal diameter and flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
 - 2. For pipes and conduit 6 inches or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe circumference. Fill depressions with tamped sand backfill.

3. Dig bell holes and depressions for joints after trench has been graded. Dimension of bell holes shall be as required for properly making the particular type of joint to ensure that the bell does not bear on the bottom of the excavation.

3.10 APPROVAL OF SUBGRADE

- A. Notify Geotechnical Owner's Representative when excavations have reached required subgrade.
- B. When Geotechnical Owner's Representative determines that unforeseen unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
 1. Unforeseen additional excavation and replacement material will be paid according to the Contract provisions for changes in Work.
- C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the Geotechnical Owner's Representative.

3.11 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending indicated bottom elevation of concrete foundation or footing to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position when acceptable to the Geotechnical Owner's Representative.
 1. Fill unauthorized excavations under other construction as directed by the Geotechnical Owner's Representative.
- B. Where indicated widths of utility trenches are exceeded, provide stronger pipe, or special installation procedures, as required by the Owner's Representative.

3.12 STORAGE OF SOIL MATERIALS

- A. Stockpile excavated materials acceptable for backfill and fill soil materials, including acceptable borrow materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent wind-blown dust.
 1. Stockpile soil materials away from edge of excavations a minimum distance of 7 feet or depth of excavation, whichever is greater. Do not store within drip line of remaining trees.

3.13 BACKFILL

- A. Backfill excavations promptly, but not before completing the following:
 1. Acceptance of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
 2. Surveying locations of underground utilities for record documents.
 3. Examination, testing, inspecting, and approval of underground utilities.
 4. Concrete formwork removal.
 5. Removal of trash and debris from excavation.
 6. Removal of temporary shoring and bracing, and sheeting.
 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.
 8. Protect excavations by methods required to prevent cave-in or loose soil from falling into excavation.
 9. Protect excavations by methods required to prevent movements and/or loosening of soils providing lateral or vertical support to existing improvements.
 10. Deepen bottom of over-excavations in building areas to limit fill thickness gradient to less than 20 percent.

3.14 UTILITY TRENCH BACKFILL AND COMPACTION

- A. Backfilling of exterior utility trenches shall not be undertaken until geotechnical Owner's Representative has received 24-hours' notice, until required tests and inspections have been completed, and until as-built location notes have been furnished. Remove uninspected backfill in accordance with requirements of this specification. Use hand-operated, plate-type, vibratory, or other suitable hand tampers in areas not accessible to larger rollers or compactors. Avoid damaging pipes and protective pipe coatings.
- B. Place backfill material in accordance with Section 306-1.3.2 of the Reference Specifications and achieve at least 90% of the maximum density per ASTM D 1557. The top 12 inches of backfill in the building or paved areas shall be compacted to 95% of maximum density per ASTM D 1557.
- C. Compaction by ponding or flooding will not be permitted.
- D. Place and compact bedding course on rock and other unyielding bearing surfaces and to fill unauthorized excavations. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- E. Concrete backfill trenches that carry below or pass under footings and that are excavated within 18 inches of footings. Place concrete to level of bottom of footings.
- F. Provide 4-inch-thick concrete base slab support for piping or conduit with less than 2'-6" of cover below finish surface of roadways. After installation and testing, completely encase piping or conduit in a minimum of 4 inches of concrete before backfilling or placing roadway base.
- G. Place and compact initial backfill of satisfactory soil material or aggregate base material, free of particles larger than 1 inch, to a height of 12 inches over the utility pipe or conduit.
 - 1. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of utility system.
- H. Coordinate backfilling with utilities testing.
- I. Fill voids with approved backfill materials as shoring and bracing, and sheeting is removed.
- J. Place and compact final backfill of satisfactory soil material to final subgrade.
- K. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.
- L. Manholes and other Appurtenances: Provide at least 12 inches clear from outer surfaces to the embankment or shoring. Remove rock as specified herein. Remove unstable soil that is incapable of supporting the structure to an over-depth of one foot and refill with gravel or sand to the proper elevation and compact to 95% percent of maximum density.

3.15 FILL

- A. In all excavations, use satisfactory excavated or borrow material sampled and tested by the District's Testing Laboratory.
- B. Preparation: Remove vegetation, topsoil, debris, wet and unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placing fills.
 - 1. Plow strip, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing surface.
- C. When subgrade or existing ground surface to receive fill has a density less than that required for fill, break up ground surface to depth required, pulverize, moisture-condition or aerate soil and re-compact to required density.
- D. Place fill material in layers to required elevations for each location listed below.
 - 1. Under grass, use satisfactory excavated or borrow soil material.
 - 2. Under walks and pavements, use base material or satisfactory excavated or borrow soil material.
 - 3. Under steps and ramps, use base material.
 - 4. Under building slabs, use drainage fill material.
 - 5. Under footings and foundations, use Owner's Representativeed fill.
- E. Continual dust control, as required by the District, and in accordance with County Air Pollution Control District's Standards shall be required for the project construction.

- F. Fill excavations as promptly as Work permits, but not until completion of the following:
1. Acceptance by District's Representative of construction below finish grade including, where applicable, waterproofing, damp-proofing, and drainage pipe.
 2. Examination, testing, approval and recording locations of underground utilities.
 3. Removal of concrete formwork.
 4. Removal of shoring and bracing and backfilling of voids with satisfactory materials.
 5. Removal of trash and debris.
 6. Permanent or temporary horizontal bracing is in place on horizontally supported walls.
 7. Protect excavations by methods required to prevent cave-in or loose soil from falling into excavation.

3.16 MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to minimum 3 percent above optimum moisture content for cohesive soils and to near optimum for cohesionless soils.
1. Do not place backfill or fill material on surfaces that are muddy, frozen or contain frost or ice.
 2. When moisture content of exposed scarified soil and/or full material is below that sufficient to achieve recommended compaction, water shall be added to the soil and/or fill. While water is being added, soil shall be bladed and mixed to provide relatively uniform moisture content throughout material.
 3. When moisture content of satisfactory soil material is too wet to compact to specified density remove and replace, or scarify and air-dry.
 - a. Stockpile or spread and dry removed wet satisfactory soil material.
 4. Jetting is not permitted for compaction.

3.17 COMPACTION

- A. General: Control soil compaction during construction providing minimum percentage of density specified for each area.
- B. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- C. Place backfill and fill materials evenly on all sides of structures to required elevations. Place backfill and fill uniformly and thoroughly blade-mix during spreading along the full length of each structure. Blocky or chunky earth materials shall be broken down to pea-size or finer during processing and prior to application of compactive effort. Where imported soils are placed adjacent to onsite fill material, the soil should be mixed to provide relative uniformity of material within the layer being placed. Keep rollers and other heavy equipment at least 18 inches from footings, foundations, piers and walls of buildings and accessory construction. Use mechanical and hand tampers weighing at least 90 pounds with a maximum face area of 48 inches square to compact backfill within 18 inches of construction and where access is restricted.
- D. Fill shall be spread in lifts no thicker than about 6 inches prior to being compacted. Fill and backfill materials may need to be placed in thinner lifts to achieve the recommended compaction with the equipment being used. Loose lift thickness shall not exceed 6 inches when using hand-operated compaction equipment.
- E. Percentage of Maximum Dry Density Requirements: Compact soil to not less than the following percentages of maximum dry density according to ASTM D 1557 and the Geotechnical Report:
1. For general site fills, compact each layer of backfill or fill material at 90 percent maximum dry density.
 2. Under structures, building slabs, steps, and pavements, scarify and compact the top 12 inches below subgrade at 95 percent maximum dry density.

3. Under walkways, scarify and compact the top 6 inches below subgrade at 90 percent maximum dry density.
4. Under lawn or unpaved areas, compact the top 6 inches below subgrade at 85 percent maximum dry density.
5. Topsoil, place in lifts no greater than 12" and loosely compact to 85 percent relative density.

3.18 IMPORT

- A. Initial sample and testing shall be performed before importing material to the project site. Identify the location of the source site in addition to the address, name of the person and entity responsible for the source site. A geotechnical Owner's Representative, retained by the District, shall obtain both the initial and additional samples from the identified site and submit samples for required testing.
- B. Soil samples shall be tested by an independent approved testing laboratory that shall perform the required tests. Test results shall be provided noting if the tested materials passed or failed such tests and shall be furnished to the district, IOR, Owner's Representative, DSA and others as required. Report shall state material was tested in accordance with applicable provisions of the contract Documents, California Building Code and the DSA. Upon the completion of the Work, the independent testing laboratory shall submit a verified report the DSA as required.
- C. Upon completion of the import operations, provide the District a certification statement attesting that the imported material has been obtained from the identified and approved source site.

3.19 GRADING

- A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 1. Provide a smooth transition between existing adjacent grades and new grades.
 2. Cut out soft spots, fill low spots, and trim high spots to conform to required surface tolerances.
 3. If necessary, the Contractor's selected equipment and construction procedure shall be altered, changed or modified in order to meet the specified compaction requirements. Flooding and water jetting is prohibited.
 4. Grading operations shall only be performed under the observation of the District's Testing Laboratory.
 5. Grading operation shall be conducted so as to prevent damaging effects of sediment product and dust on the site and adjoining properties.
 6. The exterior grades around building areas shall be sloped to drain away from the buildings to prevent ponding of water adjacent to foundations.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
 1. Lawn or Unpaved Areas: Plus or minus 0.10 foot, unless otherwise indicated.
 2. Concrete Walks: Plus or minus 0.05 foot.
 3. Pavements:
 - a. Concrete: 0.02 foot minus, with no high spots.
 - b. Asphalt: 0.05 foot minus, with no high spots.
- C. Grading Inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.20 FIELD QUALITY CONTROL

- A. Testing Agency Services: Allow testing agency to inspect and test each subgrade and each fill or backfill layer. Do not proceed until test results for previously completed work verify compliance with requirements.

1. Perform field in-place density tests according to ASTM D 1556 (sand cone method), ASTM D 2167 (rubber balloon method), or ASTM D 2937 (drive cylinder method), as applicable.
 - a. Field in-place density tests may also be performed by the nuclear method according to ASTM D 2922, provided that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D 1556. With each density calibration check, check the calibration curves furnished with the moisture gages according to ASTM D 3017.
 - b. When field in-place density tests are performed using nuclear methods, make calibration checks of both density and moisture gages at beginning of work, on each different type of material encountered, and at intervals as directed by the Geotechnical Owner's Representative.
2. Footing Subgrade: At footing subgrades, perform at least one test of each soil stratum to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of each subgrade with related tested strata when acceptable to the Geotechnical Owner's Representative.
3. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, perform at least one field in-place density test for every 2,000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.
4. Foundation Wall Backfill: In each compacted backfill layer, perform at least one field in-place density test for each 100 feet or less of wall length, but no fewer than two tests along a wall face.
5. Trench Backfill: In each compacted initial and final backfill layer, perform at least one field in-place density test for each 150 feet or less of trench, but no fewer than two tests. Not to exceed 18 inches in depth.
- B. When testing agency reports that subgrades, fills, or backfills are below specified density, scarify and moisten or aerate, or remove and replace soil to the depth required, re-compact and retest until required density is obtained at no additional cost to the City.
- C. Upon completion of the Building pads, a pad certification will be prepared by the Owner's Representative.

3.21 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and re-establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or lose compaction due to subsequent construction operations or weather conditions.
 1. Scarify or remove and replace material to depth directed by the Geotechnical Owner's Representative; reshape and re-compact at optimum moisture content to the required density.
- C. Settling: Where settling occurs during the Project correction period, remove finished surfacing, backfill with additional approved material, compact, and reconstruct surfacing.
 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.
- D. Earth materials and improvements constructed thereon shall be supported laterally and vertically, as needed, to prevent movements and deflections of same. Remediation and repair of loosened materials or movements of improvements shall be at the Contractor's expense.

3.22 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off the Owner's property.

END OF SECTION 31 20 00

SECTION 31 23 33

TRENCHING AND BACKFILLING

1.00 GENERAL

1.01 SUMMARY

- A. Excavating trenches for construction of utilities.
- B. Trench backfill materials.
- C. Backfilling and compacting requirements.

1.02 REFERENCES

- A. Standard Specifications for Public Works Construction (SSPWC), latest edition.

1.03 SUBMITTALS

- A. Materials source.
- B. Sand equivalent test reports per ASTM D2419.
- C. Certificates.
- D. Drawings for shoring, bracing, sloping, or other provisions for worker protection for any excavation shall conform to the requirements of the CAL/OSHA Construction Safety Orders Requirements.

1.04 EXISTING UTILITIES

- A. Prior to excavation, the Contractor shall notify the District's Representative to obtain any additional information which may be applicable to the Work.
- B. Any incident of a utility being inadvertently damaged by the Contractor shall be immediately shutoff and then be immediately repaired by the Contractor at no cost to the District.
- C. Contractor to pothole all utility connections and verify exact size, location and material prior to beginning construction and notify Owner's Representative of any discrepancies.

2.00 MATERIALS

2.01 APPROVALS

- A. Imported material shall be approved by the District's Representative prior to being brought to the site. Provide a sample of the material in sufficient quantity for the District's Representative's use in evaluating the material.

2.02 TRENCH BACKFILL MATERIAL

- A. Sand bedding shall have a sand equivalent (SE) of 30 or greater. The SE shall be evaluated during grading.
- B. Backfill material shall conform to the requirements of Section 217-2 of the SSPWC.
- C. Aggregate base course shall be per Plan.
- D. Topsoil removed from trenches shall be stockpiled at locations approved by the District's Representative.

2.03 SOURCE QUALITY CONTROL

- A. Inspection and testing shall be performed by the District's Representative.

3.00 EXECUTION

3.01 PREPARATION

- A. Identify required lines, levels, contours, and datum.

3.02 TRENCH EXCAVATION

- A. All saw cutting shall be neat, straight cuts and shall conform to Section 306-3 of the SSPWC. All cuts shall be square unless otherwise specifically noted on plans.
- B. Trench excavation shall conform to Section 306-3 of the SSPWC and the following requirements:
 - 1. The bottom of the trench shall be graded and prepared to provide a firm and uniform bearing throughout the entire length of the pipe barrel. Suitable excavations shall be made to receive the bell of the pipe and the joint shall not bear upon the bottom of the trench. All adjustments to line and grade shall be made by scraping away or filling in with sand under the body of the pipe and not by wedging or blocking.
 - 2. If the trench is excavated below the required grade, correct any part of the trench excavated below the grade, at no additional cost to the District. Place the backfill material over the full width of trench in compacted layers not exceeding 6 inches deep to the established grade with allowance for the pipe base. If shoring is required, the trenches shall be shored and braced in accordance with the Trench Construction Safety Orders of the Division of Industrial Safety.
 - 3. When subgrade is encountered that in the opinion of the District's Representative is unsuitable for pipe support, the District's Representative may order the excavation to be carried to an approved depth below the bottom of the pipe and backfilled with sand, to the lines and grades shown on the drawings and specified by the District's Representative.
 - 4. The minimum width of the trench at the top of the pipe zone shall be as necessary to install the pipe. The utility lines shall be centered in the trench. In the event of (1) actual physical interference between existing crossing subsurface utilities and the proposed utility lines and (2) vertical discrepancy in connecting proposed utility lines to existing utility system, a minimum clearance of 0.5 feet between the utility line and the crossing, interfering utility shall be provided, unless otherwise indicated on the plans.
 - 5. Where existing utilities or tree roots are to be protected, trench excavation shall be by hand. No mechanical excavating equipment shall be used within 6 inches of any utility or root.
 - 6. Trenching machinery may be used for excavations provided the specified trench width can be maintained.

3.03 TRENCH BACKFILL

- A. Pipe bedding and trench backfill materials: pipe bedding shall be either crushed rock or sand as specified on the plans. Sand bedding and backfill for utilities shall consist of material having a sand equivalent of at least 30. The backfill material shall be placed within the pipe zone that extends from the bottom of the pipe to at least 12 inches above the top of the pipe for the full width of the trench. The horizontal distance between the spring line of the pipe and the side walls of the trench shall be such that bedding material can be properly placed and compacted below the haunches of the pipe. Pipe bedding and pipe zone backfill shall be compacted to at least 90 percent relative compaction.
- B. Trench backfill placed above the pipe zone shall consist of suitable onsite or imported soil. Mechanical compaction of trench backfill shall be performed and water consolidation (jetting) methods of compaction shall not be permitted. Trench backfill in landscape areas shall be compacted to a minimum of 90 percent relative compaction or per landscape specifications.
- C. Trench Backfilling shall conform to the requirements of Sections 306-12 of the SSPWC:

1. During the process of laying pipe in trenches, sufficient material shall be carefully placed and hand tamped about the pipe to hold it firmly to established line and grade. Oversized material, broken rock or shale, if encountered, shall not be used for backfill.
2. No motor driven mechanical compacting equipment shall be used over pipelines until the backfill has been compacted to 12 inches over the crown of the pipe.
3. All backfill material shall be deposited in horizontal layers not exceeding the thickness specified in Section 306-12 of the SSPWC and not exceeding 8 inches in thickness. The distribution of materials shall be such that all material following compaction and consolidation will form a homogeneous mass free of voids, pockets, streaks or other imperfections. Backfilling shall be done with earth free from lumps, hardpan, chunks, paving material, organic matter or other deleterious substances.
4. Jetting of bedding or backfill material to obtain specific moisture content or for compaction shall not be permitted. If encountered, existing fill in the utility excavation shall be excavated and recompactd or removed and replaced with new fill materials per requirements of Section 2.02.
5. Appropriate warning detector tape shall be placed over all utilities.
6. Prior to final cleanup or resurfacing, the District's Representative shall take compaction tests in any backfill area and at any depth, with the Contractor providing equipment and operator to assist in such test. If any such compaction test fails, the Contractor shall correct such failure and pay for any retesting that is required. The District's Representative shall make as many tests as he feels is required to receive a satisfactory and acceptable job.

3.04 STOCKPILING

- A. Stockpiling of imported materials or excavated materials shall direct surface water away from approved stockpile site to prevent erosion.
- B. After stockpiles are removed, leave area in a clean and neat condition.

3.05 FIELD QUALITY CONTROL

- A. Inspection and testing shall be performed by District's Representative.

END OF SECTION 31 23 33

SECTION 32 01 91

TREE PROTECTION AND ROOT PRUNING

PART 1 - GENERAL

1.01 DESCRIPTION

This item shall consist of furnishing all labor, materials, tools, and equipment required to protect those trees and shrubs designated to remain on the site. Protection of designated trees shall include directing heavy construction work activity away from the protected trees. Section includes the protection, trimming, and pruning of trees that interfere with, or are affected by, execution of the Work, whether temporary or new construction. Work under this Section consists of, but is not limited to, furnishing, and installing the following:

- A. Protecting and maintaining existing trees and vegetation not specifically designated for removal, to remain.
- B. Protection shall be extended to trees and/or vegetation located within or directly adjacent to the Project Site, whether the tree trunk and/or vegetation are located within the designated Limits of Work.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 31 10 00 Site Clearing
- B. Section 32 84 00 Planting Irrigation
- C. Section 32 90 00 Planting

1.03 SUBMITTALS

- A. Product Data: For each type of product indicated, submit complete and legible materials list of items to be provided for Work described herein this Section.
- B. Qualification Data: For tree service firm and arborist, ISA certification required.
- C. Contractor shall provide site photographs or video, sufficiently detailed and described, of existing conditions of trees and vegetation, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing, tree pruning, or tree protection. Submit photographs or video recordings to the City Engineer or his/her designated representative prior to commencement of Work.
- D. Certification: From arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly pruned and repaired when damaged.
- E. Schedule: The contractor shall submit complete detailed schedule and description of Work to be done within dripline of any existing trees designated to remain (including, but not limited to oak trees), including list of equipment to be used.
- F. Submit schedule and description of proposed pruning and/or other remedial work to existing plant materials. Submit qualifications describing years of experience and list of similar projects completed for the following:
 - a. A State of California licensed Pest Control Advisor shall propose application of all herbicides or pesticides.
 - b. A Certified Arborist shall propose pruning of trees or other vegetation. The Certified Arborist shall have a minimum of five (5) year's post-certification experience performing pruning and observation work for projects of comparable size with trees of similar size and nature.
 - c. Tree Pruning Company, and List of Certified Tree Workers, who will perform Work relating to requirements herein this Section. Tree Pruning Company shall have a minimum of five (5) years' experience specializing in performing the work of this Section for projects of comparable size with trees of similar size and nature.
- G. Maintenance Recommendations: From certified arborist, for care and protection of trees affected by construction during and after completion of the Work.

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

1.04 QUALITY ASSURANCE

- A. Tree Service Qualifications: An experienced tree service firm that has successfully completed tree protection and trimming work similar to that required for this Project and that will assign an experienced, qualified arborist to project site on a full-time basis during execution of the work.
- B. Arborist qualifications: An arborist certified by the International Society of Arboriculture.
- C. Tree Pruning Standards: Comply with ANSI A300 (Part 1), "Trees, Shrubs, and other Woody Plant Maintenance—Standard Practices (Pruning)."
- D. Pre-installation Conference: Before starting tree protection and trimming, meet with representatives of authorities having jurisdiction, Owner, Architect, consultants, and other concerned entities to review tree protection and trimming procedures and responsibilities.
- E. Pruning and remedial work shall be done under the direct supervision of an ISA certified Arborist, in compliance with ISA and ANSI standards. Arborist shall be on Site continuously while existing trees or roots are being pruned or remedial work is being performed.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Materials for tree/vegetation protection barriers shall conform to the following requirements and AOBs:
 - 1. Mesh Construction Fencing by Conwed or Approved Equal (orange color)
 - 2. Cedar Posts (minimum length 6.0 feet)
 - 3. #14-gauge steel wire
 - 4. Nylon locking ties
- B. Temporary Signs: White or yellow weatherproof material, 8 inch by 40-inch minimum, with 3- inch black letter: text – "Tree Protection Area – Do Not Enter" in English and Spanish.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Locate and clearly flag trees and vegetation to remain.
- B. Protect existing site improvements to remain from damage during construction.
- C. Temporary Fencing: Install temporary fencing around the tree protection zones designated on the plans or where directed by the engineer to protect remaining vegetation from construction damage. Maintain temporary fence and remove when construction is complete.
- D. Temporary Signs: Install temporary signs 60 feet apart, or two per protected tree, whichever is greater, on posts of temporary fencing. Maintain temporary signs and remove when construction is complete.
- E. The Contractor shall repair or replace any and all damaged plant material determined by the Certified Arborist to any existing or newly installed plant material at its own expense. Unnecessary damage to ground cover or turf shall be repaired or replaced as specified for restoration of similar areas within the plans, or as directed by the Certified Arborist, and shall be at the Contractor's expense.
- F. Root Zone Protection: During the entire construction period all reasonable efforts shall be made to protect from damage those trees and their root system designated to remain. Around the trees to be protected, the Contractor shall avoid excessive excavation or compaction and damage during the removal of trees and shrubs designated to be removed. All plant material designated to be saved, or outside of the limits of construction, shall be protected during subsequent construction work. Work under these items will include construction and maintenance of temporary fencing to protect the root zones of existing trees and other plantings, construction, and maintenance of tree trunk protection.

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

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

The protection barrier shall be constructed of orange snow fencing securely fastened to fence posts spaced a maximum of 5 feet on center. Posts are 6 feet in length with 2 feet set into the ground and 4 feet extending above ground. The fencing shall be attached to the post with a minimum of four (4) nylon-locking ties evenly placed at each post. The protection barrier shall be installed plumb, taut, and sturdy to prevent unauthorized access around dripline of trees and protected vegetation. Repair sagging or damaged barriers immediately.

Immediately after barrier fencing is installed, cover entire soil area inside of the fence area with a four-inch (4") layer of mulch. Keep mulch eighteen inches (18") away from root crown. Irrigate protected trees and vegetation to a moist soil depth of eighteen inches (18") deep.

During the course of construction, relocation of the barrier fencing may be required to facilitate construction. Contractor shall relocate barrier fencing as directed by the City Engineer or his/her designated representative at no additional expense to the City.

E. Dimensions of the protection barrier are as follows:

1. Small Trees (Less than 9" caliper at 4.5 ft) – Minimum 5 feet from face of tree.
2. Medium Trees (10" to 15" caliper at 4.5 ft) – Minimum 10 feet from face of tree.
3. Large Trees (Greater than 15" caliper at 4.5 ft) – Minimum 15 feet from face of tree.

The Contractor shall be responsible to protect all trees from damage at the construction site. Any trees damaged as a result of construction activity as determined by the Certified Arborist shall be repaired, removed and/or replaced at the Contractor's expense. The Contractor shall pay liquidated damages in the amount of the appraised value of the tree(s). At a minimum, any tree greater than 4" D.B.H. that is permanently damaged due to the construction project and not originally marked for removal shall be replaced with a new tree as identified by the Owner and shall have a minimum of 4" caliper B&B. Any damaged tree smaller than 4" caliper measured 6" above the ground shall be replaced in kind, inch for inch.

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

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

H. Do not store construction materials, debris, or excavated material inside tree protection zones.

I. Do not permit vehicles or foot traffic within tree protection zones; prevent soil compaction over root systems.

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

K. Irrigation: Contractor shall supply fresh, potable water in adequate amounts and rates of application as required to maintain the health of protected plant material throughout the duration of the construction operations. Contractor shall maintain a watering schedule and document dates and duration of irrigation applications.

3.02 EXCAVATION

A. All damage to existing trees by Contractor shall be repaired by a licensed tree surgeon or other approved personnel by the Owner at the expense of the Contractor.

B. Damage to a tree which results in death or permanent disfigurement shall result in the Contractor's complete removal of said tree, including roots, from the Site. The contractor shall, at the expense of the Contractor, replace the tree with one of equal value.

C. The Contractor shall ensure that no foreign material and/or liquid, such as paint, concrete, cement, oil, turpentine, acid or the like, be allowed to contaminate any soil within the dripline of any tree or shrub. If such contamination should occur, the Contractor shall remove the soil and replace it with acceptable soil at the expense of the Contractor.

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

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

F. Where excavation for new construction is required within drip line of trees, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks and comb soil to expose roots. If the tree is an oak or sycamore tree, hand tools must be used if the work is within the protected zone and 5' beyond the dripline.

1. Relocate roots in backfill areas where possible. If encountering large, main lateral roots, expose

roots beyond excavation limits as required to bend and relocate them without breaking. If encountered immediately adjacent to location of new construction and relocation is not practical; cut roots approximately 3 inches back from new construction.

2. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect. Backfill with soil as soon as possible.
 3. Do not allow heavy equipment in tree protection areas. All excavation work is to be performed by hand.
- G. Root Pruning: Do not cut main lateral roots; cut only smaller roots that interfere with installation of utilities or construction. Cut roots with sharp pruning instruments; do not break or chop.
- H. When excavating, place excavated soil on opposite side of trench from tree.
- 3.03 ROOT PRUNING

- A. Root pruning shall take place only where the roots of existing trees have been damaged by the Contractor during construction of the Project, as directed by the Certified Arborist.
- B. If construction is to occur within the root zone of existing plant material, root pruning and special plant care including fertilizing and watering will be required, as directed by the Certified Arborist, and hereinafter specified. Prior to root pruning, remove all weeds growing in existing tree mulch rings. Root pruning using an approved mechanical root pruning saw shall be performed prior to digging where noted on the plans or directed by the Certified Arborist. Air Spading excavation consisting of hand and/or pneumatic excavation may be required if indicated on plans or as directed by Certified Arborist. Whenever roots of plant material to remain are exposed during construction, the damaged root ends are to be removed by cutting them off cleanly.
- C. Initial watering shall be performed on all trees, which are designated for root pruning. Water trees immediately by thoroughly saturating root balls and provide a horticultural watering bag, such as a Gator Bag or equivalent, filled with water to keep root balls thoroughly saturated during first three weeks following root pruning. Thereafter refill bags as required, according to weather conditions, to keep root balls in a moist condition during growing seasons, through the duration of the Project. Test root balls for optimal moisture once a week using a soil auger.
- D. Contractor shall be responsible for location of all utilities prior to installation of trees. Notification of the local Utilities Alert Network is required for all planting sites.
- E. All pruning shall be overseen by a professional arborist (someone whose principal occupation is the care and maintenance of trees). All pruning shall be done according to the National Arborist Association's Pruning Standards for Shade Trees Class 11 - Standard Pruning Specifications.
- F. Any damage to the root zone, as determined by the Certified Arborist, will be compensated by pruning an equivalent amount of the top vegetative growth of the material within 1 week following root damage, fertilization, and supplemental watering.
- G. Fertilize damaged trees with fertilizer that promotes root growth. Fertilizer nutrients shall be applied within 48 hours after root damage occurs. Fertilizer nutrients shall be applied within 48 hours after root damage occurs. A fertilizer with a 1: 1: 1 ratio shall be applied at the rate of .5 pounds of nutrients per 1000 square feet.
- H. Application shall be accomplished by placing dry fertilizer in holes in the soil. The holes shall be 8 inches to 12 inches deep and spaced 24 inches apart in an area beginning 30 inches from the base of the plant. Holes can be punched with a punch bar, dug with a spade, drilled with an auger or any other method approved by the Certified Arborist.
- I. Approximately 0.02 pounds of fertilizer nutrients shall be placed in each hole, 250 holes per 1000 square feet. Fertilizer Nutrients shall not be measured for payment but considered incidental to root pruning. If the Certified Arborist determines that the whole method of fertilizer placement is not practical or desirable, an approved method of uniform surface application will be allowed. Neither separate measurement nor payment will be made for fertilization but will be considered incidental to the cost of tree protection.
- J. Supplemental water shall be applied within 48 hours of any root damage. The water shall be applied at the rate of 7 quarts per square yard of surface area within the root zone of plant material having sustained damage to the root zone. Root zone shall be calculated as the areas which extend three meters beyond the limits of the crown's branches. Subsequent weekly watering shall be applied if deemed necessary by the Certified Arborist. Neither separate measurement nor payment will be

made for supplemental watering but will be considered incidental to the cost of tree protection.

- K. The Contractor shall repair or replace any and all damage determined by the Certified Arborist to any existing or newly installed plant material at its own expense. Unnecessary damage to ground cover or turf shall be repaired or replaced as specified for restoration of similar areas within the plans, or as directed by the Certified Arborist, and shall be at the Contractor's expense.
- L. Materials shall be disposed of in accordance with specifications.

3.04 REGRADING

- A. Do not fill within tree protection zones, unless otherwise indicated.
- B. Where filling for new construction is required within drip line of trees, perform work by hand to minimize damage to root systems.
 - 1. Where existing grade is below elevation of finish grade, fill with topsoil. Place topsoil by hand in a single uncompacted layer and hand grade to required finish elevations.

3.05 TREE PRUNING

- A. Prune trees to remain that are affected by temporary and permanent construction.
- B. Pruning Standards: Prune trees according to ANSI A300 (Part 1).
- C. Cut branches with sharp pruning instruments; do not break or chop.
 - 1. Clean all pruning instruments with antimicrobial solution between performing work on separate trees to avoid the potential spread of pathogens.
- D. Chip removed tree branches and uses as organic mulch or dispose of off-site.
- E. Provide pruning, cabling, and bracing, irrigation, pest and disease control and other remedial treatments as recommended by the certified Arborist, required to assure the long-term health of the trees and existing vegetation, and the safety of persons and property.

3.06 TREE REPAIR AND REPLACEMENT

- A. Promptly repair trees damaged by construction operations within 24 hours. Treat damaged trunks, limbs, and roots according to arborist's written instructions.
- B. Remove and replace dead and damaged trees that arborist determines to be incapable of restoring to a normal growth pattern.
 - 1. Provide new trees of a 6-inch caliber size and of a species selected by Architect when damaged trees more than 6-inch caliber size, measured at breast height, are required to be replaced.
 - 2. Warranty and Maintenance Period: Ninety days (90).

3.07 DISPOSAL OF WASTE MATERIALS

- A. Burning is not permitted.
- B. Disposal: Remove excess excavated material, displaced trees, and excess chips from Owner's property. Disposal shall be in a legal manner.

END OF SECTION 32 01 91

SECTION 32 11 23

AGGREGATE BASE COURSES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Geotechnical Report for City of Guadalupe Central Park Renovation, Guadalupe, California, by Earth Systems Pacific, Project No. 305572-001, Dated January 27, 2023, and any updates or addendums.

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Aggregate base course for, but not limited to, curbs, gutter, concrete flatwork, restroom foundation, poured in place rubberized surfacing, and decomposed granite paving as shown in the Contract Drawings.
- B. Related Sections include the following:
 - 1. Section 01 45 00 - Quality Control
 - 2. Section 31 20 00 – Earth Moving
 - 3. Section 31 23 17 - Trenching
 - 4. Section 31 23 23 - Backfilling
 - 5. Section 32 12 16 - Asphalt Paving
 - 6. Section 32 16 00 - Concrete Paving

1.03 REFERENCE STANDARDS

- A. *Standard Specification for Public Works Construction (SSPWC)*, Latest Edition
- B. ASTM Standards.
- C. State Standard Specifications (SSS), Caltrans, latest edition.

1.04 SUBMITTALS

- A. Submit product data, samples, and manufacturing sources for materials. All product data shall also include source or manufacturer's name, address, and telephone numbers. Product submittals shall state the amount of recycled materials.
- B. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the requirements indicated, based on comprehensive testing of current materials.
- C. Material Certificates in lieu of material laboratory test reports when permitted by the City of Guadalupe. Material certificates shall be signed by the manufacturer and Contractor certifying that each material item complies with or exceeds requirements.
- D. Submit samples in sufficient quantities for material testing.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Aggregate Base Material shall be Class 2 Aggregate Base conforming to SSS Section 26-1.02A. Aggregate Base shall have a minimum sand equivalence of 22 and a minimum R-value of 78 and shall be free of organic materials and other deleterious substances.

- B. Aggregate Base materials used within building areas shall be free of asphaltic materials.

PART 3 - EXECUTION

3.01 GENERAL

- A. Attention is directed to Section 301-2, "Untreated Base," of the Greenbook.

3.2 EXAMINATION

- A. Verify that subgrade is firm and unyielding, gradients and elevations are correct, area is at suitable moisture content with no standing water, and the Geotechnical Engineer has approved subgrade preparation prior to installation of aggregate base.

3.03 PREPARATION

- A. Attention is directed to Section 301-1, "Subgrade Preparation," of the Greenbook.
- B. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.
- C. Do not place fill on soft, yielding, or muddy surfaces.

3.04 AGGREGATE PLACEMENT

- A. Aggregate base placement shall conform to the provisions of the SSPWC, Section 301-2.
- B. Place aggregate in maximum six-inch loose layers and roller compact to specified density.
- C. Level and contour surfaces to elevations and gradients indicated. Attention is directed to Section 301-2, "Untreated Base" of the Greenbook.
- D. Crushed aggregate base shall be compacted to a minimum of 95% relative compaction in accordance with the California Test Method 216 or ASTM D1557 at the Geotechnical Engineers direction.
- E. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.
- F. Where the required aggregate base thickness is 6 inches or less, the watered base may be spread and compacted in one layer. Where the required thickness is more than 6 inches, the aggregate base material shall be spread and compacted in 2 or more layers of approximately equal thickness. The maximum compacted thickness of any one layer shall not exceed 6 inches.
- G. Maintain optimum moisture content of fill materials to attain required compaction density.
- H. Use mechanical tamping equipment in areas inaccessible to compaction equipment.
- I. Aggregate base course shall be dense and unyielding upon proof-rolling with full water truck.

3.05 COMPACTION & TOLERANCES

- A. Flatness: Maximum variation of ¼ inch.
- B. Scheduled Compacted Thickness shall conform to the provisions of the SSPWC Section 301-2.2 and Section 301-2.3.

3.06 FIELD QUALITY CONTROL

- A. Tests.

1. Inspection and testing shall be performed by the Owner's Testing Laboratory.
2. Compaction testing will be performed in accordance with California Test Method 216 or ASTM D1557 at the Geotechnical Engineers direction.
3. When tests indicate Work does not meet specified requirements, remove, replace and retest work at no additional cost to the Owner.
4. Frequency of Tests: Compaction tests will be taken at the rate of one test for each 500 square yards per lift placed, or as directed by the Geotechnical Engineer, in accordance with the requirements of ASTM D2922 and ATM D3017. Areas represented by noncompliant tests shall be reworked and retested for compliance at the Contractor's expense.

END OF SECTION 32 11 23

SECTION 32 12 16

ASPHALT CONCRETE PAVING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Geotechnical Report for City of Guadalupe Central Park Renovation, Guadalupe, California, by Earth Systems Pacific, Project No. 305572-001, Dated January 27, 2023, and any updates or addendums.

1.02 SUMMARY

- A. Asphaltic concrete paving for parking lots and driveway pavements.
- B. Related Sections include the following:
 - 1. Section 31 20 00 - Earth Moving
 - 2. Section 32 17 23 - Pavement Markings
 - 3. Section 31 22 00 - Grading
 - 4. Section 32 11 23 - Aggregate Base Courses

1.03 REFERENCES

- A. Standard Specifications for Public Works Construction (SSPWC), Latest Edition.
- B. ASTM Standards.

1.04 SUBMITTALS

- A. Submit asphalt concrete mix design(s) for approval of the Owner's Representative.

1.05 TESTING AND INSPECTION

- A. Testing and inspection of asphalt pavement mix(es) and testing of placed stabilizing base course and asphalt pavement will be performed by a laboratory chosen by the Owner's Representative. Testing and inspection will be performed so as to minimize disruption of work.
- B. Allow the Testing Laboratory access to the mixing plant for verification of weights or proportions, character of materials used and determination of temperatures used in the preparation of asphaltic concrete mix.

1.06 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if substrate is wet or excessively damp or if the following conditions are not met:
 - 1. Prime and Tack Coats: Minimum surface temperature of 60 deg F (15.5 deg C).
 - 2. Slurry Coat: Comply with weather limitations of ASTM D 3910.
 - 3. Asphalt Base Course: Minimum surface temperature of 40 deg F (4 deg C) and rising at time of placement.
 - 4. Asphalt Surface Course: Minimum surface temperature of 60 deg F (15.5 deg C) at time of placement.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Provide the aggregate base, and bituminous surface conforming to the requirements of the standard specifications for public works construction (SSPWC).

2.02 PAVING MATERIALS

- A. Asphalt Concrete: Asphalt concrete material shall be C2-PG 64-10 per SSPWC Section 203-6. The grading and proportioning of aggregates shall be such that the combined mineral aggregate conforms to the specified requirements.
- B. Asphalt Emulsion: SSPWC Section 203-3, Grade SS-1h.
- C. Prime Coat: Grade SC-70 per SSPWC Section 203-2.
- D. Aggregates for base course shall conform to requirements of Specification Section 32 11 23, Aggregate Base Course.

2.03 ASPHALT PAVEMENT MIX

- A. Combine mineral constituents in proportions to produce a mixture conforming to requirements of the SSPWC Section 203-6.
- B. Percentage by weight of asphalt cement in mixture shall be in accordance with SSPWC Section 203-6.
- C. Maintain thorough and uniform mixture.
- D. Bring asphalt and mineral constituents to required temperatures before mixing. Ensure aggregates are sufficiently dry so as not to cause foaming in mixture.

PART 3 - EXECUTION

3.01 GENERAL

- A. Execute work in accordance with SSPWC section 302.

3.02 PREPARATION

- A. Ensure grading of subgrade to required elevation. Subgrade preparation shall be per SSPWC Section 301.
- B. Before final rolling, shape entire section, add additional sub-soil if necessary, and compact subgrade to provide grades, elevation and cross-section indicated. Points of finished subgrade surface shall be within 0.04 foot of elevations indicated on the Drawings.

3.03 BASE COURSE

- A. Place aggregate base in accordance with requirements of SSPWC section 301 and to the thickness shown on the drawings. Grade and compact in 6-inch layers to at least 95 percent of compaction (ASTM D1557).

3.04 MAINTENANCE

- A. Maintain the base course until the asphaltic pavement is in place. Maintenance shall include drainage, rolling, shaping and water as necessary to maintain the course in proper condition. Maintain sufficient moisture at the surface to prevent a dusty condition. Areas of completed base course that are damaged shall be conditioned, reshaped and re-

compacted in accordance with the requirements of the Specifications without additional cost to the City.

3.05 TACK COAT

- A. Prior to the application of the asphalt concrete, a paint binder (tack coat) shall be applied to all surfaces of walkway, curbs, gutters, manholes and drainage structures which will be in contact with asphalt pavement per SSPWC Section 302-5.4.
- B. Coat surfaces of catch basins which are to remain free of asphalt with oil, or provide equivalent protection, to prevent asphalt adhesion.

3.06 PRIME COAT

- A. Prior to the application of the asphalt concrete, a prime coat shall be applied at a rate of 0.20 to 0.40 gallons per square yard.

3.07 ASPHALT CONCRETE

- A. Requirements: The bituminous concrete shall consist of mineral aggregate, uniformly mixed with bituminous material in a central plant in accordance with SSPWC Section 203-6. The percentage of asphalt binder shall be in accordance with SSPWC Section 203-6. The mixing plant and construction equipment shall conform to the requirements of SSPWC Sections 203-6 and 302-5.
- B. Placing: Deliver bituminous mixtures to the work site temperatures specified in SSPWC Section 302-5.5. Spread and place in accordance with SSPC Section 302-5.5. Asphalt surface shall be fog-sealed.
- C. Compaction: Initial or breakdown rolling and the final rolling of the uppermost layer of the asphalt concrete shall be in accordance with SSPWC Section 302-5.6. Compaction by vehicular traffic shall not be permitted.

3.08 JOINING PAVEMENT

- A. Carefully make joints between old and new pavements or between successive days work in such manner as to insure a continuous bond between old and new sections of the course in accordance with SSPWC Section 302.
- B. Expose and clean edges of existing pavement. Cut edge to straight, vertical surfaces. Paint all joints with a uniform coat of tack coat before the fresh mixture is placed. Prepare joints in the new pavement in accordance with SSPWC Section 302-5.7.

3.09 JOINING NON-PAVED AREAS

- A. Where paving will join landscape or other non-hardscape area a redwood header shall be installed.

3.10 TOLERANCES

- A. Flatness: Maximum variation of 1/8 inch when measured with a 10-foot straight edge
- B. Variation from True Elevation: Within 1/4 inch.

3.11 FIELD QUALITY CONTROL

- A. Inspection and testing shall be performed by the City's chosen Testing Laboratory.
- B. Field inspection and testing will be performed by the Testing Laboratory. The Contractor shall cooperate with such testing and shall give the Owner's Representative advance notice

of paving scheduling. Sufficient "Advance Notice" shall be determined by the Owner's Representative.

- C. If tests indicate materials do not meet specified requirement, replace material and retest at no additional cost to the City.
- D. Frequency of Test: As determined by the Testing Laboratory.

3.12 PROTECTION:

- A. Immediately after placement, protect pavement from mechanical injury or damage. Should damage occur, Contractor shall remove and replace or repair at the expense of the Contractor.

3.13 QUALITY CONTROL

- A. Perform the following contract conformance testing:

<u>Material</u>	<u>Test</u>	<u>Frequency</u>
Asphalt Concrete	Submit Load Tickets	Daily*
Asphalt Concrete	Field Temperature in Windrow	Record Hourly
Asphalt Concrete	California Test 375 (Relative Compaction)	Daily*

*Test Samples shall not represent more than 500 tons or 1 day's production, whichever is less.

END OF SECTION 32 12 16

SECTION 32 14 00

UNIT PAVING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Pavers – Vehicular
 - 2. Pavers – Pedestrian
 - 3. Salvaged Concrete
- B. Related Requirements:
 - 1. Section 321313 "Concrete Paving" for concrete base under unit pavers and for cast-in-place concrete curbs and gutters serving as edge restraints for unit pavers.
 - 2. Section 321123 "Aggregate Base Courses"

1.03 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.04 ACTION SUBMITTALS

- A. Product Data:
 - 1. For materials other than water and aggregates.
 - 2. For the following:
 - a. Pavers.
 - b. Mortar and grout materials.
 - c. Edge restraints.
- B. Sustainable Design Submittals:
 - 1. Product Certificates: For regional materials, indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include distance to Project and cost for each regional material.
- C. Sieve Analyses: For aggregate setting-bed materials, according to ASTM C136.
- D. Samples for Verification: For full-size units of each type of unit paver indicated. Include Samples of the following:
 - 1. Joint materials.
 - 2. Exposed edge restraints.

1.05 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Material Certificates: For unit pavers. Include statements of material properties indicating compliance with requirements, including compliance with standards. Provide for each type and size of unit.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified unit paving installer. Installer's field supervisor shall have Concrete Paver Installer Certification from the Interlocking Concrete Pavement Institute (ICPI) with one of the following designations:
 - 1. Residential Paver Technician Designation.
 - 2. Commercial Paver Technician Designation.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store pavers on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained, and contamination avoided.
- D. Store liquids in tightly closed containers protected from freezing.
- E. Store asphalt cement and other bituminous materials in tightly closed containers.

1.08 FIELD CONDITIONS

- A. Cold-Weather Protection: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace unit paver work damaged by frost or freezing.
- B. Weather Limitations for Bituminous Setting Bed:
 - 1. Install bituminous setting bed only when ambient temperature is above 40 deg F and when base is dry.
 - 2. Apply asphalt adhesive only when ambient temperature is above 50 deg F and when temperature has not been below 35 deg F for 12 hours immediately before application. Do not apply when setting bed is wet or contains excess moisture.
- C. Weather Limitations for Mortar and Grout:
 - 1. Cold-Weather Requirements: Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.
 - 2. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6. Provide artificial shade and windbreaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 100 deg F and higher.
 - a. When ambient temperature exceeds 100 deg F, or when wind velocity exceeds 8 mph and ambient temperature exceeds 90 deg F, set pavers within 1 minute of spreading setting-bed mortar.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Source Limitations: Obtain each type of unit paver, joint material, and setting material from single source with resources to provide materials and products of consistent quality in appearance and physical properties.

2.02 CONCRETE PAVERS – LINEAR PAVERS

- A. Regional Materials: Concrete pavers shall be manufactured within 500 miles of Project site.
- B. Basis-of-Design Product: Solid Interlocking Paving Units: Complying with ASTM C936/C936M, made from normal-weight aggregates. Subject to compliance with requirements, provide product indicated on Drawings or comparable product.
 - 1. Manufacturers: Subject to compliance with requirements:
 - a. Angelus Paving Stones
 - 2. Product: 4x12
 - 3. Thickness:
 - a. Pedestrian: 8 cm (80 mm).
 - 4. Face Size and Shape: 3.94" x 11.81".
 - 5. Color(s): As indicated per plan.
 - 6. Substitutions: Products by other manufacturers that comply with specifications will be considered in accordance with Section 012500 – Substitution Procedures.

2.03 SALVAGED CONCRETE

- A. See Section 02 41 19 "Selective Demolition" for Concrete salvage execution.
- B. Salvaged concrete shall be in size ranges as indicated on contract drawings.

2.04 AGGREGATE SETTING-BED MATERIALS

- A. Graded Aggregate for Subbase: Sound, crushed stone or gravel complying with ASTM D448 for Size No. 57 ASTM D2940/D2940M, subbase material.
- B. Graded Aggregate for Base: Sound, crushed stone or gravel complying with ASTM D448 for Size No. 8 ASTM D2940/D2940M, base material.
- C. Sand for Leveling Course: Sound, sharp, washed, natural sand or crushed stone complying with gradation requirements in ASTM C33/C33M for fine aggregate.
- D. Stone Screenings for Leveling Course: Sound stone screenings complying with ASTM D448 for Size No. 10.
- E. Sand for Joints: Fine, sharp, washed, natural sand or crushed stone with 100 percent passing No. 16 sieve and no more than 10 percent passing No. 200 sieve.
 - 1. Provide sand of color needed to produce required joint color.
- F. Herbicide: Commercial chemical for weed control, registered with the EPA. Provide in granular, liquid, or wettable powder form.

2.05 MORTAR SETTING-BED MATERIALS

- A. Regional Materials: Aggregate for mortar and grout, cement, and lime shall be manufactured within 500 miles of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.
- B. Regional Materials: Aggregate for mortar and grout, cement, and lime shall be manufactured within 500 miles of Project site.
- C. Portland Cement: ASTM C150/C150M, Type I or Type II.
- D. Hydrated Lime: ASTM C207, Type S.
- E. Sand: ASTM C144.
- F. Latex Additive: water emulsion, serving as replacement for part or all of gaging water, of type specifically recommended by latex-additive manufacturer for use with field-mixed portland cement and aggregate mortar bed, and not containing a retarder.
- G. Thin-Set Mortar for Bond Coat: Latex-portland cement mortar complying with ANSI A118.4.
 - 1. Manufacturers: Subject to compliance with requirements, undefined:
 - a. Bostik, Inc.
 - b. MAPEI Corporation.
 - 2. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
 - 3. Provide prepackaged, dry-mortar mix combined with liquid-latex additive at Project site.
 - 4. Provide product that is approved by manufacturer for application thickness of 5/8 inch.
- H. Water: Potable.
- I. Reinforcing Wire Fabric: Galvanized, welded wire fabric, 2 by 2 inches by 0.062 inch in diameter; comply with ASTM A185/A185M and ASTM A82/A82M except for minimum wire size.

2.06 MORTAR AND GROUT MIXES

- A. General: Comply with referenced standards and with manufacturers' written instructions for mix proportions, mixing equipment, mixer speeds, mixing containers, mixing times, and other procedures needed to produce setting-bed and joint materials of uniform quality and with optimal performance characteristics. Discard mortars and grout if they have reached their initial set before being used.
- B. Mortar-Bed Bond Coat: Mix neat cement and to a creamy consistency.

- C. Portland Cement-Lime Setting-Bed Mortar: Type M complying with ASTM C270, Proportion Specification.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine surfaces indicated to receive unit paving, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Remove substances from concrete substrates that could impair mortar bond, including curing and sealing compounds, form oil, and laitance.
- B. Sweep concrete substrates to remove dirt, dust, debris, and loose particles.
- C. Proof-roll prepared subgrade according to requirements in Section 312000 "Earth Moving" to identify soft pockets and areas of excess yielding. Proceed with unit paver installation only after deficient subgrades have been corrected and are ready to receive subbase and base course for unit pavers.

3.03 INSTALLATION, GENERAL

- A. Do not use unit pavers with chips, cracks, voids, discolorations, or other defects that might be visible or cause staining in finished work.
- B. Mix pavers from several pallets or cubes, as they are placed, to produce uniform blend of colors and textures.
- C. Cut unit pavers with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable.
 - 1. For concrete pavers, a block splitter may be used.
- D. Handle protective-coated brick pavers to prevent coated surfaces from contacting backs or edges of other units. If, despite these precautions, coating does contact bonding surfaces of brick, remove coating from bonding surfaces before setting brick.
- E. Joint Pattern: As indicated.
- F. Tolerances:
 - 1. Do not exceed 1/32-inch unit-to-unit offset from flush (lippage) or 1/8 inch in 10 feet from level, or indicated slope, for finished surface of paving.
 - 2. Do not exceed 1/16-inch unit-to-unit offset from flush (lippage) nor 1/8 inch in 24 inches and 1/4 inch in 10 feet from level, or indicated slope, for finished surface of paving.
- G. Expansion and Control Joints:
 - 1. Provide for sealant-filled joints at locations and of widths indicated. Provide compressible foam filler as backing for sealant-filled joints. Install joint filler before setting pavers. Sealant materials and installation are specified in Section 079200 "Joint Sealants."
 - 2. Provide cork joint filler at locations and of widths indicated. Install joint filler before setting pavers. Make top of joint filler flush with top of pavers.
- H. Provide edge restraints as indicated. Install edge restraints before placing unit pavers.
 - 1. Install edge restraints to comply with manufacturer's written instructions. Install stakes at intervals required to hold edge restraints in place during and after unit paver installation.
 - 2. For metal edge restraints with top edge exposed, drive stakes at least 1 inch below top edge.
 - 3. Install job-built concrete edge restraints to comply with requirements in Section 033000 "Cast-in-Place Concrete."
 - 4. Where pavers set in mortar bed are indicated as edge restraints for pavers set in aggregate setting bed, install pavers set in mortar and allow mortar to cure before placing aggregate setting bed and remainder of pavers. Cut off mortar bed at a steep angle so it will not interfere with aggregate setting bed.

5. Where pavers embedded in concrete are indicated as edge restraints for pavers set in aggregate setting bed, install pavers embedded in concrete and allow concrete to cure before placing aggregate setting bed and remainder of pavers. Hold top of concrete below aggregate setting bed.

3.04 INSTALLATION, SALVAGED CONCRETE

- A. Mix salvaged concrete to provide a variety of sizes and finishes, as they are placed, to produce uniform blend of colors and textures.
- B. No cutting. Edges should be left with natural breaks and should generally create the desired edge shape.
- C. Joint Pattern: As indicated.
- D. Tolerances:
 1. Do not exceed 1/8-inch unit-to-unit offset from flush (lippage) or 1/2 inch in 10 feet from level, or indicated slope, for finished surface of paving.
 2. Do not exceed 1/4-inch unit-to-unit offset from flush (lippage) nor 1/2 inch in 24 inches and 1/4 inch in 10 feet from level, or indicated slope, for finished surface of paving.
- E. Provide edge restraints as indicated per contract drawings. Install edge restraints before placing salvaged concrete.
 1. Install job-built concrete edge restraints to comply with requirements in Section 033000 "Cast-in-Place Concrete."
- F. Joints:
 1. Joints shall be swept with stabilized decomposed granite. See Section 31 15 40 "Aggregate Paving".
 2. Install in 2" maximum lift thickness and soak with sufficient water to activate Organic-lock through entire depth of lift.
 3. Install the additional lifts and soak with sufficient water to activate Organic-lock as required.
 4. Compact: After +/- 4 hours, compact final lift with manual tamp-rod.
 5. Sweep final surface to clean concrete pavers and expose joints

3.05 AGGREGATE SETTING-BED APPLICATIONS

- A. Compact soil subgrade uniformly to at least 95 percent of ASTM D698 laboratory density.
- B. Proof-roll prepared subgrade to identify soft pockets and areas of excess yielding. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.
- C. Place separation geotextile over prepared subgrade, overlapping ends and edges at least 12 inches.
- D. Place aggregate subbase and base, compact by tamping with plate vibrator, and screed to depth indicated.
- E. Place aggregate subbase and base, compact to 100 percent of ASTM D1557 maximum laboratory density, and screed to depth indicated.
- F. Place drainage geotextile over compacted base course, overlapping ends and edges at least 12 inches.
- G. Place leveling course and screed to a thickness of 1 to 1-1/2 inches, taking care that moisture content remains constant, and density is loose and uniform until pavers are set and compacted.
- H. Treat leveling course with herbicide to inhibit growth of grass and weeds.
- I. Set pavers with a minimum joint width of 1/16 inch and a maximum of 1/8 inch, being careful not to disturb leveling base. If pavers have spacer bars, place pavers hand tight against spacer bars. Use string lines to keep straight lines. Fill gaps between units that exceed 3/8 inch with pieces cut to fit from full-size unit pavers.
 1. When installation is performed with mechanical equipment, use only unit pavers with spacer bars on sides of each unit.
- J. Vibrate pavers into leveling course with a low-amplitude plate vibrator capable of a 3500- to 5000-lbf compaction force at 80 to 90 Hz. Use vibrator with neoprene mat on face of plate or other means as needed to prevent cracking and chipping of pavers. Perform at least three passes across paving with vibrator.

1. Compact pavers when there is sufficient surface to accommodate operation of vibrator, leaving at least 36 inches of uncompacted pavers adjacent to temporary edges.
 2. Before ending each day's work, compact installed concrete pavers except for 36-inch width of uncompacted pavers adjacent to temporary edges (laying faces).
 3. As work progresses to perimeter of installation, compact installed pavers that are adjacent to permanent edges unless they are within 36 inches of laying face.
 4. Before ending each day's work and when rain interrupts work, cover pavers that have not been compacted and cover leveling course on which pavers have not been placed with nonstaining plastic sheets to protect them from rain.
- K. Spread dry sand and fill joints immediately after vibrating pavers into leveling course. Vibrate pavers and add sand until joints are completely filled, then remove excess sand. Leave a slight surplus of sand on the surface for joint filling.
- L. Do not allow traffic on installed pavers until sand has been vibrated into joints.
- M. Repeat joint-filling process 30 days later.

3.06 MORTAR SETTING-BED APPLICATIONS

- A. Saturate concrete subbase with clean water several hours before placing setting bed. Remove surface water about one hour before placing setting bed.
- B. Apply mortar-bed bond coat over surface of concrete subbase about 15 minutes before placing mortar bed. Do not exceed 1/8-inch thickness for bond coat. Limit area of bond coat to avoid its drying out before placing setting bed.
- C. Apply mortar bed over bond coat; spread and screed mortar bed to uniform thickness at subgrade elevations required for accurate setting of pavers to finished grades indicated.
- D. Mix and place only that amount of mortar bed that can be covered with pavers before initial set. Before placing pavers, cut back, bevel edge, and remove and discard setting-bed material that has reached initial set.
- E. Place pavers before initial set of cement occurs. Immediately before placing pavers on mortar bed, apply uniform 1/8-inch-thick bond coat to mortar bed or to back of each paver with a flat trowel.
- F. Tamp or beat pavers with a wooden block or rubber mallet to obtain full contact with setting bed and to bring finished surfaces within indicated tolerances. Set each paver in a single operation before initial set of mortar; do not return to areas already set or disturb pavers for purposes of realigning finished surfaces or adjusting joints.
- G. Spaced Joint Widths: Provide nominal joint width with variations not exceeding plus or minus.
- H. Grouted Joints: Grout paver joints complying with ANSI A108.10.
- I. Grout joints as soon as possible after initial set of setting bed.
 1. Force grout into joints, taking care not to smear grout on adjoining surfaces.
 2. Clean pavers as grouting progresses by dry brushing or rubbing with dry burlap to remove smears before tooling joints.
 3. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
 4. If tooling squeezes grout from joints, remove excess grout and smears by dry brushing or rubbing with dry burlap and tool joints again to produce a uniform appearance.
- J. Cure grout by maintaining in a damp condition for seven days unless otherwise recommended by grout or liquid-latex manufacturer.

3.07 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace unit pavers that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Provide new units to match adjoining units and install in same manner as original units, with same joint treatment and with no evidence of replacement.
- B. Pointing: During tooling of joints, enlarge voids or holes and completely fill with grout. Point joints at sealant joints to provide a neat, uniform appearance, properly prepared for sealant application.
- C. Cleaning: Remove excess grout from exposed paver surfaces; wash and scrub clean.

1. Remove temporary protective coating as recommended by coating manufacturer and as acceptable to paver and grout manufacturers.
2. Do not allow protective coating to enter floor drains. Trap, collect, and remove coating material.

END OF SECTION 32 14 00

SECTION 32 15 40

AGGREGATE PAVING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Stabilized Decomposed Granite Paving course, compacted.
 - 2. Contrasting Surfacing at Bocce Ball Court (infield mix).
 - 3. Pea Gravel (at Dog Park).
 - 4. DG/Oyster Shell Blend (Bocce Court).
- B. Related Requirements:
 - 1. Division 01 Section "General Requirements."

1.03 REFERENCES

- A. General:
 - 1. The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply.
 - 2. Unless otherwise noted, the referenced standard edition is the current one at the time of commencement of the Work.
 - 3. Refer to Division 01 Section "General Requirements" for the list of applicable regulatory requirements.
- B. ASTM C136 – Sieve Analysis of Fine and Coarse Aggregates.
- C. ASTM D2419 – Sand Equivalent Value of Soils and Fine Aggregates.
- D. "Greenbook" Standard Specifications for Public Works Construction.
- E. USP – U.S. Pharmacopeial Convention (1995).
- F. American Association of State Highway and Transportation Officials:
 - 1. AASHTO T 27 Sieve Analysis of Fine and Coarse Aggregates.

1.04 DEFINITIONS

- A. Finish Grade: Elevation of finished surface of paving.
- B. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.05 SUBMITTALS

- A. Submit in accordance with Section 013300 – Submittal Procedures
 - 1. Manufacturer's product data sheet and installation instructions indicating that product complies with specifications for:
 - a. Stabilized decomposed granite surfacing.
 - b. Organic Binder
 - 2. Submit quart samples of:
 - a. Stabilized decomposed granite material in color[s] specified.
 - b. Contrasting Surface- Infield Mix.
 - c. Pea Gravel.
 - d. DG/Oyster Shell Blend.
 - 3. Aluminum Edging: Submit manufacturer product data sheets.

1.06 MOCK-UP

- A. Install 20 square feet minimum of stabilized decomposed granite surfacing, including base course and edging, at location approved by Landscape Architect.
- B. Allow Landscape Architect to view mock-up before proceeding with rest of stabilized decomposed granite surfacing.
- C. Approved mock-up may remain as part of completed Work.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Protect stabilized decomposed granite mix from contamination. Store under cover.

1.08 FIELD CONDITIONS

- A. Do not install stabilized decomposed granite surfacing when subbase is wet at saturated field capacity.
- B. Do not install stabilized decomposed granite surfacing during rain. Rain within 3-5 days after installation will increase curing time.
- C. It is not recommended to install when temperatures are below 40 degrees F.

PART 2 - PRODUCTS

2.01 STABILIZED DECOMPOSED GRANITE

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. Manufacturer: List of suppliers shall be one of the following:
 - a. Central Coast Landscape Products, San Luis Obispo, CA; phone 805-595-3478; www.cclandscapeproducts.com
 - b. Gail Materials, Corona, CA; phone 951-667-6106; fax 951-667-6102; www.gailmaterials.net.
 - 2. Substitutions: Products by other manufacturers that comply with specifications will be considered in accordance with Section 012500 – Substitution Procedures.
- B. Decomposed Granite:
 - 1. Produce from naturally friable granite. Blends of coarse sand and rock dust are not acceptable.
 - 2. Gradation, in accordance with ASTM C136:

Sieve Size	Percent Passing
1/2 inch	100
3/8 inch	90 to 100
No. 4	50 to 100
No. 30	25 to 55
No. 100	10 to 20
No. 200	1 to 18
 - 3. Sand Equivalent: 30 minimum in accordance with ASTM D2419.
 - 4. Color: Equal to Gail Materials California Gold
- C. Binder: Provide Organic-Lock, Envirobond Products Corporation, 6191-2100 Bloor Street West, Toronto, Ontario, Canada M6S 5A5, and complying with following requirements:
 - 1. Patented powdered organic binder designed to be blended with crushed aggregate.
 - 2. Made from 100% naturally occurring materials.
- D. Factory Blending:
 - 1. Mix decomposed granite and Organic-lock with a pug mill that includes a weigh-belt feeder.
 - 2. Mix manufacturer recommended amounts of binder/stabilizer per weight of aggregate.

2.02 CONTRASTING SURFACING AT BOCCE COURT- INFIELD MIX

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
1. Manufacturer: List of suppliers shall be one of the following:
 - a. Central Coast Landscape Products, San Luis Obispo, CA; phone 805-595-3478; www.cclandscapeproducts.com
 - b. Gail Materials, Corona, CA; phone 951-667-6106; fax 951-667-6102; www.gailmaterials.net.
 2. Substitutions: Products by other manufacturers that comply with specifications will be considered in accordance with Section 012500 – Substitution Procedures.
- B. Baseball Infield Mix:
1. Produce from 70/30 Sand Clay Mix. Blends of coarse sand and rock dust are not acceptable.
 2. Gradation, in accordance with ASTM C136:

Sieve Size	Percent Passing
1/2 inch	100
3/8 inch	90 to 100
No. 4	50 to 100
No. 30	25 to 55
No. 100	10 to 20
No. 200	1 to 18
 3. Sand Equivalent: 30 minimum in accordance with ASTM D2419.
 4. Color: Red
- C. Binder: Provide Organic-Lock, Envirobond Products Corporation, 6191-2100 Bloor Street West, Toronto, Ontario, Canada M6S 5A5, and complying with following requirements:
1. Patented powdered organic binder designed to be blended with crushed aggregate.
 2. Made from 100% naturally occurring materials.
- D. Factory Blending:
1. Mix decomposed granite and Organic-lock with a pug mill that includes a weigh-belt feeder.
 2. Mix manufacturer recommended amounts of binder/stabilizer per weight of aggregate.

2.03 PEA GRAVEL AT DOG PARK

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
1. Manufacturer: List of suppliers shall be one of the following:
 - a. Central Coast Landscape Products, San Luis Obispo, CA; phone 805-595-3478; www.cclandscapeproducts.com
 - b. Gail Materials, Corona, CA; phone 951-667-6106; fax 951-667-6102; www.gailmaterials.net.
 2. Substitutions: Products by other manufacturers that comply with specifications will be considered in accordance with Section 012500 – Substitution Procedures.
- B. 3/8" Pea Gravel:
1. 3/8" Pea Gravel (#4 gravel) with rounded edges. Blends of coarse sand and rock dust are not acceptable.
 2. Gradation, in accordance with ASTM C-33:

Sieve Size	Percent Passing
1/2 inch	100
3/8 inch	85 to 100
No. 4	10 to 30
No. 8	0 to 10
No. 16	0 to 15

3. Color: Grays

2.04 DG/OYSTER SHELL BLEND- BOCCE COURT

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 1. Manufacturer: List of suppliers shall be one of the following:
 - a. Earth Stone Rock- California Building Materials Supply, Goshen, CA; phone 800-215-7372; www.earthstonerock.com
 - b. Gail Materials, Corona, CA; phone 951-667-6106; fax 951-667-6102; www.gailmaterials.net.
 2. Substitutions: Products by other manufacturers that comply with specifications will be considered in accordance with Section 012500 – Substitution Procedures.
- B. Gold Decomposed Granite Oyster Shell Blend for Bocce Court:
 1. Gold Queen Decomposed Granite material with 25% crushed naturally marine composted oyster shell. Shell is 3/8" wide, thin flakes with approximately 20% fines or oyster shell flour. Oyster shell shall be flaked, not shell pebbles.
 2. Gold Queen DG 1/4" Minus Gradation, in accordance with ASTM C136:

Sieve Size	Percent Passing
3/8 inch	100
No. 4	95
No. 8	74
No. 16	59
No. 30	46
No. 50	31
No. 100	19
No. 200	9
 3. Color: Equal to Gold Decomposed Granite Oyster Shell Blend from Earth Stone Rock.

2.05 BASE COURSE MATERIAL

- A. Comply with Greenbook Section 200-2 – "Untreated Base Materials" for crushed miscellaneous base processed miscellaneous base.

2.06 ACCESSORIES

- A. Water: Free from contaminants that would discolor or be deleterious to stabilized decomposed granite surfacing.
- B. Aluminum Edging
 1. Material: Permaloc CleanLine XL as available from Permaloc Corporation, Holland MI 49424, (800) 356-9660
 - a. Extruded aluminum, 6063 alloy, T-6 hardness, landscape edging for straight-line and curvilinear applications in corrugated straight profile.
 2. Finish: Black DuraFlex. Paint finish shall comply with AAMA 2603 for electrostatically baked on paint.
 3. Dimensions: 3/16" gage 6" height x 16'-0" length.
 4. Stakes: 18" long; located per plan.
- C. Geosynthetic Fabric: Comply with Greenbook Section 213-2 – "Geosynthetics", Type N90

PART 3 - EXECUTION

3.01 INSPECTION

- A. The Contractor shall retain the services of an independent inspection agency to verify that compacted subgrade is dry and ready to receive work of this section.
- B. The Contractor shall retain the services of an independent surveyor to verify that gradients and elevations of base are correct.
- C. Beginning of installation means acceptance of existing conditions.

3.02 PLACING STONE PAVING

- A. Examine grading and subsoil conditions. Do not proceed until conditions are acceptable.

3.03 PREPARATION

- A. Excavation: Excavate to depth required so edges of stabilized decomposed granite surfacing will match adjacent grades and have a maximum cross slope of 1.5 percent.
- B. Subgrade Preparation: Comply with Greenbook Section 301-1 – “Subgrade Preparation.”
- C. Geosynthetic Fabric: Comply with Greenbook Section 300-10 – “Geotextiles for Separation”. Do not extend beyond limits of stabilized decomposed granite surfacing.
- D. Base Course Installation: Comply with Greenbook Section 301-2 – “Untreated Base.”
- E. Edging. Install flush with stabilized decomposed granite surfacing. Provide sufficient stakes to secure in place.

3.04 INSTALLATION- DECOMPOSED GRANITE OR INFIELD MIX

- A. Prior to installation, thoroughly presoak surface on which stabilized decomposed granite surfacing or infield mix is to be placed.
- B. Install in 2" maximum lift thickness and soak with sufficient water to activate Organic-lock through entire depth of lift. Compact each lift prior to installation of additional lifts.
- C. Install the additional lifts and soak with sufficient water to activate Organic-lock as required.
- D. Grade and smooth to required elevation. Finish surface for stabilized decomposed granite or infield mix shall be a minimum of 1/4" and a maximum of 1/2" below adjacent paving.
- E. Compact: After +/- 4 hours, compact final lift with a three-five ton double or single static drum roller. Compact placed materials to achieve 95 percent compacted density.
- F. Perform hand tamping in areas inaccessible to compaction equipment.
- G. Minimum Compacted Thickness: Install to depth shown on Drawings.
- H. Surface shall follow overall contours of landscape. Flat areas shall be crowned for drainage. Slope one percent minimum to drain away from structures.
- I. Completed surface shall be of consistent quality and free of deleterious materials such as organic materials, nails, stones, and loose material. Surface shall not have depressions or humps greater than 1/4 inch in ten feet.

3.05 INSTALLATION- PEA GRAVEL FOR DOG PARK

- A. Per Contract Drawings.

3.06 INSTALLATION- DG/OYSTER SHELL BLEND FOR BOCCIE COURT

- A. Spread a 3" layer of DG/Oyster Shell blend.
- B. Level DG/Oyster Shell blend using a rake of 44"-48" size.
- C. Thoroughly saturate DG/Oyster Shell blend with water.
- D. Compact using a drum roller.
- E. After compaction, spread the Oyster Shell Flour on top at a depth of 1/4" to 1/2".
- F. Broom finish the Bocce Court surfacing to remove compaction lines.

3.07 PROTECTION

- A. Do not allow traffic on stabilized decomposed granite or infield mix surfacing for four days after placement or until compacted stabilized decomposed granite has fully cured.
- B. Protect stabilized decomposed granite or infield mix surfacing from damage until Project completion. Repair damaged areas to match specified requirements.
- C. Protect Bocce Court surfacing from damage until Project completion. Repair damaged areas to match specified requirements.

3.08 MAINTENANCE & REPAIRS

- A. Loose aggregate will appear on the surface over time which is a natural occurrence. If excessive aggregate over $\frac{1}{4}$ inches occurs, redistribute the stabilized decomposed granite over the entire surface, water thoroughly and re-compact with a minimum one-ton drum roller. This process can be repeated as needed.
- B. To repair, excavate damaged area leaving a minimum one-inch depth of existing stabilized decomposed granite, water and scarify. Scarifying existing stabilized decomposed granite will prevent a cold joint layer between the existing stabilized decomposed granite and the newly imported pre-blended stabilized decomposed granite.
- C. Add water to the pre-blended stabilized decomposed granite to activate. Apply moistened pre-blended stabilized decomposed granite to excavated area at or above finished grade.
- D. Compact with a walk behind drum roller. Do not allow traffic on stabilized decomposed granite surfacing for one-two days after placement or until compacted stabilized decomposed granite has fully cured.
- E. Bocce Court Maintenance: Water the court surfacing for a $\frac{1}{4}$ " depth penetration; after play- spike drag the surface at $\frac{1}{8}$ " depth using a spike drag. Broom finish the surface.
- F. Rake the dog park pea gravel to maintain even surface.

END OF SECTION 32 15 40

SECTION 32 16 00

CURBS, GUTTERS, SIDEWALKS

PART 1 - GENERAL

- 1.01 SUMMARY
 - A. Concrete for curbs, gutters, sidewalks, mow curbs and basketball court.
- 1.02 RELATED SECTIONS
 - A. Section 31 20 00 – Earthwork
 - B. Section 32 11 23 – Aggregate Base Courses
- 1.03 REFERENCES
 - A. Standard Specifications for Public Works Construction (SSPWC), latest edition.
 - B. ASTM Standards.
- 1.04 SUBMITTALS
 - A. Submit the following:
 - 1. Product Data: Provide data on admixtures and curing compounds.
 - 2. Concrete mix design(s).
 - 3. Certificates from the batch plant.
- 1.05 QUALITY ASSURANCE
 - A. Perform Work in accordance with the SSPWC, latest edition; and ASTM Standards, latest edition.
 - B. Obtain cementitious materials from same source throughout.
- 1.06 ENVIRONMENTAL REQUIREMENTS
 - A. Do not place concrete when base surface temperature is less than 40 degrees F or surface is wet.

PART 2 - PRODUCTS

- 2.01 FORM MATERIALS
 - A. Form Materials: Section 303-5 of the SSPWC.
- 2.02 CONCRETE MATERIALS
 - A. Concrete Material for Curbs and Walks (Path of Travel):
 - 1. Class 520-C-2500. Portland cement concrete per Standard Specifications for Public Works Construction Section 201-1.
 - 2. Concrete reinforcements shall be constructed per the Project Plans and Specifications.
 - B. Concrete Material for Traffic Loaded Concrete:
 - 1. Class 650-CW-4000. Portland cement concrete per Standard Specifications for Public Works Construction Section 201-1.
 - 2. Concrete reinforcements shall be constructed per the Project Plans and Specifications.
- 2.03 ACCESSORIES
 - A. Curing Compound shall conform to SSPWC Section 201-4. Pigmented compound shall not demonstrate any residual coloring of the concrete after one week.
- 2.04 CONCRETE MIX
 - A. Mix and deliver concrete in accordance with ASTM C94.

- B. Use accelerating admixtures in cold weather only when approved by the District's Representative. Use of admixtures will not relax cold weather placement requirements.
- C. Use calcium chloride only when approved by the District 's Representative.
- D. Use set retarding admixtures during hot weather only when approved by the District 's Representative.

2.05 CONCRETE REINFORCEMENT

- A. Concrete reinforcement shall conform to SSPWC Section 201-2.

2.06 SOURCE QUALITY CONTROL

- A. Provide certificates of compliance from the batch plant.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify compacted subgrade is acceptable and ready to support imposed loads.
- B. Verify gradients and elevations of subgrade are correct.

3.02 PREPARATION

- A. Moisten subgrade to minimize absorption of water from fresh concrete.
- B. Coat surfaces of catch basin frames with oil to prevent bond with concrete pavement.
- C. Notify District's Representative a minimum of 24 hours prior to commencement of concrete placement operations.

3.03 FORMING

- A. Place and secure forms to correct location, dimension, and profile.
- B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.04 PLACING CONCRETE

- A. Place concrete in accordance with SSPWC Section 303-5.
- B. Install ½" thick fiberboard expansion joint and snap cap. Seal with Sikaflex self-leveling sealant after removal of snap cap (typical).
- C. Construct weakened plane joints conforming to SSPWC Section 303-5.4.3, 1 ¼" inch deep, at intervals not exceeding 12 feet.
- D. The top edges of curbs shall have 0.5" radius.

3.05 FINISHING

- A. Concrete finishes shall be per SSPWC Section 303-5.5.
- B. Portland cement concrete paving in all accessible routes of travel shall have slip resistant finish.
- C. Walkway grades in excess of 5% shall conform to requirements of Section 11B-401 of the latest edition of the California Building Code.
- D. Place curing compound in accordance with SSPWC Section 303-5.6 on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

3.06 FIELD QUALITY CONTROL

- A. Inspection and testing shall be performed by the District's Testing Laboratory.
- B. District 's Testing Laboratory will perform slump and compressive strength tests.
- C. Contractor shall maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.07 PROTECTION

- A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, vandalism and mechanical injury.
- B. It is the Contractor's responsibility to replace all concrete work subject to vandalism and graffiti at no extra cost to the District.

END OF SECTION 32 16 00

SECTION 32 17 23

PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes surface preparation and field application of pavement marking on hot-mix asphalt paving and Portland cement concrete paving.

1.3 SUBMITTALS

- A. Product Data:
 - 1. Material List: Provide an inclusive list of required coating materials, including primers and other surface preparation materials. Indicate each material and cross-reference specific coating and application. Identify each material by manufacturer's catalog number and general classification.
 - 2. Manufacturer's Information: Provide manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material proposed for use.
 - 3. Certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).
- B. Results of preconstruction field testing.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of pavement marking material from one source and by a single manufacturer.
- B. Installer Qualifications: Engage an experienced installer who has completed pavement marking similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance of at least 5 years.
- C. Pre-Application Field Testing: Prepare a sample marking of each different paint formulation on asphalt substrates for the purpose of establishing quality of application, adherence of paint to the substrate, compatibility of the paint with the asphalt, and to determine whether a primer will be necessary if not otherwise required by the manufacturer.
 - 1. Minimum length of test stripe: 3 feet.
 - 2. Perform a minimum of 3 test stripes, located to provide a representative sample of entire area indicated to receive pavement marking paint.
 - 3. Apply test markings using methods and equipment recommended by the manufacturer of the marking paint and as specified in this Section.
 - 4. Arrange for a technical representative of the marking paint manufacturer to observe cured test samples and provide written recommendations for changes, if any, to materials or methods necessary to achieve optimum paint performance on specific substrates.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.
- B. Store pavement-marking materials in a clean, dry, protected location and within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.6 PROJECT CONDITIONS

- A. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 50 deg F, and not exceeding 90 deg F.

PART 2 - PRODUCTS

2.1 PAVEMENT MARKING MATERIALS

- A. Pavement-Marking Paint: Lead free latex, water-base emulsion, ready-mixed, complying with FS TT-P-1952, and suitable for use on both hot-mix asphalt and Portland cement concrete paving. Provide material having a volatile organic compound (VOC) content of 250 g/L, or less.
 - 1. Colors:
 - a. Color: White (for all parking stalls other than disabled access parking, for traffic and lane marking, and for painted text).
 - b. Color: Yellow, where indicated.
 - c. Color: Red (for "No Parking" areas as shown).
 - d. Color: Blue (for pavement markings identifying disabled access parking and paths of travel).
 - 2. Gloss: Flat or eggshell with gloss at 30 percent or less when measured at a 60-degree meter.
- B. Primer: Type recommended by the marking paint manufacturer.
- C. Surface Cleaning Material: Cleaning agent or agents suitable for removing grease, oil, and other contaminants that will not damage asphalt or Portland cement concrete paving and are acceptable to pavement marking paint manufacturer.

PART 3 - EXECUTION

3.1 PAVEMENT MARKING

- A. Allow paving to cure for a minimum of 30 days before starting pavement marking. Comply with recommendations of the pavement marking paint manufacturer for longer cure periods.
- B. Sweep and clean surface to eliminate loose material and dust. Ensure all surfaces indicated to receive pavement marking are clean and free from grease, oil, concrete sealers and curing agents, and other contaminants that might interfere with paint adhesion.
 - 1. Comply with manufacturer's instructions for use of special cleaning agents.
 - 2. For removal of substances that would interfere with paint adhesion use methods recommended by the paint manufacturer if applicable, or methods that will completely remove the substance without damaging or discoloring the underlying pavement substrate.
- C. Apply paint with mechanical equipment to produce pavement markings of dimensions indicated with uniform, straight edges. Apply at manufacturer's recommended rates based on substrate type and cure conditions to provide a minimum wet film thickness of 15 mils and dry film thickness of 8 mils, unless otherwise recommended by the manufacturer.
- D. Comply with paint manufacturer's maximum recommended drying time before allowing traffic in order to prevent undue softening of bitumen and pick-up, displacement, or discoloration of pavement marking by vehicular traffic.
- E. Paint pavement, curbs, and other surfaces as shown on the Drawings. Painting shall be straight, uniform, exact, and sharp without blobs at the start and finish. Edges shall be even, accurate, symmetrical, and free of fuzziness.
 - 1. Edge Tolerance: 1/2 inch in 20 feet, maximum.
- F. Apply markings for disabled access symbols in accordance with State of California Building Code, Part 2, Title 24, California Building Standards.
- G. Where work consists of modifications of, or additions to existing pavement marking, match existing color and line width.

3.2 ADJUSTING

- A. Touch up pavement markings not complying with requirements of this Section by painting out the errors with permanently opaque paint of the same color as the substrate pavement.
 - 1. Block out and eliminate all traces of splashed, tracked, and spilled pavement marking paint from the background surfaces.

- 2. Paint over deviations in marking edges exceeding allowable tolerance and apply new marking meeting specified requirements.
 - B. The Owner reserves the right to require sandblast removal of extensive defective pavement marking and application of new marking meeting specified requirements at no additional cost.
- 3.3 PROTECTION
- A. Provide traffic cones, barricades, and other devices needed to protect the pavement marking until it is sufficiently dry to withstand traffic without damage.

END OF SECTION 32 17 23

SECTION 32 17 26

CAST IN PLACE DETECTABLE/TACTILE WARNING SURFACING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section specifies furnishing and installing Cast In Place Detectable/Tactile Warning Surface Tiles where indicated. Not recommended for asphalt applications:
- B. Related Requirements:
 - 1. Section 321313 "Concrete Paving" for concrete walkways serving as substrates for tactile warning surfacing.

1.03 SUBMITTALS

Product Data:

- A. Submit manufacturer's literature describing products, installation procedures and routine maintenance.
- B. Samples for Verification Purposes: Submit two (2) tile samples minimum 12"x12" of the kind proposed for use.
- C. Shop drawings are required for products specified showing fabrication details, composite structural system, tile surface profile, sound on cane contact amplification feature, plans of tile placement including joints, and material to be used as well as outlining installation materials and procedure.
- D. Material Test Reports: Submit complete test reports from qualified accredited independent testing laboratories to qualify that materials proposed for use are in compliance with requirements and meet or exceed the properties indicated on the specifications. All tests shall be conducted on a Cast In Place Detectable/Tactile Warning Surface Tile system as certified by a qualified independent testing laboratory.
- E. Maintenance Instructions: Submit copies of manufacturer's specified installation and maintenance practices for each type of Detectable Warning Surface Tile and accessory as required.

1.04 QUALITY ASSURANCE

- A. Provide Cast In Place Detectable/Tactile Warning Surface Tiles and accessories as produced by a single manufacturer with a minimum of five (5) years' experience in the manufacturing of Cast In Place Detectable/Tactile Warning Surface Tiles.
- B. Installer's Qualifications: Engage an experienced Installer certified in writing by Cast In Place Detectable/Tactile Warning Surface Tile manufacturer as qualified for installation, who has successfully completed installations similar in material, design, and extent to that indicated for Project.
- C. Americans with Disabilities Act (ADA): Provide Surface Applied Detectable/Tactile Warning Surface Tiles which comply with the detectable warnings on walking surfaces section of the Americans with Disabilities Act (Title III Regulations, 28 CFR Part 36 ADA STANDARDS FOR ACCESSIBLE DESIGN, Appendix A, Section 4.29.2 DETECTABLE WARNINGS ON WALKING SURFACES).
- D. California Code of Regulations (CCR): Provide only approved DSAAC detectable warning products as provided in the California Code of Regulations (CCR) Title 24, Chapter 2, Section 202 definition of "Detectable Warning". Section 11B-247 and 11B-705 "Detectable Warnings And Detectable Directional Texture."
- E. Vitrified Polymer Composite (VPC) Cast in Place Warning tiles shall include continuous strand woven fiberglass sheet matrix embedded within an epoxy polymer composition

with a ultra-violet coating employing aluminum oxide particles in the truncated domes. The tile shall incorporate an in-line pattern of truncated domes measuring nominal 0.2" height, 0.9" base diameter, and 0.45" top diameter, spaced center-to-center 2.35" to 2.40 as measured "In Line". For wheelchair safety the field area shall consist of a non-slip surface with a minimum of 40 - 90° raised points 0.045" high, per square inch; "Armor-Tile" as manufactured by Engineered Plastics Inc., Tel: 800-682-2525, or approved equal.

1. Dimensions: Cast in Place Detectable/Tactile Warning Surface Tiles shall be held within the following dimensions and tolerances:
 - a. Length and Width: 36x60 nominal
 - b. Depth: 1.375 (1-3/8") (+/-) 5% max.
 - c. Face Thickness: 0.1875 (1-3/8") (+/-) 5% max.
 - d. Warpage of Edge: 0.5% max.
 - e. Embedment Flange Spacing: shall be no greater than 3.1"
2. Water Absorption of Tile when tested by ASTM D 570-98 not to exceed 0.05%.
3. Slip Resistance of Tile when tested by ASTM C 1028-96 the combined Wet and Dry Static Co-Efficients of Friction not to be less than 0.80 on top of domes and field area.
4. Compressive Strength of Tile when tested by ASTM D 695-02a not to be less than 28,000 psi.
5. Tensile Strength of Tile when tested by ASTM D 638-03 not to be less than 19,000 psi.
6. Flexural Strength of Tile when tested by ASTM D 790-03 not to be less than 25,000 psi.
7. Chemical Stain Resistance of Tile when tested by ASTM D 543-95 (re approved 2001) to withstand without discoloration or staining - 10% hydrochloric acid, urine, saturated calcium chloride, black stamp pad ink, chewing gum, red aerosol paint, 10% ammonium hydroxide, 1% soap solution, turpentine, Urea 5%, diesel fuel and motor oil.
8. Abrasive Wear of Tile when tested by BYK - Gardner Tester ASTM D 2486-00 with reciprocating linear motion of 37± cycles per minute over a 10" travel. The abrasive medium, a 40 grit Norton Metallite sand paper, to be fixed and leveled to a holder. The combined mass of the sled, weight and wood block is to be 3.2 lb. Average wear depth shall not exceed 0.060 after 1000 abrasion cycles when measured on the top surface of the dome representing the average of three measurement locations per sample.
9. Resistance to Wear of Unglazed Ceramic Tile by Taber Abrasion per ASTM C501-84 (re approved 2002) shall not be less than 500.
10. Gardner Impact to Geometry "GE" of the standard when tested by ASTM D 5420-04 to have a mean failure energy expressed as a function of specimen thickness of not less than 550 in. lbf/in. A failure is noted when a crack is visible on either surface or when any brittle splitting is observed on the bottom plaque in the specimen.
11. Accelerated Weathering of Tile when tested by ASTM G 155-05a for 3000 hours shall exhibit the following result – $\Delta E < 4.5$, as well as no deterioration, fading or chalking of surface of tile color No 33538.
12. Accelerated Aging and Freeze Thaw Test of Tile and Adhesive System when tested to ASTM D 1037-99 shall show no evidence of cracking, delamination, warpage, checking, blistering, color change, loosening of tiles or other detrimental defects.
13. Salt and Spray Performance of Tile when tested to ASTM B 117-03 not to show any deterioration or other defects after 200 hours of exposure.
14. AASHTO HB-17 single wheel HS20-44 loading "Standard Specifications for Highways and Bridges". The Cast In Place Tile shall be mounted on a concrete platform with a 1/2" airspace at the underside of the tile top plate then subjected to the specified maximum load of 10,400 lbs., corresponding to an 8000 lb individual wheel load and a 30% impact factor. The tile shall exhibit no visible damage at the maximum load of 10,400 lbs.

15. Embedment flange spacing shall be no greater than 3.1" center to center spacing as illustrated on the product Cast In Place drawing.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Cast In Place Detectable/Tactile Warning Surface Tiles shall be suitably packaged or crated to prevent damage in shipment or handling. Finished surfaces shall be protected by sturdy plastic wrappings to protect tile from concrete residue during installation and tile type shall be identified by part number.
- B. Cast In Place Detectable/Tactile Warning Surface Tiles shall be delivered to location at building site for storage prior to installation.

1.06 SITE CONDITIONS

- A. Environmental Conditions and Protection: Maintain minimum temperature of 40°F in spaces to receive Cast In Place Detectable/Tactile Warning Surface Tiles for at least 24 hours prior to installation, during installation, and for not less than 24 hours after installation.
- B. The use of water for work, cleaning or dust control, etc. shall be contained and controlled and shall not be allowed to come into contact with the general public. Provide barricades or screens to protect the general public.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. The Vitrified Polymer Composite (VPC) Cast In Place Detectable/Tactile Warning Surface Tile specified is based on Armor-Tile manufactured by Engineered Plastics Inc. (800-682-2525). No equal substitutions allowed after bidding process.
- B. Color: Yellow conforming to Federal Color No. 33538. Color shall be homogeneous throughout the tile.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. During Cast In Place Detectable/Tactile Warning Surface Tile installation procedures, ensure adequate safety guidelines are in place and that they are in accordance with the applicable industry and government standards.
- B. Prior to placement of the Cast In Place Detectable/Tactile Warning Surface Tile system, review manufacturer and contract drawings with the Contractor prior to the construction and refer any and all discrepancies to the Owner's Representative.
- C. The specifications of the structural embedment flange system and related materials shall be in strict accordance with the contract documents and the guidelines set by their respective manufacturers. Not recommended for asphalt applications.
- D. The physical characteristics of the concrete shall be consistent with the contract specifications while maintaining a slump range of 4 - 7 to permit solid placement of the Cast In Place Detectable/Tactile Warning Surface Tile system. An overly wet mix will cause the tile to float. Under these conditions, suitable weights such as 2 concrete blocks or sandbags (25 lb) shall be placed on each tile.
- E. The concrete pouring and finishing operations require typical mason's tools, however, a 4' long level with electronic slope readout, 25 lb. weights, and a large non-marring rubber mallet are specific to the installation of the Cast In Place Detectable/Tactile Warning Surface Tile system. A vibrating mechanism such as that manufactured by Vibco can be employed, if desired. The vibrating unit should be fixed to a soft base such as wood, at least 1 foot square.
- F. The factory-installed plastic sheeting must remain in place during the entire installation process to prevent the splashing of concrete onto the finished surface of the tile.
- G. When preparing to set the tile, it is important that no concrete be removed in the area to accept the tile. It is imperative that the installation technique eliminates any air voids

under the tile. Holes in the tile perimeter allow air to escape during the installation process. Concrete will flow through the large holes in each embedment flange on the underside of the tile. This will lock the tile solidly into the cured concrete.

- H. The concrete shall be poured and finished true and smooth to the required dimensions and slope prior to the tile placement. Immediately after finishing concrete, the electronic level should be used to check that the required slope is achieved. The tile shall be placed true and square to the curb edge in accordance with the contract drawings. The Cast In Place Detectable/Tactile Warning Surface Tiles shall be tamped (or vibrated) into the fresh concrete to ensure that the field level of the tile is flush to the adjacent concrete surface. The embedment process should not be accomplished by stepping on the tile as this may cause uneven setting which can result in air voids under the tile surface. The contract drawings indicate that the tile field level (base of truncated dome) is flush to adjacent surfaces to permit proper water drainage and eliminate tripping hazards between adjacent finishes.
- I. In cold weather climates it is recommended that the Cast In Place Detectable/Tactile Warning Surface Tiles be set deeper such that the top of domes are level to the adjacent concrete on the top and sides of ramp and that the base of domes to allow water drainage. This installation will reduce the possibility of damage due to snow clearing operations.
- J. Immediately after placement, the tile elevation is to be checked to adjacent concrete. The elevation and slope should be set consistent with contract drawings to permit water drainage to curb as the design dictates. Ensure that the field surface of the tile is flush with the surrounding concrete and back of curb so that no ponding is possible on the tile at the back side of curb.
- K. While concrete is workable, a 3/8" radius edging tool shall be used to create a finished edge of concrete, then a steel trowel shall be used to finish the concrete around the tile's perimeter, flush to the field level of the tile.
- L. During and after the tile installation and the concrete curing stage, it is imperative that there is no walking, leaning or external forces placed on the tile that may rock the tile causing a void between the underside of tile and concrete.
- M. Following tile placement, review installation tolerances to contract drawings and adjust tile before the concrete sets. Two suitable weights of 25 lb each may be required to be placed on each tile as necessary to ensure solid contact of the underside of tile to concrete.
- N. Following the concrete curing stage, protective plastic wrap is to be removed from the tile surface by cutting the plastic with a sharp knife, tight to the concrete/tile interface. If concrete bled under the plastic, a soft brass wire brush will clean the residue without damage to the tile surface.
- O. If desired, individual tiles can be bolted together using 1/4 inch or equivalent hardware. This can help to ensure that adjacent tiles are flush to each other during the installation process. Tape or caulking can be placed on the underside of the bolted butt joint to ensure that concrete does not rise up between the tiles during installation. Any protective plastic wrap which was peeled back to facilitate bolting or cutting, should be replaced and taped to ensure that the tile surface remains free of concrete during the installation process.
- P. Tiles can be cut to custom sizes, or to make a radius, using a continuous rim diamond blade in a circular saw or mini-grinder. Use of a straightedge to guide the cut is advisable where appropriate.
- Q. Any sound-amplifying plates on the underside of the tile, which are dislodged during handling or cutting, should be replaced and secured with construction adhesive. The air gap created between these plates and the bottom of the tile is important in preserving the sound on cane audible properties of the Armor-Tile system as required in various jurisdictions.

3.02 CLEANING, PROTECTING AND MAINTENANCE

- A. Protect tiles against damage during construction period to comply with Tactile Tile manufacturer's specification.

- B. Protect tiles against damage from rolling loads following installation by covering with plywood or hardwood.
- C. Clean Tactile Tiles not more than four days prior to date scheduled for inspection intended to establish date of substantial completion in each area of project. Clean Tactile Tile by method specified by Tactile Tile manufacturer.
- D. Comply with manufacturers maintenance manual for cleaning and maintaining tile surface and it is recommended to perform annual inspections for safety and tile integrity.

END OF SECTION 32 17 26

SECTION 32 18 16.13

PLAYGROUND PROTECTIVE SURFACING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Poured-in-Place Playground Surfacing System.

1.03 DEFINITIONS

- A. Definitions in ASTM F 2223 apply to Work of this Section.
- B. Critical Height: Standard measure of shock attenuation according to ASTM F 2223; same as "critical fall height" in ASTM F 1292. According to ASTM F 1292, this approximates "the maximum fall height from which a life-threatening head injury would not be expected to occur."
- C. SBR: Styrene-butadiene rubber.
- D. Unitary Surfacing: A protective surfacing of one or more material components bound together to form a continuous surface; same as "unitary system" in ASTM F 2223.

1.04 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension.
 - 2. ASTM D624 Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
 - 3. ASTM D2047 Standard Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine.
 - 4. ASTM D2859 Standard Test Method for Flammability of Finished Textile Floor Covering Materials.
 - 5. ASTM E303 Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester.
 - 6. ASTM F1292 Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment.
 - 7. ASTM F1951 Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment.

1.05 SYSTEM DESCRIPTION – POUR-IN-PLACE PLAYGROUND SURFACING SYSTEM

- A. Performance Requirements: Provide a 2-layer rubber-urethane playground surfacing system which has been designed, manufactured and installed to meet the following criteria:
 - 1. Shock Attenuation (ASTM F1292):
 - a. Gmax: Less than 200.
 - b. Head Injury Criteria: Less than 1000.
 - 2. Flammability (ASTM D2859): Pass.
 - 3. Tensile Strength (ASTM D412): 60 psi (413 kPa).
 - 4. Tear Resistance (ASTM D624): 140%.
 - 5. Water Permeability: 0.4 gal/yd²/second.
 - 6. Accessibility: Comply with requirements of ASTM F1951.

1.06 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions.
- B. Sustainable Design Submittals:
 - 1. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.
- C. Shop Drawings: For each type of protective surfacing.
 - 1. Include plans, sections, placement and penetration details, and attachment to substrates.
 - 2. Include accessories and edge terminations.
 - 3. Include patterns made by varying colors of surfacing and details of graphics.
 - 4. Include fall heights and use zones for equipment and structures specified in Section 116800 "Play Field Equipment and Structures," coordinated with the critical heights for protective surfacing.
- D. Samples for Initial Selection: For each type of exposed finish.
 - 1. Include Samples of accessories involving color selection.
- E. Samples for Verification: For each type of protective surfacing and exposed finish.
 - 1. Include Samples of accessories to verify color and finish selection.
 - 2. Unitary, Seamless Surfacing: Minimum 6 by 6 inches.
 - 3. Edging: 6 inches long by full width and cross section.
 - 4. Drainage/Separation Geotextile: Minimum 12 by 12 inches.
 - 5. Drainage Panel: Minimum 6 by 6 inches.
 - 6. Loose-Fill Surfacing: Minimum 1 quart.
- F. Product Schedule: For protective surfacing. Use same designations indicated on Drawings.

1.07 INFORMATIONAL SUBMITTALS

- A. Quality Assurance/Control Submittals: Submit the following:
 - 1. Certificate of qualifications of the playground surfacing installer. Product Data: For each type of unitary surfacing product.

1.08 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For playground protective surfacing to include in maintenance manuals.
- B. Warranty documents specified herein.

1.09 QUALITY ASSURANCE

- A. Qualifications: Utilize an installer approved and trained by the manufacturer of the playground surfacing system or a direct employee of the manufacturer's installation division, having experience with other projects of the scope and scale of the work described in this section.
- B. Certifications: Certification by manufacturer that installer is an approved applicator of the playground surfacing system.
- C. International Play Equipment Manufacturers Association (IPEMA) certified.
- D. Mockups: Build mockups to verify selections made under Sample submittals and to set quality standards for materials and execution.
 - 1. Build mockups for protective surfacing including accessories.
 - a. Size: 48 inches by 48 inches.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.10 DELIVERY, STORAGE & HANDLING

- A. General: Comply with Division 1 Product Requirement Section.

- B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at a minimum temperature of 40 degrees F (4 degrees C) and a maximum temperature of 90 degrees F (32 degrees C).

1.11 PROJECT/SITE CONDITIONS

- A. Environmental Requirements: Install surfacing system when minimum ambient temperature is 40 degrees F (1 degree C) and maximum ambient temperature is 95 degrees F (32 degrees C). Exception to the temperature requirements can be made by the manufacturer of the surfacing system. Do not install in steady or heavy rain.

1.12 WARRANTY

- A. Special Warranty: Manufacturer and Installer agree to repair or replace components of protective surfacing that fail in materials or workmanship within specified warranty period.
- B. Proper drainage is critical to the longevity of the Poured-in-Place surfacing system. Inadequate drainage will cause premature breakdown of the poured system in affected areas; and void the warranty.
 - 1. Failures include, but are not limited to, the following:
 - a. Reduction in impact attenuation as measured by reduction of critical fall height.
 - b. Deterioration of protective surfacing and other materials beyond normal weathering.
 - 2. Warranty Period: Five (5) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Source Limitations: Obtain protective surfacing materials from single source from single manufacturer.
 - 1. Provide geosynthetic accessories of each type from source recommended by manufacturer of protective surfacing materials.

2.02 PERFORMANCE REQUIREMENTS

- A. Impact Attenuation: Critical fall height tested according to ASTM F 1292.
- B. Accessibility Standard: Minimum surfacing performance according to ASTM F 1951.

2.03 POUR IN PLACE PLAYGROUND SURFACING SYSTEM (RUBBERIZED PLAY SURFACE)

- A. Description: Manufacturer's standard, site-mixed and applied, two-layer material with wearing layer over cushioning layer, with combined, overall thickness as required, tested for impact attenuation according to ASTM F 1292 and for accessibility according to ASTM F 1951.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. SpectraTurf, Inc. Contact: 555 South Promenade Avenue, #103, Corona, CA 92879; Telephone: (800) 875-5788; Fax: (951) 734-3630; E-mail: info@spectraturf.com website: <http://www.spectraturf.com>
 - b. Surface America Incorporated.
 - c. GameTime; a PlayCore, Inc. company.
 - 2. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 85 percent.
 - 3. Wearing Layer/Top Surface: Formulation of polyurethane granules, EPDM (ethylene propylene diene monomer) rubber, aliphatic urethane binder, and other organic and inorganic components.

- a. Thickness: Nominal 1/2" (12.7 mm), minimum 3/8" (9.5 mm), maximum 5/8" (15.9 mm).
- b. Wearing Layer Color(s): As indicated per plan.
- 4. Design: Where colored pattern is required, provide as indicated on Drawings.
 - a. Dry Static Coefficient of Friction (ASTM D2047): 1.0.
 - b. Wet Static Coefficient of Friction (ASTM D2047): 0.9.
 - c. Dry Skid Resistance (ASTM E303): 89.
 - d. Wet Skid Resistance (ASTM E303): 57.
- 5. Cushioning Layer/Basemat: Formulation of recycled SBR particles and binder.
 - a. Basemat Thickness per the following table of critical fall heights per ASTM F1292.

<u>CRITICAL FALL HEIGHT</u>	<u>BASEMAT THICKNESS</u>
Up to 4 feet	1-1/4 inches
Up to 5 feet	1-1/2 inches
Up to 6 feet	2 inches
Up to 7 feet	2-1/2 inches
Up to 8 feet	3 inches
Up to 10 feet	4 inches
Up to 12 feet	4-1/2 inches

- 6. Aliphatic Binder: Weather-resistant, UV-stabilized, flexible, nonhardening, 100 percent solids polyurethane.
- 7. Lacquer Topcoat: Manufacturer's standard polyurethane-based formulation.
- 8. Overall Thickness: Not less than [as required for critical height indicated.
- 9. Primer/Adhesive: Manufacturer's standard primer and weather-resistant, moisture-cured polyurethane adhesive suitable for unit, substrate, and location.
- 10. Wearing Layer Color(s): As indicated per plan.
 - a. Design: Where colored pattern is required, provide as indicated on Drawings.
- B. Leveling and Patching Material: Portland cement-based grout or epoxy- or polyurethane-based formulation suitable for exterior use and approved by protective surfacing manufacturer.
- C. Substitutions: surfacing basemat thickness per pip rubberized manufacturer specified. If an alternate vendor is submitted, contractor shall verify basemat thickness for fall height indicated with alternate manufacturer and provide shop drawings indicating basemat thickness.

2.04 GEOSYNTHETIC ACCESSORIES

- A. Drainage/Separation Geotextile: Nonwoven, needle-punched geotextile, manufactured for drainage applications and made from polyolefins or polyesters; with the following minimum properties:
 - 1. Weight: ; ASTM D 5261.
 - 2. Water Flow Rate: according to ASTM D 4491.

2.05 MIXES

- A. A. Required mix proportions by weight:
 - 1. Basemat: 16+% urethane (as ratio: 14% urethane divided by 86% rubber). 14% urethane, 86% rubber (based on entire rubber & urethane mix).
 - 2. Top Surface: 25% urethane (ratio: 20% urethane divided by 80% TPV). 20% urethane, 80% TPV (based on entire rubber & urethane mix).

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for subgrade elevations, slope, and drainage and for other conditions affecting performance of the Work.

1. Verify that substrates are sound and without high spots, ridges, holes, and depressions.
- B. Hard-Surface Substrates: Verify that substrates are satisfactory for unitary, protective surfacing installation and that substrate surfaces are dry, cured, and uniformly sloped to drain within recommended tolerances according to protective surfacing manufacturer's written requirements for cross-section profile.
 1. Concrete Substrates: Verify that substrates are dry and free from surface defects, laitance, glaze, efflorescence, curing compounds, form-release agents, hardeners, dust, dirt, loose particles, grease, oil, and other contaminants incompatible with protective surfacing or that may interfere with adhesive bond. Determine adhesion, dryness, and acidity characteristics by performing procedures recommended in writing by protective surfacing manufacturer.
 - a. New concrete must be fully cured – up to 7 days.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Prepare substrates to receive surfacing products according to protective surfacing manufacturer's written instructions.
- B. Edge Surface Preparation: Using a brush or short nap roller, apply primer to the substrate perimeter and any adjacent vertical barriers such as playground equipment support legs, curbs or slabs that will contact the surfacing system at the rate of 300 ft²/gal.
- C. Hard-Surface Substrates: Clean surface free of laitance, efflorescence, curing compounds, and other contaminants incompatible with protective surfacing.
 1. Repair: Fill holes and depressions in unsatisfactory surfaces with leveling and patching material.
 2. Treatment: Mechanically abrade or otherwise prepare concrete substrates according to protective surfacing manufacturer's written instructions to achieve adequate roughness.
 3. Terminal Edges: Saw cut concrete for terminal edges of protective surfacing.
 4. Treat control joints and other nonmoving substrate cracks to prevent telegraphing through protective surfacing.

3.03 INSTALLATION OF GEOSYNTHETIC ACCESSORIES

- A. Install geosynthetic accessories before edging and according to playground surface system manufacturer's and geosynthetic manufacturer's written instructions and in a manner that cannot become a tripping hazard.
 1. Drainage/Separation Geotextile: Completely cover area beneath protective surfacing, overlapping geotextile sides and edges a minimum of 4 inches with manufacturer's standard treatment for seams.
 2. Drainage Panels: Completely cover area beneath protective surfacing, abutting the drainage cores and overlapping seams with geotextile fabric facing with manufacturer's standard treatment seams.
 3. Weed-Control Barrier: Completely cover area beneath loose-fill installation, overlapping barrier edges a minimum of with seams.

3.04 INSTALLATION OF POUR IN PLACE PLAYGROUND SURFACING SYSTEM (RUBBERIZED PLAY SURFACE)

- A. Do not proceed with playground surfacing installation until all applicable site work, including substrate preparation, fencing, playground equipment installation and other relevant work, has been completed.
- B. Basemat Installation:
 1. Using screeds and hand trowels, install the basemat at a consistent density of 29 pounds, 1 ounce per cubic foot to the specified thickness.
 2. Allow basemat to cure for sufficient time so that indentations are not left in the basemat from applicator foot traffic or equipment.
 3. Do not allow foot traffic or use of the basemat surface until it is sufficiently cured.

- C. Primer Application: Using a brush or short nap roller, apply primer to the basemat perimeter and any adjacent vertical barriers such as playground equipment support legs, curbs or slabs that will contact the surfacing system at the rate of 300 ft²/gal (7.5 m²/L).
- D. Top Surface Installation:
 - 1. Using a hand trowel, install top surface at a consistent density of 58 pounds, 9 ounces per cubic foot to a nominal thickness of 1/2".
 - 2. Allow top surface to cure for a minimum of 72 hours.
 - 3. At the end of the minimum curing period, verify that the top surface is sufficiently dry and firm to allow foot traffic and use without damage to the surface.
 - 4. Do not allow foot traffic or use of the surface until it is sufficiently cured.
- E. Mix and apply components of seamless surfacing according to manufacturer's written instructions to produce uniform, monolithic, and impact-attenuating protective surfacing of required overall thickness.
 - 1. Substrate Primer: Apply over prepared substrate at manufacturer's standard spreading rate for type of substrate.
 - 2. Poured Cushioning Layer: Spread evenly over primed substrate to form a uniform layer applied at manufacturer's standard spreading rate in one continuous operation, with a minimum of cold joints.
 - 3. Intercoat Primer: Over cured cushioning layer, apply primer at manufacturer's standard spreading rate.
 - 4. Wearing Layer: Spread over primed base course to form a uniform layer applied at manufacturer's standard spreading rate in one continuous operation and, except where color changes, with no cold joints. Finish surface to produce manufacturer's standard wearing-surface texture.
 - a. Design: Where colored pattern is required, place colored, design material as soon as previously placed material is sufficiently cured, using primer or adhesive if required by manufacturer's written instructions.
 - 5. Lacquer Topcoat: Spray or roller applied at manufacturer's standard coating rate in one continuous operation.
 - 6. Edge Treatment: Flush. Fully adhere edges to substrate with full coverage of substrate. Maintain fully cushioned thickness required to comply with performance requirements.

3.05 FIELD QUALITY CONTROL

- A. Testing Agency: Owner to engage a qualified testing agency to perform tests.
- B. Perform the following tests:
 - 1. Perform "Installed Surface Performance Test" according to ASTM F 1292 for each protective surfacing type and thickness in each playground area.
 - 2. Perform installed-surface-performance tests at no less than one series of tests for each 1000 sq. ft. of each type and thickness of in-place protective surfacing or part thereof.
- C. Playground protective surfacing will be considered defective if it does not pass tests.
- D. Prepare test reports.

3.06 PROTECTION

- A. Prevent traffic over seamless surfacing for not less than 48 hours after installation.

END OF SECTION 32 18 16.13

SECTION 32 18 23.43

RECREATIONAL COURT SURFACING

PART 1 - GENERAL

1.01 SUMMARY

- A. Concrete basketball court surface color coating system.

1.02 RELATED REQUIREMENTS

- A. Section 32 13 13- Concrete Paving.
- B. Section 32 11 26 Aggregate Base Courses.

1.03 REFERENCES

- A. American Sports Builders Association (ASBA).
- B. National Basketball Association (NBA) Official Rules.
- C. National Federation of State High School Associations (NFHS) Rule Book.
- D. National Collegiate Athletic Association (NCAA) Rule Book.

1.04 SUBMITTALS

- A. Comply with Section 01 33 00- Submittal Procedures.
- B. Product Data: Submit manufacturer's product data, including surface and crack preparation and application instructions.
- C. Samples: Submit manufacturer's color samples of color coating.
- D. Test Reports:
 - 1. Submit independent test results for solar reflectance index.
 - 2. Submit independent test results for 2000 Hour ASTM G154, accelerated weathering UV test, to demonstrate long-term durability and fade resistance.
 - 3. Submit independent test results for 2000 Hour, accelerated weathering ASTM G155 Xenon Arc test, to demonstrate long-term fade resistance and quality of pigment.
- E. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.
- F. Manufacturer's Project References: Submit manufacturer's list of successfully completed concrete basketball & multi-purpose court surface color coating system projects, including project name, location, and date of application.
- G. Applicator's Project References: Submit applicator's list of successfully completed concrete basketball & multi-purpose court surface color coating system projects, including project name, location, type and quantity of color coating system applied, and date of application.
- H. Warranty Documentation: Submit manufacturer's standard warranty.
- I. Authorized Installer Certificate: Submit manufacturer's authorized installer certificate.

1.05 QUALITY ASSURANCE

- A. Manufacturer's Qualifications:
 - 1. Manufacturer regularly engaged, for past 5 years, in manufacture of concrete basketball & multi-purpose court surface color coating systems of similar type to that specified.
 - 2. United States owned company.
 - 3. Member: ASBA.
- B. Applicator's Qualifications:
 - 1. Applicator regularly engaged, for past 3 years, in application of basketball & multi-purpose court surface color coating systems of similar type to that specified.

2. Employ persons trained for application of basketball & multi-purpose court surface color coating systems.
3. Applicator must be authorized installer of the surfacing brand used.

1.06 DELIVERY, STORAGE & HANDLING

- A. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage and Handling Requirements:
 1. Store and handle materials in accordance with manufacturer's instructions.
 2. Keep materials in manufacturer's original, unopened containers and packaging until application.
 3. Store materials in clean, dry area indoors.
 4. Store materials out of direct sunlight.
 5. Keep materials from freezing.
 6. Protect materials during storage, handling, and application to prevent contamination or damage.
 7. Close containers when not in use.
 8. Retain manufacturer batch codes on each container and application dates, for warranty purposes.

1.07 AMBIENT CONDITIONS

- A. Do not apply concrete basketball & multi-purpose court surface color coating system when air or surface temperatures are below 50°F (10°C) during application or within 24 hours after application.
- B. Do not apply concrete basketball & multi-purpose court surface color coating system when rain is expected during application or within 24 hours after application.

PART 2- PRODUCTS

2.01 MANUFACTURER

- A. SportMaster Sport Surfaces, PO Box 2277, 2520 South Campbell Street, Sandusky, Ohio 44870. Toll Free 800-326-1994. Fax 877-825-9226. Website www.sportmaster.net. E-mail moreinfo@sportmaster.net.
- B. All other brands must be pre-approved by the architect/owner, 7 days prior to the bid date. If submitting another brand, bidder must furnish copies of all submittal documents under section 1.4.

2.02 MATERIALS

- A. Concrete Basketball & Multi-Purpose Court Surface Color Coating System: SportMaster Color Coating System.
- B. Filler Course: SportMaster "Acrylic Resurfacer."
 1. 100 percent acrylic emulsion resurfacer.
 2. Mix on-site with silica sand.
 3. Apply to adhesion promoter or previously colored acrylic surfaces in preparation of color coating system.
 4. Chemical Characteristics, by Weight, Minimum:
 - a. Acrylic Emulsion: 44.0 percent.
 - b. Hiding Pigment: 2.0 percent.
 - c. Mineral Inert Fillers: 5.0 percent.
 - d. Film Formers, Additives: 0.2 percent.
 - e. Water: 45.0 percent.
 5. Weight per Gallon at 77 Degrees F: 8.5 lbs., plus or minus 0.5 lbs.
 6. Non-Volatile Material: 27.5 percent, plus or minus 5.0 percent.
 7. Color: Black or Neutral.
- C. Adhesion Promoter: SportMaster "Acrylic Adhesion Promoter."
 1. Acrylic emulsion primer.
 2. Primes concrete surface and promotes adhesion of color coating system materials.

3. Weight per Gallon at 77 Degrees F: 8.7 lbs., plus or minus 0.5 lbs.
- D. Color Coating: SportMaster "ColorPlus System."
 1. 100 percent acrylic emulsion coating.
 2. Mix on-site with silica sand and water.
 3. Color coats basketball and multi-purpose courts.
 4. Weight per Gallon at 77 Degrees F: 9.2 lbs., plus or minus 0.5 lbs.
 5. Color: As indicated on the plans.
- E. Line Markings Primer: SportMaster "Stripe-Rite."
 1. 100 percent acrylic emulsion primer, clear drying.
 2. Primes line markings and prevents bleed-under for sharp lines.
 3. Chemical Characteristics, by Weight, Nominal:
 - a. Acrylic Emulsion: 38.0 percent.
 - b. Hiding Pigment: 0.0 percent.
 - c. Mineral Inert Fillers: 7.0 percent.
 - d. Film Formers, Additives: 1.5 percent.
 - e. Water: 50.0 percent.
 4. Weight per Gallon at 77 Degrees F: 8.9 lbs., plus or minus 0.5 lbs.
 5. Non-Volatile Material: 29 percent, plus or minus 5 percent.
- F. Line Paint: SportMaster "Textured Line Paint."
 1. Pigmented, 100 percent acrylic emulsion line paint.
 2. Line marking on concrete basketball and multi-purpose courts.
 3. Chemical Characteristics, by Weight, Nominal:
 - a. Acrylic Emulsion: 25.89 percent.
 - b. Pigment: 14.90 percent.
 - c. Mineral Inert Fillers: 13.12 percent.
 - d. Additives: 4.73 percent.
 - e. Water: 41.36 percent.
 4. Weight per Gallon at 77 Degrees F: 10.65 lbs., plus or minus 0.75 lbs.
 5. Non-Volatile Material: 45.17 percent, plus or minus 5 percent.
 6. Color: White.

EXECUTION

3.01 EXAMINATION

- A. Examine concrete basketball and multi-purpose court surfaces to receive color coating system.
- B. Hard-Surface Substrates: Verify that substrates are satisfactory for unitary, protective surfacing installation and that substrate surfaces are dry, cured, and uniformly sloped to drain within recommended tolerances according to protective surfacing manufacturer's written requirements for cross-section profile.
 1. Concrete Substrates: Verify that substrates are dry and free from surface defects, laitance, glaze, efflorescence, curing compounds, form-release agents, hardeners, dust, dirt, loose particles, grease, oil, and other contaminants incompatible with protective surfacing or that may interfere with bond. Determine adhesion, dryness, and acidity characteristics by performing procedures recommended in writing by protective surfacing manufacturer.
 2. Suitable vapor barrier beneath concrete slab.
 3. Perimeter drainage to prevent moisture accumulation beneath concrete surface.
 4. No compounds have been applied to surface.
 5. Concrete basketball and multi-purpose courts meet ASBA requirements.
- C. Notify Owner's Representative of conditions that would adversely affect application or subsequent use.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 SURFACE PREPARATION

- A. Protection of In-Place Conditions: Protect adjacent surfaces and landscaping from contact with concrete basketball and multi-purpose court surface color coating system.
- B. Prepare surfaces in accordance with manufacturer's instructions.
- C. New Concrete:

1. Cure new concrete surfaces a minimum of 28 days before application of concrete basketball and multi-purpose court surface color coating system.
 2. Provide medium broom finish or similar roughened texture.
 3. Do not steel trowel finish.
 4. Acid etch with phosphoric or muriatic acid and rinse thoroughly prior to application of color coating system.
- D. Existing Concrete:
1. Sandblast, shotblast, or scarify smooth concrete surfaces to roughened texture similar to medium broom finish. If shot blasting, a shot blast profile of CSP3 or CSP4 is recommended.
 2. If existing concrete is uncoated, acid etch with phosphoric or muriatic acid and rinse thoroughly prior to application of color coating system.
- E. Remove dirt, dust, debris, oil, grease, sealers, curing compounds, vegetation, loose coatings, loose materials, and other surface contaminants which could adversely affect application of concrete basketball and multi-purpose court surface color coating system. Pressure wash entire surface.
- F. Repair cracks, depressions, and surface defects in accordance with manufacturer's instructions before application of color coating.
- G. Repair spalled areas and level depressions 1/8 inch and deeper with patch binder in accordance with manufacturer's instructions.
- H. Apply adhesion promoter over entire concrete surface in accordance with manufacturer's instructions.
- I. Apply 1 coat of filler course to provide smooth underlayment for application of color coating.
- J. Ensure surface repairs are flush and smooth to adjoining surfaces.

3.03 APPLICATION

- A. Apply concrete basketball and multi-purpose court surface color coating system in accordance with manufacturer's instructions at locations indicated on the Drawings.
- B. Mix materials in accordance with manufacturer's instructions.
- C. Apply Filler Course and Color Coating with a 50-60 durometer, soft rubber squeegee.
- D. Filler Course:
 1. Apply 1 coat on new concrete or existing acrylic surfaces with minimal repairs.
 2. Apply 2 coats on existing acrylic surfaces with extensive cracks or low spot repair.
- E. Apply a minimum of 2 coats of color coating to prepared surfaces in accordance with manufacturer's instructions.
- F. Allow material drying times in accordance with manufacturer's instructions before applying other materials or opening completed surface to foot traffic.

3.04 LINE MARKINGS

- A. Lay out court line markings in accordance with construction drawings.
- B. Apply line markings primer, after masking tape has been laid, to seal voids between masking tape and court surface to prevent bleed-under when line paint is applied.
- C. Apply a minimum of 1 coat of line paint in accordance with manufacturer's instructions.

3.05 PROTECTION

- A. Allow a minimum of 24 hours curing time before opening courts for play.
- B. Protect applied concrete basketball and multi-purpose court surface color coating system to ensure that, except for normal weathering, coating system will be without damage or deterioration at time of Substantial Completion.

END OF SECTION 32 18 23.43

SECTION 32 31 13

CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Chain-link fences.
 - 2. Swing gates.
- B. Related Requirements:
 - 1. Section 03 30 53 "Miscellaneous Cast-in-Place Concrete" for cast-in-place concrete and post footings.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Inspect and discuss electrical roughing-in, equipment bases, and other preparatory work specified elsewhere.
 - 2. Review coordination of interlocked equipment specified in this Section and elsewhere.
 - 3. Review required testing, inspecting, and certifying procedures.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
 - a. Fence and gate posts, rails, and fittings.
 - b. Chain-link fabric, reinforcements, and attachments.
 - c. Gates and hardware.
 - d. Privacy Slats.
- B. Shop Drawings: For each type of fence and gate assembly.
 - 1. Include plans, elevations, sections, details, and attachments to other work.
 - 2. Include accessories, hardware, gate operation, and operational clearances.
 - 3. Wiring Diagrams: For power, signal, and control wiring.
- C. Samples for Initial Selection: For each type of factory-applied finish.
- D. Samples for Verification: For each type of component with factory-applied finish, prepared on Samples of size indicated below:
 - 1. Polymer-Coated Components: In 6-inch lengths for components and on full-sized units for accessories.
- E. Delegated-Design Submittal: For structural performance of chain-link fence and gate frameworks, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For professional engineer.
- B. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

1.7 QUALITY ASSURANCE

- A. Mockups: Build mockups to set quality standards for fabrication and installation.
 - 1. Build mockup for typical chain-link fence and gate, including accessories.
 - a. Size: 10-foot length of fence.

1.8 FIELD CONDITIONS

- A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

1.9 WARRANTY

- A. Special Warranty: Installer agrees to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Failure to comply with performance requirements.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - c. .
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CHAIN-LINK FENCE FABRIC

- A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist according to "CLFMI Product Manual" and requirements indicated below:
 - 1. Fabric Height: As indicated on Drawings.
 - 2. Steel Wire for Fabric: Wire diameter of 0.148 inch.
 - a. Mesh Size: 2 inches.
 - b. Polymer-Coated Fabric: ASTM F 668, Class 1 over zinc -coated steel wire.
 - 1) Color: Black, according to ASTM F 934.
 - c. Coat selvage ends of metallic-coated fabric before the weaving process with manufacturer's standard clear protective coating.
 - 3. Selvage: Knuckled at both selvages.

2.2 PRIVACY SLATS

- A. General: Provide privacy slats in color indicated on Contract Drawings.
 - 1. Material: Polyethylene tubular slats, not less than 0.023 inch (0.58 mm) thick, manufactured for chain link fences from virgin polyethylene containing UV inhibitor; sized to fit mesh specified for direction indicated.
 - 2. Color: As indicated on Contract Drawings.

2.3 FENCE FRAMEWORK

- A. Posts and Rails: ASTM F 1043 for framework, including rails, braces, and line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F 1043 based on the following:
 - 1. Fence Height: As indicated on Drawings.
 - 2. Light-Industrial-Strength Material: Group IC-L, round steel pipe, electric-resistance-welded pipe.
 - a. Line Post: 2.375 inches in diameter.

- b. End, Corner, and Pull Posts: 2.375 inches.
- 3. Horizontal Framework Members: Intermediate top rails according to ASTM F 1043.
 - a. Top Rail: 1.66 inches in diameter.
- 4. Brace Rails: ASTM F 1043.
- 5. Polymer coating over metallic coating.
 - a. Color: Match chain-link fabric, according to ASTM F 934.

2.4 TENSION WIRE

- A. Polymer-Coated Steel Wire: 0.148-inch- diameter, tension wire according to ASTM F 1664, Class 1 over zinc -coated steel wire.
 - 1. Color: Match chain-link fabric, according to ASTM F 934.

2.5 SWING GATES

- A. General: ASTM F 900 for gate posts and double swing gate types.
 - 1. Gate Leaf Width: As indicated.
 - 2. Framework Member Sizes and Strength: Based on gate fabric height as indicated.
- B. Pipe and Tubing:
 - 1. Zinc-Coated Steel: ASTM F 1043 and ASTM F 1083; protective coating and finish to match fence framework.
 - 2. Gate Posts: Round tubular steel.
 - 3. Gate Frames and Bracing: Round tubular steel.
- C. Frame Corner Construction: assembled with corner fittings.
- D. Hardware:
 - 1. Hinges: 180-degree outward swing.
 - 2. Latch: Permitting operation from both sides of gate with provision for padlocking accessible from both sides of gate.
 - 3. Closer

2.6 FITTINGS

- A. Provide fittings according to ASTM F 626.
- B. Post Caps: Provide for each post.
 - 1. Provide line post caps with loop to receive tension wire or top rail.
- C. Rail and Brace Ends: For each gate, corner, pull, and end post.
- D. Rail Fittings: Provide the following:
 - 1. Top Rail Sleeves: Pressed-steel or round-steel tubing not less than 6 inches long.
 - 2. Rail Clamps: Line and corner boulevard clamps for connecting intermediate and bottom rails to posts.
- E. Tension and Brace Bands: Pressed steel.
- F. Tension Bars:., length not less than 2 inches shorter than full height of chain-link fabric. Provide one bar for each gate and end post, and two for each corner and pull post, unless fabric is integrally woven into post.
- G. Tie Wires, Clips, and Fasteners: According to ASTM F 626.
 - 1. Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames, according to the following:
 - a. Hot-Dip Galvanized Steel: 0.148-inch- diameter wire.
 - b. Aluminum: ASTM B 211; Alloy 1350-H19; 0.148-inch- diameter, mill-finished wire.
- H. Finish:
 - 1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz./sq. ft. of zinc.
 - a. Polymer coating over metallic coating.
 - 2. Aluminum: Mill finish.

2.7 GROUT AND ANCHORING CEMENT

- A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout, recommended in writing by manufacturer, for exterior applications.
- B. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating, and that is recommended in writing by manufacturer for exterior applications.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for a certified survey of property lines and legal boundaries, site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.
 - 1. Do not begin installation before final grading is completed unless otherwise permitted by Owner's Representative.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

3.3 CHAIN-LINK FENCE INSTALLATION

- A. Install chain-link fencing according to ASTM F 567 and more stringent requirements specified.
 - 1. Install fencing on established boundary lines inside property line.
- B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.
- C. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.
 - 1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
 - 2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
 - a. Concealed Concrete: Place top of concrete 2 inches below grade to allow covering with surface material.
 - 3. Mechanically Driven Posts: Drive into soil to depth of As indicated. Protect post top to prevent distortion.
- D. Terminal Posts: Install terminal end, corner, and gate posts according to ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of as indicated on Drawings. For runs exceeding 500 feet, space pull posts an equal distance between corner or end posts.
- E. Line Posts: Space line posts uniformly at 96 inches o.c.
- F. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gate posts and at both sides of corner and pull posts.
 - 1. Locate horizontal braces at midheight of fabric 72 inches or higher, on fences with top rail, and at two-third fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.
- G. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch- diameter

hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches o.c. Install tension wire in locations indicated before stretching fabric. Provide horizontal tension wire at the following locations:

1. As indicated on Drawings.
- H. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.
- I. Intermediate and Bottom Rails: Secure to posts with fittings.
- J. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 1-inch bottom clearance between finish grade or surface and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.
- K. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts, with tension bands spaced not more than 15 inches o.c.
- L. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric according to ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.
 1. Maximum Spacing: Tie fabric to line posts at 12 inches o.c. and to braces at 24 inches o.c.
- M. Fasteners: Install nuts for tension bands and carriage bolts on the side of fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.
- N. Privacy Slats: Install slats in direction indicated, securely locked in place.

3.4 GATE INSTALLATION

- A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation.

3.5 ADJUSTING

- A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
- B. Lubricate hardware and other moving parts.

END OF SECTION 32 31 13

SECTION 32 31 32

WOOD COMPOSITE FENCES AND GATES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Wood Composite fences.
- B. Wood Composite gates.
- C. Excavation for posts.

1.2 RELATED SECTIONS

- A. Section 03 30 00 - Cast-in-Place Concrete

1.3 REFERENCES

- A. ASTM C 94 - Standard Specification for Ready-Mixed Concrete.
- B. ASTM C 177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
- C. ASTM D 143 - Standard Test Methods for Small Clear Specimens of Timber.
- D. ASTM D 198 - Standard Test Methods of Static Tests of Lumber in Structural Sizes.
- E. ASTM D 1037 - Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials.
- F. ASTM D 1413 - Standard Test Method for Wood Preservatives by Laboratory Soil-Block Cultures.
- G. ASTM D 1761 - Standard Test Methods for Mechanical Fasteners in Wood.
- H. ASTM D1929 - Standard Test Method for Determining Ignition Temperature of Plastics.
- I. ASTM D 2047 - Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine.
- J. ASTM D 2394 - Standard Methods for Simulated Service Testing of Wood and Wood-Base Finish Flooring.
- K. ASTM D 2395 - Standard Test Methods for Specific Gravity of Wood and Wood-Based Materials.
- L. ASTM D 4761 - Standard Test Methods for Mechanical Properties of Lumber and Wood-Base Structural Material.
- M. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- N. ASTM F 1679 - Standard Test Method for Using a Variable Incidence Tribometer (VIT).
- O. American Wood Preservers Association (AWPA) E1-06 - Standard Method for Laboratory Evaluation to Determine Resistance to Subterranean Termites.

1.4 DESIGN/PERFORMANCE REQUIREMENTS

- A. Design Requirements: Design fence system to withstand Miami/Dade County 110 MPH steady wind and 130 MPH gusting wind tests.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Product Data: Manufacturer's data sheets on each product to be used indicating sizes, profiles, surface finishes, and performance characteristics, and including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
 - 4. Instructions on care and cleaning of composite wood products.

- C. Verification Samples: For each finish product specified, two samples, minimum size 9 inches (229 mm) square, representing actual product, color, and patterns.
- D. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- E. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for cleaning and maintenance.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle products in accordance with the manufacturer's instructions.
- B. Store level and flat, off ground or floor, with supports at each end and maximum 24 inches on center.
- C. Do not stack wood composite over 8 feet (203 mm) high.
- D. Cover wood composite with waterproof covering, vented to prevent moisture buildup.

1.7 WARRANTY

- A. Provide manufacturer's 25-year residential warranty / 10 year commercial warranty providing coverage against checking, splitting, splintering, rotting, structural damage from termites, and fungal decay of wood composite.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Bufftech (SimTek) by Barrette Outdoor Living, 7830 Freeway Circle, Middleburg Hts., Ohio 44130; Distributors and Technical Contacts: <https://bufftech.com/>
- B. Substitutions: All other brands must be pre-approved by the architect/owner, 7 days prior to the bid date. If submitting another brand, bidder must furnish copies of all submittal documents under section 1.4.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 MATERIALS

- A. Wood composite: Reclaimed wood and plastic with integral coloring; free from toxic chemicals and preservatives:
 - 1. Characteristics:
 - a. Abrasion resistance: 0.01-inch wear per 1000 revolutions, tested to ASTM D 2394.
 - b. Hardness: 1124 pounds, tested to ASTM D 143.
 - c. Self-ignition temperature: 743 degrees F, tested to ASTM D 1929.
 - d. Flash ignition temperature: 698 degrees F, tested to ASTM D 1929.
 - e. Flame spread rating: 80, tested to ASTM E 84.
 - f. Water absorption, 24-hour immersion, tested to ASTM D 1037:
 - 1) Sanded surface: 4.3 percent.
 - 2) Unsanded surface: 1.7 percent.
 - g. Thermal expansion coefficient, 36 inch long samples:
 - 1) Width: 35.2 x 10⁻⁶ to 42.7 x 10⁻⁶.
 - 2) Length: 16.1 x 10⁻⁶ to 19.2 x 10⁻⁶.
 - h. Fastener withdrawal, tested to ASTM D 1761:
 - 1) Nail: 163 pounds per inch.
 - 2) Screw: 558 pounds per inch.
 - i. Static coefficient of friction:
 - 1) Dry: 0.53 to 0.55, tested to ASTM D 2047.
 - 2) Dry: 0.59 to 0.70, tested to ASTM F 1679.
 - 3) Wet: 0.70 to 0.75, tested to ASTM F 1679.
 - j. Fungus resistance, white and brown rot: No decay, tested to ASTM D 1413.

- k. Termite resistance: 9.6 rating, tested to AWPA E-1.
- l. Specific gravity: 0.91 to 0.95, tested to ASTM D 2395.
- m. Compression:
 - 1) Parallel: 1806 PSI ultimate, 550 PSI design, tested to ASTM D 198.
 - 2) Perpendicular: 1944 PSI ultimate, 625 PSI design, tested to ASTM D 143.
- n. Tensile strength: 854 PSI ultimate, 250 PSI design, tested to ASTM D 198.
- o. Shear strength: 561 PSI ultimate, 200 PSI design, tested to ASTM D 143.
- p. Modulus of rupture: 1423 PSI ultimate, 250 PSI design, tested to ASTM D 4761.
- q. Modulus of elasticity: 175,000 PSI ultimate, 100,000 PSI design, tested to ASTM D 4761.
- r. Thermal conductivity: 1.57 BTU per inch per hour per square foot at 85 degrees F, tested to ASTM C 177.

2.3 COMPONENTS

- A. Fence System: SimTek Sherwood Molded Privacy Panel Fence System.
 - 1. Fence height:
 - a. 6 feet.
 - 2. Components:
 - a. Fence posts.
 - b. Post caps:
 - 1) Textured Flat Top External.
 - c. Panel Size: 6'x6'
 - d. Top/bottom rail covers, panels
 - e. Steel top/bottom rail stiffeners.
 - f. Fence brackets.
 - 3. Surface texture: Molded wood grain.
 - 4. Color:
 - a. Walnut Brown.

2.4 ACCESSORIES

- A. Fasteners: 1-5/8 inch galvanized or corrosion-resistant coated steel. Provide finish nails where applicable.
- B. Concrete: Provide as Specified in Section 03 30 00 - Cast-in-Place Concrete; minimum 2500 PSI compressive strength at 28 days, with a 3-to-5-inch slump.
- C. Concrete: Provide concrete conforming to ASTM C 94; minimum 2500 PSI compressive strength at 28 days, with a 3-to-5-inch slump.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

- B. Cut and drill wood composite using carbide tipped blades.
- C. Space posts maximum 6 feet on center.
- D. Drill post holes into undisturbed or compacted soil; excavate deeper in soft or loose soils and for posts with heavy lateral loads.
- E. Drill post holes to 12-inch diameter. Locate bottom of post 48 inches below grade or below frost line whichever is greater.
- F. Place top of concrete 2 inches below finished grade.
- G. Screw fence panels to posts with four 1-5/8 inch long exterior screws.
- H. Cut panels and steel stiffeners to lengths required.
- I. Place post caps over post tops and secure with construction adhesive or a 3" deck screw.

3.4 CLEANING

- A. Clean wood composite to remove stains:
 - 1. Mold, mildew, and berry and leaf stains: Clean surfaces with conventional deck wash containing detergent or sodium hypochlorite.
 - 2. Rust and ground-in dirt: Clean surfaces with cleaner containing oxalic or phosphoric acid.
 - 3. Oil and grease: Clean surfaces with detergent containing degreasing agent.

3.5 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 32 31 32

SECTION 32 33 00

SITE FURNISHINGS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Bench
 - 2. Trash and Recycling receptacles with lids for cigarette ash disposal.
 - 3. Charcoal Ash Receptacles.
 - 4. Barbeques.
 - 5. Picnic Tables
 - 6. Game Tables and Chairs
 - 7. Bicycle racks
 - 8. Pet Waste Bag Station
 - 9. Removable Bollards
 - 10. Monument Sign (on 10th Street)
 - 11. Proposition 68 sign (on 9th Street)
- B. Related Requirements:
 - 1. Section 033000 "Cast-in-Place Concrete" for installing pipe sleeves cast formed voids in concrete footings.
 - 2. Section 312000 "Earth Moving" for excavation for installing concrete footings.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Sustainable Design Submittals:
 - 1. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.
 - 2. Chain-of-Custody Certificates: For certified wood products. Include statement of costs.
- C. Shop Drawings: Provide installation details for each product.
- D. Substitutions: Products by other manufacturers that comply with specifications will be considered in accordance with Section 012500 – Substitution Procedures.

1.04 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For site furnishings manufactured with preservative-treated wood.
 - 1. Indicate type of preservative used and net amount of preservative retained.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver products to site in manufacturer's original, unopened containers and packaging. Upon delivery, examine packages immediately to ensure all products are complete and undamaged.
- B. Storage: Store products in a protected, dry area in original undamaged packaging and containers until ready for installation.
- C. Handling: Handle powder coated products with sufficient care to prevent any scratches or damage to the finish.

1.06 CLOSEOUT SUBMITTALS

- A. Maintenance Data: Provide all manufacturer maintenance and product data for all site furnishings to include in maintenance manuals.
 - 1. Provide recommended methods for repairing damage and abrasions to the powder coat finish of all powder coated items.

PART 2 - PRODUCTS

2.01 BENCH

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. DuMor Inc. 138 Industrial Circle, Mifflintown, PA 17059 Phone: 800-598-4018 Email: sales@dumor.com. Website: www.dumor.com.
 - 2. Product: DuMor Model 521-60TX with 521 rounded edge armrests.
 - a. Color: As indicated per drawings
- B. Materials:
 - 1. Supports:
 - a. End Supports shall be manufactured from 1/2" x 6" ASTM A36 carbon steel flat bar and 3/8" thick ASTM A36 steel plate.
 - 2. Seat Assembly Wood Slat:
 - a. Seat assembly shall be manufactured from 2" x 4" nominal wood slats and 1/4" thick ASTM A36 steel plate and 3/8" thick ASTM A36 steel plate.
 - 3. Seat Assembly Recycled Plastic "PL" or Wood Grain Recycled Plastic "TX":
 - a. Seat assembly shall be manufactured from 2" x 4" HDPE recycled plastic slats, 1/4" thick ASTM A36 steel plate, and 3/8" thick ASTM A36 steel plate.
 - 4. Intermediate armrests (optional):
 - a. Intermediate armrests shall be manufactured from 1/4" thick ASTM A36 steel plate and 1/2" x 2 1/2" ASTM A36 carbon steel flat bar.
 - 5. Anchoring:
 - a. Stainless steel expansion anchors (1/2" x 3 3/4") provided.
- C. Dimensions
 - 1. Bench- 6 foot
 - a. Overall: 71" long x 19" deep x 18" high.
- D. Finish:
 - 1. Powder Coating
 - a. All parts are processed through an 8-stage iron phosphorous wash system.
 - b. Parts are coated with a zinc-rich epoxy primer to an AVERAGE of 4-5 mils.
 - c. Parts are then finished with a top coat of TGIC-polyester powder to an AVERAGE of 4-5 mils.
 - d. Powder is cured at the powder manufacturers specifications using combination of infrared and convection heat for approximately 20 minutes.
 - e. Finished parts shall comply with the following American Standard Test Method (ASTM) for coating and coating method: ASTM-D-523, ASTM-D-3363, ASTM-D-1737, ASTM-D-3359, ASTM-D-2794, ASTM-B-117 and ASTM-D-3451.
- E. Warranty: warranted against defect in materials and/or workmanship and in accordance with manufacturer's published specifications
 - 1. Limited twenty-year warranty against structural failure of all bench frames.
 - 2. Limited ten-year warranty against structural failure of recycled plastic.
- F. Substitutions: Products by other manufacturers that comply with specifications will be considered in accordance with Section 012500 – Substitution Procedures.

2.02 TRASH AND RECYCLING RECEPTACLES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
1. DuMor Inc. 138 Industrial Circle, Mifflintown, PA 17059 Phone: 800-598-4018 Email: sales@dumor.com. Website: www.dumor.com.
 - a. Product: Model 84 Series #84-32-FTO with large steel bonnet top with ash urn #CVR-30-BTA for trash and recycled lid #CVR-30-RC0075.
 - b. Color: As indicated per drawings.
- B. Materials:
1. Receptacle Body 32 Gallon:
 - a. Receptacle body shall be manufactured from 1/4" x 1 1/2" ASTM A36 carbon steel flat bar, 1/4" x 3" ASTM A36 carbon steel flat bar, 5/8" diameter ASTM A36 steel round bar and 1/4" thick ASTM A36 steel plate.
 2. Cover:
 - a. Cover shall be manufactured from 14 gauge ASTM A1011 steel plate.
 - b. Bonnet top with ash urn per plan.
 - c. Recycling top per plan.
 3. Liner:
 - a. Liner shall be HDPE with 32-gallon capacity.
 4. Anchoring:
 - a. Stainless steel expansion anchors (1/2" x 3 3/4") provided.
- C. Dimensions
1. 32-gallon receptacle
 - a. Overall: 31 1/2" diameter x 36 3/16" high
- D. Powder Coating
1. All parts are processed through an 8-stage iron phosphorous wash system.
 2. Parts are coated with a zinc-rich epoxy primer to an AVERAGE of 4-5 mils.
 3. Parts are then finished with a topcoat of TGIC-polyester powder to an AVERAGE of 4-5 mils.
 4. Powder is cured at the powder manufacturers specifications using combination of infrared and convection heat for approximately 20 minutes.
 5. Finished parts shall comply with the following American Standard Test Method (ASTM) for coating and coating method: ASTM-D-523, ASTM-D-3363, ASTM-D-1737, ASTM-D-3359, ASTM-D-2794, ASTM-B-117 and ASTM-D-3451
- E. Mounting Option: Surface Mount.
- F. Warranty: warranted against defect in materials and/or workmanship and in accordance with manufacturer's published specifications
1. Limited twenty-year warranty against structural failure of all litter receptacle frames.
 2. Limited one-year warranty on any item not specifically discussed above.
- G. Substitutions: Products by other manufacturers that comply with specifications will be considered in accordance with Section 012500 – Substitution Procedures.

2.03 CHARCOAL ASH RECEPTACLE

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
1. Pilot Rock, R. J. Thomas Mfg. Co. Inc. P.O. Box 946 Cherokee, IA 51012 Phone: 1-800-762-5002.
 2. Product: Hot Coal Bin, Model #HCB/B-1 High heat enamel bin with #CNG-2310C 31-gallon galvanized steel collection can and BR-4HSA anchors.
 3. Color: Black
- B. Materials:
1. 14 ga. (1/16") steel for side panels and top funnel. Galvanized fasteners.
 2. 1/2" dia. Steel bars for grate and full length piano hinge attaches the access door to one side panel.
 3. Dimensions: 23"x23"x32-1/2" tall.

4. Finish:
 - a. High temp non-toxic black enamel paint with two "caution" decals.
5. Mounting:
 - a. Set of four (4) 3/8" x 1-7/8" hex sleeve anchors for concrete surface.

2.04 BARBEQUE

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 1. Pilot Rock, R. J. Thomas Mfg. Co. Inc. P.O. Box 946 Cherokee, IA 51012 Phone: 1-800-762-5002.
 2. Product: Accessible Grill, ASW-20/B2 Series
 3. Color: Black
- B. Materials:
 1. Firebox: 3/16" (7 ga.) thick steel all welded firebox, plus integral die-formed flanges to retain ashes.
 2. Grate: 1/2" diameter solid steel bars, mounted on steel tube allowing it to swivel 180 degrees, welded on both sides.
 3. Operator Handle: 1/8" x 1/2" flat bar coiled spring grip.
 4. Dimensions: 23"x23"x32-1/2" tall.
 5. Finish:
 - a. High temp non-toxic black enamel paint.
 6. Mounting:
 - a. Embedded installation.

2.05 PICNIC TABLES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 1. DuMor Inc. 138 Industrial Circle, Mifflintown, PA 17059 Phone: 800-598-4018 Email: sales@dumor.com. Website: www.dumor.com.
 2. Product: DuMor Model 100 Series
 - a. Accessible Picnic Table: Model 100-68-1PL
 - b. Color: As indicated per drawings
- B. Materials:
 1. Table and Seat Supports:
 - a. Table and seat supports shall be 3" x 3" x 1/4" wall ASTM A500 steel tubing and 1/2" x 3" ASTM A36 carbon steel flat bar.
 2. Table Top Assembly:
 - a. Table top assembly shall be manufactured from 1" (1 5/16" OD) ASTM A500 schedule 40 steel tubing, 3/16" thick ASTM A36 steel plate, 3" x 4" and 3" x 6" nominal HDPE recycled plastic slats.
 3. Seat Assembly
 - a. Seat assembly shall be manufactured from 1" (1 5/16" OD) ASTM A500 schedule 40 steel tubing, 3/16" thick ASTM A36 steel plate, 3" x 4" and 3" x 6" nominal HDPE recycled plastic slats.
 4. Anchoring:
 - a. Stainless steel expansion anchors (1/2" x 3 3/4") provided.
- C. Dimensions
 1. ADA accessible table (100-68-1PL)
 - a. Overall: 95" long x 66" deep x 31 3/16" high
- D. Powder Coating
 1. All parts are processed through an 8-stage iron phosphorous wash system.
 2. Parts are coated with a zinc-rich epoxy primer to an AVERAGE of 4-5 mils.
 3. Parts are then finished with a topcoat of TGIC-polyester powder to an AVERAGE of 4-5 mils.
 4. Powder is cured at the powder manufacturer's specifications using combination of infrared and convection heat for approximately 20 minutes.

5. Finished parts shall comply with the following American Standard Test Method (ASTM) for coating and coating method: ASTM-D-523, ASTM-D-3363, ASTM-D-1737, ASTM-D-3359, ASTM-D-2794, ASTM-B-117 and ASTM-D-3451.
- E. Mounting Option: In-Ground Embedment Mount
- F. Warranty: warrantied against defect in materials and/or workmanship and in accordance with manufacturer's published specifications
 1. Limited twenty-year warranty against structural failure of all steel bench frames or complete steel bench assemblies, table frames, litter receptacle frames, steel planters and all cast iron and aluminum bench supports.
 2. Limited ten-year warranty against structural failure of recycled plastic. It is further warrantied not to degrade, split, crack or splinter during this period.
 3. Limited one-year warranty on any item not specifically discussed above.
- G. Substitutions: Products by other manufacturers that comply with specifications will be considered in accordance with Section 012500 – Substitution Procedures.

2.06 GAME TABLE AND CHAIRS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 1. DuMor Inc. 138 Industrial Circle, Mifflintown, PA 17059 Phone: 800-598-4018 Email: sales@dumor.com. Website: www.dumor.com.
 2. Product: DuMor 2-person table Model 78-32ADAPL and 4-person table Model 78-34PL.
 - a. Color: As indicated per drawings
- B. Materials:
 1. Table Support:
 - a. Table supports shall be 3" x 3" x 1/4" wall ASTM A500 steel tubing and 3/8" thick ASTM A36 steel plate.
 2. Game Tabletop Assembly Plastic "PL":
 - a. Table top assembly shall be manufactured from 1/4" thick ASTM A36 steel plate, 3/8" thick ASTM A36 steel plate, 3" x 4" nominal HDPE recycled plastic slats and 10 gauge ASTM B209 aluminum plate.
 3. Seat Assembly Plastic "PL":
 - a. Seat assembly shall be manufactured from 2 1/2" x 2 1/2" x 1/4" wall ASTM A500 steel tubing, 3/8" thick ASTM A36 steel plate and 3" x 4" nominal HDPE recycled plastic slats.
 4. Anchoring:
 - a. Stainless steel expansion anchors (1/2" x 3 3/4") provided.
- C. Dimensions
 1. 2-seat table overall: 82 3/4" long x 25 1/4" deep x 30" high
 2. 4 seat table overall: 82 3/4" long x 82 3/4" deep x 30" high
- D. Powder Coating
 1. All parts are processed through an 8-stage iron phosphorous wash system.
 2. Parts are coated with a zinc-rich epoxy primer to an AVERAGE of 4-5 mils.
 3. Parts are then finished with a topcoat of TGIC-polyester powder to an AVERAGE of 4-5 mils.
 4. Powder is cured at the powder manufacturer's specifications using combination of infrared and convection heat for approximately 20 minutes.
 5. Finished parts shall comply with the following American Standard Test Method (ASTM) for coating and coating method: ASTM-D-523, ASTM-D-3363, ASTM-D-1737, ASTM-D-3359, ASTM-D-2794, ASTM-B117 and ASTM-D-3451.
- E. Mounting Option: Surface Mount
- F. Warranty: warrantied against defect in materials and/or workmanship and in accordance with manufacturer's published specifications
 1. Limited twenty-year warranty against structural failure of all litter receptacle frames.
 2. Limited five-year warranty against structural failure of wood slats.
- G. Substitutions: Products by other manufacturers that comply with specifications will be considered in accordance with Section 012500 – Substitution Procedures.

2.07 BICYCLE RACKS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
1. DuMor Inc. 138 Industrial Circle, Mifflintown, PA 17059 Phone: 800-598-4018 Email: sales@dumor.com. Website: www.dumor.com.
 - a. Product: Model 293-00/S-1
 - b. Color: As indicated per drawings
- B. Materials:
1. Rack Assembly:
 - a. Rack assembly shall be manufactured from 2" x 2" x 11-gauge ASTM A513 steel tubing and 3/8" thick ASTM A36 steel plate.
 2. Anchoring:
 - a. Stainless steel expansion anchors (1/2" x 3 3/4") provided.
- C. Dimensions:
1. Overall: 40 3/8" long x 6" deep x 32 5/16" high.
- D. Bicycle Rack Construction:
1. Mounting: Surface Mount
 2. Installation Method: As indicated.
- E. Powder Coating
1. All parts are processed through an 8-stage iron phosphorous wash system.
 2. Parts are coated with a zinc-rich epoxy primer to an AVERAGE of 4-5 mils.
 3. Parts are then finished with a topcoat of TGIC-polyester powder to an AVERAGE of 4-5 mils.
 4. Powder is cured at the powder manufacturer's specifications using combination of infrared and convection heat for approximately 20 minutes.
 5. Finished parts shall comply with the following American Standard Test Method (ASTM) for coating and coating method: ASTM-D-523, ASTM-D-3363, ASTM-D-1737, ASTM-D-3359, ASTM-D-2794, ASTM-B-117 and ASTM-D-3451
- F. Warranty:
1. Structural: Limited three-year warranty on structural failure of all bike racks.
- G. Substitutions: Products by other manufacturers that comply with specifications will be considered in accordance with Section 012500 – Substitution Procedures.

2.08 PET WASTE BAG STATION

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
1. Poo Free Parks, www.poofreeparks.com (855)-766-3733.
 - a. Product: 'PFP Dog Bone Shaped Bag Dispenser'.
 - b. Color: Mfr. standard color.
- B. Materials:
1. Commercial grade steel with weather resistant label on front.
 2. Locking with 2 keys.
 3. Capacity: up to 600 bags, 2 rolls of bags.
 4. Bag dispenser with teeth tear bags to dispense one at a time.
 5. Rubber coated rollers
- C. Dimensions:
1. Overall: 27.75"Hx10.25"Wx6.25"D

2.09 REMOVABLE BOLLARDS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
1. DuMor Inc. 138 Industrial Circle, Mifflintown, PA 17059 Phone: 800-598-4018 Email: sales@dumor.com. Website: www.dumor.com.
 - a. Product: Model 400-36/S-1SL
 - b. Color: As indicated per drawings
- B. Materials:
1. Main Post:

- a. Main post shall be manufactured from 4" (4 1/2" OD) ASTM A513 schedule 40 steel tubing.
 - 2. Ground Sleeve and Cap S-1SL
 - a. Ground sleeve shall be manufactured from 5" OD x 3/16" wall ASTM A513 mechanical steel tubing and 1/4" thick ASTM A36 steel plate.
- C. Dimensions
 - 1. 36" Bollard
 - a. Overall: 36" above grade and 36" below grade
- D. Finish:
 - 1. Powder Coating
 - a. All parts are processed through an 8-stage iron phosphorous wash system.
 - b. Parts are coated with a zinc-rich epoxy primer to an AVERAGE of 4-5 mils.
 - c. Parts are then finished with a topcoat of TGIC-polyester powder to an AVERAGE of 4-5 mils.
 - d. Powder is cured at the powder manufacturer's specifications using combination of infrared and convection heat for approximately 20 minutes.
 - e. Finished parts shall comply with the following American Standard Test Method (ASTM) for coating and coating method: ASTM-D-523, ASTM-D-3363, ASTM-D-1737, ASTM-D-3359, ASTM-D-2794, ASTM-B-117 and ASTM-D-3451.
- E. Warranty:
 - 1. Limited twenty-year warranty against structural failure of all steel bench frames or complete steel bench assemblies, table frames, litter receptacle frames, steel planters and all cast iron and aluminum bench supports.
 - 2. Limited five-year warranty against structural failure of wood slats.
 - 3. Limited ten-year warranty against structural failure of recycled plastic. It is further warranted not to degrade, split, crack or splinter during this period.
 - 4. Limited three-year warranty on structural failure of all bike racks.
 - 5. Limited one-year warranty on any item not specifically discussed above.
- F. Substitutions: Products by other manufacturers that comply with specifications will be considered in accordance with Section 012500 – Substitution Procedures.

2.10 MONUMENT SIGN (ON 10TH STREET)

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings by manufacturer(s) listed below or comparable product and manufacturer, to be approved by the City:
 - 1. Outdoor Creations Inc. 2270 Barney Street, Anderson, CA 96007. Phone: 530-365-6106. Email: tim@outdoorcreations.com. Website: www.outdoorcreations.com.
 - a. Product: Outdoor Creations Custom Park Sign, Model #707S/D
 - b. Color: As indicated per drawings
- B. Materials: One-piece, Pre-cast, reinforced, integrally colored Concrete with City Seal, and Park Name on integral base.
- C. Dimensions: As indicated on Drawings with #703C Base.
- D. Finish:
 - 1. Texture: As indicated on Drawings.

2.11 PROPOSITION 68 SIGN (ON 9TH STREET)

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings by manufacturer(s) listed below or comparable product and manufacturer, to be approved by the City:
 - 1. Vacker Sign 948 Sherren Street W, Roseville, MN 55113. Phone: 651-487-3100. Email: nkriegler@vackersign.com. Website: <https://vackersign.com/>.
 - a. Product: Vacker Sign Custom Park Sign, Model 9, Rectangular Sign
 - b. Color: As indicated per drawings

- B. Materials:
1. Sign: HDPE, Routed, Bi-color sign. Include City Seal, State Prop. 68 logo and text language as indicated per drawings.
 2. Dimension Lumber Posts: No. 2 Construction or No. 2 grade and any of the following species:
 - a. Douglas fir-larch, Douglas fir-larch (North), or Douglas fir-south; NLGA, WCLIB, or WWPA.
 - b. Western woods; WCLIB or WWPA.
 - c. Preservative Treatment: Pressure treat dimension lumber with waterborne preservative according to AWP A U1; Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.
 - d. Preservative Chemicals: Acceptable to authorities having jurisdiction. Do not use chemicals containing arsenic or chromium such as chromated copper arsenate (CCA).
 - e. Use process for dimension lumber that includes water-repellent treatment.
 - f. After treatment, redry boards dimension lumber to 15 percent maximum moisture content.
 - g. Mark treated wood with treatment quality mark of an inspection agency approved by ALSC's Board of Review. For items indicated to receive a stained or natural finish, omit marking and provide certificates of treatment compliance issued by inspection agency.
 3. Fasteners: Provide fasteners of size and type indicated, acceptable to authorities having jurisdiction, and that comply with requirements specified in this article for material and manufacture. Provide nails or screws, in sufficient length, to penetrate not less than 1-1/2 inches into wood substrate.
 - a. Use stainless steel fasteners.
 - b. Power-Driven Fasteners: ICC-ES AC70.
 - c. Wood Screws and Lag Screws: ASME B18.2.1, ASME B18.6.1, or ICC-ES AC233.
 - d. Stainless Steel Bolts: ASTM F593, Alloy Group 1 or 2; with ASTM F594, Alloy Group 1 or 2 hex nuts and, where indicated, flat washers.
 - e. Post installed Anchors: Stainless steel, anchors with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing according to ASTM E488, conducted by a qualified independent testing and inspecting agency.
 - f. Stainless steel bolts and nuts complying with ASTM F593 and ASTM F594, Alloy Group 1 or 2.
- C. Dimensions: As indicated on Drawings.
- D. Finish:
1. Texture: As indicated on Drawings.

2.12 FABRICATION

- A. Metal Components: Form to required shapes and sizes with true, consistent curves, lines, and angles. Separate metals from dissimilar materials to prevent electrolytic action.
- B. Welded Connections: Weld connections continuously. Weld solid members with full-length, full-penetration welds and hollow members with full-circumference welds. At exposed connections, finish surfaces smooth and blended, so no roughness or unevenness shows after finishing and welded surface matches contours of adjoining surfaces.
- C. Pipes and Tubes: Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of handrail and railing components.

- D. Preservative-Treated Wood Components: Complete fabrication of treated items before treatment if possible. If cut after treatment, apply field treatment complying with AWWA M4 to cut surfaces.
- E. Exposed Surfaces: Polished, sanded, or otherwise finished; all surfaces smooth, free of burrs, barbs, splinters, and sharpness; all edges and ends rolled, rounded, or capped.
- F. Factory Assembly: Factory assemble components to greatest extent possible to minimize field assembly. Clearly mark units for assembly in the field.

2.13 GENERAL FINISH REQUIREMENTS

- A. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.14 ALUMINUM FINISHES

- A. Powder-Coat Finish: Manufacturer's standard polyester powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.

2.15 STEEL AND GALVANIZED-STEEL FINISHES

- A. Powder-Coat Finish: Manufacturer's standard polyester, powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.
- B. PVC Finish: Manufacturer's standard, UV-light stabilized, mold-resistant, slip-resistant, matte-textured, dipped or sprayed-on, PVC-plastisol finish, with flame retardant added; complying with coating manufacturer's written instructions for pretreatment, application, and minimum dry film thickness.

2.16 IRON FINISHES

- A. Powder-Coat Finish: Manufacturer's standard polyester powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.

2.17 STAINLESS-STEEL FINISHES

- A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
- B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
- C. Run directional finishes with long dimension of each piece.
 - 1. Directional Satin Finish: No 4.
 - 2. Dull Satin Finish: No. 6.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.
- B. Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.

- C. Install site furnishings level, plumb, true, and securely anchored at locations indicated on Drawings.
- D. Post Setting: Set cast-in support posts in concrete footing with smooth top, shaped to shed water. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at correct angle and are aligned and at correct height and spacing. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.

3.03 MAINTENANCE

- A. Comply with manufacturer's written installation maintenance instructions unless more stringent requirements are indicated.

END OF SECTION 32 33 00

SECTION 32 35 00
SITE SCREENING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Pre-Formed Panels: For screening or buffering trash enclosures, utility areas, privacy areas, mechanical units, etc.
 - 1. Powder coated metal.
 - 2. Painted metal.
- B. Aluminum Support Framing: For direct attachment of screen support columns to/into concrete pads, piers, or footings provided by others.
- C. Operable gates for access through screens.
- D. Not Included in this Specification:
 - 1. Touch-up painting required for scratches and screw heads.
 - 2. Field painting of prime painted screens.

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM B 221 - Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire Profiles, and Tubes.
- B. The Aluminum Association, Inc. (AA):
 - 1. AA ADM-1516166 - Aluminum Design Manual.
- C. American Society of Civil Engineers (ASCE):
 - 1. ASCE 7-18 - Minimum Design Loads for Buildings and Other Structures.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data:
 - 1. Manufacturer's data sheets on each product to be used.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Typical installation methods.
 - 5. Sufficient data and detail to indicate compliance with these specifications.
- C. Verification Samples: Two representative units of each panel type.
 - 1. Color Selection: Submit paint chart with full range of colors available for Owner's Representative's selection. Custom color samples available upon purchase.
- D. Shop Drawings: Indicate layout heights, component connection details, and details of interface with adjacent construction.
- E. Certification: Manufacturer's Certificate of Compliance certifying that panels supplied meet or exceed requirements specified.
- F. Closeout Submittals: Warranty documents, issued and executed by manufacturer, countersigned by Contractor.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum one years documented experience.
- B. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.
- C. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.
- D. Mock-Up: Construct a mock-up with actual materials in sufficient time for Owner's Representative's review and to not delay construction progress. Locate mock-up as acceptable to Owner's Representative and provide temporary foundations and support.
 - 1. Intent of mock-up is to demonstrate quality of workmanship and visual appearance.
 - 2. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
 - 3. Retain mock-up during construction as a standard for comparison with completed work.
 - 4. Do not alter or remove mock-up until work is completed or removal is authorized.

1.6 PRE-INSTALLATION CONFERENCE

- A. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Owner's Representative, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.
 - 1. Notify Owner's Representative four (4) calendar days in advance of scheduled meeting date.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly indicating manufacturer and material.
- B. Storage and Handling: Protect materials and finishes during handling and installation to prevent damage.
- C. Protect from damage due to weather, excessive temperature, and construction operations.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
- B. Field Measurements: Take measurements of supporting paving, footings, or piers. Indicate measurements on shop drawings fully documenting any field condition that may interfere with the screen system installation.

1.9 COORDINATION

- A. Installer for work under this Section shall be responsible for coordination of panel and framing sizes and required options with the Contractor's requirements.
- B. Submit shop drawings to the Contractor and obtain written approval of shop drawing from the Contractor prior to fabrication.
- C. Confirm size, type, and location of supporting construction as adequate to resist column supports.

1.10 WARRANTY

- A. If any part of the screen system fails because of a manufacturing defect within 1 to 5 years from the date of substantial completion, the manufacturer will furnish the required replacement parts without charge. Any local transportation, related service labor, or diagnostic call charges are not included.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: CityScapes International Inc., which is located at: 4200 Lyman Ct., Hilliard, OH 43026; Toll Free: 877-SCREENS; Phone: 614-850-2549; Email: contact@cityscapesinc.com; Web: <https://cityscapesinc.com/>.
 - 1. Basis of Design: Covrit Gates and Screening System by CityScapes International Inc.
- B. Substitutions: All other brands must be pre-approved by the Owner's Representative/owner, 7 days prior to the bid date. If submitting another brand, bidder must furnish copies of all submittal documents under section 1.4 and provide structural engineered footing designs for substituted enclosure footings.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 – Product Requirements.

2.2 PERFORMANCE AND DESIGN REQUIREMENTS

- A. Regulatory Requirements: Comply with requirements of building authorities having jurisdiction in Project location.
- B. Design Criteria: Manufacturer is responsible for the structural design of all materials, assembly, and attachments to resist snow, wind, suction and uplift loading at any point without damage or permanent set.
 - 1. Framing: Designed in accordance with the Aluminum Design Manual to resist the following loading:
 - a. ASCE 7-18 - Minimum Design Loads for Buildings and Other Structures; American Society of Civil Engineers.

2.3 MATERIALS

- A. Paneling: Minimum Thickness: 0.050".
 - 1. Aluminum Extruded Sheets: Powder coated.
 - 2. Aluminum Extruded Shapes: Powder coated.
- B. Operable Access Gates: Minimum Panel thickness: 0.050"
 - 1. ToughGate: Powder coated extruded Aluminum sheets.
 - 2. ToughGate: Powder coated extruded Aluminum shapes.
- C. Framing: Aluminum Plate, Shapes and Bar: ASTM B221, alloy 6005-T5, 6061-T5 or 6063-T5.
- D. Threaded Fasteners: Screws, bolts, nut and washers to be Stainless Steel.
 - 1. Post Backer assembly fasteners shall be #10-16 stainless steel Self-Drilling screws.
 - 2. Provide lock washer or other locking device at all bolted connections.

2.4 FABRICATION

- A. Factory-Formed Panel Systems: Continuous interlocking panel connections and indicated or necessary components.
 - 1. Form components true to shape, accurate in size, square and free from distortion or defects. Cut panels to precise lengths indicated on approved shop drawings.
- B. Fabricate products to the following configurations:
 - 1. Panel Style: Metal louver.
 - 2. ToughGate Gate Style: Metal louver.
 - 3. Panel and Gate Height: 8 ft (2438 mm).
 - 4. Gate Width: 46 inches (1168.4 mm).
 - 5. Column Cap Style: Pyramid cap aluminum.
 - 6. Trim and Closures: Fabricated and finished with Manufacturer's standard coating system, unless shown otherwise on drawings.
- C. Framing: Fabricate and assemble components in largest practical sizes, for delivery to the site.

1. Construct corner assemblies to required shape with joints tightly fitted.
 2. Supply components required for anchorage of framing. Fabricate anchors and related components of material and finish as required, or as specifically noted.
- D. Gate Hardware: Provide manufacturer's adjustable standard of size required to fit support pipe provided.
1. Hinge Type: Barrel.

2.5 FINISHES

- A. Aluminum Framing: Mill finish.
- B. Panel Coating: Manufacturer's standard powder coating system, factory applied.
1. Color: Selected from full range of manufacturer's standard colors. Refer to contract documents.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Installer's Examination: Examine conditions under which construction activities of this section are to be performed.
1. Submit written notification to Owner's Representative and Screen manufacturer if such conditions are unacceptable.
 2. Beginning erection constitutes installer's acceptance of conditions.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install units in accordance with the manufacturer's instructions and approved shop drawings. Keep perimeter lines straight, plumb, and level. Provide brackets, anchors, and accessories necessary for complete installation.
- B. Fasten structural supports to/into paving, footings, or piers at spacing as indicated on approved shop drawings.
- C. Metal Separation: Where aluminum materials would contact dissimilar materials, insert rubber grommets at attachment points, thus eliminating where dissimilar metals would otherwise be in contact.
- D. Do not cut or abrade finishes which cannot be restored. Return items with such finishes to shop for required alterations.

3.4 ERECTION TOLERANCES

- A. Maximum misalignment from true position: 1/4 inch (6 mm).

3.5 CLEANING AND PROTECTION

- A. Remove all protective masking from material immediately after installation.
- B. Protection:
1. Ensure that finishes and structure of installed systems are not damaged by subsequent construction activities.
 2. If minor damage to finishes occurs, repair damage in accordance with manufacturer's recommendations; provide replacement components if repaired finishes are unacceptable to Owner's Representative.

- C. Prior to Substantial Completion: Remove dust or other foreign matter from component surfaces; clean finishes in accordance with manufacturer's instructions.
 - 1. Clean units in accordance with the manufacturer's instructions.

END OF SECTION 32 35 00

SECTION 32 84 00

PLANTING IRRIGATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Pipes, tubes, and fittings
 - 2. Piping joining materials.
 - 3. Manual valves
 - 4. Pressure-reducing valves
 - 5. Backflow preventers
 - 6. Master Valve
 - 7. Flow Sensor
 - 8. Automatic control valves
 - 9. Transition fittings
 - 10. Dielectric fittings
 - 11. Miscellaneous piping specialties
 - 12. Sprinklers
 - 13. Quick couplers
 - 14. Drip irrigation specialties
 - 15. Central control system
 - 16. Controller
 - 17. Boxes for automatic control valves and other underground equipment

1.03 DEFINITIONS

- A. Circuit Piping: Downstream from control valves to sprinklers, specialties, and drain valves. Piping is under pressure during flow.
- B. Drain Piping: Downstream from circuit-piping drain valves. Piping is not under pressure.
- C. ET Controllers: EvapoTranspiration Controllers. Irrigation controllers which use some method of weather-based adjustment of irrigation. These adjusting methods include use of historical monthly averages of ET; broadcasting of ET measurements; or use of on-site sensors to track ET.
- D. Main Piping: Downstream from point of connection to water distribution piping to, and including, control valves. Piping is under water-distribution-system pressure.
- E. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling power-limited circuits.

1.04 PERFORMANCE REQUIREMENTS

- A. Irrigation zone control shall be automatic operation with controller and automatic control valves.
- B. Location of Sprinklers and Specialties: Design location is approximate. Make minor adjustments necessary to avoid plantings and obstructions such as signs and light standards. Maintain 100 percent irrigation coverage of areas indicated.
- C. Delegated Design: Design 100 percent coverage irrigation system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- D. Minimum Working Pressures: The following are minimum pressure requirements for piping, valves, and specialties unless otherwise indicated:
 - 1. Irrigation Main Piping: 200 psig.
 - 2. Circuit Piping: 150 psig.

1.05 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories.
- B. Wiring Diagrams: For power, signal, and control wiring.

- C. Delegated-Design Submittal: For irrigation systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - D. Substitutions: Products by other manufacturers that comply with specifications will be considered in accordance with Section 012500 – Substitution Procedures.
- 1.06 INFORMATIONAL SUBMITTALS
- A. Coordination Drawings: Irrigation systems, drawn to scale, on which components are shown and coordinated with each other, using input from Installers of the items involved. Also include adjustments necessary to avoid plantings and obstructions such as signs and light standards.
 - B. Qualification Data: For qualified Installer.
 - C. Zoning Chart: Show each irrigation zone and its control valve.
 - D. Controller Timing Schedule: Indicate timing settings for each automatic controller zone.
 - E. Field quality-control reports.
- 1.07 CLOSEOUT SUBMITTALS
- A. Operation and Maintenance Data: For sprinklers and all distribution emitters, controllers and automatic control valves to include in operation and maintenance manuals.
 - B. Controller Charts- Prior to final acceptance, the Contractor shall provide to the Owner's Representative two (2) hermetically sealed, controller charts illustrating valve numbers, gpm's and permanently colored locations of the area covered by each valve. The controller charts shall be of a size that will fit inside the door of the controller cabinet. Controller charts will identify to the nearest foot the locations of mainlines, sleeves valves, controllers and point of connection appurtenances. The controller charts shall reflect any changes made during construction. A copy of each controller chart shall be provided to the City prior to installation certification by the City.
 - C. Record Drawings- The Contractor shall provide and keep up-to-date "As-Built" drawings on the job site at all times. The Contractor shall record accurately on one set of "As-Built" drawings all changes in the work constituting departures from the original approved drawings. The changes and dimensions shall be recorded in a legible and workmanlike manner. All dimensions shall have two (2) permanent points of reference, such as the roadway station points or measures along park center lines. Prior to the landscape architect of record construction certification, the Contractor shall provide corrected and completed as-built Record Drawings. Delivery of the drawings will not relieve the Contractor of the responsibility of furnishing information that may have been omitted from the plans. The following items shall be shown on the Record Drawings.
 - 1. Connection of existing water lines.
 - 2. Water meter(s).
 - 3. Electrical power connection.
 - 4. Electrical meter(s).
 - 5. Controller(s).
 - 6. Routing of mainlines.
 - 7. Sleeves.
 - 8. Gate Valves.
 - 9. Ball Valves.
 - 10. Remote Control Valves.
 - 11. Quick Coupling Valves.
 - 12. Other Related Equipment.
 - 13. The area watered by each Remote Control Valve
- 1.08 MAINTENANCE MATERIAL SUBMITTALS
- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Rotary/Spray Sprinklers: Equal to 5 percent of amount installed for each type and size indicated, but no fewer than 10 units.
 - 2. Bubblers: Equal to 5 percent of amount installed for each type indicated, but no fewer than 20 units.
 - 3. Emitters: Equal to 5 percent of amount installed for each type indicated, but no fewer than 20 units.

4. Drip-Tube System Tubing: Equal to 10 percent of total length installed for each type and size indicated, but not less than 500 feet.
 5. Dripline: Equal to 10 percent of total length installed for each type and size indicated, but not less than 100 feet.
 6. Quick Coupler keys- provide two (2).
 7. Controller enclosure keys.
- 1.09 QUALITY ASSURANCE
- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- 1.10 DELIVERY, STORAGE, AND HANDLING
- A. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
 - B. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.
- 1.11 PROJECT CONDITIONS
- A. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:
 1. Notify Construction Manager no fewer than two days in advance of proposed interruption of water service.
 2. Do not proceed with interruption of water service without Construction Manager's written permission.

PART 2 - PRODUCTS

- 2.01 PIPES, TUBES, AND FITTINGS
- B. Comply with requirements in the piping schedule for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.
 - C. Galvanized-Steel Pipe: ASTM A 53/A 53M, Standard Weight, Type E, Grade B.
 1. Galvanized-Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M or ASTM A 106/A 106M, Standard Weight, seamless-steel pipe with threaded ends.
 2. Galvanized, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.
 3. Malleable-Iron Unions: ASME B16.39, Class 150, hexagonal-stock body with ball-and-socket, metal-to-metal, bronze seating surface, and female threaded ends.
 4. Cast-Iron Flanges: ASME B16.1, Class 125.
 - D. PVC Pipe: ASTM D 1785, PVC 1120 compound, Schedule 40.
 1. PVC Socket Fittings: ASTM D 2466, Schedules 40 and 80.
 2. PVC Threaded Fittings: ASTM D 2464, Schedule 80.
 3. PVC Socket Unions: Construction similar to MSS SP-107, except both headpiece and tailpiece shall be PVC with socket ends.
- 1.12 PIPING JOINING MATERIALS
- A. Pipe-Flange Gasket Materials: AWWA C110, rubber, flat face, 1/8 inch thick unless otherwise indicated; full-face or ring type unless otherwise indicated.
 - B. Solvent Cements for Joining PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.
 - C. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.
- 1.13 MANUAL VALVES
- A. Bronze Ball Valves:
 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. NIBCO INC.
 - b. Watts; a Watts Water Technologies company.
 - c. Apollo Valves; Conbraco Industries, Inc.
 2. Description:

- a. Standard: MSS SP-110.
- b. SWP Rating: 150 psig.
- c. CWP Rating: 600 psig.
- d. Body Design: Two piece.
- e. Body Material: Bronze.
- f. Ends: Threaded or solder joint if indicated.
- g. Seats: PTFE or TFE.
- h. Stem: Bronze.
- i. Ball: Chrome-plated brass.
- j. Port: Full or regular, but not reduced.

B. Plastic Ball Valves:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. NIBCO INC.
- b. Spears Manufacturing Company.
- c. Hayward Flow Control.

- 2. Description:

- a. Standard: MSS SP-122.
- b. Pressure Rating: 125 psig minimum.
- c. Body Material: PVC.
- d. Type: Union.
- e. End Connections: Socket or threaded.
- f. Port: Full.

C. Bronze Gate Valves:

- 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

- a. NIBCO INC.
- b. Watts; a Watts Water Technologies company.

- 2. Description:

- a. Standard: MSS SP-80, Type 2.
- b. Class: 125.
- c. CWP Rating: 200 psig.
- d. Body Material: ASTM B 62 bronze with integral seat and screw-in bonnet.
- e. Ends: Threaded or solder joint.
- f. Stem: Bronze, nonrising.
- g. Disc: Solid wedge; bronze.
- h. Packing: Asbestos free.
- i. Handwheel: Malleable iron, bronze, or aluminum.

1.14 PRESSURE-REDUCING VALVES

A. Water Regulators:

- 1. Manufacturers: Subject to compliance with requirements, provide products by the following:

- a. Apollo Valves; Conbraco Industries, Inc.
- b. Watts; a Watts Water Technologies company.
- c. Zurn Industries, LLC.

- 2. Description:

- a. Standard: ASSE 1003.

- b. Body Material: Bronze for NPS 2 and smaller; cast iron with interior lining complying with AWWA C550 or that is FDA approved for NPS 2-1/2 and NPS 3.
- c. Pressure Rating: Initial pressure of 150 psig.
- d. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and NPS 3.

1.15 BACKFLOW PREVENTERS

A. Water Regulators:

- 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Zurn Industries, LLC.
 - b. Watts; a Watts Water Technologies company.
 - c. Apollo Valves; Conbraco Industries, Inc.
- 2. Description:
 - a. The Reduced Pressure Principle Backflow Preventer shall be shall be ASSE® Listed 1013, rated to 180°F, and supplied with full port ball valves.
 - b. The main body and access covers shall be bronze (ASTM B 584), the seat ring and all internal polymers shall be NSF® Listed Noryl™ and the seat disc elastomers shall be silicone.
 - c. The first and second checks shall be accessible for maintenance without removing the relief valve or the entire device from the line. If Project has more than one type or configuration of water regulator, delete subparagraph below and schedule water regulators on Drawings.
 - d. The product should be listed as lead free.

1.16 MASTER VALVE

A. Bronze, Master Control Valves:

- 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Buckner Superior: 3200 Series
- 2. Description: Cast-bronze body, normally closed, diaphragm type valve with manual-flow adjustment, no minimum flow capability, dirty and recycled water protection and operated by 24-VAC solenoid.

1.17 FLOW SENSOR

A. PVC Tee Type, Flow Sensor

- 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Creative Technologies: FSI-T15-001
 - b. Description: PVC Tee Type with socket connections, impeller-based technology, digital output signal, pulse signal travels up to 2,000 feet without amplification, solid state electronics.

1.18 AUTOMATIC CONTROL VALVES

A. Plastic, Automatic Control Valves:

- 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Rain Bird Corporation.
 - b. Hunter Industries Incorporated.
- 2. Description: Molded-plastic body, normally closed, diaphragm type with manual-flow adjustment, and operated by 24-V ac solenoid. Irrigation valve specifications include but are not limited to:

- a. Potable water: Standard configuration
- b. Greywater/Non-potable water: Purple color reclaimed water option.
- c. The valve body and bonnet shall be constructed of heavy-duty and ultra-violet resistant plastic.
- d. The bonnet shall be assembled to the body using multi-drive screws for use with flathead, Phillips, or hexagonal tools.
- e. Shall possess a water tight seal between the body and bonnet.
- f. Shall be a normally closed, forward flow design.
- g. Shall have a filtered pilot flow to resist debris and clogging.
- h. Shall be slow closing to prevent water hammer from causing subsequent system damage.
- i. Shall have a Ø1 inch NPT globe inlet as well as a Ø1 inch NPT outlet.
- j. Shall have a manual internal bleed capability to operate the valve without allowing water into the valve box.
- k. Shall have an external bleed to permit flushing of debris from the system.
- l. Shall have a flow control handle to adjust water flow as needed.
- m. Shall include a nylon scrubber mechanism that scrapes the filter screen to break down grit and plant material to prevent clogging.
- n. Shall include a 24 VAC 50/60 Hz solenoid capable of 2-wire operation.

(a) Inrush current: 0.41A (9.9VA) at 60Hz

(b) Holding current: 0.14A (3.43 VA) at 60Hz

- o. Operating flow rate of 0.25-50 gpm (0.95-189.3 l/min).
- p. Operating pressure range of 20-200 psi (1.38-13.8 bar).
- q. Water temperature: Up to 150°F (66°C).
- r. Ambient temperature: Up to 150°F (66°C).
- s. Shall accommodate an optional field-installed pressure regulating dial.
- t. Shall accept an optional latching solenoid for use with battery operated controllers.
- u. Shall be available with an optional purple flow control handle for use with non-potable water applications.
- v. Shall have a heavy-duty stainless steel spring for positive diaphragm closure.
- w. Shall include a five-year trade warranty.

B. Plastic, Drip Control Zone Kits:

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

- a. Rain Bird Corporation.
- b. Hunter Industries Incorporated.
- c. Netafim USA

2. Description: Molded-plastic body, normally closed, diaphragm type with manual-flow adjustment, and operated by 24-V ac solenoid. Pressure-regulating basket filter, regulating to 40 psi maximum. Must be compatible with 2-wire decoder operation.

- a. Potable water: Standard configuration
- b. Greywater/Non-potable water: Purple color reclaimed water option.
- c. Low Flow Control Zone Kit for dripline zones with flows from 0.2 to 3.0 GPM, including low flow valve (LFV) and pressure regulating filter (PRF).

- 1) Low Flow Valve (LFV) component specifications include:
 - a) Valve body and bonnet constructed of high impact, weather-resistant plastic, stainless steel and other chemical/UV resistant materials

- b) Diaphragm with a double-knife seal, constructed of durable Buna-N rubber with a clog-resistant metering orifice
 - c) Energy-efficient, low-power encapsulated solenoid with captured plunger and 90 mesh (200 micron) solenoid filter
 - d) External bleed for manual system flushing during start-up, internal bleed for manual zone activation during maintenance operations
 - e) Inlet pressure rating: 20 to 120 PSI (1,4 to 8,3 bar)
 - f) Female threaded inlet and outlet connections
 - g) Anti-siphon valve configuration includes listed features and incorporates atmospheric vacuum breaker with I.A.P.M.O and A.S.S.E. listing approval
- 2) Pressure Regulating Filter (PRF) combines filtration and pressure regulation in one integrated unit for protection of downstream components of drip irrigation system. PRF component specifications include:
 - a) Compact "Y" filter body and cap configuration constructed of glass-filled, UV-resistant polypropylene, with 120 PSI (8,3 bar) operating pressure rating. Maximum dimensions of filter body; Height: 4 1/2" (11,4 cm), Length: 5 1/2" (14 cm), Width: 2" (5,1 cm)
 - b) Standard 200 mesh (75 micron) filter screen constructed of durable stainless steel attached to a polypropylene frame. Screen is serviceable for cleaning purposes by unscrewing cap from filter body and removing filter element.
 - c) Normally-open pressure regulating device with preset outlet pressure of approximately 40 PSI (2,1 bar). Pressure regulating device allows full flow with minimal pressure loss unless inlet pressure is greater than preset level. As inlet pressure increases above preset level, internal spring compresses to reduce downstream pressure.
 - d) Male threaded 3/4" (19 mm) inlet and
- d. Control Zone Kits for dripline zones with flows from 3.0 to 20.0 GPM (11.4 to 75.7 lpm), including, valve with PVC ball valve and pressure regulating quick-check basket filter.
 - 1) Valve assembly component specifications must include:
 - a) 1" (25 mm) PVC full-port ball valve with female threaded inlet and outlet connections
 - b) Valve body and bonnet constructed of durable glass-filled nylon, stainless steel and other chemical/UV resistant materials
 - c) Diaphragm constructed of a durable Buna-N rubber material reinforced with nylon
 - d) One-piece solenoid with captured plunger and 90 mesh (200 micron) solenoid filter
 - e) External bleed for manual system flushing during start-up, internal bleed for manual zone activation during maintenance operations
 - f) Inlet pressure rating: 20 to 200 PSI (1,4 to 13,8 bar)
 - g) Female threaded inlet and outlet connections
 - 2) Pressure Regulating Quick Check Basket Filter combines filtration and pressure regulation in one integrated unit for protection of downstream components of drip irrigation system. Pressure regulating basket filter component specifications must include:

- a) Basket style body and jar-top cap constructed of heavy-duty glass-filled, UV-resistant polypropylene, with 150 PSI (10,3 bar) operating pressure rating. Maximum dimensions of filter body; Height: 6 1/2" (16,5 cm), Length: 6 1/2" (16,5 cm), Width: 3 1/2" (8,9 cm)
- b) Indicator incorporated into filter cap that changes color from green to red during operation when the filter element requires cleaning.
- c) Standard 200 mesh (75 micron) filter screen constructed of stainless steel attached to propylene frame. Screen is serviceable for cleaning purposes by unscrewing cap from filter body and removing filter element.
- d) Normally-open in-line pressure regulating device, constructed of durable, UV resistant non-corrosive material able to accommodate an inlet pressure rating of not less than 150 PSI (10,3 bar), with preset outlet pressure of approximately 40 PSI (2,8 bar). Pressure regulating device allows full flow with minimal pressure loss unless inlet pressure is greater than preset level. As inlet pressure increases above preset level, internal spring compresses to reduce downstream pressure.
- e) Male threaded 1" (25 mm) inlet and outlet connections.

1.19 TRANSITION FITTINGS

- A. General Requirements: Same size as, and with pressure rating at least equal to and with ends compatible with, piping to be joined.
- B. Plastic-to-Metal Transition Fittings:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Spears Manufacturing Company.
 - 2. Description: PVC one-piece fitting with manufacturer's Schedule 80 equivalent dimensions; one end with threaded brass insert, and one solvent-cement-socket end.
- C. Plastic-to-Metal Transition Unions:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. NIBCO INC.
 - b. Spears Manufacturing Company.
 - 2. Description: MSS SP-107, PVC four-part union. Include one brass threaded end, one solvent-cement-joint plastic end, rubber O-ring, and union nut.

1.20 DIELECTRIC FITTINGS

- A. General Requirements: Assembly of copper alloy and ferrous materials or ferrous material body with separating nonconductive insulating material suitable for system fluid, pressure, and temperature.
- B. Dielectric Unions:
 - 1. Description: Factory-fabricated union, NPS 2 and smaller.
 - a. Pressure Rating: 150 psig minimum at 180 deg F.
 - b. End Connections: Solder-joint copper alloy and threaded ferrous; threaded ferrous.
- C. Dielectric Flanges:
 - 1. Description: Factory-fabricated, bolted, companion-flange assembly, NPS 2-1/2 to NPS 4 and larger.
 - a. Pressure Rating: 175 psig minimum.

- b. End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.
- D. Dielectric-Flange Kits:
 - 1. Description: Nonconducting materials for field assembly of companion flanges, NPS 2-1/2 and larger.
 - a. Pressure Rating: 150 psig minimum.
 - b. Gasket: Neoprene or phenolic.
 - c. Bolt Sleeves: Phenolic or polyethylene.
 - d. Washers: Phenolic with steel backing washers.
- E. Dielectric Couplings:
 - 1. Description: Galvanized-steel coupling.
 - a. Pressure Rating: 300 psig at 225 deg F.
 - b. End Connections: Female threaded.
 - c. Lining: Inert and noncorrosive, thermoplastic lining.
- F. Dielectric Nipples:
 - 1. Description: Electroplated steel nipple complying with ASTM F 1545.
 - a. Pressure Rating: 300 psig at 225 deg F.
 - b. End Connections: Male threaded or grooved.
 - c. Lining: Inert and noncorrosive, propylene.
- 1.21 MISCELLANEOUS PIPING SPECIALTIES
 - A. Water Hammer Arresters: ASSE 1010 or PDI WH 201, with bellows or piston-type pressurized cushioning chamber and in sizes complying with PDI WH 201, Sizes A to F.
 - B. Pressure Gauges: ASME B40.1. Include 4-1/2-inch-diameter dial, dial range of two times system operating pressure, and bottom outlet.
- 1.22 SPRINKLERS
 - A. General Requirements: Designed for uniform coverage over entire spray area indicated at available water pressure.
 - B. Plastic, Pop-up, High-efficiency, multi-stream, multi-trajectory, match precipitation rate, rotary sprinkler:
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Hunter Industries Incorporated.
 - b. Rain Bird Corporation.
 - 2. Plastic Material Description:
 - a. The adjustable orifice shall be manufactured from polyurethane and acetal plastic materials for durability and adjustability.
 - b. The acetal material shall have UV stabilizers for outdoor applications.
 - 3. Metal Component materials:
 - a. The radius adjustment screw, arc ring, spring, and internal collar shall be made of stainless steel.
 - b. The stator that drives the speed of rotation inside the silicone chamber shall be made of brass.
 - 4. Filter Screen description:
 - a. Each MP Rotator Nozzle shall come with a detachable filter screen.
 - b. The filter screen shall be made of polypropylene.
 - c. The screen mesh (or micron) size shall be dependent on the MP Rotator Nozzle model.
 - 1) 60 mesh (250 microns): MP-800SR-90.
 - 2) 40 mesh (420 microns): MP-1000, MP-2000, MP-CORNER, MP Strips, MP-800SR-360, MP-815.
 - 3) 20 mesh (840 microns): MP-3000, MP-3500, MP-820.
 - 5. Capacities and Characteristics:

- a. Flow: 0.42 to 1.10 GPM.
 - b. Pop-up Height: 6 inches above ground to nozzle
 - c. Arc: 45 to 360 circle.
 - d. Radius: per contract drawings.
 - e. Inlet: NPS 3/4.
 - f. Color Description: Each nozzle model shall have its own designated color scheme.
 - g. Nozzle Threads: Nozzles shall be fit for installation in pop-up bodies having a 5/8"-27 UNS male threaded stem at all common pop-up heights.
 - h. Viscous Drive: The viscous fluid used to maintain the rotation speed of the MP Rotator Nozzle shall be made of a silicone material. The silicone chamber shall be sealed with EPDM rubber seals. The brass stator inside the silicone chamber shall control the rotation speed.
 - i. Operating Pressure: MP Rotator Nozzles shall operate between 30 to 55 PSI (2.1 to 3.8 bar; 210 to 380 kPa). The recommended operating pressure shall be 40 PSI (2.8 bar; 280 kPa).
- C. Plastic, Pop-up Spray Sprinklers:
- 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Hunter Industries Incorporated.
 - b. Rain Bird Corporation.
 - 2. Description:
 - a. Body Material: ABS.
 - b. Nozzle: ABS.
 - c. Retraction Spring: Stainless steel.
 - d. Internal Parts: Corrosion resistant.
 - e. Pattern: Fixed, with flow adjustment.
 - 3. Capacities and Characteristics:
 - a. Nozzle: ABS.
 - b. Pop-up Height: 6 inches aboveground to nozzle.
 - c. The sprinkler body shall have a standard pressure-regulating device as an integral part of the pop-up riser. This regulator will provide optimal distribution uniformity of the rotator nozzle by maintaining a constant outlet pressure of 40 PSI with inlet pressures of up to 100 PSI, regardless of the rotator installed.
 - d. The body of the sprinkler shall be constructed of corrosion and UV-resistant, heavy-duty A.B.S. The riser of the sprinkler shall be constructed of abrasion and UV-resistant A.B.S. and shall be adjustable for pattern alignment. The riser shall be compatible with female threaded nozzles and shall have a stainless steel spring for positive retraction when irrigation is complete.
 - e. The sprinkler shall have a pressure-activated, multi-function, UV stable wiper seal that will clean debris from the pop-up stem while it retracts. The seal shall be molded around a rigid plastic ring to prevent seal deformation. This seal shall prevent the sprinkler from sticking in the up position and be capable of sealing the sprinkler riser stem to the sprinkler cap under normal operating pressures. The seal shall be removable from the cap for easy service and shall be replaceable.
 - f. The sprinkler shall have a factory-installed, removable flush cap with a pull-up tab that shall prevent debris from entering the sprinkler during installation and allow the system to be flushed before installing the nozzle. The flush cap shall have a directional flushing action that allows the water to escape only in one direction. The flush cap shall open as the stem extends and completely close when the stem is in the retracted position.

- g. The sprinkler shall have an exposed surface diameter after installation of 2-1/4 inches (6 cm). The sprinkler shall have a 1/2-inch Female National Pipe Thread (FNPT) bottom inlet. In addition, the 6-inch (15 cm) and 12-inch (30 cm) sprinklers shall be available with a 1/2-inch FNPT side inlet. When specified with a factory-installed check valve, the 6-inch (15 cm) and 12-inch (30 cm) sprinklers will be supplied without the side inlet.
- h. The sprinkler body shall carry a five-year, exchange warranty (not prorated).
- i. The sprinkler nozzle shall be of the viscous fluid brake rotary type and be a multi-stream, multi-trajectory rotating stream sprinkler.
- j. In full or part circle mode the sprinkler nozzle shall be capable of covering a 30 foot radius at 40 psi pressure with an equivalent full circle discharge rate of 3-4 gpm.
- k. Sprinkler Nozzle Assembly models shall produce and maintain a matched precipitation rate no greater than 0.6" per hour throughout the arc adjustment range and radius adjustment range, (up to 25% of radius reduction), when spaced at 50% of wetted diameter.
- l. The part circle sprinkler shall have an infinitely adjustable arc from 45° to 105°, 90° to 210° or between 210° to 270° depending on the model selected. The full circle sprinkler shall irrigate a full 360°. The 45° to 105° model shall not require coverage from adjacent sprinklers closer than 3' from the head.
- m. Full or part circle sprinklers shall be capable of up to 25% radius reduction using a radius adjustment screw. The radius reduction screw shall have a slip clutch mechanism to prevent internal damage if turned past the minimum or maximum radius settings. The radius reduction screw shall reduce the pressure and flow upstream of the adjustable orifice thereby maintaining stream integrity.
- n. Part circle sprinklers shall have arc adjustment capabilities using a stainless steel ring. The adjustment ring shall be effective only while the sprinkler is popped up and shall be ineffective while the sprinkler is popped down. When turned past the minimum or maximum arc limits the adjustment mechanism shall have a ratcheting action to prevent internal damage.
- o. This same ratcheting action shall allow the orientation of the left edge of the variable arc when installed on a fixed riser or in a popup body. This is independent of and in addition to any ratchet that may exist in a popup body.
- p. The sprinkler itself shall pop-up at approximately 15 psi of water pressure. Upon cessation of water pressure, the sprinkler itself shall retract. When installed in a pop-up body the sprinkler itself shall pop-up after the body stem is almost fully extended. Upon decreasing pressure the sprinkler itself shall pop-down before the pop-down of the body stem is complete.
- q. The sprinkler nozzles adjustable orifice shall be manufactured from polyurethane and acetyl plastic materials for durability.
- r. The sprinkler nozzle shall be fitted with a detachable filter.
- s. Sprinkler Nozzle Assembly models shall be able to be installed in popup bodies having a 5/8-27 UNS male threaded stem, at all common popup heights. Sprinkler Assembly shall also be able to be attached to a 1/2 FIPT x 5/8-27 UNS male threaded adapter for use on fixed pipe risers. Sprinkler Assembly shall also be able to be attached to a 1/2 FIPT x 5/8-28 UNS female threaded adapter for use on fixed pipe risers.

1.23 QUICK COUPLERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. Rain Bird Corporation.
 - 2. Buckner; a Storm Manufacturing Group, Inc. brand.
 - 3. Hunter Industries Incorporated.

- B. Description: Factory-fabricated, bronze or brass, two-piece assembly. Include coupler water-seal valve; removable upper body with spring-loaded or weighted, rubber-covered cap; hose swivel with ASME B1.20.7, 3/4-11.5NH threads for garden hose on outlet; and operating key.
1. Locking-Top Option: Vandal-resistant locking feature. Include two matching key(s).
- 1.24 DRIP IRRIGATION SPECIALTIES
- A. On-Surface Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
1. Hunter Industries Incorporated; HDL Dripline.
- B. Triple-layer, co-extruded, pressure-compensating dripline. Pressure-compensating inline emitters installed during extrusion process at factory shall have regular intervals and flows as specified by model.
1. Tubing: Product used is a linear low-density polyethylene and shall have a mixture of approximately 20–25% virgin materials and 75–80% pre-consumer reprocessed resins. Resins used shall not create a weakened and degraded molecular structure such as post-consumer repelletized resins. Outside layers of virgin material provide higher resistance to UV and a better surface for emitters to adhere to the inner circumference of the tube.
 2. HDL shall be color-coded with stripes that reveal the flow. There shall be one middle stripe into which emitter holes are drilled and there is one pinstripe of the same color on each side of the thicker stripe. The exception to color stripes indicating flow are purple stripes, which indicate only that reclaimed water may be in use.
 - a. 0.4 GPH shall have three stripes, all in TAN.
 - b. 0.6 GPH shall have three stripes, all in GRAY.
 - c. 0.9 GPH shall have three stripes, all in BLACK.
 - d. Reclaimed indicator shall have three stripes, all in PURPLE.
 3. Stripes shall be part of the extrusion process and not painted or printed.
 4. The presence of a check valve in HDL shall be identified by the brown color of the tube.
 - a. Light brown indicates that the product is pressure compensating, but no check valve is present in the emitters.
 - b. Dark brown indicates that the product is pressure compensating, but also contains check valves in each emitter.
 5. Function and Operation:
 - a. Emitters: Consistent flow shall be supplied from each and every emitter based on inlet pressure in the range of 10–60 PSI (0,7–4,1 bar) for PC emitter and 15–60 PSI (1,0–4,1 bar) for CV emitter.
 - b. Emitters are available in three separate flows: 0.4 GPH (1,5 bar), 0.6 GPH (2,1 bar), and 0.9 GPH (3,4 bar).
 - c. Required filtration for all HDL models is 120 mesh (125 micron).
 - d. HDL shall be connected with any standard 17 mm barb fittings or for quicker installation, the PLD-LOC Fittings.
- C. Point Source Drip; On Surface Drip Tubes with Direct-Attached Emitters Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
1. Rain Bird Corporation.
 2. Hunter Industries Incorporated.
 3. NDS/Raindrip.
 4. Netafim USA.
 5. Agrifim; NDS Inc
 6. Tubing: Flexible PE with plugged end.
 - a. Potable water: Standard model
 - b. Greywater/Non-potable water: Purple color reclaimed water option.

7. Emitters: Devices to deliver water at approximately 20 psig.
 - a. Body Material: PE or vinyl, with flow control.
 - b. Mounting: Inserted into tubing at set intervals.
 8. Capacities and Characteristics:
 - a. Tubing Size: 17mm.
 - b. Emitter Spacing: per contract drawings.
 - c. Emitter Flow: 2.0 gallons per hour.
 - D. Application Pressure Regulators: Brass or plastic housing, NPS 3/4, with corrosion-resistant internal parts; capable of controlling outlet pressure to approximately 20 psig.
 - E. Filter Units: Brass or plastic housing, with corrosion-resistant internal parts; of size and capacity required for devices downstream from unit.
 - F. Air Relief Valves: Brass or plastic housing, with corrosion-resistant internal parts.
 - G. Vacuum Relief Valves: Brass or plastic housing, with corrosion-resistant internal parts.
- 1.25 CENTRAL CONTROL
- A. Products: Subject to compliance with requirements, provide the following:
 1. Rain Bird Corporation; IQ4-Cloud
 - B. General
 1. The Central Control System shall consist of internet hosted control software capable of monitoring and managing an unlimited number of dial-based commercial irrigation controllers via Wi-Fi or Local Area Network (LAN) connections.
 2. The Central Control System shall display in an internet browser the status of all controllers in list and/or map overviews, including controller dial position, adjustment status, and any timed weather shutdowns.
 3. All controllers shall be visible in a live, online map and located automatically based on the user-supplied controller address.
 4. The map shall be selectable between "street" and "satellite" or terrain views.
 5. The map shall automatically size to the extents of the controller locations to show all controllers, and users may then zoom, pan, and navigate freely throughout the map for controller selection purposes.
 6. The Central Control System shall permit selection of any controller and then offer full remote programming of all controller features in the browser, including irrigation scheduling, controller settings, and weather-based watering adjustments.
 7. The Central Control System shall allow the user full remote-control capabilities, including starting and stopping individual stations and programs, or setting the controller to Off for a user-defined number of days. The System shall also allow quick adjustment of irrigation amounts by a percentage value.
 8. The Central Control System shall be compatible with locally installed smart weather adjustment sensors, which may adjust each controller's irrigation amounts automatically based on local climate conditions and shall report such adjustments in the browser to the user. The software shall also report controller shutdowns due to active rain, freeze, or other sensors.
 9. The Central Control System shall display the forecast weather for each controller several days in advance and shall enable automatic shutdowns of irrigation when forecasted temperature or chance of rainfall exceeds a user-specified amount.
 10. The Central Control System shall have multi-user permissions for maintenance organizations, where each controller shall have a designated owner, who may then grant control access for specified controllers to other authorized personnel by email address.
 11. Both crewmembers and controllers may be organized into named groups.
 12. Access may be granted or cancelled at any time (by individual or group) by the designated owner.
 13. The Central Control Software shall automatically alert owners and/or designated crew members via SMS text messages when selected alarms occur at a controller location, indicating the controller and the type of alarm for rapid response or repair.
 - C. Hardware Support

1. For interface with software:
 - a. 4G Network Communication Cartridge (NCC)
 - b. NCC Ethernet Cartridge.
 - c. NCC RS 232 Cartridge.
 2. Configuration: Direct, Server and Client.
 3. Up to 255 Client Controller per each server controller with sharing of weather sensors and master valves.
- D. Software Capabilities
1. Detect modules.
 2. Cartridge firmware updates.
 3. Upload programs to Controller (Synchronize)
 4. Retrieve controller programs (Reverse synchronize)
 5. Automatic contact to upload programs to controller after 1 hour of inactivity and retrieve logs from controller outside watering window (Auto-Synchronize).
 6. Manual Functions: Start program, test program, Auto On/Off, Turn Master Valves On/Off for manual watering, turn Flo-Manager On/Off and Rain Delay.
 7. Adjustments: Program Adjust and ET adjust
 8. ET/Rain weather resources: IQ Global Weather.
 9. Group Edit: Site level, controller level, Program level and station level.
 10. Define Valve types and sensor types.
 11. Flo-Watch based on learned flow; diagnose and shut off the source.
 12. User defined Station Priority.
 13. Begin watering in next watering window
 14. User defined Simulstations.
 15. Flo-Manager to reduce overall watering time.
 16. Configurable scheduled reporting through emails
 17. Water Management, Configuration and Audit reports
 18. Remote controller diagnostics
 19. Minute-by-minute flow logs in a graph comparing actual flow and projected flow.
 20. PIN based user access: two-way programming, user access levels, complete and partial lockout, 5 PINs per controller.
 21. Flow Logs: minute-by-minute graphical comparing of actual flow and projected flow, actual flow totals in the automated email reports.
 22. Configurable master valve and sensor sharing.
 23. Dryrun for schedule forecasting.
- E. Compatible Controllers
1. The irrigation controllers shall be supplied by the same manufacturer of the Central Control System and warranted for use together as a complete system.
 2. The controllers shall be commercial grade irrigation products suitable for outdoor or indoor use, with all necessary approvals.
 3. The controller manufacturer shall offer a range of models that are suitable for different applications, including economical controllers with up to 54 station capacity, and heavy-duty controllers with up to 225 station capacity.
 4. The controllers shall include water-saving features such as cycle and soak, delay between stations, rain sensor inputs with automatic shutdown, and manual or automated Seasonal Adjustment.
 5. Heavy-duty controllers shall also include built-in flow monitoring ability with multiple master valves to monitor up to 6 flow zones.
 6. The controllers must also be compatible with a local, license-free remote control that is independent of internet connectivity.
 7. The Central Control Software shall detect any settings or scheduling conflict between the software and the hardware and shall alert the user if a conflict is detected. The software shall have the ability to identify and display any conflicts and allow the user to decide which settings shall be used.
- F. Models
1. The software shall be Rainbird IQ4 Platform, as offered by Rain Bird Corporation.

2. The cellular communications module for the heavy-duty ESP-LXME2P controller, as listed below, shall be Rainbird model IQ-NCC-EN.
- 1.26 CONTROLLER
- A. Products: Subject to compliance with requirements, provide the following:
 1. Rain Bird Corporation; ESP-LXME2P-LXMMSS-LXMMSSPED.
24 Station, Traditionally-Wired, PRO-Smart, Commercial Controller. (1)
ESPLXME2 12-Station, PROSmart (Module included) Indoor/Outdoor, Plastic
Wall-Mount Enclosure w/ (1) ESPLXMSM12 - 12-Station Expansion Module.
Install in LXMMSS-LXMMSSPED Stainless Steel Cabinet w/ Pedestal
 - a. Central Control: install IQ-NCC-EN Wifi Cartridge.
 - B. General
 1. The controller shall be a full-featured commercial-industrial product for the purpose of irrigation management and monitoring of control valves, flow, and sensors. The controller shall be a 12-station base model expandable with 12-station input modules up to 48 stations.
 - C. System Description
 1. Multi-program operation (up to 40 independent programs).
 2. 10 start times per program.
 3. Seasonal adjustment from 0–300%
 4. Advanced flow management with FloWatch™ and FloManager™
 5. Weather sensor input integration
 6. Manual and automatic operation modes.
 7. The IQ-NCC cartridge enables remote programming, monitoring, and control through IQ Central, with support for:
 - a. ESP-LXME2P (1 to 48 stations, traditionally wired).
 - D. Quality Assurance
 1. Ensure compliance with FCC Part 15 Rules, UL, CE, and ISED certifications.
 2. Controllers must have non-volatile memory for program retention during power outages.
 3. Must be installed according to local electrical codes.
 - E. Warranty
 1. Manufacturer's three (3) year warranty covering defects in materials and workmanship.
 2. Lithium battery replacement and disposal must comply with local regulations.
 - F. Controller Features
 1. Display: Large LCD with navigation buttons.
 2. Power Requirements: U.S. Model: 120 VAC input; 26.5 VAC output.
 3. Base Module (12 stations).
 - a. Expandable up to 48 Stations with additional SM12 Modules.
 4. Surge Protection: 10kV surge protection included.
 - G. Network Communication Cartridge
 1. The IQ-NCC cartridge upgrades ESP-LXME2 controllers to IQ-compatible satellites for remote monitoring and control. Available models:
 - a. NCC-4G Cellular Cartridge: 4G cellular modem with internal/external antenna options.
 - b. NCC-EN Ethernet Cartridge: Embedded Ethernet modem, RJ-45 connection.
 - c. NCC-RS RS232 Cartridge: RS-232 port for direct cable or external modem connections.
 - H. Satellite Configurations
 1. Direct Satellites: Standalone controllers communicating directly with IQ Central via Ethernet or Cellular.
 2. Server Satellites: Multi-controller server sites communicate with IQ central and client satellites via IQNet™ (radio or high-speed data cable).
 3. Client Satellites: Communicate via Server satellites over IQNet; no direct connection to IQ Central.
 - I. Installation per manufacturer's specifications.

- J. Programming
 - 1. Set Date/Time: Adjust via controller dial and navigation buttons.
 - 2. Set Start Times: Up to 10 start times per program.
 - 3. Set Run Times: Configure station run times (max: 96 hours).
 - 4. Watering Days: Set custom, cyclic, or even/odd days.
 - 5. Advanced Features:
 - a. Cycle + Soak: Prevents runoff.
 - b. SimulStations: Allows 5 stations to run simultaneously.
 - c. FloManager™: Adjusts sequencing based on hydraulic capacity.
 - d. FloWatch™: Monitors flow rates and triggers alerts.
 - K. Testing & Commissioning
 - 1. Run Diagnostic Tests:
 - a. Test all stations to confirm valve operation.
 - b. Check for alarms (flow, sensors, power loss).
 - 2. Adjust Seasonal Settings:
 - a. Configure seasonal adjust (%) by month.
 - 3. Enable IQ Integration:
 - a. Connect IQ-NCC to IQ Central.
 - b. Configure Direct, Server, or Client satellite settings.
 - L. Maintenance
 - 1. Battery Replacement: The controller contains a non-replaceable lithium battery.
 - 2. Software Updates: Update firmware via IQ Central Control.
 - 3. Surge Protection Inspection: Ensure proper grounding for 10kV protection.
 - M. Completion & Owner Training
 - 1. Provide an operation guide to the owner.
 - 2. Conduct a demonstration of programming and manual operation.
 - 3. Train on alarm troubleshooting and seasonal adjustments.
- 1.27 BOXES FOR AUTOMATIC CONTROL VALVES AND OTHER UNDERGROUND EQUIPMENT
- A. Plastic Boxes:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. NDS.
 - b. Oldcastle Enclosure Solutions.
 - c. Oldcastle, Inc.
 - d. Rainbird.
 - 2. Description: Box and cover, with open bottom and openings for piping; designed for installing flush with grade.
 - a. Size: As required for valves and service.
 - b. Shape: Round, Square, Rectangular.
 - c. Sidewall Material: PE.
 - d. Cover Material: PE.
 - e. Cover and Sidewall Color: Black in Planting Areas, Green cover/lid in Turf.
 - 1) Master Control Valve Lettering: " IRR-MV."
 - 2) Control Valve Lettering: " IRR-A-#." (Stamp with POC letter and station number).
 - 3) Quick Coupler Valve Lettering: " IRR-QC."
 - 4) Flush Valve Lettering: " IRR-FV."
 - 5) Gate Valve Lettering: "IRR-GV."
 - 6) Other Irrigation Box Lettering: " IRR."
 - B. Polymer-Concrete Boxes:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Oldcastle Enclosure Solutions.

2. Description: Box and cover, with open bottom and openings for piping; designed for installing flush with grade.
 - a. Size: As required for valves or other equipment and service.
 - b. Shape: Rectangular.
 - c. Sidewall Material: Polymer concrete with lateral and vertical sidewall design loading of 10,000 lb minimum over 10 by 10 inches square.
 - d. Cover Material: Reinforced polymer concrete with cover design loading of 10,000 lb minimum over 10 by 10 inches square.
 - 1) Master Control Valve Lettering: " IRR-MV."
 - 2) Control Valve Lettering: " IRR-CV."
 - 3) Quick Coupler Valve Lettering: " IRR-QC."
 - 4) Flush Valve Lettering: " IRR-FV."
 - 5) Gate Valve Lettering: "IRR-GV."
 - 6) Other Irrigation Box Lettering: " IRR."
- C. Drainage Backfill: Cleaned gravel or crushed stone, graded from 3/4 inch minimum to 3 inches maximum.

PART 2 - EXECUTION

2.01 EARTHWORK

- A. Excavating, trenching, and backfilling are specified in Section 312000 "Earth Moving."
- B. Drain Pockets: Excavate to sizes indicated. Backfill with cleaned gravel or crushed stone, graded from 3/4 to 3 inches to 12 inches below grade. Cover gravel or crushed stone with sheet of asphalt-saturated felt and backfill remainder with excavated material.
- C. Provide minimum cover over top of underground piping according to the following:
 1. Irrigation Main Piping: Minimum depth of 24 inches below finished grade.
 2. Circuit Piping: 18 inches.
 3. Drain Piping: 12 inches.
 4. Sleeves: 24 inches.

2.02 PREPARATION

- A. Set stakes to identify locations of proposed irrigation system. Obtain Owner's Representative's approval before excavation.

2.03 PIPING INSTALLATION

- A. Location and Arrangement: Drawings indicate location and arrangement of piping systems. Install piping as indicated unless deviations are approved on Coordination Drawings.
- B. Install piping at minimum uniform slope of 0.5 percent down toward drain valves.
- C. Install piping free of sags and bends.
- D. Install groups of pipes parallel to each other, spaced to permit valve servicing.
- E. Install fittings for changes in direction and branch connections.
- F. Install unions adjacent to valves and to final connections to other components with NPS 2 or smaller pipe connection.
- G. Install flanges adjacent to valves and to final connections to other components with NPS 2-1/2 or larger pipe connection.
- H. Install expansion loops in control-valve boxes for plastic piping.
- I. Lay piping on solid subbase, uniformly sloped without humps or depressions.
- J. Install ductile-iron piping according to AWWA C600.
- K. Install PVC piping in dry weather when temperature is above 40 deg F. Allow joints to cure at least 24 hours at temperatures above 40 deg F before testing.
- L. Install piping in sleeves under parking lots, roadways, buildings and sidewalks.
- M. Install sleeves made of Schedule 40 PVC pipe and socket fittings, and solvent-cemented joints.
- N. Install transition fittings for plastic-to-metal pipe connections according to the following:
 1. Underground Piping:
 - a. NPS 1-1/2 and Smaller: Plastic-to-metal transition fittings.
 - b. NPS 2 and Larger: AWWA transition couplings.

2. Aboveground Piping:
 - a. NPS 2 and Smaller: Plastic-to-metal transition fittings.
 - b. NPS 2 and Larger: Use dielectric flange kits with one plastic flange.
- O. Install dielectric fittings for dissimilar-metal pipe connections according to the following:
 1. Underground Piping:
 - a. NPS 2 and Smaller: Dielectric coupling or dielectric nipple.
 - b. NPS 2-1/2 and Larger: Prohibited except in control-valve box.
 2. Aboveground Piping:
 - a. NPS 2 and Smaller: Dielectric union.
 - b. NPS 2-1/2 to NPS 4: Dielectric flange.
 - c. NPS 5 and Larger: Dielectric flange kit.
 3. Piping in Control-Valve Boxes:
 - a. NPS 2 and Smaller: Dielectric union.
 - b. NPS 2-1/2 to NPS 4: Dielectric flange.
 - c. NPS 5 and Larger: Dielectric flange kit.
- 2.04 JOINT CONSTRUCTION
 - A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
 - B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
 - C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
 - D. Flanged Joints: Select rubber gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.
 - E. Ductile-Iron Piping Gasketed Joints: Comply with AWWA C600 and AWWA M41.
 - F. PVC Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
 1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
 2. PVC Pressure Piping: Join schedule number, ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
 3. PVC Nonpressure Piping: Join according to ASTM D 2855.
- 2.05 VALVE INSTALLATION
 - A. Underground Curb Valves: Install in curb-valve casings with tops flush with grade.
 - B. Underground Iron Gate Valves, Resilient Seat: Comply with AWWA C600 and AWWA M44. Install in valve casing with top flush with grade.
 1. Install valves and PVC pipe with restrained, gasketed joints.
 - C. Aboveground Valves: Install as components of connected piping system.
 - D. Pressure-Reducing Valves: Install in boxes for automatic control valves or aboveground between shutoff valves.
 - E. Throttling Valves: Install in underground piping in boxes for automatic control valves.
 - F. Drain Valves: Install in underground piping in boxes for automatic control valves.
- 2.06 SPRINKLER INSTALLATION
 - A. Install sprinklers after hydrostatic test is completed.
 - B. Install sprinklers at manufacturer's recommended heights.
 - C. Locate part-circle sprinklers to maintain a minimum distance of 4 inches from walls and 2 inches from other boundaries unless otherwise indicated.
- 2.07 DRIP IRRIGATION SPECIALTY INSTALLATION
 - A. On-surface dripline.
 1. Install on-surface drip tubes with direct-attached emitters on ground. Scratch lines 1 inch to 2 inch into finish grade.
 2. Install application pressure regulators and filter units with drip control zone kits, and in control-valve boxes.

3. Install air relief valves and vacuum relief valves in piping, and in control-valve boxes.
- B. Sub-surface dripline.
 1. Install sub-surface drip tubes 4-6" below proposed finished grade and per manufacturer's recommendations.
 2. Install application pressure regulators and filter units with drip control zone kits, and in control-valve boxes.
 3. Install air relief valves and vacuum relief valves in piping, and in control-valve boxes.
- 2.08 AUTOMATIC IRRIGATION-CONTROL SYSTEM INSTALLATION
 - A. Equipment Mounting: Install interior controllers on wall.
 1. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 2. Install anchor bolts to elevations required for proper attachment to supported equipment.
 - B. Equipment Mounting: Install exterior freestanding controllers on precast concrete bases.
 1. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 2. Install anchor bolts to elevations required for proper attachment to supported equipment.
 - C. Install control cable in same trench as irrigation piping and at least 2 inches below or beside piping. Provide conductors of size not smaller than recommended by controller manufacturer. Install cable in separate sleeve under paved areas.
- 2.09 CONNECTIONS
 - A. Comply with requirements for piping specified in Section 221113 "Facility Water Distribution Piping" for water supply from exterior water service piping, water meters, protective enclosures, and backflow preventers. Drawings indicate general arrangement of piping, fittings, and specialties.
 - B. Install piping adjacent to equipment, valves, and devices to allow service and maintenance.
 - C. Connect wiring between controllers and automatic control valves.
- 2.10 IDENTIFICATION
 - A. Identify system components. Comply with requirements for identification specified in Section 220553 "Identification for Plumbing Piping and Equipment."
 - B. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplates and signs on each automatic controller.
 1. Text: In addition to identifying unit, distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.
 - C. Warning Tapes: Arrange for installation of continuous, underground, detectable warning tapes over underground piping during backfilling of trenches. See Section 312000 "Earth Moving" for warning tapes.
- 2.11 FIELD QUALITY CONTROL
 - A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
 - B. Perform tests and inspections.
 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
 - C. Tests and Inspections:
 1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 2. Operational Test: After electrical circuitry has been energized, operate controllers and automatic control valves to confirm proper system operation.
 3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - D. Any irrigation product will be considered defective if it does not pass tests and inspections.
 - E. Prepare test and inspection reports.

- 2.12 STARTUP SERVICE
 - A. Perform startup service.
 - 1. Complete installation and startup checks according to manufacturer's written instructions.
 - 2. Verify that controllers are installed and connected according to the Contract Documents.
 - 3. Verify that electrical wiring installation complies with manufacturer's submittal.
- 2.13 ADJUSTING
 - A. Adjust settings of controllers.
 - B. Adjust automatic control valves to provide flow rate at rated operating pressure required for each sprinkler circuit.
 - C. Adjust sprinklers and devices, except those intended to be mounted aboveground, so they will be flush with, or not more than 1/2 inch above, finish grade.
- 2.14 CLEANING
 - A. Flush dirt and debris from piping before installing sprinklers and other devices.
- 2.15 DEMONSTRATION
 - A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain automatic control valves and controllers.
- 2.16 PIPING SCHEDULE
 - A. Install components having pressure rating equal to or greater than system operating pressure.
 - B. Piping in control-valve boxes and aboveground may be joined with flanges or unions instead of joints indicated.
 - C. Underground irrigation main piping, shall be the following:
 - 1. For Potable Water Supply – Standard Schedule 40, PVC pipe and socket fittings, and solvent-cemented joints.
 - 2. For Greywater/Non-potable Water Supply – Purple Colored Schedule 40, PVC pipe and socket fittings, and solvent-cemented joints.
 - D. Circuit piping, shall be the following:
 - 1. For Potable Water Supply – Standard Schedule 40, PVC pipe and socket fittings, and solvent-cemented joints.
 - 2. For Greywater/Non-potable Water Supply – Purple Colored Schedule 40, PVC pipe and socket fittings, and solvent-cemented joints.
 - E. Underground Branches and Offsets at Sprinklers and Devices: Schedule 80, PVC pipe; threaded PVC fittings; and threaded joints.
 - 1. Option: Plastic swing-joint assemblies, with offsets for flexible joints, manufactured for this application.
 - F. Risers to Aboveground Sprinklers and Specialties: Schedule 80, PVC pipe and socket fittings; and solvent-cemented joints.
 - G. Drain piping shall be the following:
 - 1. Schedule 40, PVC pipe and socket fittings; and solvent-cemented joints.
- 2.17 VALVE SCHEDULE
 - A. Underground, Shutoff-Duty Valves: Use the following:
 - 1. NPS 2 and Smaller: Curb valve, curb-valve casing, and shutoff rod.
 - 2. NPS 3 and Larger: Iron gate valve, resilient seated; iron gate valve casing; and operating wrench(es).
 - B. Aboveground, Shutoff-Duty Valves:
 - 1. NPS 2 and Smaller: Bronze gate valve.
 - C. Drain Valves:
 - 1. NPS 1/2 and NPS 3/4: Plastic ball valve.
 - 2. NPS 1 to NPS 2: Plastic ball valve.

END OF SECTION 32 84 00

SECTION 32 91 15

SOIL PREPARATION (PERFORMANCE SPECIFICATION)

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section includes planting soils specified according to performance requirements of the mixes.
- B. Bioretention soil media.
- C. Related Requirements:
 - 1. Section 329300 "Plants" for placing planting soil for plantings.
 - 2. Section 329200 "Turf and Grasses"

1.03 DEFINITIONS

- A. AAPFCO: Association of American Plant Food Control Officials.
- B. Backfill: The earth used to replace or the act of replacing earth in an excavation. This can be amended or unamended soil as indicated.
- C. CEC: Cation exchange capacity.
- D. Compost: The product resulting from the controlled biological decomposition of organic material that has been sanitized through the generation of heat and stabilized to the point that it is beneficial to plant growth.
- E. Duff Layer: A surface layer of soil, typical of forested areas, that is composed of mostly decayed leaves, twigs, and detritus.
- F. Imported Soil: Soil that is transported to Project site for use.
- G. Layered Soil Assembly: A designed series of planting soils, layered on each other, that together produce an environment for plant growth.
- H. Manufactured Soil: Soil produced by blending soils, sand, stabilized organic soil amendments, and other materials to produce planting soil.
- I. NAPT: North American Proficiency Testing Program. An SSSA program to assist soil-, plant-, and water-testing laboratories through interlaboratory sample exchanges and statistical evaluation of analytical data.
- J. Organic Matter: The total of organic materials in soil exclusive of undecayed plant and animal tissues, their partial decomposition products, and the soil biomass; also called "humus" or "soil organic matter."
- K. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified as specified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- L. RCRA Metals: Hazardous metals identified by the EPA under the Resource Conservation and Recovery Act.
- M. SSSA: Soil Science Society of America.
- N. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.
- O. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.

- P. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil"; but in disturbed areas such as urban environments, the surface soil can be subsoil.
- Q. USCC: U.S. Composting Council.

1.04 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include recommendations for application and use.
 - 2. Include test data substantiating that products comply with requirements.
 - 3. Include sieve analyses for aggregate materials.
 - 4. Material Certificates: For each type of imported soil and soil amendment and fertilizer Five (5) working days before delivery to the site, according to the following:
 - a. Manufacturer's qualified testing agency's certified analysis of standard products.
 - b. Analysis of fertilizers, by a qualified testing agency, made according to AAPFCO methods for testing and labeling and according to AAPFCO's SUIP #25.
 - c. Analysis of nonstandard materials, by a qualified testing agency, made according to SSSA methods, where applicable.
- B. Samples: For each bulk-supplied material, 1-gal. volume of each in sealed containers labeled with content, source, and date obtained. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of composition, color, and texture.

1.05 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For each testing agency.
- B. Preconstruction Test Reports: For preconstruction soil analyses specified in "Preconstruction Testing" Article.
- C. Field quality-control reports.

1.06 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent laboratory; experienced in soil science, soil testing, and plant nutrition; with the experience and capability to conduct the testing indicated; and that specializes in types of tests to be performed.
 - 1. Laboratories: Subject to compliance with requirements, provide testing by the following:
 - a. Ag Laboratory & Consulting, 2255 S. Broadway, #12, Santa Maria, CA 93455. (805) 739-5333.
 - b. Fruit Growers Lab, San Luis Obispo, CA. (805) 783-2940.
 - 2. Multiple Laboratories: At Contractor's option, work may be divided among qualified testing laboratories specializing in physical testing, chemical testing, and fertility testing.

1.07 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Contractor shall engage a qualified testing agency to perform preconstruction soil analyses on existing, on-site soil.
 - 1. Notify Owner and Landscape Architect seven days in advance of the dates and times when laboratory samples will be taken.
- B. Preconstruction Soil Analyses: For each unamended soil type, perform testing on soil samples and furnish soil analysis and a written report containing soil-amendment and fertilizer recommendations by a qualified testing agency performing the testing according to "Soil-Sampling Requirements" and "Testing Requirements" articles.
 - 1. Have testing agency identify and label samples and test reports according to sample collection and labeling requirements.

1.08 SOIL-SAMPLING REQUIREMENTS

- A. General: Extract soil samples according to requirements in this article.
- B. Sample Collection and Labeling: Have samples taken and labeled by Contractor in presence of Landscape architect or state-certified, -licensed, or -registered soil scientist under the direction of the testing agency.
 - 1. Number and Location of Samples: Minimum of eight representative soil samples where directed by Landscape architect for each soil to be used or amended for landscaping purposes.
 - 2. Procedures and Depth of Samples: Two (2) depths in each testing location as directed by Landscape architect.
 - 3. Division of Samples: Split each sample into two, equal parts. Send half to the testing agency and half to Owner for its records.
 - 4. Labeling: Label each sample with the date, location keyed to a site plan or other location system, visible soil condition, and sampling depth.

1.09 TESTING REQUIREMENTS

- A. General: Perform tests on soil samples according to requirements in this article.
- B. Physical Testing: Must Comply with State Model Water Efficient Landscape Ordinance requirements for '*Soil Analysis Report*.'
 - 1. Soil Texture: Soil-particle, size-distribution analysis by one of the following methods according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods":
 - a. Sieving Method: Report sand-gradation percentages for very coarse, coarse, medium, fine, and very fine sand; and fragment-gradation (gravel) percentages for fine, medium, and coarse fragments; according to USDA sand and fragment sizes.
 - b. Hydrometer Method: Report percentages of sand, silt, and clay.
 - 2. Bulk Density: Analysis according to core method of SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
 - 3. Total Porosity: Calculate using particle density and bulk density according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
 - 4. Water Retention: According to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
 - 5. Saturated Hydraulic Conductivity: According to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods"; at 85 percent compaction according to ASTM D 698 (Standard Proctor).
 - 6. Phytotoxicity: Test for plant-available concentrations of phytotoxic minerals including aluminum, arsenic, barium, cadmium, chlorides, chromium, cobalt, copper, lead, lithium, mercury, nickel, selenium, silver, sodium, strontium, tin, titanium, vanadium, and zinc.
- C. Fertility Testing: Soil fertility analysis according to standard laboratory protocol of SSSA NAPT NCR-13, including the following:
 - 1. Percentage of organic matter.
 - 2. CEC, calcium percent of CEC, and magnesium percent of CEC.
 - 3. Soil reaction (acidity/alkalinity pH value).
 - 4. Buffered acidity or alkalinity.
 - 5. Nitrogen ppm.
 - 6. Phosphorous ppm.
 - 7. Potassium ppm.
 - 8. Manganese ppm.
 - 9. Manganese-availability ppm.
 - 10. Zinc ppm.
 - 11. Zinc availability ppm.
 - 12. Copper ppm.
 - 13. Sodium ppm.
 - 14. Soluble-salts ppm.

15. Presence and quantities of problem materials including salts and metals cited in the Standard protocol. If such problem materials are present, provide additional recommendations for corrective action.
16. Other deleterious materials, including their characteristics and content of each.
- D. Organic-Matter Content: Analysis using loss-by-ignition method according to SSSA's "Methods of Soil Analysis - Part 3-Chemical Methods."
- E. Recommendations: Based on the test results, state recommendations for soil treatments and soil amendments to be incorporated to produce satisfactory planting soil suitable for healthy, viable plants indicated. Include, at a minimum, recommendations for nitrogen, phosphorous, and potassium fertilization, and for micronutrients.
 1. Fertilizers and Soil Amendment Rates: State recommendations in weight per 1000 sq. ft. for 6-inch depth of soil.
 2. Soil Reaction: State the recommended liming rates for raising pH or sulfur for lowering pH according to the buffered acidity or buffered alkalinity in weight per 1000 sq. ft. for 6-inch depth of soil.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and compliance with state and Federal laws if applicable.
- B. Bulk Materials:
 1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 3. Do not move or handle materials when they are wet or frozen.
 4. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

PART 2 - PRODUCTS

2.01 PLANTING SOILS SPECIFIED ACCORDING TO PERFORMANCE REQUIREMENTS

- C. Planting-Soil: Existing, on-site surface soil, with the duff layer, if any, retained; and stockpiled on-site; modified to produce viable planting soil. Using preconstruction soil analyses and materials specified in other articles of this Section, amend existing, on-site surface soil to become planting soil complying with the following requirements:
 1. Particle Size Distribution by USDA Textures: Classified as sandy loam soil according to USDA textures.
 2. Percentage of Organic Matter: Minimum 6 percent by volume.
 3. Soil Reaction: pH of 6 to 7.
- D. Planting-Soil: Imported, naturally formed soil from off-site sources and consisting of sandy loam soil according to USDA textures; and modified to produce viable planting soil. Amend imported soil with materials specified in other articles of this Section to become planting soil complying with the following requirements:
 1. Sources: Take imported, unamended soil from sources that are naturally well-drained sites where topsoil occurs at least 4 inches deep, not from agricultural land, or marshes; and that do not contain undesirable organisms; disease-causing plant pathogens; or obnoxious weeds and invasive plants.
 2. Additional Properties of Imported Soil before Amending: Minimum of 6 percent organic-matter content, friable, and with sufficient structure to give good tilth and aeration. Clean soil to be of the following:
 - a. Unacceptable Materials: Concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.

- b. Unsuitable Materials: Stones, roots, plants, sod, clay lumps, and pockets of coarse sand that exceed a combined maximum of 8 percent by dry weight of the imported soil.
 - c. Large Materials: Stones, clods, roots, clay lumps, and pockets of coarse sand exceeding 3 inches in any dimension.
- E. Planting-Soil: Manufactured soil consisting of manufacturer's basic topsoil, sandy loam according to USDA textures, blended in a manufacturing facility with sand, stabilized organic soil amendments, and other materials as specified in other articles of this Section to produce viable planting soil.
 - 1. Basic Properties: Manufactured soil shall not contain the following:
 - a. Unacceptable Materials: Concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.
 - b. Unsuitable Materials: Stones, roots, plants, sod, clay lumps, and pockets of coarse sand that exceed a combined maximum of 5 percent by dry weight of the manufactured soil.
 - c. Large Materials: Stones, clods, roots, clay lumps, and pockets of coarse sand exceeding 2 inches in any dimension.

1.11 INORGANIC SOIL AMENDMENTS

- A. Inorganic soil amendments shall match recommendations provided by soil testing agency in required soil testing report.
- B. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:
 - 1. Class: T, with a minimum of 99 percent passing through a No. 8 sieve and a minimum of 75 percent passing through a No. 60 sieve.
 - 2. Class: O, with a minimum of 95 percent passing through No. 8 sieve and a minimum of 55 percent passing through a No. 60 sieve.
 - 3. Form: Provide lime in form of ground dolomitic limestone.
- C. Sulfur: Granular, biodegradable, and containing a minimum of 90 percent elemental sulfur, with a minimum of 99 percent passing through a No. 6 sieve and a maximum of 10 percent passing through a No. 40 sieve.
- D. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.
- E. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through a No. 50 sieve.
- F. Sand: Clean, washed, natural or manufactured, free of toxic materials, and according to ASTM C 33/C 33M.

1.12 ORGANIC SOIL AMENDMENTS

- A. Organic soil amendments shall match recommendations provided by soil testing agency in required soil testing report.
- B. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. Engle & Gray, Inc. 745 Betteravia Rd., Santa Maria, CA 93455; (805) 925-2771.
 - 2. Product: Harvest Blend Compost.
- C. Compost: Well-composted, stable, and weed-free organic matter produced by composting feedstock, and bearing USCC's "Seal of Testing Assurance," and as follows:
 - 1. Feedstock: Limited to leaves.
 - 2. Reaction: pH of 5.5 to 8.
 - 3. Soluble-Salt Concentration: Less than 4 dS/m.
 - 4. Moisture Content: 35 to 55 percent by weight.
 - 5. Organic-Matter Content: 30 to 40 percent of dry weight.
 - 6. Particle Size: Minimum of 98 percent passing through a 2-inch sieve.

- D. Sphagnum Peat: Partially decomposed sphagnum peat moss, finely divided or of granular texture with 100 percent passing through a 1/2-inch sieve, a pH of 3.4 to 4.8, and a soluble-salt content measured by electrical conductivity of maximum 5 dS/m.
- E. Wood Derivatives: Shredded and composted, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.
 - 1. Partially Decomposed Wood Derivatives: In lieu of shredded and composted wood derivatives, mix shredded and partially decomposed wood derivatives with ammonium nitrate at a minimum rate of 0.15 lb/cu. ft. of loose sawdust or ground bark, or with ammonium sulfate at a minimum rate of 0.25 lb/cu. ft. of loose sawdust or ground bark.
- F. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, debris, and material harmful to plant growth.

1.13 BIORETENTION SOIL MEDIA

- A. The planting media placed in the cell should achieve a long-term, in-place infiltration rate of at least 5 inches per hour. Higher infiltration rates of up to 12 inches per hour are permissible. Bioretention/biofiltration soil shall retain sufficient moisture to support vigorous plant growth. Soil media shall have a minimum porosity of 25%.
- B. Planting media should consist of 60 to 80% fine sand and 20 to 40% compost.
- C. Sand should be free of wood, waste, coating such as clay, stone dust, carbonate, etc. or any other deleterious material. All aggregate passing the No. 200 sieve size should be non-plastic. Sand for bioretention should be analyzed by an accredited lab using #200, #100, #40, #30, #16, #8, #4, and 3/8 sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation (Note: all sands complying with ASTM C33 for fine aggregate comply with the gradation requirements provided in Table 1):

Table 1 Sand Mixture

<u>Sieve Size</u>	<u>Percent Passing</u> <u>Min.</u>	<u>Percent Passing</u> <u>Max.</u>
3/8 inch	100	100
No. 4	90	100
No. 8	70	100
No. 16	40	95
No. 30	15	70
No. 40	5	55
No. 110	0	15
No. 200	0	5

- D. **Note:** The gradation of the sand component of the media is believed to be a major factor in the hydraulic conductivity of the media mix. If the desired hydraulic conductivity of the media cannot be achieved within the specified proportions of sand and compost, then it may be necessary to utilize sand at the coarser end of the range specified in above ("minimum" column).
- E. Compost should be a well decomposed, stable, weed free organic matter source derived from waste materials including yard debris, wood wastes, or other organic materials not including manure or biosolids meeting standards developed by the US Composting Council (USCC). The product shall be certified through the USCC Seal of Testing Assurance (STA) Program (a compost testing and information disclosure program). Compost quality should be verified via a lab analysis to be:

1. Feedstock materials shall be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.
2. Organic matter: 35-75% dry weight basis.
3. Carbon and Nitrogen Ratio: 15:1 < C:N < 25:1.
4. Maturity/Stability: shall have dark brown color and a soil-like odor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or is hot (120 F) upon delivery or rewetting is not acceptable.
5. Toxicity: any one of the following measures is sufficient to indicate non-toxicity:
 - a. $\text{NH}_4:\text{NH}_3 < 3$
 - b. Ammonium < 500ppm, dry weight basis.
 - c. Seed Germination > 80% of control.
 - d. Plant trials > 80% of control.
 - e. Solvita® > 5 index value.
6. Nutrient content:
 - a. Total Nitrogen content 0.9% or above preferred.
 - b. Total Boron should be <80 ppm, soluble boron < 2.5 ppm.
7. Salinity: <6.0 mmhos/cm.
8. pH between 6.5 and 8 (may vary with plant palette).
9. Compost for bioretention should be analyzed by an accredited lab using #200, ¼ inch, ½ inch, and 1 inch sieves (ASTM D422) and meet the gradation described in Table 2:

Table 2 Compost Mixture

<u>Sieve Size</u>	<u>Percent Passing</u> <u>Min.</u>	<u>Percent Passing</u> <u>Max.</u>
1 inch	99	100
½ inch	90	100
¼" inch	40	90
No. 200	2	10

- F. Tests should be sufficiently recent to represent the actual material that is anticipated to be delivered to the site. If processes or sources used by the supplier have changed significantly since the most recent testing, new tests should be requested.
- G. Note: the gradation of compost used in bioretention/biofiltration media is believed to play an important role in the saturated hydraulic conductivity of the media. To achieve a higher saturated hydraulic conductivity, it may be necessary to utilize compost at the coarser end of this range ("minimum" column). The percent passing the #200 sieve (fines) is believed to be the most important factor in hydraulic conductivity.
- H. In addition, a coarser compost mix provides more heterogeneity of the bioretention media, which is believed to be advantageous for more rapid development of soil structure needed to support health biological processes. This may be an advantage for plant establishment with lower nutrient and water input.
- I. At least 30 days prior to ordering materials, the Contractor shall submit to the Engineers representative samples, certificates, manufacturer's literature and certified tests for materials specified below. No materials shall be ordered until the required samples, certificates, manufacturer's literature and test results have been reviewed and approved by the Engineer. Delivered materials shall closely match the approved samples. Approval shall not constitute final acceptance. The engineer reserves the right to reject, on or after delivery, any material that does not meet these specifications.
- J. Submit two, one-half cubic foots representative samples of the bioretention soil media for approval. Submit one set of samples for every 500 CY of material delivered. In the event of multiple source fields for bioretention soil media, submit a minimum of one set of samples per source field or stockpile. Samples shall be taken randomly throughout the field or

stockpile at locations as directed by the Engineer and packaged in the presences of the Engineer. Samples shall be labeled to include the location of the source of the material, the date of the sample and the Contractor's name. Submit soil test analysis reports for each sample of soil media from an approved soil-testing laboratory. The test results shall report the following:

1. The soil testing laboratory shall be approved by the Engineer. The testing laboratory for particle size and chemical analysis may be a public agricultural extension service agency or agricultural experiment station.
2. Submit a bulk density of the sample and particle size analysis.
3. Submit a chemical analysis, performed in accordance with current Association of Official Agricultural Chemists Standards, including the following:
 - a. pH and Buffer pH.
 - b. Percent organic matter as determined by the loss of ignition of oven dried samples. Test samples shall be oven dried to a constant weight at a temperature of 230 degrees F, plus or minus 9 degrees.
 - c. Analysis for nutrient levels by parts per million including nitrate nitrogen, ammonium nitrogen, phosphorus, potassium, magnesium, manganese, iron, zinc, calcium and extractable aluminum. Nutrient test shall include the testing laboratory recommendations for supplemental additions to the soil as calculated by the amount of material to be added per volume of soil for the type of plants to be grown in the soil.

1.14 FERTILIZERS

- A. Fertilizers shall match recommendations provided by soil testing agency in required soil testing report.
- B. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.
- C. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
 1. Composition: 1 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified testing agency.
- D. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
 1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified testing agency.
- E. Chelated Iron: Commercial-grade FeEDDHA for dicots and woody plants, and commercial-grade FeDTPA for ornamental grasses and monocots.

PART 3 - EXECUTION

1.15 GENERAL

- A. Place planting soil and fertilizers according to requirements in other Specification Sections.
- B. Planting soil is expected to be incorporated in the planting areas to bring the site to finish grade where required.
- C. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in planting soil.
- D. Proceed with placement only after unsatisfactory conditions have been corrected.
- E. Do not deliver or place soils in frozen, wet or muddy conditions.

- F. Protect soils and mixes from absorbing excess water and from erosion at all times. Do not store materials unprotected from large rainfall events. Do not allow excess water to enter site prior to compaction. If water is introduced into the material after grading, allow material to drain or aerate to optimum compaction moisture content.

1.16 PREPARATION OF UNAMENDED, ON-SITE SOIL BEFORE AMENDING

- A. Excavation: Excavate or rip soil from designated area(s) to the following depths
 1. General Planting areas shall be over-excavated to a depth of 12 inches.
 2. Sunken stormwater planters shall be over-excavated to a depth of 30 inches.
- B. Unacceptable Materials: Clean soil of concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.
- C. Unsuitable Materials: Clean soil to contain a combined maximum of 8 percent by dry weight of stones, roots, plants, sod, clay lumps, and pockets of coarse sand.
- D. Screening: Remove rocks and other inorganic material greater than 3" in diameter.

1.17 PLACING SOIL OVER EXPOSED SUBGRADE

- A. General: Return unamended soil to planting areas on-site. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.
- B. Spreading: Spread unamended soil to within 4 inches of finish surface, but not less than required to meet finish grades after mixing with amendments, natural settlement, and application of mulch. Do not spread if soil or subgrade is frozen, muddy, or excessively wet.
 1. Lifts: Apply and mix unamended soil and amendments in lifts not exceeding 8 inches in loose depth for material compacted by compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- C. Compaction: Compact each blended lift of planting soil to 80-85 percent of maximum Standard Proctor density according to ASTM D 698 except where a different compaction value is indicated on Drawings.
- D. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

1.18 BLENDING PLANTING SOIL IN PLACE – GROUNDCOVERS AND TURF PLANTING AREAS

- A. General: For planting areas to receive turf or groundcover plantings, mix amendments with in-place, unamended soil to produce required planting soil. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.
- B. Preparation: Till unamended, existing soil in planting areas to a minimum depth of 4 inches. Remove stones larger than 3 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
- C. Mixing: Apply soil amendments and fertilizer as directed by soils test recommendations, evenly on surface, and thoroughly blend them into full depth of unamended, in-place soil to produce planting soil.
 1. Mix lime with dry soil before mixing fertilizer.
 2. Mix fertilizer with planting soil no more than seven days before planting.
- D. Compaction: Compact blended planting soil to 80-85 percent of maximum Standard Proctor density according to ASTM D 698 except where a different compaction value is indicated on Drawings.
- E. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

1.19 BLENDING PLANTING SOIL– CONTAINER PLANTS

- A. General: For planting areas to receive container plants (trees or shrubs), mix amendments with backfill soil to produce required planting soil. Do not apply materials if existing soil or subgrade is frozen, muddy, or excessively wet.
- B. Preparation: Excavate plant pits per Section 329200 "Plants". Remove stones larger than 3 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
- C. Mixing: Apply soil amendments and fertilizer, if required, evenly on surface, and thoroughly blend them into full depth of unamended, in-place soil to produce planting soil.
 - 1. Mix lime with dry soil before mixing fertilizer.
 - 2. Mix fertilizer with planting soil no more than seven days before planting.
- D. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

1.20 PLACING MANUFACTURED PLANTING SOIL IN GARDEN BEDS

- A. General: Apply manufactured soil on-site in its final, blended condition. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.
- B. Subgrade Preparation: Till subgrade to a minimum depth of 4 inches. Remove stones larger than 3 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
 - 1. Apply approximately half the thickness of planting soil over prepared, loosened subgrade. Mix thoroughly into top 4 inches of subgrade. Spread remainder of planting soil.
- C. Application: Spread planting soil to total depth within 6 inches from the top of the garden planters, but not less than required after natural settlement. Do not spread if soil or subgrade is frozen, muddy, or excessively wet.
 - 1. Lifts: Apply planting soil in lifts not exceeding 8 inches in loose depth for material compacted by compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- D. Compaction: Compact each lift of planting soil to 80-85 percent of maximum Standard Proctor density according to ASTM D 698 except where a different compaction value is indicated on Drawings.
- E. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

1.21 APPLYING COMPOST TO SURFACE OF PLANTING SOIL

- A. Application: Apply compost component of planting-soil mix to surface of in-place planting soil. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.
- B. Finish Grading: Grade surface to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

1.22 PLACING BIORETENTION SOIL MEDIA

- A. All areas to receive the bioretention soil shall be inspected by the Contractor before starting work and all defects such as incorrect grading, compaction and inadequate drainage etc. shall be reported to the Engineer prior to beginning this work.
- B. The Contractor shall be responsible for judging the full extent of work requirements involved, including but not limited to the potential need for temporary storage and staging of soils, including moving soil stock piles at the site to accommodate scheduling of other work and the need to protect installed soils from compaction, erosion and contamination.
- C. Bioretention soil media shall be fully mixed and placed in loose lifts. No greater than 6 inches at a time. All soil media should be analyzed for background levels of nutrients. Total phosphorus should not exceed 15 ppm.

1.23 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Perform the following tests:
 - 1. Compaction: Test planting-soil compaction after placing each lift and at completion using a densitometer or soil-compaction meter calibrated to a reference test value based on laboratory testing according to ASTM D 698. Space tests at no less than one for each 1000 sq. ft. of in-place soil or part thereof.
 - 2. Performance Testing: For each amended planting-soil type, demonstrating compliance with specified performance requirements. Perform testing according to "Soil-Sampling Requirements" and "Testing Requirements" articles.
- C. Soil will be considered defective if it does not pass tests.
- D. Prepare test reports.
- E. Label each sample and test report with the date, location keyed to a site plan or other location system, visible conditions when and where sample was taken, and sampling depth.

1.24 PROTECTION

- A. Protection Zone: Identify protection zones according to Section 015639 "Temporary Tree and Plant Protection."
- B. Protect areas of in-place soil from additional compaction, disturbance, and contamination. Prohibit the following practices within these areas except as required to perform planting operations:
 - 1. Storage of construction materials, debris, or excavated material.
 - 2. Parking vehicles or equipment.
 - 3. Vehicle traffic.
 - 4. Foot traffic.
 - 5. Erection of sheds or structures.
 - 6. Impoundment of water.
 - 7. Excavation or other digging unless otherwise indicated.
- C. If planting soil or subgrade is overcompacted, disturbed, or contaminated by foreign or deleterious materials or liquids, remove the planting soil and contamination; restore the subgrade as directed by Landscape landscape architect and replace contaminated planting soil with new planting soil.

1.25 CLEANING

- A. Protect areas adjacent to planting-soil preparation and placement areas from contamination. Keep adjacent paving and construction clean and work area in an orderly condition.
- B. Remove surplus soil and waste material including excess subsoil, unsuitable materials, trash, and debris and legally dispose of them off Owner's property unless otherwise indicated.
 - 1. Dispose of excess subsoil and unsuitable materials on-site where directed by Owner.

END OF SECTION 32 91 15

SECTION 32 92 00

TURF AND GRASSES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Sodding.
 - 2. Fertilizers
- B. Related Requirements:
 - 1. Section 329300 "Plants" for trees, shrubs, ground covers, and other plants as well as border edgings and mow strips.

1.03 DEFINITIONS

- A. Finish Grade: Elevation of finished surface of planting soil.
- B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.
- C. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
- D. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth. See Section 329115 "Soil Preparation (Performance Specification)" and drawing designations for planting soils.
- E. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.04 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Construction Manager, Superintendent, Landscape Contractor Foreman, Landscape Architect.

1.05 INFORMATIONAL SUBMITTALS

- A. Certification of Grass Sod: From seed vendor for each grass-seed monostand or mixture, stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
 - 1. Certification of each seed mixture for turfgrass sod. Include identification of source and name and telephone number of suppliers.
- B. Product Certificates: For fertilizers, from manufacturer.

1.06 CLOSEOUT SUBMITTALS

- A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of turf and meadows during a calendar year. Submit before expiration of required maintenance periods.

1.07 QUALITY ASSURANCE

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws, as applicable.
- B. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" sections in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod within 24 hours of harvesting and in time for planting promptly. Protect sod from breakage and drying.
- C. Bulk Materials:
 - 1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
 - 2. Accompany each delivery of bulk materials with appropriate certificates.

1.09 FIELD CONDITIONS

- A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of planting completion.
 - 1. Fall Planting: October 15 through December 31.
- B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

PART 2 - PRODUCTS

2.01 TURFGRASS SOD

- A. Turfgrass Sod: Certified, complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture that is strongly rooted and capable of vigorous growth and development when planted.
- B. Turfgrass Species, Cool-Season Grass: Sod of grass species as follows, with not less than 85 percent germination, not less than 95 percent pure seed, and not more than 0.5 percent weed seed:
 - 1. Products: Subject to compliance with requirements, provide the following available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Marathon II Sod.

2.02 BIOFILTRATION SOD

- A. Biofiltration Sod: a combination of dryland and wetland species that can tolerate drought conditions and limited amounts of standing water. Grown on degrading netting.
 - 1. Source: Delta Bluegrass Co., 111 N. Zuckerman Rd, Stockton, CA 95206.

2.03 FERTILIZERS

- A. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
 - 1. Composition:
 - a. 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
 - b. Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine areas to be planted for compliance with requirements and other conditions affecting installation and performance of the Work.
 - 1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
 - 2. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
 - 3. Uniformly moisten excessively dry soil that is not workable, or which is dusty.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.02 PREPARATION

- A. Protect structures; utilities; sidewalks; pavements; and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
 - 1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
 - 2. Protect grade stakes set by others until directed to remove them.

3.03 TURF AREA PREPARATION

- A. General: Prepare planting area for soil placement and mix planting soil according to Section 329115 "Soil Preparation (Performance Specification)."
- B. Placing Planting Soil: Blend planting soil in place.
 - 1. Reduce elevation of planting soil to allow for soil thickness of sod.
- C. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- D. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.04 SODDING

- A. Lay sod within 24 hours of harvesting unless a suitable preservation method is accepted by Architect prior to delivery time. Do not lay sod if dormant or if ground is frozen or muddy.
- B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to soil or sod during installation. Tamp and roll lightly to ensure contact with soil, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.
 - 1. Lay sod across slopes exceeding 1:3.
- C. Saturate sod with fine water spray within two hours of planting. During first week after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below sod.

3.05 TURF MAINTENANCE

- A. General: Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.

1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
 2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
 3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.
- B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches.
1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
 2. Water turf with fine spray at a minimum rate of 1 inch per week unless rainfall precipitation is adequate.
- C. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than one-third of grass height. Remove no more than one-third of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:
1. Mow Marathon II Sod to a height of 1-1/2 to 2 inches.
 2. Biofiltration Sod- does not require mowing. If mowing is desired, maintain these grasses at a mowing height of 3-4 inches. NEVER remove more than 1/3 of the leaf blade per mow cycle.
- D. Turf Postfertilization: Apply slow-release fertilizer after initial mowing and when grass is dry.
1. Use fertilizer that provides actual nitrogen of at least 1 lb/1000 sq. ft. to turf area.

3.06 SATISFACTORY TURF

- A. Turf installations shall meet the following criteria as determined by Architect:
1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.
 2. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.
- B. Use specified materials to reestablish turf that does not comply with requirements, and continue maintenance until turf is satisfactory.

3.07 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.
- C. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

END OF SECTION 32 92 00

SECTION 32 93 00

PLANTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Plants and Trees.
- B. Related Requirements:
 - 1. Section 015639 "Temporary Tree and Plant Protection" for protecting, trimming, pruning, repairing, and replacing existing trees to remain that interfere with, or are affected by, execution of the Work.
 - 2. Section 329115 "Soil Preparation (Performance Specification)"
 - 3. Section 329200 "Turf and Grasses" for turf (lawn) and meadow planting, hydroseeding, and erosion-control materials.
 - 4. Section 329400 "Landscape Planting Accessories"
 - 5. Section 329423 "Tree Grates and Tree Guards"
 - 6. Section 329813 "Landscape Maintenance/Establishment Period"

1.03 DEFINITIONS

- A. Backfill: The earth used to replace or the act of replacing earth in an excavation.
- B. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.
- C. Finish Grade: Elevation of finished surface of planting soil.
- D. Integrated Pest Management – is a holistic approach to mitigating insects, plant diseases, weeds, and other pests. It involves the use of many strategies for managing, but not eliminating pests. Integrated Pest Management (IPM) uses cultural, mechanical, physical, and biological control methods before using pesticides to control pests and diseases in the landscape. Chemical controls are applied only when monitoring indicates that preventative and non-chemical methods are not keeping pests below acceptable levels. When pesticides are required, the least toxic and the least persistent pesticide that will provide adequate pest control is applied.
- E. The Organic Materials Research Institute (OMRI) – is a national nonprofit organization founded in 1997 to support the organic community. OMRI reviews products to determine their suitability for producing, processing and handling organic food and fiber under the USDA National Organic Program Rule (OMRI General Materials List)
- F. Pesticide – As defined in Section 12753 of the California food and Agricultural Code, a pesticide includes any of the following: "(a) Any spray adjuvant. (b) Any substance, or mixture of substances which is intended to be used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling, or mitigating any pest, which may infest or be detrimental to vegetation, man, animals, or households, or be present in any agricultural or nonagricultural environment whatsoever". Antimicrobial agents are excluded from the definition of pesticide.
- G. The Organic Materials Research Institute (OMRI) – is a national nonprofit organization founded in 1997 to support the organic community. OMRI reviews products to determine

- their suitability for producing, processing and handling organic food and fiber under the USDA National Organic Program Rule (OMRI General Materials List)
- H. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
 - I. Planting Area: Areas to be planted.
 - J. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth. See Section 329115 "Soil Preparation (Performance Specification)" for drawing designations for planting soils.
 - K. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.
 - L. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots, the area of transition between the root system and the stem or trunk.
 - M. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.
 - N. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.04 COORDINATION

- A. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.
 - 1. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

1.05 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials.
 - 2. Plant Photographs: Include color photographs in digital format of each required species and size of plant material as it will be furnished to Project. Take photographs from an angle depicting true size and condition of the typical plant to be furnished. Include a scale rod or other measuring device in each photograph. For species where more than 50 plants are required, include a minimum of three photographs showing the average plant, the best quality plant, and the worst quality plant to be furnished. Identify each photograph with the full scientific name of the plant, plant size, and name of the growing nursery.
 - 3. Pesticides and Herbicides:
 - 4. Fertilizers
 - 5. Tree Staking and Tying
 - 6. Mulch verifying recycled content and source of material.
- B. Samples for Verification: For each of the following:
 - 1. Organic Mulch: 1-quart volume of each organic mulch required; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of color, texture, and organic makeup.
 - 2. Weed Control Barrier: 12 by 12 inches.
 - 3. Root Barrier: Width of panel by 12 inches.
- C. Lab Analysis Reports: See Section 32 91 15 "Soil Preparation"

1.06 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of owners' contact persons.
- B. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:
 - 1. Manufacturer's certified analysis of standard products.
 - 2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.
- C. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.
- D. Sample Warranty: For special warranty.

1.07 CLOSEOUT SUBMITTALS

- A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before expiration of required maintenance periods.

1.08 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful establishment of plants.
 - 1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
- B. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.
- C. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.
 - 1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container-grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches above the root flare for trees up to 4-inch caliper size, and 12 inches above the root flare for larger sizes.
 - 2. Other Plants: Measure with stems, petioles, and foliage in their normal position.
- D. Plant Material Observation: Landscape Architect and City Landscape Inspector may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Landscape Architect and City Landscape Inspector may also observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and may reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.
 - 1. Notify Landscape Architect of sources and estimated time of delivery of planting materials seven days in advance of delivery to site.
 - 2. Notify City Landscape Inspector of sources of planting materials seven days in advance of delivery to site and schedule an inspection of tree placement.
 - 3. Rejected plant material must be removed from the Project Site and replaced at the Contractor's time and expense.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws if applicable.

- B. Bulk Materials:
 - 1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
 - 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 - 3. Accompany each delivery of bulk materials with appropriate certificates.
- C. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.
- D. Handle planting stock by root ball.
- E. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.
 - 1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.
- F. Deliver plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.
 - 1. Retain subparagraphs below to suit Project.
 - 2. Do not remove container-grown stock from containers before time of planting.
 - 3. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly wet condition.

1.10 FIELD CONDITIONS

- A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.
- B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

1.11 WARRANTY

- A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner.
 - b. Structural failures including plantings falling or blowing over.
 - c. Faulty performance of tree stabilization.
 - d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 2. Warranty Periods: From date of planting completion.
 - a. Trees, Shrubs, Vines, and Ornamental Grasses: 12 months.
 - b. Ground Covers, Biennials, Perennials, and Other Plants: 12 months.
 - c. Annuals: 6 months.
 - 3. Include the following remedial actions as a minimum:
 - a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
 - b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.

- c. A limit of one replacement of each plant is required except for losses or replacements due to failure to comply with requirements.
- d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

PART 2 - PRODUCTS

2.01 PLANT MATERIAL

- A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant List, Plant Schedule, or Plant Legend indicated on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
 - 1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch in diameter; or with stem girdling roots are unacceptable.
 - 2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.
- B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Landscape Architect, with a proportionate increase in size of roots or balls.
- C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which begins at root flare according to ANSI Z60.1. Root flare shall be visible before planting.
- D. Annuals and Biennials: Provide healthy, disease-free plants of species and variety shown or listed, with well-established root systems reaching to sides of the container to maintain a firm ball, but not with excessive root growth encircling the container. Provide only plants that are acclimated to outdoor conditions before delivery.

2.02 FERTILIZERS

- A. Planting Tablets: Tightly compressed chip-type, long-lasting, slow-release, commercial-grade planting fertilizer in tablet form. Tablets shall break down with soil bacteria, converting nutrients into a form that can be absorbed by plant roots.
 - 1. Size: 7-gram tablets.
 - 2. Nutrient Composition: 12 percent nitrogen, 8 percent phosphorous, and 8 percent potassium, by weight plus micronutrients (12-8-8 NPK).

2.03 MULCHES

- 1. Refer to Section 32 94 00 Landscape Planting Accessories.

2.04 WEED-CONTROL BARRIERS

- A. Nonwoven Geotextile Filter Fabric: Polypropylene or polyester fabric, 3 oz./sq. yd. minimum, composed of fibers formed into a stable network so that fibers retain their relative position. Fabric shall be inert to biological degradation and resist naturally encountered chemicals, alkalis, and acids.
- B. Composite Fabric: Woven, needle-punched polypropylene substrate bonded to a nonwoven polypropylene fabric, 4.8 oz./sq. yd.

2.05 INTEGRATED/ORGANIC PEST MANAGEMENT

- A. Integrated Pest Management (IPM) practices shall be used to control pests and diseases in the landscape.
- B. Synthetic pre emergents are prohibited.
- C. Pesticides that are not allowed by OMRI in its generic materials list are prohibited.

2.06 TREE-STABILIZATION MATERIALS

- 1. Refer to Section 32 94 00 Landscape Planting Accessories.

2.07 MISCELLANEOUS PRODUCTS

- A. Wood Pressure-Preservative Treatment: AWP A U1, Use Category UC4a; acceptable to authorities having jurisdiction, and containing no arsenic or chromium.
- B. Root Barrier: Black, molded, modular panels 24" high (deep), 85 mils thick, and with vertical root deflecting ribs protruding 3/4 inch out from panel surface; manufactured with minimum 50 percent recycled polyethylene plastic with UV inhibitors.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Century Products Root Barrier.
 - b. Villa Root Barrier.
 - c. Substitutions: Products by other manufacturers that comply with specifications will be considered in accordance with Section 012500 – Substitution Procedures.
- C. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.
- D. Planter Drainage Gravel: Washed, sound crushed stone or gravel complying with ASTM D 448 for Size No. 8.
- E. Planter Filter Fabric: Nonwoven geotextile manufactured for separation applications and made of polypropylene, polyolefin, or polyester fibers or combination of them.
- F. Mycorrhizal Fungi: Dry, granular inoculant containing at least 5300 spores per lb of vesicular-arbuscular mycorrhizal fungi and 95 million spores per lb of ectomycorrhizal fungi, 33 percent hydrogel, and a maximum of 5.5 percent inert material.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine areas to receive plants, with Installer present, for compliance with requirements and conditions affecting installation and performance of the Work.
 - 1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
 - 2. Verify that plants and vehicles loaded with plants can travel to planting locations with adequate overhead clearance.
 - 3. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
 - 4. Uniformly moisten excessively dry soil that is not workable or which is dusty.
- B. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Landscape Architect and replace with new planting soil.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.
- B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Landscape Architect's and City Landscape Inspector's acceptance of layout before excavating or planting. Make minor adjustments as required.
 - 1. Notify City Landscape Inspector seven days in advance of delivery to site and schedule an inspection of tree placement.

3.03 PLANTING AREA ESTABLISHMENT

- A. General: Prepare planting area for soil placement and mix planting soil according to Section 329115 "Soil Preparation (Performance Specification)."
- B. Placing Planting Soil: Blend planting soil in place.
- C. Before planting, obtain Landscape Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.
- D. Planting Pits and Trenches: Excavate circular planting pits.
 - 1. Excavate planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are unacceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
 - 2. Excavate approximately three times as wide as ball diameter for container-grown stock.
 - 3. Excavate at least 12 inches wider than root spread and deep enough to accommodate vertical roots for bare-root stock.
 - 4. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
 - 5. If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
 - 6. Maintain angles of repose of adjacent materials to ensure stability. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
 - 7. Maintain supervision of excavations during working hours.
 - 8. Keep excavations covered or otherwise protected when unattended by Installer's personnel.
 - 9. If drain tile is indicated on Drawings or required under planting areas, excavate to top of porous backfill over tile.
- E. Backfill Soil: Subsoil and topsoil removed from excavations may be used as backfill soil unless otherwise indicated. Amend backfill soil as directed by required soil testing per Section 329115 "Soil Preparation (Performance Specification)"
- F. Obstructions: Notify Landscape Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.
- G. Drainage: Notify Landscape Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.
- H. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.04 TREE, SHRUB, AND VINE PLANTING

- A. Inspection: At time of planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball

- to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.
- B. Roots: Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.
 - 1. Backfill: Planting soil amended per required soils tests. For trees, use excavated soil for backfill.
 - 2. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
 - 3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
 - 4. Place planting tablets equally distributed around each planting pit when pit is approximately one-half filled. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
 - a. Quantity: As indicated on Drawings.
 - 5. Continue backfilling process. Water again after placing and tamping final layer of soil.
 - C. Container-Grown Stock: Set each plant plumb and in center of planting pit or trench with root flare 2 inches above adjacent finish grades.
 - 1. Carefully remove root ball from container without damaging root ball or plant.
 - 2. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
 - 3. Place planting tablets equally distributed around each planting pit when pit is approximately one-half filled. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
 - a. Quantity: As indicated on Drawings
 - 4. Continue backfilling process. Water again after placing and tamping final layer of soil.
 - D. Slopes: When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.05 TREE, SHRUB, AND VINE PRUNING

- A. Remove only dead, dying, or broken branches. Do not prune for shape.
- B. Prune, thin, and shape trees, shrubs, and vines as directed by Landscape Architect.
- C. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Landscape Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.
- D. Do not apply pruning paint to wounds.

3.06 TREE STABILIZATION

- A. Trunk Stabilization by Upright Staking and Tying: Install trunk stabilization as follows unless otherwise indicated:
 - 1. Upright Staking and Tying: Stake trees of 2- through 5-inch caliper. Stake trees of less than 2-inch caliper only as required to prevent wind tip out. Use a minimum of two stakes of length required to penetrate at least 18 inches below bottom of backfilled excavation and to extend to the dimension indicated on

- Drawings above grade. Set vertical stakes and space to avoid penetrating root balls or root masses.
- 2. Upright Staking and Tying: Stake trees with two stakes for trees up to 12 feet high and 2-1/2 inches or less in caliper; three stakes for trees less than 14 feet high and up to 4 inches in caliper. Space stakes equally around trees.
- 3. Support trees with bands of flexible ties at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.
- 4. Support trees with two strands of tie wire, connected to the brass grommets of tree-tie webbing at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.
- B. Trunk Stabilization by Staking and Guying: Install trunk stabilization as follows unless otherwise indicated on Drawings. Stake and guy trees more than 14 feet in height and more than 3 inches in caliper unless otherwise indicated.
 - 1. Site-Fabricated, Staking-and-Guying Method: Install no fewer than three guys spaced equally around tree.
 - a. Securely attach guys to stakes 30 inches long, driven to grade. Adjust spacing to avoid penetrating root balls or root masses. Provide turnbuckle for each guy wire and tighten securely.
 - b. For trees more than 6 inches in caliper, anchor guys to wood deadmen buried at least 36 inches below grade. Provide turnbuckle for each guy wire and tighten securely.
 - c. Support trees with bands of flexible ties at contact points with tree trunk and reaching to turnbuckle. Allow enough slack to avoid rigid restraint of tree.
 - d. Attach flags to each guy wire, 30 inches above finish grade.
 - 2. Proprietary Staking and Guying Device: Install staking and guying system sized and positioned as recommended by manufacturer unless otherwise indicated and according to manufacturer's written instructions.

3.07 ROOT-BARRIER INSTALLATION

- A. Install root barrier where trees are planted within 60 inches of paving or other hardscape elements, such as walls, curbs, and walkways, unless otherwise indicated on Drawings.
- B. Align root barrier vertically and run it linearly along and adjacent to the paving or other hardscape elements to be protected from invasive roots.
- C. Install root barrier continuously for a distance of 60 inches in each direction from the tree trunk, for a total distance of 10 feet per tree. If trees are spaced closer, use a single continuous piece of root barrier.
 - 1. Position top of root barrier flush with finish grade.
 - 2. Overlap root barrier a minimum of 12 inches at joints.
 - 3. Do not distort or bend root barrier during construction activities.
 - 4. Do not install root barrier surrounding the root ball of tree.

3.08 GROUND COVER AND PLANT PLANTING

- A. Set out and space ground cover and plants other than trees, shrubs, and vines as indicated on Drawings in even rows with triangular spacing.
- B. Use planting soil for backfill.
- C. Dig holes large enough to allow spreading of roots.
- D. For rooted cutting plants supplied in flats, plant each in a manner that minimally disturbs the root system but to a depth not less than two nodes.
- E. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.
- F. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.
- G. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.09 PLANTING AREA MULCHING

- A. Mulch backfilled surfaces of planting areas and other areas indicated.
 - 1. Organic Mulch in Planting Areas: Apply 3-inch average thickness of organic mulch over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 3 inches of trunks or stems.

3.10 PLANT MAINTENANCE

- A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.
- B. Fill in, as necessary, soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.
- C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices when possible to minimize use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

3.11 INTEGRATED PEST MANAGEMENT

- A. Contractor shall utilize integrated pest management (IPM) practices during installation and maintenance to control pests and disease in the landscape. IPM uses cultural, mechanical, physical, and biological control methods before using pesticides. Chemical controls are applied only when monitoring indicates that preventative and non-chemical methods are not keeping pests below acceptable levels. When pesticides are required, the least toxic and the least persistent pesticide that will provide adequate pest control is applied. Refer to BFL Guidelines and Maintenance Specification for more information.
- B. Controls
 - 1. Cultural/Mechanical/physical methods will be used as the first choice in weed management.
 - 2. Monitor planting areas frequently to identify and eradicate weeds early in the growth stage prior to their setting seed.
 - 3. Cut or pull weeds using hand operated equipment where possible.
 - 4. Mulches shall be maintained at all times over soil surface that is not covered by vegetation. (see also Section 3.3 E, Incorporate Organic Soil Amendments)
- C. If allowed on this project, Contractor shall apply all chemicals in a safe manner and according to label instructions and Agency, State and Federal requirements. A California Chemical Applicators license is required by the Contractor for chemical applications. The Contractor shall mix and apply chemicals to protect against accidental spills and drift to non-target areas, and to insure safety of the applicator. Any spilled chemicals, as well as contaminated soil, water, and/or landscape materials must be removed from the Project and disposed of in accordance with the Agency requirements. The Contractor shall maintain applicator's licenses and records of applications as required by the State.
- D. A Chemical Work Report shall be completed for each chemical application. The Contractor is responsible for submitting chemical usage reports to the County Agricultural Department.
 - 1. Contractor shall maintain records of all pest management activities. Each record shall include the following information:
 - a. target pest;
 - b. type and quantity of pesticide used;
 - c. site of the pesticide application;
 - d. date the pesticide was used;
 - e. name of the pesticide applicator;
 - f. application equipment used;
 - g. prevention and other non-chemical methods of control used.
 - 2. Contractor shall submit the pest management record to Owner on monthly basis.
- E. Herbicides

1. Least toxic herbicides may be employed by Contractor as a last resort. (Trade names are used only as examples and are not intended as an endorsement)
Examples are:
 - a. Fatty acid potassium salts (herbicidal soaps e.g. Safer's Superfast Weed and Grass Killer® Dr. Bronner's Peppermint Anti-Bacterial Soap)
 - b. Acetic and citric acids (e.g. Phydura ® Burnout II ®)
 - c. Clove, citrus, mint and thyme oil (e.g. Avenger®, Matran II®)
 - d. Corn gluten
 - e. Low-toxic, low-residual herbicide [e.g. glyphosate (Round-up®), glufosinate-ammonium (Finale®), pelargonic acid (Scythe®)]
2. Restricted herbicides that may not be used because they have been identified as ground water contaminants are (trade names in parentheses):
 - a. Atrazine (Aatrex)
 - b. Simazine (Princep)
 - c. Bromacil (Hyvar, Krovar)
 - d. Prometon (Pramitol)
 - e. Bentazon (Basagran)
 - f. Norflurazon (Solicam, Predict, Zorial)
3. Restricted herbicides that may not be used because they have been identified as a compost contaminant are:
 - a. Picloram
 - b. Clopyralid

3.12 REPAIR AND REPLACEMENT

- A. General: Repair or replace existing or new trees and other plants that are damaged by construction operations, in a manner approved by Landscape Architect.
 1. Submit details of proposed pruning and repairs.
 2. Perform repairs of damaged trunks, branches, and roots within 24 hours, if approved.
 3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Landscape Architect.
- B. Remove and replace trees that are more than 25 percent dead or in an unhealthy condition before the end of the corrections period or are damaged during construction operations that Landscape Architect determines are incapable of restoring to normal growth pattern.
 1. Provide new trees of same size as those being replaced for each tree of 6 inches or smaller in caliper size.
 2. Species of Replacement Trees: Same species being replaced.

3.13 CLEANING AND PROTECTION

- A. During planting, keep adjacent paving and construction clean and work area in an orderly condition. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.
- C. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.
- D. After installation and before Substantial Completion, remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.
- E. At time of Substantial Completion, verify that tree-watering devices are in good working order and leave them in place. Replace improperly functioning devices.

3.14 MAINTENANCE SERVICE

- A. Maintenance Service for Trees and Shrubs and all landscape areas: Provide maintenance by skilled employees of landscape Installer. Maintain as required in "Plant Maintenance" Article. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:

1. Maintenance Period: See Section 32 98 13

END OF SECTION 32 93 00

SECTION 32 94 00

LANDSCAPE PLANTING ACCESSORIES

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes materials, labor, apparatus, tools, equipment, temporary construction, transportation, and services necessary for and incidental to performing the proper completion of Work, as required to make a complete exterior Landscape Planting Accessories installation, as shown in the Contract Drawings, and as specified herein this Section.
- B. Work under this Section consists of, but is not necessarily limited to, furnishing, and installing the following:
 - 1. Mulches (wood products) for trees & shrubs.
 - 2. Stakes.
 - 3. Landscape Edging.
 - 4. Miscellaneous Materials (Herbicides, Vitamin Stimulant/Root Hormone, etc.).
- C. Related Sections: The following Sections contain requirements that relate to Work in this Section:
 - 1. Section 311100 – Site Clearing
 - 2. Section 320191 – Tree Protection and Root Pruning.
 - 3. Section 328400 – Planting Irrigation.
 - 4. Section 329300 – Plants
 - 5. Section 329813 – Landscape Maintenance / Establishment Period.

1.02 DEFINITIONS AND APPLICABLE STANDARDS

- A. References:
 - 1. ASTM – American Society for Testing and Materials.
 - 2. ANSI – American National Standards Institute.
- B. Definitions: (Not Used).
- C. Measurements:
 - 1. PSI: Measurement, in pounds per square inch.
 - 2. CU/FT: Measurement, in cubic foot.
 - 3. PPM: Measurement, in parts per million.

1.03 SUBMITTALS

- A. General:
 - 1. Collect information into a single Submittal for each element of construction and type of product or equipment identified under this Section for review.
 - 2. To expedite review, Submittal shall be organized and presented into specific sections or headings. Furnish neat, concise, legible, and clearly identifiable information, and sufficiently explicit detail, to enable proper evaluation for Contract compliance. Highlight catalog, product data, or brochures containing various products, sizes, and materials to show particular item submitted.
 - 3. Submittal Format: As applicable, furnish Submittal as a single electronic digital PDF (Portable Document Format) file.
- B. Digital Submittal Information:

1. Product/Material Data. Submit available product/material literature supplied by manufacturer's, indicating that their products comply with specified requirements. Provide manufacturing source (name, address, and telephone number), and distributor source (name, address, and telephone number) for each type of product/material.
 2. Qualification Data: Submit names for firms and persons specified in the "Quality Assurance and Control" Article to demonstrate their capabilities and experience on similar Landscape Planting Accessories installations.
- C. Material Samples: Submit four (4) sets of physical Material Samples for review of kind, color, pattern, size, and texture for a check of these characteristics with other elements, and for a comparison of these characteristics between Submittal and actual component as delivered and installed. Include the full range of exposed color and texture expected in the completed Work. Provide Material Samples bound and individually wrapped in re-sealable labeled 1-gallon plastic bags (as applicable):
1. 0.50 cubic foot of Landscape Mulch Material (Shredded Wood Mulch).
 2. One (1) set of Tree Tying/Staking Materials for each type used, as applicable.
 3. One (1) two-foot (2'-0") square sample of Weed Control Barrier / Geotextile Filter Fabric for each type used, as applicable.
- D. Scaled Shop Drawings: Not Required.
- E. Field-Constructed Mock-ups: Not Required.
- F. Submittals under this Article will be rejected and returned without the benefit of review by the City Engineer or his/her designated representative if they are difficult to read due to insufficient scale, poor image quality, or poor drafting quality; or if all of the required information is missing or not presented in the format as requested. Partial Submittals will not be accepted.
- G. No Work shall proceed under this Section until Submittal requirements indicated herein have been reviewed accordingly by the City Engineer or his/her designated representative.

1.04 LANDSCAPE EDGING WARRANTY

- A. 15-year limited material warranty for landscape edging from manufacturing defects in workmanship or material.

1.05 QUALITY ASSURANCE AND CONTROL

- A. Installer Qualifications:
1. Requirement: Valid California C-27 (Landscaping Contractor) License.
 2. Engage an experienced Installer who has completed Landscape Planting Accessories work similar in material, design, and extent to that indicated for this Project and with a record of successful installation.
 3. Installer's Field Supervision: Installer shall maintain an experienced full-time supervisor on the Project site during times that installations under this Section are in progress.
- B. Observation: City Engineer or his/her designated representative may observe installation of Landscape Planting Accessories at Project Site for compliance with requirements for type, size, and quality. City Engineer or his/her designated representative retains right to observe Landscape Planting Accessories for defects and to reject unsatisfactory or defective material at any time during progress of Work. Contractor shall remove rejected Accessories immediately from Project site.
- C. Manufacturer's Directions: Follow Manufacturer's directions and drawings in cases where the Manufacturers of articles used in this Section furnish directions covering points not shown in the Contract Drawings and Contract Specifications.
- D. Permits, Fees, Bonds, and Inspections: Contractor shall arrange and pay for permits, fees, bonds, testing services, and inspections necessary to perform and complete Work under this Section.
- E. Single-Source Responsibility: Obtain each color, type, and variety of products/materials from a single source with resources to provide products/materials of consistent quality in appearance

and physical properties without delaying Work.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Provide new, unused materials indicated under this Section. Store and secure properly to prevent theft or damage. Deliver and store perishable material in original, unopened packaging. It is the responsibility of the Contractor to install "factory condition" Units.
- B. Damaged Materials: Be responsible for all damage or disfiguration of Work until Final Acceptance. Remove off site and replace at no additional cost to City all damaged or rejected materials.
- C. Deliver materials so as to not delay Work and install only after preparations for installation have been completed.

1.07 COORDINATION, SCHEDULING, AND OBSERVATIONS

- A. Utilities: Determine location of above grade and underground utilities and perform Work in a manner which will avoid damage to utilities. Hand excavate, as required. Maintain grade stakes until removal is mutually agreed upon by parties concerned.
- B. Excavation: When conditions detrimental to installing Landscape Planting Accessories are encountered, such as rubble fill, adverse drainage conditions, or obstructions, cease installation operations and notify City Engineer or his/her designated representative for further direction.
- C. Field Measurements: Contractor shall take field measurements as required. Report major discrepancies between the Contract Drawings and field dimensions to the City Engineer or his/her designated representative prior to commencing Work.
- D. Installation: Perform installation of Landscape Planting Accessories only when weather and soil conditions are suitable in accordance with locally accepted practices.
- E. Construction Site Observations: Contractor shall request, in writing, at least one (1) week in advance of the time when mandatory site observation(s) by the City Engineer or his/her designated representative are required.

1.08 SUBSTITUTIONS

- A. Consideration: Materials to be considered equal to the Materials indicated herein this Section shall be reviewed by the City Engineer or his/her designated representative. Materials with equal performance characteristics produced by other Manufacturer's and/or Distributors may be considered, providing deviations in dimensional size, color, composition, operation, and/or other characteristics do not change the design concept, aesthetic appearance, nor intended performance, as solely judged by the City Engineer or his/her designated representative. The burden of proof on product equality is on the Contractor.
- B. Specific reference to Manufacturer's names and products specified herein are used as standards of quality. This implies no right to the Contractor to substitute other materials without prior written approval by the City Engineer or his/her designated representative for Work under this Section.
- C. Materials substituted and installed by the Contractor, without prior written approval by the City Engineer or his/her designated representative, may be rejected. Contractor shall not be entitled to be compensated by the City where the Contractor has installed rejected substitutions without receiving prior written approval.
- D. Contract Price: Substituted Materials under this Section shall not increase the Contract price.

1.09 LANDSCAPE MAINTENANCE/ ESTABLISHMENT PERIOD

- A. Refer to Section 329813 – Landscape Maintenance Establishment Period, for requirements under this Article.
 - 1. During the duration of the Landscape Maintenance / Establishment Period, continuously maintain Landscape Planting Accessories by tightening, holding plumb, and/or repairing

Staking supports, providing adequate depths and coverage requirements of Landscape Mulching Materials, hold Edging Materials true and in proper alignments, and other requirements, as required, to establish healthy, viable landscape planting materials until Final Acceptance of Work is granted.

PART 2 - PRODUCTS

2.01 LANDSCAPE MULCH MATERIALS

- A. Shredded Wood Mulch: Shredded Wood Mulch, free from deleterious materials, debris, and weed seed. Suitable as a top dressing of trees, shrubs, and groundcovers, consisting of following:
1. Type: Shredded cedar, redwood, fir, or hardwood commercial wood bark products, composted with humus and leaf materials. Shredded Wood Mulch shall be graded and to average dimensions of one-inch (1") to three-inches (3") in length, and flat in cross-section.
 - a. Minimum organic matter content at 80%.
 - b. pH between 5.0 and 8.0.
 - c. Salt content shall be less than 4 millimho/cm @ 25 ° C. on a saturated paste extract.
 - d. Boron content of the saturated extract shall be less than 1.0 parts per million.
 - e. Calcium carbonate shall not be present.
 - f. Carbon: Nitrogen ratio is less than 100:1.
 - g. Compost shall be aerobic without malodorous presence of decomposition products.
 - h. Maximum particle size shall be 2 inches. A maximum of 5% shall pass a No. 2 screen.

<i>Maximum Total Permissible Pollu- tant Concentrations (in parts per million (PPM)) on a dry weight ba- sis:</i>	
Arsenic	20 ppm
Molybdenum	30 ppm
Cadmium	15 ppm
Nickel	50 ppm
Chromium	150 ppm
Selenium	25 ppm
Cobalt	50 ppm
Silver	10 ppm
Copper	150 ppm
Vanadium	50 ppm
Lead	150 ppm
Zinc	150 ppm
Mercury	10 ppm

2. Coverage Depth:
 - a. Refer to Part III indicated herein this Section.
3. Products & Manufacturer's: Subject to compliance with requirements, provide products by one (1) of the following:
 - a. *Cover Mulch (formerly ES-2 Mulch)*, Agromin Horticultural Products.
 - b. *Pacific Mulch™*, Greenways Environmental.

- c. *Walk-On Chips*, Earthworks Soil Amendments, Inc.
- d. *Landscape Mulch*, Agri Service, Inc.
- e. *A-1 Oak Deco Chips*, Hanson Aggregates/A-1 Soils.
- f. *#SBM 3, Special Mulch #3*, Plants Choice, Inc.
- g. Or equal, as approved by the City Engineer or his/her designated representative.

2.02 STAKES

A. Tree Staking Assembly:

1. Wooden Stake Tree Staking Assembly: Complete tree staking Unit, consisting of Lodge Pole Pine Tree Stakes with Tree Straps
 - a. Tree Stakes: Lodge Pole Pine Wooden Tree Stake, straight shaft, shaved and cut, cleaned and bare of branches and stubs, free of loose knots, bends, splits, or bows, of uniform thickness, with a minimum diameter of either two-inches (2") or two-one-half (2-1/2") to three-inches (3"). Lengths shall be eight-feet (8'), ten-feet (10') or twelve-feet (12'), as required, to adequately and firmly penetrate the sub grade and support the tree. Stake shall have a minimum ten-inch (10") long tapered/conical driving point, and chamfered top to minimize splitting when driven. Stake shall be pressure treated (per Federal Specification TT-W-00571-J-Table 2) with an EPA- registered pesticide containing inorganic arsenic (copper chromium arsenate, meeting Federal Specification TT-W-550-Type 1) to protect it from insect attack and decay.
 - 1) Quantity, Size, and Length per tree:
 - a) #15 container stock: One (1), two-inch (2") diameter, 10'-0 long or 12'-0" long (as required) Wooden Tree Stake per tree.
 - b) 24" box container stock: Two (2) Two-inch (2") diameter, ten- foot (10') long or twelve-foot (12') long (as required) Wooden Tree Stakes per tree.
 - c) >24" box container stock: Minimum two (2) two-one-half- inches (2-1/2") or three-inches (3") diameter, ten-foot (10') or twelve-foot (12') long (as required) Wooden Tree Stakes per tree.
 - 2) Special Circumstances: Should lengths of Wooden Tree Stakes be inadequate to satisfactorily support the tree being staked in an upright, plumb condition.
 - 3) Products & Manufacturer's: Subject to compliance with requirements, provide products by one (1) of the following:
 - a) Villa Root Barrier, Site One Landscape Supply.
 - b) BVC Tree Stakes.
 - c) TruStakes, 4Seasons Wood Products.
 - d) Or equal, as approved by the City Engineer or his/her designated representative.
 - b. Tree Straps: Non-stretch, biodegradable cotton, dyed dark-green color, one-inch (1") wide x eighteen-inches (18") long, with one-inch (1") brass grommets at each end. Break strength at 260 lbs. nominal.
 - 1) Quantity, Size, and Length per tree:
 - a) #5 container stock: Provide two (2) Tree Straps minimum for each Tree Stake provided.
 - b) #15 container stock: Provide two (2) Tree Straps minimum for each Tree Stake provided.
 - c) 24" box container stock and larger: Provide two (2) Tree Straps minimum for each set of Tree Stakes provided.
 - 2) Products & Manufacturer's: Subject to compliance with requirements, provide products by one (1) of the following:
 - a) #3718 Biodegradable Original Treestrap®, GCS.
 - b) Or equal (no known equal).

- 3) Tree Strap Wire: Smooth, galvanized annealed Steel Wire, 12 gauge. Provide Wire in adequate lengths to anchor the grommet ends of the Tree Straps to the Tree Stakes.

2.03 PLANTING ACCESSORIES

- A. Extra Heavy Duty Straight Profile Edging: Permaloc CleanLine XL, 3/16 inch (4.8 mm) x 6" (152 mm) high, extruded aluminum, 6063 alloy, T-6 hardness, landscape edging for straight-line and curvilinear applications in corrugated straight profile, as manufactured by PermaLoc Corporation, Holland MI 49424, telephone (800) 356-9660.
- B. Thickness: 3/16 inch (4.8 mm) gage section at 0.116 inch (2.95 mm) minimum thick with 0.375 inch (9.53 mm) exposed top lip.
- C. Length: 16 feet (2.44 meters) sections.
- D. Connection Method: Section ends shall splice together with the sliding XLR Adaptor.
- E. Stake: 18 inch (457 mm) Permaloc Standard Stake, 0.10 inch (2.5 mm) thick, with optional extruded aluminum, heavy duty 0.125 inch (3.2 mm) thick x 18 inches (457 mm)
- F. Finish: Black DuraFlex Painted, Paint finish shall comply with AAMA 2603 for electrostatically baked on paint.

2.04 MISCELLANEOUS MATERIALS

- A. Water: Per ASTM C94, from potable domestic source, and free from deleterious materials such as oils, acids, and organic matter. Transport as required.
- B. Stress Reducing Agent: 100% natural organic root and plant stimulator solution, used to eliminate transplant shock and provide better establishment of plants. Solution shall contain a natural wetting agent, designed to improve nutrient release, water-holding capacity, cation exchange capacity in soil, and stimulate fertilizer and micronutrient uptake.
 1. Products & Manufacturer's: Subject to compliance with requirements, provide products by one (1) of the following:
 - a. *Roots NoBurn®*, Novozymes Biologicals, Inc., Salem, VA.
 - b. *Essential® Plus 1-0-1*, Growth Products, White Plains, NY.
 2. Application Rate: Provide at prescribed rate and application per Manufacturer's written recommendations.
- C. Wetting Agent and Soil Penetrant (Surfactant): Highly concentrated liquid solution. Provide in a diluted liquid solution, mixed with water, at the time of watering-in recently planted plant species.
 1. Products & Manufacturer's: Subject to compliance with requirements, provide products by one (1) of the following:
 - a. *Roots NoBurn®*, Novozymes Biologicals, Inc., Salem, VA.
 - b. *LESCO-Wet™ Plus*, Lesco, Inc., Cleveland, OH.
 - c. *Naiad Liquid Wetting Agent*, Naiad Company, Inc., Stockton, CA.
 - d. *Aqua-Gro L*, Scotts Company, Marysville, OH.
 - e. *Sixteen-90*, Aquatrols, Cherry Hills, NJ.
 - f. Or equal, as approved by the City Engineer or his/her designated representative.
 2. Application Rate: Provide at prescribed rate and application per Manufacturer's written recommendations, per one hundred (100) gallons of water.
- D. Plant Vitamin/Hormone Stimulant: Highly concentrated liquid vitamin solution. Provide in a diluted liquid solution, mixed with water, at the time of watering-in recently planted plant species.
 1. Products & Manufacturer's: Subject to compliance with requirements, provide products by one (1) of the following:
 - a. *SUPERthrive*, Vitamin Institute.
 - b. *Roots Concentrate Rooting Stimulant*, Novozymes Biologicals, Inc.
 - c. *Root-Maxx Plus*, Bio-Plex.
 - d. Or equal, as approved by the City Engineer or his/her designated representative.

2. Application Rate: Provide at prescribed rate and application per Manufacturer's written recommendations, per one-hundred (100) gallons of water.
- E. Herbicides: EPA registered and approved, from the following:
 1. Non-Selective Post-Emergent Herbicide: Spray-applied solution containing a minimum of 41% of the active ingredient "glyphosate" (full strength), with a surfactant, mixed with water accordingly per the Manufacturer's directions.
 - a. Products & Manufacturer's: Subject to compliance with requirements, provide products by one (1) of the following:
 - 1) *Roundup® PRO*, (41% glyphosate), Monsanto Company.
 - 2) *Roundup® PROMax* (concentrate, 50% glyphosate), Monsanto Company.
 - 3) *Honcho® Plus*, (41% glyphosate), Monsanto Company.
 - 4) *Prosecutor* (41% glyphosate), LESCO, Inc.
 - 5) *High Yield® Kill-Zall Weed & Grass Killer*, (41% glyphosate), Voluntary Purchasing Groups.
 - 6) Or equal, as approved by the City Engineer or his/her designated representative.
 - b. Application Rate: Provide at prescribed rate and application per Manufacturer's written recommendations, per one-hundred (100) gallons of water.
 2. Selective Pre-Emergent Herbicide (Packaged dry material application): Pre-emergent control of annual grasses and broadleaf weeds in turf grass areas, and woody ornamental trees, shrubs, vines, and groundcover areas.
 - a. Products & Manufacturer's: Subject to compliance with requirements, provide products by one (1) of the following:
 - 1) *Ronstar® 2G*, (granular), Aventis Environmental Science USA.
 - 2) *Snapshot® 2.5 GT* (granular), (2% trifluralin), Dow AgroSciences LLC.
 - 3) *XL*2G*, SETRE Chemical Company.
 - 4) *Casoron 4G*, Chemtura.
 - 5) *Treflan® HFP* (43% trifluralin), Dow AgroSciences LLC.
 - 6) *Treflan® TR-10*, (10% Granular trifluralin), Dow AgroSciences LLC.
 - 7) *Surflan®*, Dow AgroSciences, LLC.
 - 8) Or equal, as approved by the City Engineer or his/her designated representative.
 - b. Application Rate: Provide at prescribed rate and application per Manufacturer's written recommendations, per one-hundred (100) gallons of water.
 3. Selective Post-Emergent Herbicide: Pre-mixed, flow-able formulation designed for product stability, uniformity in the spray solution and ease of handling. Post-emergent control of annual grasses, nutsedge, and broadleaf weeds in turf, generally with one (1) application.
 - a. Products & Manufacturer's: Subject to compliance with requirements, provide products by one (1) of the following:
 - 1) *Trimec® Plus*, PBI/Gordon Corporation.
 - 2) *Three-Way*, LESCO, Inc.
 - 3) Or equal, as approved by the City Engineer or his/her designated representative.
 - b. Application Rate: Provide at prescribed rate and application per Manufacturer's written recommendations, per one hundred (100) gallons of water.

PART 3 - EXECUTION

3.01 GENERAL

- A. Installation practices of the Landscape Planting Accessories shall be performed during those periods when weather and soil conditions are suitable and in accordance with locally accepted horticultural practice, as approved by the City Engineer or his/her designated representative. Contractor shall notify the City Engineer or his/her designated representative, in writing, on the

anticipated commencement date and length of duration of the landscape installation.

- B. Examination: Examine areas to receive landscaping for compliance with requirements and for conditions affecting performance of Work of this Section. NO WORK UNDER THIS SECTION SHALL COMMENCE UNTIL ALL SUBMITTALS UNDER THIS SECTION HAVE BEEN REVIEWED AND APPROVED, IN WRITING. DO NOT PROCEED WITH INSTALLATION UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.
- C. Prior to Work in this Section, Contractor shall examine previously installed Work from other trades and verify that such Work is complete and as required, to the point where the installation of the Landscape Planting Accessories may commence properly.

3.02 PROTECTION OF SITE

- A. Contractor shall protect existing and new improvements and systems installed prior to installation of Landscape Planting Accessories. Maintain protection in place until completion of Work and Landscape Maintenance / Establishment Period.

3.03 LANDSCAPE EDGING INSTALLATION

- A. Preparation: Ensure that all underground utility lines are located and will not interfere with the proposed edging installation before beginning work. Locate border line of edging with string or other means to assure border straightness and curves as designed. Dig trench 1 inch (25 mm) deeper than set of edging bottom.
- B. Set edging into trench with top at ½ inch (12.7 mm) above compacted finish grade on turf side with side having loops for stakes placed on opposite side of turf. Drive stakes through edging loops until locked in place. Requires 5 stakes evenly spaced for each 16 feet (4.88 meters) section, or 3 stakes evenly spaced for each 8 feet (2.44 meters). Provide additional stakes at approximately 24 inches apart, longer stakes, heavier gage stakes, or any combination of previously mentioned as necessary to firmly secure edging for permanent intended use.
- C. Where edging sections turn at corners and at angled runs, cut edging partially up through its height from bottom and turn back to desired angle to form rounded exposed radius. Preformed corners are also available upon request.
- D. Backfilling and Cleanup: Backfill both sides of edging, confirm and adjust if necessary that sections are securely held together, and compact backfill material along edging to provide top of edging at 1/2 inch (12.7 mm) above turf finish grade. Cleanup and remove excess material from site.

3.04 STAKING

- A. General: Tree Staking shall be per the direction of the City Engineer or his/her designated representative. Staking of trees shall be completed immediately following tree planting operations.
 - 1. Contactor shall provide new Tree Stake assemblies; reconditioned or previously- used Tree Stake or Tree Guy assemblies shall not be permitted. Provide one (1) set of Tree Staking materials per tree, as required. Trees shall remain plumb and straight from installation through the Contractor Warranty period. Staking assemblies shall remain the property of the City.
- B. Staking Methodology: Unless otherwise directed on the Contract Drawings or as directed by the City Engineer or his/her designated representative based on field conditions, provide the following Staking Assemblies, as measured by the size of the tree being supported:
 - 1. 15-gallon size Container Stock to 36"-Box Tree, or for trees up to 3" caliper: Provide Staking Method. Number of stakes per tree shall be as directed herein this Section.
 - 2. For trees larger than 36"-Box size or over 3" caliper: Provide Staking as directed by the City Engineer or his/her designated representative.
- C. Tree Staking Method:

1. Single Tree Stake:
 - a. Locate Stake at the closest point to the main trunk as possible, yet outside of the root ball and tree branch canopy.
 - b. Firmly drive the tapered end of the Stake plumb into the undisturbed native sub-grade, perpendicular to the side of the prevailing wind, at the minimum depth indicated in the Contract Drawings, or deeper, as required, to firmly support the Stake and minimize any movement of the Stake. Do not damage the tree trunk nor branch canopy, nor penetrate the root ball with the Stake. Do not damage or splinter the Stake. Stake shall not touch the trunk nor branch canopy of the tree.
2. Double Tree Stakes:
 - a. Locate Stakes at the closest point to the main trunk as possible, yet outside of the root ball and tree branch canopy.
 - b. Firmly drive the tapered end of one (1) of the Stakes plumb into the undisturbed native sub-grade, perpendicular to the side of the prevailing wind, at the minimum depth indicated in the Contract Drawings, or deeper, as required, to firmly support the Stake and minimize any movement of the Stake. Do not damage the tree trunk or branch canopy, nor penetrate the root ball with the Stake. Do not damage or splinter the Stake.
 - c. Install the other Stake in similar fashion, directly opposite from the first Stake (180 degrees), and equidistant from the tree trunk.
 - d. Installed Stakes shall not touch the trunk nor branch canopy of the tree.
3. Tying to Tree Stakes:
 - a. Tree Straps: Wrap and twist the Tree Strap around the tree trunk, at the lowest point where the tree gains the highest support, per the direction of the City Engineer or his/her designated representative. Secure the Strap with wire; thread the wire through the grommet ends of the Strap and twist wire to secure. Wrap other end of wire around the Stake, twist, and secure it to the Stake. Repeat for other Stake(s), as required. For trees requiring multiple tree straps, locate additional straps as required along the tree trunk to provide additional vertical support. Cut off and bend back excessive wire beyond the twists to the Stake(s) to provide a safe condition. The tree shall be supported accordingly to assure a straight, firm position of the tree canopy, yet to allow enough slack to avoid rigid restraint of the tree.
 - b. Once the tree is thoroughly staked, carefully remove the nursery stake(s). Backfill and tamp the nursery stake void(s) with planting soil.

3.05 MULCHING

- A. General: Mulch backfilled surfaces of pits, trenches, planted areas, and other areas, that are not receiving hydroseeding, as indicated.
- B. Shredded Wood Mulch:
 1. General: Verify locations to receive Shredded Wood Mulch.
 2. Apply the following average thickness of Shredded Wood Mulch, and finish level with adjacent finished surfaces. Do not place Shredded Wood Mulch directly against trunks or stems of Plant Materials. Remove Shredded Wood Mulch that is placed against the growing bases or within the basal nodes of plants.
 3. Thickness/Depth: Refer to contract Drawings.
 4. While settlement and/or decomposition of the Shredded Wood may occur during the duration of the Contract, the Shredded Wood Mulch thickness as indicated shall be consistent throughout the duration of the Contract. The Contractor shall provide additional Shredded Wood Mulch, as needed, and as directed by the City Engineer or his/her designated representative, to maintain the specified constant thickness of the Shredded Wood Mulch, until Acceptance of Work is granted.

3.06 INSTALLATION OF MISCELLANEOUS MATERIALS

- A. Anti-Dessicant: Apply using power spray to provide an adequate film over trunks, branches, stems, twigs, and foliage.
 - 1. When deciduous trees or shrubs are moved in full-leaf, spray with anti-desiccant at nursery before moving and again two (2) weeks after planting.
- B. Stress Reducing Agent: Apply, as required and directed by the City Engineer or his/her designated representative, per Manufacturer's latest printed instructions.
- C. Wetting Agent & Soil Penetrant: Apply, as required, and directed by the City Engineer or his/her designated representative per Manufacturer's latest printed instructions.
- D. Herbicides: Apply, as required, and directed by the City Engineer or his/her designated representative, per Manufacturer's latest printed instructions.
- E. Plant Vitamin/Root Stimulant: Apply, per the Manufacturer's latest printed instructions.

3.07 CLEAN UP AND PROTECTION

- A. For Work under this Section, keep Work area in a clean, orderly, and safe condition. Contractor shall remove trash caused from his Work on a weekly basis throughout the duration of the Work.
- B. Protect landscaping from damage due to landscape operations, operations by other Contractors and trades, and trespassers. Maintain protection during installation and landscape maintenance / establishment periods. Treat, repair, or replace damaged Landscape Planting Accessories as directed.
- C. Upon completion of his Work under this Section, the Contractor shall remove rubbish, waste, debris, excess construction materials, and other items resulting from construction operations offsite as described herein this Section and directed by the City Engineer or his/her designated representative.

3.08 FINAL REVIEW

- A. Final Review under this Section shall be performed upon completion of the Landscape Maintenance / Establishment Period. (Refer to Section 329813 – Landscape Maintenance / Establishment Period for requirements).

END OF SECTION 32 94 00

SECTION 32 94 43

TREE GRATES AND TREE GUARDS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Paver Support Tree Grates - Suspended pavement type Tree grates as shown on drawings and as specified herein.
 - 2. Tree Guards
- B. Related Requirements:
 - 1. Section 055000 "Metal Fabrications"

1.03 COORDINATION

- A. Coordinate installation of tree grates that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.04 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Paver Support Tree Grates - Suspended pavement type Tree grates as shown on drawings and as specified herein.
 - 2. Tree Grates as shown on drawings and as specified herein.
 - 3. Tree Guards
 - 4. Fasteners.
 - 5. Shop primers.
- B. Sustainable Design Submittals:
 - 1. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.
 - 2. Environmental product declaration.
 - 3. Product Certificates: For regional materials, indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include distance to Project and cost for each regional material.
- C. Shop Drawings: Contractor shall submit 1 set(s) of drawings of paver support tree grates and frames for review by architect prior to purchase and installation.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 - 1. Minimum 5 years of experience in fabricating suspended pavement systems for use in tree planting areas in pedestrian spaces.
 - 2. Minimum 15 years tree guard manufacturing experience.
 - 3. Minimum 15 years tree grate manufacturing experience
- B. Installer qualifications: 2 years minimum experience installing tree grates and support frames.

1.06 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls, floor slabs, decks, and other construction contiguous with tree grate installations.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store product in manufacturer's packaging until ready to install.
- B. Store protected from weather and excess moisture.

1.08 WARRANTY

- A. Tree grates and frames shall be warranted by the Manufacturer against defects in materials and workmanship for a minimum of five (5) years.
- B. Tree guards shall be warranted by the Manufacture against defects in materials and workmanship for a minimum of five (5) years.
- C. Tree grates and frames shall be warranted by the Manufacture against defects in materials and workmanship for a minimum of five (5) years.

PART 2 - PRODUCTS

2.01 PAVER SUPPORT TREE GRATE:

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. Manufacturer: IRONSMITH, INC., 41-701 Corporate Way, Unit 3, Palm Desert, CA 92260 (800) 338-4766.
 - 2. Paver support tree grates shall be: Model 4160-MS 48 inch x 60 inch galvanized steel Paver-Grate® paver suspension system in halves with 6224TR-O Olympian style expandable cast iron trim ring with 16 inch tree opening.
 - 3. Substitutions: Products by other manufacturers that comply with specifications will be considered in accordance with Section 012500 – Substitution Procedures.
- B. Suspended paver type tree grates shall be manufactured from standard steel shapes to ASTM A36 and expanded metal grating 3# to ASTM A569/569M. If required, Tubing to ASTM A500. Units shall be manufactured true to design and all components shall fit together in a satisfactory manner. Grates are to be of uniform quality, flat and free from distortion.
- C. Finish:
 - 1. Paver Grate: Grates are to be supplied galvanized by hot spray and / or hot dip method.
 - 2. Trim Ring: Trim ring to be unfinished
 - a. Trim ring to receive 'Black Max' cathodic rust arrestor or approved qual after installation per manufacturer's recommendations.

2.02 TREE GUARDS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. Manufacturer: IRONSMITH, 41701 Corporate Way #3, Palm Desert, CA 922601, (800) 338-4766.
 - 2. Tree Guards shall be Model M6 Tree guard (#TO-M6-16), welded construction, 60" in height, in halves, grate attaching hardware.
 - 3. Substitutions: Products by other manufacturers that comply with specifications will be considered in accordance with Section 012500 – Substitution Procedures.
- B. Finish: Tree Guards shall be supplied with factory applied finish, flat black powder coat.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until site is properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION, GENERAL

- A. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.

3.04 INSTALLATION, PAVER SUPPORT TREE GRATES

- A. Install grates where indicated on plans per details on plans and Manufacturer's instructions.
- B. Paver-Grate(r) Suspended pavement system footings must be flat and leveled so that grates do not rock or appear unstable before unit pavers are set. Footings are to be set to ensure that unit pavers over the paver suspension system are flush and level with the surrounding areas.
- C. Cover Paver-Grate(r) Suspended pavement system with permeable landscape fabric before setting unit pavers to permit sanding joints.
- D. Cut unit pavers to fit around tree opening ensuring a secure fit against Paver-Grate(r) Suspended pavement system opening stop.

3.05 INSTALLATION, TREE GUARDS

- A. Install materials and systems in proper relation with adjacent construction and with uniform appearance per manufacturers recommendation. Shim Guards as necessary so that they are 90 degrees from level. Coordinate with work of other sections.
- B. Install per manufacturer's instructions

3.06 INSTALLATION, TREE GRATES AND FRAMES

- A. Install grates and frames where indicated on plans flush and leveled with surrounding pavement surface.
- B. Install steel angle frame
 - 1. flush and leveled with surrounding paving surface, maintain flush and leveled at all times. Frames MUST NOT slope in more than one direction.
 - 2. Use spreaders or stakes to keep frame from being distorted by concrete pressure.
 - 3. Install frames per details on plans and manufacturer's recommendations
- C. Clean concrete and debris from frame prior to tree grate installation.
- D. If needed, grind pads on underside of tree grates to level and prevent rocking in frame.

3.07 CLEAN-UP AND PROTECTION

- A. Protect installed product until completion of project.
- B. DO NOT ALLOW water from new concrete to run off or wash onto tree grate exposed areas to prevent damage from concrete exudates, lime, and efflorescence.
- C. Touch up, repair or replace damaged products.
- D. DO NOT ALLOW ANY CONTAMINATION OF TREE PLANTING AREA! This includes, but is not limited to, construction debris, excess concrete, paint or other chemical contaminants. Any contamination of the planting area may be detrimental to the long-term health of the tree.

END OF SECTION 32 94 43

SECTION 32 98 13

LANDSCAPE MAINTENANCE / ESTABLISHMENT PERIOD

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes materials, labor, apparatus, tools, equipment, temporary construction, transportation, and services necessary for and incidental to performing the proper completion of Work, as required to make a complete Landscape Maintenance / Establishment Period ("Service"), as specified during progress of Work, after installation, for a designated period after Preliminary Acceptance, as shown in the Contract Drawings, and as specified herein this Section.
- B. Contractor acknowledges that the Services specified under this Section are not intended to express every detail of the Services to be provided by Contractor, and Contractor hereby represents that it is experienced and competent in providing Services that meets or exceeds generally accepted practices commensurate with those provided by other companies that provide such Service.
- C. Work under this Section shall consist of, but not be limited to, furnishing, and installing the following:
 - 1. Establishment of Landscape Installation, for a given frequency and duration as specified herein this Section. Work includes the following:
 - a. Litter Control.
 - b. Weed Control.
 - c. Pest Control.
 - d. Plant Care.
 - e. Fertilization of Plant Materials.
 - f. Plant Replacement.
 - g. Plant Pruning.
 - h. Plant Staking and Adjustments.
 - i. Temporary Plant Protection.
 - j. Operation, Adjustment, and Maintenance of Irrigation Controller and Irrigation System.
 - k. Cleaning of Paving Surfaces.
 - l. Reapplication of Mulching Materials.
 - m. Erosion Control and Drainage.
 - n. Removal of Green Waste.
- D. Related Sections: The following Sections contain requirements that relate to Work in this Section:
 - 1. Section 017700- Project Closeout
 - 2. Section 312514.13 Hydraulically Applied Erosion Control
 - 3. Section 320190.16 Amending Soils
 - 4. Section 320191- Tree Protection and Root Pruning.
 - 5. Section 328420- Landscape Irrigation System.
 - 6. Section 329010- Landscape Planting.
 - 7. Section 329400- Landscape Planting Accessories.

1.02 DEFINITIONS AND APPLICABLE STANDARDS

- A. References:
 - 1. USDA- United States Department of Agriculture.
 - 2. ASTM – American Society for Testing and Materials.
 - 3. ANSI – American National Standards Institute.

4. ISA- International Society of Arboriculture.
- B. Standards:
 1. American National Standard for Tree Care Operation, Tree, Shrub, and Other Woody Plant Maintenance (ANSI A300), American National Standards Institute, Latest Edition.
 2. American National Standard for Tree Care Operations (ANSI Z133), American National Standards Institute, Latest Edition.
 3. Tree Pruning Guidelines, International Society of Arboriculture, 1995 Edition.
 4. Pruning Standards for Shade Trees, National Arborists Association, Latest Edition.
- C. Integrated Pest Management – is a holistic approach to mitigating insects, plant diseases, weeds, and other pests. It involves the use of many strategies for managing, but not eliminating pests. Integrated Pest Management (IPM) uses cultural, mechanical, physical, and biological control methods before using pesticides to control pests and diseases in the landscape. Chemical controls are applied only when monitoring indicates that preventative and non-chemical methods are not keeping pests below acceptable levels. When pesticides are required, the least toxic and the least persistent pesticide that will provide adequate pest control is applied.
- D. The Organic Materials Research Institute (OMRI) – is a national nonprofit organization founded in 1997 to support the organic community. OMRI reviews products to determine their suitability for producing, processing and handling organic food and fiber under the USDA National Organic Program Rule (OMRI General Materials List)
- E. Pesticide – As defined in Section 12753 of the California food and Agricultural Code, a pesticide includes any of the following: “(a) Any spray adjuvant. (b) Any substance, or mixture of substances which is intended to be used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling, or mitigating any pest, which may infest or be detrimental to vegetation, man, animals, or households, or be present in any agricultural or nonagricultural environment whatsoever”. Antimicrobial agents are excluded from the definition of pesticide. Pesticide: Includes any of the following:
 1. Fumigant
 2. Herbicide
 3. Insecticide
 4. Fungicide
 5. Rodent repellents.

1.03 SUBMITTALS

The Contractor shall submit the following as specified in Section 013219 Contractor's Submittals:

- A. General:
 1. Collect information into a single Submittal for each element of construction and type of product or equipment identified under this Section for review.
 2. To expedite review, Submittal shall be organized and presented into specific sections or headings. Furnish neat, concise, legible, and clearly identifiable information, and sufficiently explicit detail, to enable proper evaluation for Contract compliance. Highlight catalog, product data, or brochures containing various products, sizes, and materials to show particular item submitted.
 3. Submittal Format: As applicable, furnish Submittal as a single electronic digital PDF (Portable Document Format) file.
- B. Digital Submittal Information:
 1. Quality Control Submittal:
 - a. Qualification Data: Submit names for firms and persons specified in the “Quality Assurance and Control” Article to demonstrate their capabilities and experience on similar Landscape Planting Accessories installations.
 - b. Schedule of maintenance operations and monthly status report, including list of equipment, materials proposed for the job, and watering schedule(s).

- c. Licenses, permits and insurance required by the local jurisdiction, the State, or Federal government, pertaining to Work under this Section.
 - 1) Pesticide Applicator: Valid California Qualified Applicator Certificate (QAC), with "B- Landscape Maintenance" Category, as administered by the California Department of Pesticide Regulation (DPR).
 - 2) Employer of the California Qualified Applicator Certificate (QAC), with "B- Landscape Maintenance" Category:
 - a) The company which employs the person holding the QAC must possess a Maintenance Gardener Pest Control Business License, as administered by the California Department of Pesticide Regulation (DPR).
 - d. Monthly record of herbicides, insecticides and disease control chemicals used for the Project.
 - e. Written application recommendation by a licensed agricultural pest control advisor for weed, pest and disease controls restricted by the Director of Agriculture proposed for this Work.
2. Project Closeout Submittal:
- a. Include in a single 3-ring binder a Landscape Maintenance Manual for use by the City, containing an indexed collection of all schedules, records and permits listed above, including documentation of accepted condition of planting and irrigation at Final Acceptance.
- C. Material Samples: Not required.
- D. Scaled Shop Drawings: Not Required.
- E. Field-Constructed Mock-ups: Not Required.
- F. Submittals under this Article will be rejected and returned without the benefit of review by the City Engineer or his/her designated representative if they are difficult to read due to insufficient scale, poor image quality, or poor drafting quality; or if all of the required information is missing or not presented in the format as requested. Partial Submittals will not be accepted.
- G. No Work shall proceed under this Section until Submittal requirements indicated herein have been reviewed accordingly by the City Engineer or his/her designated representative.

1.04 QUALITY ASSURANCE AND CONTROL

- A. Installer Qualifications, per Article 10 of Instructions to the Bidders the Contractor shall ensure the following:
- 1. Experience: Contractor or sub-contractor performing Work under this Section shall have a full-time employee assigned to the Project as foreman for the duration of the Contract. Employee shall have a minimum of four (4) year experience in landscape maintenance supervision, with experience or training in entomology, pest control, soils, fertilizers, and plant identification. Employee shall speak English fluently.
 - 2. Labor Force: Landscape maintenance labor force shall be thoroughly familiar with, and trained in, the Work to be accomplished, and shall perform the task in a competent, efficient manner acceptable to the City.
- B. Requirements:
- 1. Supervision: Landscape Maintenance Foreman shall directly supervise the Work force during duration indicated herein this Section. Notify the City of changes in supervision.
 - 2. Identification: Provide proper identification during duration for landscape maintenance firm's vehicles and labor force. Be uniformly dressed in a manner satisfactory to the City.

1.05 PROJECT/SITE CONDITIONS

In addition to Section 017700 Project Closeout, the Contractor shall do the following:

- A. Site Visit: At beginning of the designated Landscape Maintenance / Establishment Period, visit and tour the site with the City's Representative, City Engineer or his/her designated representative, and other interested parties, to clarify the scope of Work, and understand

- existing project/site conditions.
- B. Documentation of Conditions: Document the general condition of installed plant materials and hydroseeding/hydromulching, recording those which are healthy and thriving, and unacceptable materials which are damaged, dead, and/or dying and in need of replacement.
- C. Irrigation System: Document general condition of irrigation system, making sure that faulty, improper, and/or non-functioning irrigation materials or equipment are reported.

1.06 SEQUENCING AND SCHEDULING

- A. In addition to Section 013113 Coordination and Section 013213 CPM Schedule, the Contractor shall do the following:
 - 1. Perform Work under Landscape Establishment Period during hours mutually agreed upon between the City and Contractor.
 - 2. Work force shall be present at the Project Site at a minimum duration indicated in this Section, and at other times as necessary, to perform specified Work, in accordance with the approved schedule under the Landscape Maintenance / Establishment Period.

1.07 WARRANTY

- A. Specific Requirements: Refer to the following Sections:
 - 1. Section 320190.16-Amending Soils
 - 2. Section 328420- Landscape Irrigation System.
 - 3. Section 329010- Landscape Planting.
 - 4. Section 329400- Landscape Planting Accessories.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. General: Materials and equipment as required to perform Work under this Section shall be provided by Contractor.
- B. Water: Clean, potable and fresh, as available from the City.
- C. Fertilizers:
 - 1. Fertilizer Tablets: Tightly compressed, slow-release and long-lasting complete fertilizer tablets, bearing manufacturer's label of guaranteed analysis of chemicals present. Refer to Contract Documents, for requirements.
 - 2. Balanced, once-a-season application, controlled-release Fertilizer(s), with a blend of coated prills which supply controlled-release nitrogen, phosphorus, and potassium, and uncoated, rapidly soluble prills containing nitrogen and phosphorus.
- D. Herbicides, Insecticides, and Fungicides: See Section 32 93 00 "Plants"
- E. Replacement Tree Guys, Stakes, Ties and Wire: Match originally accepted existing materials installed on the Project.

2.02 EQUIPMENT

- A. General: Use only the proper tool(s) required for each task under this Section.
 - 1. Maintain tools in sharp, properly functioning condition.
 - 2. Clean and sterilize all pruning tools prior to usage.
- B. Insect/Disease Prevention: Provide measure to prevent introduction of insect or disease-laden materials onto the Site. Section 329010- Landscape Planting.

PART 3 - EXECUTION

3.01 FREQUENCY AND DURATION OF LANDSCAPE ESTABLISHMENT PERIOD

- A. Following satisfactory completion of work, the Landscape Maintenance / Establishment Period shall commence and progress.
- B. Frequency and Duration: Work performed under this Section shall be executed by Contractor at a minimum of once per week, for a duration of a minimum of 90 calendar days, following acceptance of the Project Site by the City Engineer.
- C. Contractor shall be fully responsible for maintenance of new landscaping and irrigation at the Project Site for the contract period that includes the 90-day landscape maintenance/establishment duration.

3.02 COMMENCING THE LANDSCAPE MAINTENANCE/ ESTABLISHMENT PERIOD

- A. Preliminary Review: As soon as landscape installation is substantially completed per the Contract Documents for the Project Site, Contractor shall arrange to hold a preliminary review on-site with the City Engineer or his/her designated representative, the City, and other interested parties to evaluate the condition and executions of the completed Work. Evaluation of the Work shall be executed by the City Engineer or his/her designated representative through a "Landscape Punch List."
- B. Date of Review: Notify City Engineer or his/her designated representative at least five (5) working days prior to anticipated Date of Review.
- C. For the Project Site, it is the Contractor's responsibility to maintain all new landscaping and irrigation.
- D. Commencing the Landscape Maintenance / Establishment Period: Following the date on which the City Engineer or his/her designated representative determines that the project work is complete for the Project Site, the 90-calendar day landscape maintenance/establishment period shall commence.

3.03 PREPARATION

- A. Protection:
 - 1. Protect new landscape planting areas from damage during duration of Landscape Maintenance / Establishment Period, until Final Acceptance.
 - 2. Provide temporary protection fences, barriers, and signs, as required, for protection.
- B. Replacements:
 - 1. Immediately treat or replace plant materials as directed, which become damaged or injured as a result of Contractor's operations or negligence, per the City Engineer or his/her designated representative, at no additional cost to the City.
 - 2. Replacement plant materials shall match size and variety of plant material being replaced.

3.04 PLANTING MAINTENANCE/ ESTABLISHMENT

- A. Watering Basins:
 - 1. Maintain watering basins around the perimeter of the installed plant materials so that enough water can be applied to establish and maintain adequate soil moisture through the root zone of the plant materials. Re-dish and tamp basins accordingly which have become damaged or have failed since installation.
 - 2. For supplemental hand watering of watering basins, use a watering wand to break the water force. Do not permit use of "jet" type watering equipment. Do not permit crown roots to become exposed to air through dislodging of soil and mulch.
 - 3. Mulch: Maintain originally specified thickness of mulch material to reduce evaporation and frequency of watering, around newly planted trees.

4. During rainy season, open basins to allow surface drainage away from the root crown where excess water may accumulate. Restore watering basins at the end of rainy season.
5. At the end of rainy season, re-dish and tamp watering basin at trees and shrubs.
- B. Settlement of Plant Materials: Rest/replant sunken or settled plant materials to proper grades and in upright position.
- C. Weed Control:
 1. Planting areas throughout site shall be weed-free at all times, including areas between plants and along watering basins.
 2. Use Integrated Pest Management practices as prescribed herein.
 3. Avoid frequent soil cultivation that destroys shallow roots and breaks the seal of pre-emergent herbicides.
- D. Pruning:
 1. Prune trees to select and develop permanent scaffold branches that are smaller in diameter than the trunk or branch to which they are attached, and which have vertical spacing of eighteen-inches (18") to forty-eight-inches (48") and radial orientation so as not to overlay each other.
 2. Prune trees to eliminate diseased or damaged growth, and narrow "V-shaped" branch forks that lack strength. Reduce toppling and wind damage by thinning-out crowns.
 3. Prune trees to maintain growth within space limitations, maintaining a natural appearance and balancing crown with roots.
 4. No stripping of lower branches of young trees shall be permitted.
 5. Retain lower branches in a "tipped back" or pinched condition to promote caliper trunk growth. Do not cut back to fewer than six (6) buds or leaves on such branches. Only cut lower branches flush with the trunk after the tree is able to stand erect without staking or other support.
 6. Thin out and shape evergreen trees when necessary to prevent wind and storm damage. Do primary pruning of deciduous trees during the dormant season. Do not permit any pruning of trees prone to excessive "bleeding" during growth season.
 7. Prune damaged trees or those that constitute health or safety hazards at any time of year as required.
 8. Make pruning cuts clean and close to the trunk, without cutting into the branch collar. "Stubbing" will not be permitted. Cut smaller branches flush with trunk or lateral branch. Make larger cuts one inch (1") diameter or larger parallel to shoulder rings, with the top edge of the cut at the trunk or lateral branch.
 9. Branches too heavy to handle shall be precut in three (3) stages to prevent splitting or peeling of bark. Make the first two (2) cuts eighteen inches (18") or more from the trunk to remove the branch. Make the third cut at the trunk to remove the resulting stub.
 10. Do not prune or clip shrubs into balled or boxed forms unless specifically called for by design.
 11. Clip shrubs to be hedged when branches project two-inches (2") beyond limit of clipped hedge shown on the Contract Drawings.
 12. Take extreme care to avoid transmitting disease from one infected plant to another. Properly sterilize pruning tools before going from one infected plant to other plant materials.
- E. Staking and Guying of Trees:
 1. Adjustments: Inspect stakes and guys periodically (minimum once per month) throughout duration of Landscape Maintenance / Establishment Period to check for rubbing of staking materials on trunks or branches causing bark wounds.
 2. Repair and replace faulty staking and guying materials as shown and as specified.

3.05 TURF/GROUNDCOVER MAINTENANCE/ESTABLISHMENT

- A. Irrigation:
 1. Check for moisture penetration throughout the root zone at least twice a month.

2. Water as frequently as necessary to maintain healthy growth of groundcovers.
- B. Weed Control:
 1. Control weeds, preferably by hand removal and with integrated pest management practices specified herein.
 2. Minimize hoeing of weeds in order to avoid plant damage.
- C. Fertilization:
 1. Recently installed plant materials: Verify with the City actual completion date of planting installation and rate of prior application of fertilizers.
 2. Established Plant Materials: Do not use complete fertilizers unless soil test shows specific nutrient deficiencies.
- D. Mowing and Edging:
 1. Edge groundcovers to keep in bounds. Trim top growth as necessary to achieve an overall even appearance.
 2. Ground covers which lend themselves to mowing shall be mowed to specified height above finished grade in order to renew growth, improve density and attractiveness.
- E. Replacements:
 1. Replace dead and missing newly planted landscaping.
 2. All damages caused by the Contractor shall be restored/fixed/repared by the Contractor.

3.06 INSECTS, PESTS, AND DISEASE CONTROL

- A. Inspection: Inspect plant materials for signs of stress, damage and potential trouble from the following:
 1. Presence of insects, moles, gophers, rabbits, ground squirrels, snails and slugs in planting areas.
 2. Discolored or blotching leaves or needles.
 3. Unusually light green or yellowish green color inconsistent with normal green color of leaves.
- B. See Section 32 93 00 "Plants" for Integrated Pest Management practices
- C. Lawn or vegetation-damaging pests shall be controlled in a timely manner to minimize damage.

3.07 IRRIGATION

- A. General:
 1. Apply water in sufficient quantities and as often as seasonal conditions require to keep installed plant areas moist at all times, well below the root system of plants. Hand water as required if irrigation system is not fully functional.
 2. Repair without additional charge to the City damages to Irrigation System caused by Contractor's operations. Perform repairs within one (1) watering period.
 3. Twice a month, use a probe or other acceptable tool to check the rootball moisture of representative plants as well as the surrounding soil.
- B. Cleaning and Monitoring the System:
 1. Continually monitor the irrigation systems to verify that they are functioning properly as designed. Make program adjustments required by changing field conditions.
 2. Prevent over spray onto pavement by balancing the throttle control on the remote-control valves and the adjustment screws on the sprinkler heads. Do not allow water to atomize and drift.

3.08 GRADING AND DRAINAGE

- A. During the Landscape Maintenance / Establishment Period, all flow lines shall be maintained to allow for free flow of surface water. Displaced material which interferes with drainage shall be removed and placed as directed. Low spots and pockets shall be graded to drain properly. Jute netting or other erosion control measure as directed shall be installed at flow lines and other locations where surface erosion is evident.

- B. Damage to planting areas shall be repaired immediately and throughout the Landscape Maintenance / Establishment Period. Depressions caused by vehicles, bicycles, or foot traffic shall be filled and leveled. Replant damaged areas.
- C. All paved areas shall be washed and maintained in a neat and clean condition at all times.
- D. All subsurface drains and inlets shall be periodically cleared of debris, leaves, trash, etc., and flushed with clear water to avoid buildup of silt and debris.

3.09 CLEANING

- A. In addition to items detailed in Article 23 of the General Conditions, the Contractor shall perform the following:
 - 1. General: Dispose of pruned plant materials, vacuum clippings and leaves, sweep walkways and rake smooth mulched areas. Remove from the site containers and other evidence of maintenance activities.
 - 2. Litter Control:
 - a. Site areas under the Contract shall be cleared on a weekly basis of visible litter or debris, and clippings.
 - b. Debris caused by normal seasonal winds shall be removed from site.
 - c. Contractor shall be responsible for disposal of debris in accordance with local rules and regulations.
 - 3. Blowing:
 - a. Landscape debris generated shall blown-off or swept on a weekly basis. Do not blow grass clippings, edgings, or debris into planting areas or onto paved areas unless after such blowing, the resultant accumulation of material shall be gathered and removed from the site.

3.010 TERMINATION OF THE LANDSCAPE MAINTENANCE/ESTABLISHMENT PERIOD

- A. In addition to Section 017700 Project Closeout, the Contractor shall perform the following:
 - 1. Final Acceptance Procedure:
 - a. Work requires acceptance by the City Engineer or his/her designated representative upon satisfactory completion, including Landscape Maintenance / Establishment Period, but exclusive of replacement of materials under the Warranty Period.
 - b. Submit a written request to City Engineer or his/her designated representative for review of Final Acceptance at least five (5) working days prior to anticipated Final Review date, which is at the end of the Landscape Maintenance / Establishment Period.
 - 2. Corrective Work:
 - a. Work requiring corrective action or replacement shall be performed within ten (10) calendar days after the Final Review.
 - b. Perform corrective Work and materials replacement in accordance with the Contract Documents, Work shall be made by the Contractor at no cost to the City.
 - c. After corrective Work is completed, the Contractor shall again request a Final Review for Final Acceptance as outlined above.
 - 1) Continue maintenance of all landscaped areas until such time as all corrective measures have been completed and accepted.
 - 3. Conditions for Acceptance of Work at End of Landscape Maintenance / Establishment Period:
 - a. All new landscaping shall be alive and thriving, showing signs of growth and no signs of stress, disease, or any other weaknesses.
 - b. Replace plant materials not meeting these conditions. An additional Warranty Period equal in length to the original shall be commenced for all such plants and planted areas.
 - 4. Final Acceptance Date shall be the date on which the City Engineer or his/her designated

representative issues a Letter of Final Acceptance. Upon Final Acceptance, the City will assume responsibility for maintenance of the Work beyond the Landscape Maintenance / Establishment Period.

3.011 CLOSE OUT

In addition to Section 017700 Project Closeout, the Contractor shall perform the following:

- A. Landscape Maintenance Record:
 - 1. Submit binder to the City with documentation and records required and utilized during the Landscape Maintenance / Establishment Period.
- B. Keys and Identification: Return keys and identification materials supplied by the City for the purpose of site access.

END OF SECTION 32 98 13

SECTION 33 10 00

WATER UTILITIES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Geotechnical Report for City of Guadalupe Central Park Renovation, Guadalupe, California, by Earth Systems Pacific, Project No. 305572-001, Dated January 27, 2023, and any updates or addendums.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Pipe and fittings for site domestic water lines.
 - 2. Valves.
 - 3. Water Meter.
 - 4. Backflow Preventer.
- B. Related Sections:
 - 1. Section 31 20 00 - Earthwork.
 - 2. Section 31 23 17 – Trenching.

1.3 REFERENCES

- A. *American Water Works Association Standards (AWWA)*.
- B. *Standard Specifications for Public Works Construction (SSPWC)*, Latest Edition.
- C. City of Guadalupe Water Standard Plans.
- D. County of Santa Barbara Environmental Health Standards.

1.4 SUBMITTALS

- A. Submit the following:
 - 1. Product Data: Provide data on pipe materials, pipefittings, valves and accessories.
 - 2. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.5 PROJECT RECORD DOCUMENTS

- A. Accurately record actual locations of piping mains, valves, connections, and invert elevations.
- B. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.6 QUALITY ASSURANCE

- A. Perform work in accordance with AWWA, Standard Specifications for Public Works Construction, and Guadalupe Water Standards.
- B. Valves: Manufacturer's name and pressure rating marked on valve body.

1.7 DELIVERY AND STORAGE

- A. Deliver and store valves in shipping containers with labeling in place.

PART 2 – PRODUCTS

2.1 PIPE

- A. Joints: Mechanical joints shall be used for the waterline construction unless otherwise shown on plans and standard details. Gaskets for mechanical joints shall be rubber conforming to ANSI A21.11 and AWWA C111.
- B. Fittings: Conform to Guadalupe Water Standard Plans.
- C. Pipe size smaller than 4-inch diameter: pipe material shall be polyvinyl chloride (PVC) schedule 40 solvent weld pipe and shall be manufactured in accordance with ASTM D-1785, or type K Copper pipe shall be used as indicated on plans.
- D. Pipe size equal or larger than 4-inch diameter: pipe material shall be AWWA C900 Class 305 with AWWA C1101 ductile iron fittings and ASTM D3139 compression gasket rings.

2.2 GATE VALVES

- A. Conform to AWWA C-509.

2.5 BACK FLOW PREVENTER

- A. Domestic Water Backflow preventer shall be reduced pressure type and approved by the Water Agency.

2.6 ACCESSORIES

- A. Concrete for Thrust Blocks: concrete for thrust block shall have a minimum 28-day compressive strength of 2,000 psi.
- B. Thrust blocks shall be constructed to bear against undisturbed earth and shall not bear against adjacent pipe, fittings, or valves. Where concrete must be poured around adjacent pipe, a block out or a short pipe length shall be used such that a flexible joint exists within 12 inches of each side of thrust block, unless indicated otherwise on the plans. Concrete shall not be allowed to set in contact with pipe surfaces or to enter or come in contact with any joint.
- C. Valve Appurtenances: The Contractor shall furnish and install all valve appurtenances. Provide two galvanized T-handled operating wrenches, 4 feet total length or as required to easily access valve from grade.
- D. Valve box body shall be unreinforced concrete 8 ¾ inch inside diameter traffic box with cast iron ring. The valve box cover shall be cast iron. Both valve body and cover shall be Christy G3 or equal. The cover shall be marked "WATER." The cover of each valve box shall be provided with a 2-inch diameter bronze disc and the Contractor shall stamp the valve number on the disc per the District Representative's instructions. The disc shall be mounted to the valve box cover or higher using stainless steel screws. The extension piece shall be 8-inch in diameter, Class 235 P.V.C. water line conforming to the requirements of AWWA C-900.
- E. Appropriate warning detector tape shall be placed over all utilities.
 - 1. Underground detectable warning tape shall be placed over all non-metallic underground utilities.
 - 2. 12-gauge copper continuous location wire shall be placed on all water mains.
- F. All copper pipe to be encased in plastic sleeve.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify the existing water main sizes, class of pipes, and locations as indicated.

3.2 PREPARATION

- A. Remove scale and dirt, on inside and outside, before assembly.
- B. Prepare pipe connections to equipment with flanges or unions.

3.3 BEDDING

- A. Excavate pipe trench in accordance with Specification Section 31 23 17 for work of this section. Hand trim excavation for accurate placement of pipe to elevations indicated.
- B. Place bedding material at trench bottom, level fill materials in one continuous layer not exceeding 6 inches compacted depth, compact to minimum 90 percent compaction.
- C. The compaction of the backfill material along the sides and one foot above the pipe shall be done with hand tampers to protect the pipe. Jetting is not permitted to obtain required compaction.
- D. Maintain optimum moisture content of bedding material to attain required compaction density.

3.4 INSTALLATION - PIPE

- A. Route pipe in straight line.
- B. Install pipe to allow for expansion and contraction without stressing pipe or joints. Insert spigot into bell only to limit line.
- C. Install access fittings to permit disinfection of water system.
- D. Form and place concrete for thrust blocks at each elbow or change of direction or size of pipe main.
- E. Establish elevations of buried piping to ensure cover conforming to the Standards. The minimum cover from the finish grade to the top of pipe is 36 inches for potable and fire waterline, any shallower cover to clear with the existing utility crossings shall be reviewed and approved by the District Representative.
- F. Install 12-gauge copper continuous location wire on all water mains.
- G. Backfill trench in accordance with Specification Section 31 23 17.
- H. Maintain separation of water main from sewer piping in accordance with the State Department of Health Services, Criteria for the Separation of Water Mains and Sanitary Sewers (Section 64630, Title 22 California Administrative Code), and State Regional Water Quality Control Board.
- I. All pipe laid in trench which is to be left for further extension (i.e., end of work day) shall have its open end covered to protect from possible rodent intrusion.

3.5 INSTALLATION - VALVES

- A. Set valves on solid bearing.
- B. Center and plumb valve box over valve. Set box cover flush with finished grade.
- C. Provide concrete collar around valve box.
- D. Coat all steel bolts with non-oxide corrosion resistant grease and plastic wrap.

3.6 PRESSURE TEST OF WATER PIPING SYSTEM

- A. Water piping system shall be pressure tested for 2 hours at 200 psi, with no allowable drop in water pressure.
- B. All leakage tests shall be completed and approved prior to placing of permanent resurfacing.
- C. Pressure test shall be witnessed by District Representative.

3.7 DISINFECTION AND BACTERIA TESTING OF WATER PIPING SYSTEM

- A. Water piping system shall be disinfected and flushed per AAWA Section C651.
- B. Before pipeline is connected to existing system, or placed in service, employ an approved independent testing laboratory to sample, test and certify water quality.

3.8 TEST RECORDS

- A. Records shall be made of each piping system installation during the test. These records shall include:
 - 1. Date of test.
 - 2. Description and identification of piping tested.
 - 3. Test fluid.
 - 4. Test pressure.
 - 5. Remarks to include such items as:
 - a. Leaks (type, location).
 - b. Repairs made on leaks.
 - 6. Certification by Contractor and signed acknowledgment by Inspector of Record.

3.9 FIELD QUALITY CONTROL

- A. Inspection shall be performed by Inspector of Record.

END OF SECTION 33 10 00

SECTION 33 30 00

SANITARY SEWERAGE UTILITIES

- 1.00 GENERAL
- 1.01 SUMMARY
 - A. Site sanitary sewerage piping, fittings, accessories and bedding.
 - B. Cleanouts.
- 1.02 RELATED SECTIONS
 - A. Section 31 20 00 Earthwork.
 - B. Section 31 23 33 Trenching and Backfilling.
- 1.03 REFERENCES
 - A. Standard Specifications for Public Works Construction SSPWC (Green Book), latest edition.
 - B. ASTM Standards.
 - C. Rosamond Community Services District - Design Standards.
- 1.04 SUBMITTALS
 - A. Submit:
 - 1. Product Data: Provide data indicating pipe, pipe accessories and appurtenances, and manhole covers.
 - 2. Manufacturer's Installation Instructions: Indicate special procedures required to install products specified.
 - 3. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
 - 4. Manufacturer's Certificate: Certify that installers are certified for installing plastic pipe.
- 1.05 PROJECT RECORD DOCUMENTS
 - A. Submit Record Drawings: Record location of pipe runs, connections, manholes, cleanouts, and invert elevations.
 - B. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.
- 1.06 REGULATORY REQUIREMENTS
 - A. Conform to California Title 24 (CCR) Part 5, latest edition, for installation of the Work of this section.
 - B. Minimum separation distance and requirements between water, reclaimed water and sewer pipes per the State of California, Department of Health Services shall be established.
- 2.00 PRODUCTS
- 2.01 SEWER PIPE MATERIALS AND ACCESSORIES
 - A. Polyvinyl Chloride (PVC) Pipe for Gravity Sewer: ASTM 3034-SDR35 Ring-Tite Polyvinyl Chloride (PVC) gravity sewer pipe and fittings; inside nominal diameter as indicated on Drawings. PVC pipe shall use "locked-in" rubber sealing ring conforming to ASTM D-3212. Joints using flexible Elastomeric Seals. Minimum pipe stiffness at 5% deflection shall be 46 psi for all sizes when tested in accordance with ASTM Method of Test D2412.
- 2.02 CLEANOUTS
 - A. Form and cast-in-place, Class 618-CLE-4000 P concrete base pad, with provisions for sewer pipe end section.

- B. Frame and cover shall be Christy G3 or equal, lettered "sewer".
- 2.03 BEDDING MATERIALS
 - A. Refer to Specification Section 31 23 33 Trenching and Backfilling for Bedding Material.
- 3.00 EXECUTION
- 3.01 EXAMINATION
 - A. Verify that trench cut and/or excavation base is ready to receive work and excavations, dimensions, and elevations are as indicated on drawings.
- 3.02 PREPARATION
 - A. Hand trim excavations to required elevations. Correct over excavation with granular fill.
 - B. Remove large stones or other hard matter which could damage pipe or impede consistent backfilling or compaction.
- 3.03 BEDDING
 - A. Excavate pipe trench in accordance with Specification Section 31 23 33. Hand trim excavation for accurate placement of pipe to elevations indicated on drawings.
 - B. Place bedding material at trench bottom, level materials in continuous layer not exceeding 6 inches compacted depth, compact to minimum of 95 percent of maximum dry density.
 - C. Maintain optimum moisture content of bedding material to attain required compaction density.
- 3.04 INSTALLATION - PIPE
 - A. Install pipe, fittings and accessories in accordance with manufacturer's instructions.
 - B. Sewer pipeline shall be placed from downstream to upstream beginning at the downstream connection to the existing sewers.
 - C. Lay pipe to slope gradients noted on drawings; with maximum variation from true slope of 1/8 inch in 10 feet.
 - D. Install bedding along sides and over top of pipe to minimum compacted thickness of 12 inches; compacted to a minimum of 95 percent of maximum dry density.
 - E. Refer to Specification Section 31 23 33 for Trenching Requirements. Do not displace or damage pipe when compacting.
 - F. The compaction of the backfill material along the sides and one foot above the pipe shall be done with hand tampers to protect the pipe.
- 3.05 INSTALLATION – CLEANOUTS
 - A. From bottom of excavation clean and smooth to correct elevation.
 - B. Establish elevations and pipe inverts for inlets and outlets as indicated on drawings.
 - C. Mount lid and frame level in grout, secured to cone section to elevation indicated on drawings.
- 3.06 FIELD QUALITY CONTROL
 - A. Preliminary Tests: The Contractor may perform any tests desired which are not harmful to the lines before backfilling is completed.
 - B. Cleaning: Before final tests are performed for acceptance of any sewer pipe, clean the pipe by inflatable rubber ball method.
 - C. Perform air pressure test per SSPWC Section 501-6.4.
 - D. Repairs, if necessary: If the leakage or infiltration is greater than the amount specified, the pipe shall be overhauled and re-laid if necessary, by the Contractor, at its own expense, until the joints will hold satisfactorily.

- E. Regardless of the results of the above tests, any visible evidence of individual leaks shall be corrected by the Contractor to the satisfaction of the District's Representative.
 - F. Cleaning Sewer: After all backfilling, compaction testing and paving is completed, sewer lines shall be cleaned by Inflatable Rubber Ball Method, flushed and cleaned, before acceptance by the District's Representative and connection to their sewer system is made.
 - G. The Contractor shall furnish all sewer line plugs necessary for blocking off all lines as required by the District's Representative until final acceptance.
- 3.07 PROTECTION
- A. Protect finished installation.
 - B. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.

END OF SECTION 33 30 00

SECTION 33 40 00

STORM DRAINAGE UTILITIES

PART 1- GENERAL

1.01 SUMMARY

- A. Storm drainage piping, fittings, accessories, and bedding.
- B. Catch basins.
- C. Inlet and outlet structures.

1.02 RELATED SECTIONS

- A. Section 31 20 00 Earthwork.
- B. Section 31 23 33 Trenching and Backfilling.

1.03 REFERENCES

- A. Standard Specifications for Public Works Construction (SSPWC), latest edition.
- B. ASTM Standards.

1.04 SUBMITTALS

- A. Submit the following in accordance with provisions in Division 1:
 - 1. Product Data: Provide data indicating pipe, pipe accessories and catch basin grates.
 - 2. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.
 - 3. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
 - 4. Layout diagram for storm drain components per plan.

1.05 PROJECT RECORD DOCUMENTS

- A. Submit record drawings. Accurately record locations of pipe runs, connections, catch basins, structures, manholes and invert elevations.
- B. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.06 FIELD MEASUREMENTS

- A. Verify that field measurements and elevations are as indicated on drawings.
- B. Complete pothole work per plans and notify the District of any discrepancy prior to commencing construction.

1.07 COORDINATION

- A. Coordinate the work with connection to existing storm drain mains, and trenching.

PART 2- PRODUCTS

2.01 PIPE MATERIALS

- A. 12" Dia and Under: Polyvinyl Chloride (PVC) Pipe with water tight joints, per SSPWC Section 207-17.
- B. 18" Dia and Larger: High Density Polyethylene (HDPE) Pipe (N-12 WT) with water tight joints, per SSPWC Section 207-18.

2.02 PIPE ACCESSORIES

- A. PVC: Elastomeric Gasket water tight joints per SSPWC Section 207-17.3.2.
- B. HDPE: Water-Tight Joints per SSPWC Section 207-18.4.1.

2.03 CATCH BASINS

- A. Precast catch basins shall include grate, as manufactured by Old Castle or approved equal.
- B. PVC drain basins shall be Nyloplast or approved equal.

2.04 METAL

- A. All exposed metal parts are to be galvanized in accordance with SSPWC, Section 210-3.

2.05 CONCRETE

- A. All concrete shall be Class 560-C-3250, per SSPWC Section 201.

2.06 BEDDING MATERIALS

- A. Refer to Specification Section 31 23 33 Trenching and Backfilling for Bedding Material.

2.07 FILTER FABRIC

- A. Filter fabric shall be non-woven geotextile filter fabric Mirafi 140N or approved equal.

PART 3- EXECUTION

3.01 EXAMINATION

- A. Verify that trench cut is ready to receive Work and excavations, dimensions, and elevations are as indicated on Drawings.

3.02 PREPARATION

- A. Hand trim excavations to required elevations. Correct over excavation with compacted bedding material.
- B. Remove large stones or other hard matter which could damage piping or impede consistent backfilling or compaction.

3.03 BEDDING

- A. Excavate pipe trench in accordance with Specification Section 31 23 33. Hand trim excavation for accurate placement of pipe to elevations indicated on Drawings.
- B. Place bedding material in trench bottom, level materials in continuous layer. Bedding shall be 4" thickness for pipe diameters less than or equal to 24" and 6" thickness for pipe diameters greater than 24" and shall be per SSPWC Section 217-1.2.

3.04 INSTALLATION - PIPE

- A. Install pipe, fittings, and accessories in accordance with manufacturer's instructions and per SSPWC Section 207.
- B. Lay pipe to slope gradients noted on drawings; with maximum variation from true slope of 1/8 inch in 10 feet.
- C. Install backfill along sides and over top of pipe. Provide backfill over top of pipe to minimum compacted thickness of 12 inches, compacted to a minimum of 95 percent of maximum dry density.
- D. Refer to Specification Section 31 23 33 for Trenching Requirements. Do not displace or damage pipe when compacting.
- E. The compaction of the backfill material along the sides and one foot above the pipe shall be done with hand tampers or equal to protect the pipe.

3.05 INSTALLATION - CATCH BASINS

- A. Form bottom of excavation clean and smooth to correct elevation.
- B. Form and place cast-in-place concrete base with provisions for storm drainage pipe end sections.
- C. Level top surface of concrete base to receive shaft sections.
- D. Establish elevations and pipe inverts for inlets and outlets as indicated on drawings.
- E. Compact top 12" of native materials below the bottom of catch basins and manholes to minimum 95 percent of maximum dry density.

3.06 FIELD QUALITY CONTROL

- A. Inspection and testing shall be performed by the District's representative.
- B. Request inspection prior to and immediately after placing backfill cover over pipe.
- C. If tests indicate work does not meet specified requirements, remove work, replace and retest at no cost to the District.

3.07 PROTECTION

- A. Protect pipe and backfill cover from damage or displacement until backfilling operation is in progress.

END OF SECTION 33 40 00

APPENDIX A

GEOTECHNICAL REPORT



September 30, 2024

FILE NO.: 305572-001

Ms. Brooke McDonnell
Pacific Coast Land Design, Inc.
461 East Main Street
Ventura, California 93001

PROJECT: CITY OF GUADALUPE LAS MUJERES PARK (FORMERLY CENTRAL PARK) RENOVATION
WEST OF PACHECO STREET BETWEEN 9TH AND 10TH STREETS
GUADALUPE, CALIFORNIA

SUBJECT: Plan Review

REF: 1) Construction Documents for: Las Mujeres Park (Formerly Central Park)
Renovation Project, Las Mujeres, Guadalupe, CA 93434, 73 Pages,
Prepared by Pacific Coast Land Design, Inc., dated July 22, 2024

2) Geotechnical Engineering Report, City of Guadalupe Central Park
Renovation, West of Pacheco Street Between 9th and 10th Streets,
Guadalupe, California, by Earth Systems Pacific, dated January 27, 2023,
Doc. No. 2301-037.SER

Dear Ms. McDonnell:

We have reviewed the project plans for this project (Ref. No. 1) for general conformance with the recommendations contained in the geotechnical engineering report prepared by this firm (Ref. No. 2). This review was performed specifically with respect to geotechnical recommendations provided in the referenced report; factors related to civil or structural engineering, architecture, drafting and other disciplines are beyond the scope of this review. In performing this review, we attempted to verify that the concepts and recommendations presented in the report were generally incorporated into the plans.

Based on this review, in our opinion, the referenced plans are in conformance with the concepts and recommendations presented in the geotechnical engineering report. While not specifically mentioned, we understand the overexcavation will be performed for the restroom building. Further, the playground equipment will be constructed per their standard details.

If there are any questions concerning this letter, please do not hesitate to contact the undersigned.

Sincerely,
Earth Systems Pacific

Robert Down, PE
Principal Engineer

Doc. No.: 2409-031.LTR/In



**GEOTECHNICAL ENGINEERING REPORT
CITY OF GUADALUPE CENTRAL PARK RENOVATION
WEST OF PACHECO STREET BETWEEN 9TH AND 10TH STREETS
GUADALUPE, CALIFORNIA**

January 27, 2023

Prepared for

Mr. Eric Berg
Pacific Coast Land Design, Inc.

Prepared by

Earth Systems Pacific
2049 Preisker Lane, Suite E
Santa Maria, California 93454

Copyright © 2023



Earth Systems

2049 Preisker Lane, Suite E | Santa Maria, CA 93454 | 805.928.2991 | www.earthsystems.com

January 27, 2023

FILE NO.: 305572-001

Mr. Eric Berg
Pacific Coast Land Design, Inc.
461 East Main Street
Ventura, California 93001

PROJECT: CITY OF GUADALUPE CENTRAL PARK RENOVATION
WEST OF PACHECO STREET BETWEEN 9TH AND 10TH STREETS
GUADALUPE, CALIFORNIA

SUBJECT: Geotechnical Engineering Report

REF: Proposal for a Geotechnical Engineering Report, Infiltration Testing, Plan Review, and Consultation, City of Guadalupe Central Park Renovation, West of Pacheco Street Between 9th and 10th Streets, Guadalupe, California, by Earth Systems Pacific, dated April 1, 2022, Doc. No. 2204-004.PRP

Dear Mr. Berg:

In accordance with your authorization of the above-referenced proposal, this geotechnical engineering report has been prepared for use in the development of plans and specifications for the City of Guadalupe Central Park Renovation project. The project is located west of Pacheco Street between 9th and 10th Streets in the City of Guadalupe, California. Preliminary geotechnical recommendations for site preparation, grading, utility trenches, foundations, retaining walls, slabs-on-grade and exterior flatwork, drainage and maintenance, and construction observation and testing are presented herein. An electronic copy of this report is being furnished for your use.

We appreciate the opportunity to have provided services for this project and look forward to working with you again in the future. If there are any questions concerning this report, please do not hesitate to contact the undersigned.

Sincerely,
Earth Systems Pacific


Luke Johnson, EIT
Staff Engineer

Doc. No. 2301-037.SER/lm


Doug Dunham, GE
Associate Engineer





Table of Contents

COVER LETTER.....	ii
1.0 INTRODUCTION.....	1
2.0 SCOPE OF SERVICES	2
3.0 SITE SETTING	3
4.0 FIELD INVESTIGATION AND LABORATORY ANALYSIS	4
5.0 GENERAL SUBSURFACE PROFILE.....	5
6.0 INFILTRATION TESTING	6
7.0 CONCLUSIONS.....	8
8.0 PRELIMINARY GEOTECHNICAL RECOMMENDATIONS.....	11
Definitions	11
Site Preparation	12
Grading.....	13
Utility Trenches	14
Foundations	15
Retaining Walls	17
Slabs-on-Grade and Exterior Flatwork.....	19
Drainage and Maintenance.....	23
Construction Observation and Testing	24
9.0 CLOSURE.....	26
TECHNICAL REFERENCES.....	28

Appendices

APPENDIX A

Exploration Location Map
Boring Log Legend
Boring Logs
Graphical CPT Data

APPENDIX B

Laboratory Test Results

APPENDIX C

Infiltration Test Results

APPENDIX D

Typical Detail A: Pipe Placed Parallel to Foundations



1.0 INTRODUCTION

The City of Guadalupe Central Park Renovation project is planned, and the park is located west of Pacheco Street between 9th and 10th Streets in the City of Guadalupe, California. The general area where the project will be constructed is referred to herein as “the site.” The site is shown on the Exploration Location Map presented in Appendix A.

The project is in the early design stages and precise development plans were not available at the writing of this report. Based on a conceptual plan, we have assumed the project will generally consist of the construction of various park and recreation related structures and improvements which could include but would not be limited to:

- Skate Park
- Dog Park
- Basketball Half Court
- New Restroom Building
- Game Tables
- Playground Equipment
- Picnic Tables with Mini-BBQ Stations
- Adult Exercise Stations
- Climbing Wall
- Bioswale Area
- Bocce Ball or Horseshoe Pits

We have assumed the restroom building will be approximately 200 square feet in plan, will be one story in height, will be of wood and steel frame construction, of masonry construction, or a combination thereof, and will utilize a Portland cement concrete (PCC) slab-on-grade floor. Retaining walls for sitework and not exceeding 6 feet in height may also be constructed. We have assumed the playground equipment, benches, fitness equipment, etc. will be mainly of steel frame construction but could further utilize plastic and/or wood components. We have assumed the skate park will be of PCC construction and will not include below grade features. For the purposes of this report, we have assumed that maximum line loads will be approximately 1 kip/foot and maximum point loads will be approximately 10 kips. We have further assumed the fundamental period of the structures will not exceed 0.5 seconds.

Surface and subsurface improvements will also be constructed at the site. We have assumed surface improvements will consist of PCC flatwork for pedestrian access and recreational use. No



new vehicle pavement is planned. Subsurface improvements will be the underground municipal utilities that will provide the sewer, water, power, and communication services. Low Impact Development (LID) drainage disposal systems will be constructed in the westerly and southerly portions of the site. No on-site effluent disposal systems are planned; therefore, this item is not within our current scope of work and is not addressed in this report.

We have assumed the site will be mass graded to develop the building and surface improvement areas, to improve access, and to improve drainage. No slopes are anticipated.

2.0 SCOPE OF SERVICES

The scope of work for the geotechnical engineering report included a general site reconnaissance, subsurface investigation, laboratory testing of selected soil samples, and preparation of this report. The analysis and subsequent recommendations were based, in part, upon information provided by the client.

This report and preliminary geotechnical recommendations are intended to comply with the considerations of California Building Code (CBC) Sections 1803.1 through 1803.6, J104.3 and J104.4 (CBSC, 2022), as applicable, and common geotechnical engineering practice in this area under similar conditions at this time. The test procedures were accomplished in general conformance with the standards noted, as modified by common geotechnical engineering practice in this area under similar conditions at this time.

Preliminary geotechnical recommendations for site preparation, grading, utility trenches, foundations, retaining walls, slabs-on-grade and exterior flatwork, drainage and maintenance, and construction observation and testing are presented to guide the development of project plans and specifications. It is our intent that this report be used exclusively by the client to form the geotechnical basis of the design of the project and in the preparation of plans and specifications. Application beyond this intent is strictly at the user's risk. If future parties wish to use this report, such use may be allowed to the extent the report is applicable, only if the user



agrees to be bound by the same contractual conditions as the original client, or contractual conditions that may be applicable at the time of the report use.

This report does not address issues in the domain of contractors such as, but not limited to, site safety, loss of volume due to stripping of the site, shrinkage of soils during compaction, dewatering, shoring, temporary slope angles, construction means and methods, etc. Analyses of the soil for asbestos (either man-made or naturally occurring), radioisotopes, mold or other microbial content, hydrocarbons, lead, corrosivity, and/or other chemical properties are beyond the scope of this report. Ancillary features such as temporary access roads, fencing, flag poles, signage, effluent disposal systems, and nonstructural fills and slopes are not within our scope and are also not addressed in this report.

As there may be unresolved geotechnical issues with respect to this project, the geotechnical engineer should be retained to provide consultation as the design progresses, and to review project plans as they near completion to assist in verifying that pertinent geotechnical issues have been addressed and to aid in conformance with the intent of this report. In the event that there are any changes in the nature, design, or location of improvements, or if any assumptions used in the preparation of this report prove to be incorrect, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed, and the conclusions of this report are verified or modified by the geotechnical engineer in writing. The criteria presented in this report are considered preliminary until such time as any peer review or review by any jurisdiction has been completed, conditions are observed by the geotechnical engineer in the field during construction, and the recommendations have been verified as appropriate or are modified by the geotechnical engineer in writing.

3.0 SITE SETTING

This site is located within the City of Guadalupe Central Park located west of Pacheco Street between 9th and 10th Streets which is in the northern sector of the City of Guadalupe, California.



The approximate central site coordinates and elevation from the Google Earth website (Google, 2023) are latitude 34.9702 degrees north and longitude 120.5709 degrees west, and 74 feet.

The site is bounded to the east by Pacheco Street, to the south by 9th Street, to the north by 10th Street, and to the west by a residential development. The site is accessed from both 9th and 10th Streets. The site currently supports a restroom building and parking lot and is otherwise covered with typical landscape surface and subsurface improvements. Topographically, the site is relatively flat, and surface drainage is by sheet flow.

4.0 FIELD INVESTIGATION AND LABORATORY ANALYSIS

Hollow Stem Auger Borings

On December 15, 2022 three exploration and sample acquisition borings were drilled at the site to depths ranging from approximately 6.5 to 51.5 feet below the existing ground surface (bgs). The borings were drilled with a Mobile Drill Model B-53 truck-mounted drill rig equipped with 6-inch diameter hollow stem auger and an automatic trip hammer for sampling. The approximate locations of the borings are shown on the Exploration Location Map presented in Appendix A.

Soils encountered in the borings were categorized and logged in general accordance with the Unified Soil Classification System and ASTM D2488-17. Copies of the boring logs are presented in Appendix A along with a Boring Log Legend. In reviewing the boring logs and legend, the reader should recognize that the legend is intended as a guideline only and there are a number of conditions that may influence the soil characteristics as observed during excavation. These include, but are not limited to, the presence of cobbles or boulders, cementation, variations in soil moisture, presence of groundwater, and other factors. Consequently, the logger must exercise judgment in interpreting the subsurface characteristics, possibly resulting in soil descriptions that vary somewhat from the legend. The reader should also consider the sampler type used when reviewing the blow counts.



As the borings were drilled, soil samples were obtained using a 3-inch outside diameter ring-lined barrel sampler (ASTM D3550-17 with shoe similar to D2937-17). Standard penetration tests (SPT) using a 2-inch outside diameter split-spoon sampler were also performed in the borings (ASTM D1586-18) at selected depths. Bulk soil samples were obtained from the auger cuttings.

Ring samples were tested for bulk density per ASTM D2937-17 (modified for ring liners). One bulk sample was tested for maximum dry density and optimum moisture content [ASTM D1557-12 (2021)]. The same sample was tested for direct shear (ASTM D3080-11) after it was remolded to approximately 90 percent of the maximum dry density. Another bulk sample was tested for expansion index (ASTM D4829-21). A consolidation test [ASTM D2435-11 (2020)] was conducted on a selected ring sample. The laboratory test results are presented in Appendix B.

Cone Penetrometer Test Sounding

On December 6, 2020, one cone penetrometer test (CPT) sounding was also performed within the site. The CPT sounding was advanced to an approximate depth of 70 feet bgs. The approximate location of the CPT sounding is also shown on the Exploration Location Map presented in Appendix A.

The CPT sounding was conducted in general accordance with ASTM D5778-12 and D3441-16 using an electric cone penetrometer. A copy of the graphical CPT data can also be found in Appendix A.

5.0 GENERAL SUBSURFACE PROFILE

The general subsurface profile encountered in the borings and CPT sounding consisted of layered sand, silt, and clay soils. The sands were in a moist condition with a loose to medium dense consistency. The silts and clays were moist to very moist and soft to medium stiff. Subsurface water was encountered in Boring 2 at approximately 40 feet bgs after the drill augers were removed. Subsurface water was detected in the CPT sounding at a depth of approximately 29 feet bgs. Subsurface water was previously encountered at an approximate depth of 20 feet bgs



during the geotechnical investigation for the elevated water tank located near the northeast portion of the site (ESP, 2007). Please refer to the boring logs in Appendix A for a more complete description of the subsurface conditions.

Based on the subsurface profile described above and the sampler blow counts, the Site Class per Chapter 20 Table 20.3-1 (ASCE, 2017) is “E, a Soft Clay Soil Profile.”

6.0 INFILTRATION TESTING

Infiltration Test Procedures

The infiltration test procedures were generally intended to conform to the test methods developed by this firm in association with the Central Coast Regional Water Quality Control Board Low Impact Development Initiative (ESP, 2013). The deeper exploration and sample acquisition borings drilled as part of preparing this report were used as the profile borings, and the general subsurface profile observed from these borings is described above.

On December 15, 2022, two infiltration test borings (designated as A and B) were drilled to depths of approximately 5 feet bgs with a Mobile B-53 drill rig equipped with 6-inch outside diameter hollow stem auger. These borings were drilled in the areas designated by the client and their respective locations are shown on the Exploration Location Map presented in Appendix A. The soil conditions encountered within the infiltration test borings were similar to those observed in the deeper exploration and sample acquisition borings.

After the infiltration test borings were drilled, a 4-inch diameter perforated polyvinyl chloride (PVC) pipe was installed in the center of each boring. The bottom 2 inches of the borings and the annular spaces around the outside of the PVC pipes were filled with gravel to reduce caving of the areas to be tested. After installation of the PVC pipe and gravel, the infiltration test borings were completely filled with water and the constant head portion of the test was conducted. For this portion of the test, water was added to the borings as needed to maintain a relatively



constant elevation or head for a period of 30 minutes. During this process, the volume of water that flowed into the borings was measured with a calibrated flow meter.

After completing the 30-minute constant head water volume measurement, the falling head rate of infiltration was subsequently monitored over a period of approximately 160 to 240 minutes. During the tests, water was added as needed if the infiltration test borings ran dry. Following the infiltration testing, the PVC pipes were removed and the borings were backfilled with auger cuttings.

Infiltration Test Results

The infiltration test results are presented in Appendix C. The 30-minute constant head portion of the infiltration testing resulted in introducing approximate volumes of water of 0.5 and 15 gallons. The falling head infiltration rates varied between approximately 2 to 150 inches/hour over the testing period depending on the water's head or elevation, and the soil's hydraulic conductivity that existed in the respective infiltration test borings.

The infiltration test results only indicate the measured rate at the specific location and under specific conditions. Sound engineering judgment should be exercised in extrapolating the test results for other conditions or locations. Technical design references vary in methods they present for using these types of test results. However, the majority of references include reduction or correction factors for several parameters including, but not limited to, degree of processing and compaction after testing, size of the LID drainage disposal system relative to the test volume, number of tests conducted, variability in the soil profile, anticipated silt loading, anticipated biological buildup, anticipated long-term maintenance, and other factors. Typically, in aggregate these factors range from about 2.5 to 18 depending upon the method used. The final determination of the means by which these data are used is left to the design engineer.



7.0 CONCLUSIONS

In our opinion, the site is suitable from a geotechnical engineering standpoint for the planned development as described in the “Introduction” section of this report provided the recommendations contained herein are implemented in the design and construction. This opinion does not extend to the suitability of the site for LID drainage disposal improvements as that is the responsibility of other engineers. The upper site soils were tested and found to be generally nonexpansive; therefore, no special measures with respect to expansive soils are considered necessary. Assuming the site is prepared in accordance with the “Preliminary Geotechnical Recommendations” section of this report, shallow conventional continuous and spread (pad) footings may be used to support the structures.

The primary geotechnical engineering issues at this site are the potential for strong ground shaking, the potential for settlement, the excavation characteristics of the soils, the suitability of the soils for use as fill and backfill, the stability of the soils during grading, the erodible nature of the soils, and the potential for liquefaction and seismically induced settlement of dry sand.

Strong Ground Shaking

The site is in a region of high seismic activity, with the potential for large seismic events that could generate strong ground shaking. The CBC (CBSC, 2022) requires that seismic loads are considered in structural design. A seismic analysis was undertaken to provide seismic acceleration design parameters; the results are presented in the “Foundations” section of this report for use by others in the structural design process.

The ASCE 7-16 (ASCE, 2017/2018) method available on the Structural Engineers Association of California (SEAOC) Seismic Design Map Tool website (SEAOC, 2023) was used for the seismic analysis. The risk category for buildings and structures is assigned by others in accordance with Table 1604.5 (CBSC, 2022); however, based on our current understanding of the project, we selected Risk Category II for our analysis. The site coordinates from the “Site Setting” section of this report were used in the analysis. Based on the general subsurface profile encountered, the



Site Class per Chapter 20 Table 20.3-1 (ASCE, 2017) is “E, a Soft Clay Soil Profile.” A general ground motion seismic analysis was performed assuming that Exception 1 listed in Section 11.4.8 (ASCE, 2017) will apply to the project.

Settlement Potential

Settlement (total and differential) can occur when foundations and surface improvements span materials having variable consolidation, moisture, and density characteristics, such as the soils on this site. Such a situation can stress and possibly damage foundations and surface improvements, often resulting in severe cracks and displacement. To reduce this settlement potential, it is necessary for all foundations and surface improvements to bear on material that is as uniform as practicable. A program of overexcavation, scarification, moisture conditioning, and compaction of the upper soils in the building and the surface improvement areas is recommended to provide more uniform soil moisture and density and appropriate support.

Another concern with respect to settlement is the potential for hydroconsolidation. Hydroconsolidation is the tendency of soils to settle upon saturation, even without being subjected to increased loads. Based on our laboratory testing, the soils have a slight potential to collapse when saturated. The recommended earthwork program and the installation and maintenance of drainage improvements will reduce the potential for hydroconsolidation to affect the building and surface improvements.

Excavation Characteristics

The soils are anticipated to be excavatable with conventional earthmoving equipment; however, the stability of excavations is a concern. Additionally, various size gravel was noted within some of the soil layers. Based on our preliminary testing, the soils are considered to be “Type C” per the 2019 Cal/OSHA classification system. This classification should be verified by the contractor’s “Competent Person” at the time of construction. Excavation sloping and shoring will be needed to safely work in and to restrict the size of the excavations and to reduce the potential for falling



rock hazards. As with all construction safety issues, the methods of excavation stabilization, sloping, and/or shoring are ultimately the responsibility of the contractor.

Suitability of the Soils for Use as Fill and Backfill

We anticipate that the majority, if not all, of the soils excavated at the site will be acceptable from a geotechnical viewpoint for reuse as compacted fill and backfill. However, special requirements for utility trench bedding and shading per the specifications of the governing jurisdiction, the conduit manufacturer, and the utility companies should be anticipated.

Stability of Soils During Grading

The soils may be susceptible to temporary high soil moisture contents, especially during or soon after the rainy season. Attempting to compact the soils in an overly moist condition may create unstable conditions in the form of pumping, yielding, shearing, and/or rutting. These conditions will not allow proper compaction and are inappropriate for continued fill placement. Therefore, the construction schedule should allow adequate time during grading for aerating and drying the soils to near optimum moisture content prior to compaction. If unstable conditions occur, the geotechnical engineer should be consulted to provide recommendations for correction of the conditions.

Soil Erosion

The soils are considered to be highly erodible. Stabilization of the surface soils particularly those disturbed during construction by vegetation or other means during and following construction is essential to reduce the potential of erosion damage. Care should be taken to establish and maintain proper drainage around the structures and improvements.

Liquefaction and Seismically Induced Settlement of Dry Sand

Liquefaction is the loss of soil strength caused by a significant seismic event. It occurs primarily in loose, fine to medium-grained sands, and in very soft to medium stiff silts that are saturated by groundwater. During a major earthquake, the saturated sands and silts tend to compress and



the void spaces between the soil particles that are filled with water decrease in volume. This causes the pore water pressure to build up in the soils. Then if the water does drain away rapidly, the soils may lose their strength and transition into a liquefied state.

Seismically induced settlement of dry sand is also caused by a significant seismic event and may occur in lower density sand and silt soils that are not saturated by groundwater. During a major earthquake, the void spaces between the unsaturated soil particles that are filled with air tend to compress which translates to a decrease in volume or settlement.

To further understand the effects of liquefaction and seismically induced settlement of dry sand, we performed an analysis of the CPT data using the PGA_M of 0.556g (from the “Foundations” section of this report), an earthquake magnitude from all sources of 6.69 (USGS, 2023), and an assumed groundwater depth of approximately 20 feet bgs (ESP, 2007). Based on the analysis, total and differential dynamic settlement due to liquefaction and seismically induced settlement of dry sand is not anticipated to exceed approximately 2.5 inches and 1.25 inches, respectively.

Accordingly, no special measures will be needed to protect the structure and improvements from either liquefaction or seismically induced settlement of dry sand.

8.0 PRELIMINARY GEOTECHNICAL RECOMMENDATIONS

The following recommendations are applicable to the structures and improvements as described in the “Introduction” section of this report and assume that all floors will be above grade. If additional stories, basements, cellars, sunken rooms, subterranean rooms, taller or stacked retaining walls or other such features are incorporated into site development, the geotechnical engineer should be contacted for individual assessment.

Definitions

Unless otherwise noted, the following definitions are used in these recommendations. Where specific terms are not defined, common definitions used in the construction industry are intended.



- **Building Area:** The area within and extending a minimum of 5 feet beyond the foundation perimeter of the foundations for a structure. The building area also includes the foundation area (plus 5 feet to each side) of any ancillary structure that will be rigidly attached to the main structure and is expected to perform in the same manner as the main structure. Such ancillary structures could include covered walkways, covered patios, arbors, etc.
- **Surface Improvement Area:** The area within and extending a minimum of 2 feet beyond the perimeter of the surface improvement.
- **Scarified:** Ripping the exposed soil surface in two orthogonal directions to a minimum depth of 12 inches.
- **Moisture Conditioning:** Adjusting the soil moisture to optimum moisture content or slightly above, prior to the application of compaction effort.
- **Compacted or Recompacted:** Soils placed in level lifts not exceeding 8 inches in loose thickness, and compacted to a minimum of 90 percent of maximum dry density. A minimum of 95 percent will be required in the upper 1-foot of subgrade below vehicle pavement and in all AB. The standard tests used to define maximum dry density and field density should be ASTM D1557-12 (2021) and ASTM D6938-17, respectively, or by other methods acceptable to the geotechnical engineer and the governing jurisdiction.
- **Nonexpansive Material:** Nonexpansive material is defined as being a coarse-grained soil (ASTM D2487-17) and having an expansion index of 10 or less (ASTM D4829-21).

Site Preparation

1. The existing ground surface in the building and surface improvement areas should be prepared for construction by removing existing structures, improvements, vegetation, tree stumps, large roots, debris, and other deleterious material. Any existing fill soils



should be completely removed and replaced as compacted fill. Any existing utilities that will not remain in service should be removed or properly abandoned. The appropriate method of utility abandonment will depend upon the type and depth of the utility. Recommendations for abandonment can be made as necessary.

2. Voids created by the removal of materials or utilities, and extending below the recommended overexcavation depth, should be immediately called to the attention of the geotechnical engineer. No fill should be placed unless the geotechnical engineer has observed the underlying soil.

Grading

1. Following site preparation, the soil in the building area should be removed to a level plane at a minimum depth of 3 feet below the bottom of the deepest footing or 4 feet bgs, *whichever is deeper*. During construction, locally deeper removals may be recommended based on field conditions. The resulting soil surface should then be scarified, moisture conditioned, and compacted prior to placing any fill soil.
2. Following site preparation, the soil in the surface improvement area should be removed to a minimum depth of 1-foot below subgrade or 2 feet bgs, *whichever is deeper*. During construction, locally deeper removals may be recommended based on field conditions. The resulting soil surface should then be scarified, moisture conditioned, and compacted prior to placing any fill soil.
3. Following site preparation, the soils in the fill areas beyond the building and surface improvement areas should be removed to a depth of 2 feet bgs. During construction, locally deeper removals may be recommended based on field conditions. The resulting soil surface should then be scarified, moisture conditioned, and compacted prior to placing any fill soil.



4. Voids created by dislodging cobbles and/or debris during scarification should be backfilled and compacted, and the dislodged materials should be removed from the area of work.
5. On-site material and approved import materials may be used as general fill. All imported soil should be nonexpansive. Proposed imported soils should be evaluated by the geotechnical engineer before being used, and on an intermittent basis during placement on the site.
6. All materials used as fill should be cleaned of any debris and rocks larger than 6 inches in diameter. No rocks larger than 3 inches in diameter should be used within the upper 3 feet of finish grade. When fill material includes rocks, the rocks should be placed in a sufficient soil matrix to ensure that voids caused by nesting of the rocks will not occur and that the fill can be properly compacted.

Utility Trenches

1. Unless otherwise recommended, utility trenches adjacent to foundations should not be excavated within the zone of foundation influence, as shown on Typical Detail A presented in Appendix D.
2. Utilities that will pass beneath a foundation should be placed with properly compacted utility trench backfill, and the foundation should be designed to span the trench.
3. Utility connections to the buildings should be flexible enough to handle the potential for a total seismically induced settlement of 2.5 inches.
4. A select, noncorrosive, granular, easily compacted material should be used as bedding and shading immediately around utilities. Generally, the soil found at the site may be used for trench backfill above the select material.
5. Utility trench backfill should be moisture conditioned and compacted. A minimum of 95 percent of maximum dry density should also be obtained where trench backfill comprises



the upper 1-foot of subgrade beneath vehicle pavement, and in all AB. A minimum of 85 percent of maximum dry density will generally be sufficient where trench backfill is located in landscaped or other unimproved areas, where settlement of trench backfill would not be detrimental.

6. Jetting of trench backfill should generally not be allowed as a means of backfill densification. However, to aid in encasing utility conduits, particularly corrugated conduits and multiple closely spaced conduits in a single trench, jetting or flooding may be useful. Jetting or flooding should only be attempted with extreme caution, and any jetting or flooding operation should be subject to review by the geotechnical engineer.
7. Long-term settlement of properly compacted imported sand should be assumed to be about 0.25 to 0.5 percent of the depth of the backfill. Where trenches are backfilled with site soils, the anticipated settlement would be about twice that of imported sand. Improvements that are constructed over or near trenches should be designed to accommodate the potential for settlement.
8. The recommendations of this section are minimums only, and may be superseded by the architect/engineer based upon the soil corrosivity, or the requirements of the pipe manufacturer, the utility companies, or the governing jurisdiction.

Foundations

1. Conventional continuous and spread footings bearing entirely on soil compacted per the “Grading” section of this report may be used to support the structures. Grade beams should be placed across all entrances into the restroom building. Footings and grade beams should have a minimum depth of 12 inches below lowest adjacent grade; however, footing and grade beam dimensions should also conform to the requirements of Section 1809 (CBSC, 2022). All spread footings should be a minimum of 2 feet square. Conventional footing and grade beam reinforcement should be in accordance with the



requirements of the architect/engineer; minimum continuous footing and grade beam reinforcement should consist of two No. 4 rebar, one near the top and one near the bottom of the footing or grade beam.

2. Footings should be designed using a maximum allowable bearing capacity of 2,000 psf dead plus live loads. The allowable bearing capacity may be increased by 250 psf for each additional 6 inches of embedment below a depth of 12 inches below lowest adjacent grade. The allowable bearing capacity should not exceed 2,500 psf dead plus live loads, regardless of footing depth.
3. Using these criteria, total and differential settlement is expected to be on the order of 0.75 inches and 0.375 inches in 40 feet, respectively. Foundations should also be designed to accommodate total and differential seismically induced settlement 2.5 inches and 1.25 inches, respectively. The differential settlement value should be applied across the largest diagonal distance from corner to corner of any given building footprint.

The allowable bearing capacity may be increased by one-third when transient loads such as wind or seismicity are included if the structural engineer determines they are allowed per Sections 1605.3.1 and 1605.3.2 (CBSC, 2022). The following seismic parameters are presented for use in structural design.

Seismic Design Parameters

2022 CBC Mapped Values		Site Class "E" Adjusted Values				Design Values	
Seismic Parameters	Values (g)	Site Coefficients	Values	Seismic Parameters	Values (g)	Seismic Parameters	Values (g)
S_s	0.899	F_a	1.300	S_{MS}	1.169	S_{DS}	0.779
S_1	0.336	F_v	2.656	S_{M1}	0.892	S_{D1}	0.595
Peak Mean Ground Acceleration (PGA_M) = 0.556g Seismic Design Category = D							



4. Lateral loads may be resisted by soil friction and by passive resistance of the soil acting on foundations. Lateral capacity is based on the assumption that backfill adjacent to foundations is properly compacted. A passive equivalent fluid pressure of 350 pcf and a coefficient of friction of 0.38 may be used in design. No factors of safety, load factors, and/or other factors have been applied to any of these values.
5. Foundation excavations should be observed by the geotechnical engineer prior to rebar and PCC placement. Footing excavations should be thoroughly moistened prior to PCC placement and no desiccation cracks should be present.

Retaining Walls

1. All retaining wall foundations should be supported by soil compacted as recommended in the "Grading" section of this report. Conventional foundations for retaining walls should have a minimum depth of 12 inches below the lowest adjacent grade not including the keyway. It is assumed that retaining walls will not exceed 6 feet in height.
2. As we have assumed that retaining wall heights will not exceed a height of 6 feet, seismic design per Section 1803.5.12.1 (CBSC, 2022) is not required. If retaining walls will retain more than 6 feet of soil, seismic design will be required by the geotechnical engineer.
3. Retaining wall design should be based on the following parameters:

Active equivalent fluid pressure

(native soil or imported sand or gravel backfill) 35 pcf

At-rest equivalent fluid pressure

(native soil or imported sand or gravel backfill) 55 pcf

Passive equivalent fluid pressure (compacted fill) 350 pcf

Maximum toe pressure (compacted fill) 2,000 psf

Coefficient of sliding friction (compacted fill) 0.38



4. No surcharges are taken into consideration in the above values. The maximum toe pressure is an *allowable* value to which a factor of safety has been applied. No factors of safety, load factors, and/or other factors have been applied to any of the remaining values.
5. The above pressures are applicable to a horizontal retained surface behind the wall. Walls having a retained surface that slopes upward from the wall should be designed for an additional equivalent fluid pressure of 1 pcf for the active case and 1.5 pcf for the at-rest case, for every degree of slope inclination.
6. The active and at-rest values presented above are for drained conditions. Consequently, retaining walls should be drained with rigid perforated pipe encased in a free draining gravel blanket. The pipe should be placed perforations downward and should discharge in a nonerosive manner away from foundations and other improvements. The gravel blanket should have a width of approximately 1-foot and should extend upward to approximately 1-foot from the top of the wall. The upper foot should be backfilled with on-site soil, except in areas where a PCC slab or HMA pavement will abut the top of the wall. In such cases, the gravel backfill should extend up to the material that supports the PCC or HMA. To reduce infiltration of the soil into the gravel, a permeable synthetic fabric conforming to the Standard Specifications Section 96-1.02B – Class “C,” (Caltrans, 2018) should be placed between the two. Manufactured geocomposite wall drains conforming to the Standard Specifications Section 96-1.02C (Caltrans, 2018) are acceptable alternatives to the use of gravel, provided that they are installed in accordance with the recommendations of the manufacturer. Where drainage can be properly controlled, weep holes on maximum 4-foot centers may be used in lieu of perforated pipe. A filter fabric as described above should be placed between the weep holes and the drain gravel.



7. Retaining walls where moisture transmission through the wall would be undesirable should be thoroughly waterproofed in accordance with the specifications of the architect/engineer.
8. The architect/engineer should bear in mind that retaining walls by their nature are flexible structures, and that surface treatments on walls often crack. Where walls are to be plastered or otherwise have a finish applied, the flexibility should be considered in determining the suitability of the surfacing material, spacing of horizontal and vertical control joints, etc. The flexibility should also be considered where a retaining wall will abut or be connected to a rigid structure, and where the geometry of the wall is such that its flexibility will vary along its length.

Slabs-on-Grade and Exterior Flatwork

Design Considerations

1. Conventional interior light-duty PCC slabs-on-grade and exterior flatwork should have a minimum thickness of 4 full inches; the thickness of heavy-duty slabs and exterior flatwork should be specified by the architect/engineer. Slabs-on-grade should be doweled to footings and grade beams with dowels.
2. Reinforcement size, placement, and dowels should be as directed by the architect/engineer. Light-duty exterior pedestrian flatwork should be reinforced, at a minimum, with No. 3 rebar at 18 inches on-center each way. Heavy-duty slabs and flatwork should have minimum rebar sizing and spacing that meets the criteria of American Concrete Institute (ACI) 318 (ACI, 2014). A modulus of subgrade reaction (K_{30}) of 50 psi/inch may be used in the design of heavy-duty slabs-on-grade founded on compacted native soil. The modulus of subgrade reaction (K_{30}) may be increased to 100 psi/inch if the slab is underlain with a minimum of 6 inches of compacted Class 2 aggregate base (AB) (Caltrans, 2018), and to 150 psi/inch if the slab is underlain with a minimum of 12 inches of compacted Class 2 AB.



Moisture Vapor Transmission Considerations

3. Due to the current use of impermeable floor coverings, water-soluble flooring adhesives, and the speed at which buildings are now constructed, moisture vapor transmission through slabs is a much more common problem than in past years. Where moisture vapor transmitted from the underlying soil would be undesirable, the slabs should be protected from subsurface moisture vapor. A number of options for vapor protection are discussed below; however, the means of vapor protection, including the type and thickness of the vapor retarder, if specified, are left to the discretion of the architect/engineer.
4. Where specified, vapor retarders should conform to ASTM Standard E1745-17. This standard specifies properties for three performance classes, Class “A”, “B” and “C”. The appropriate class should be selected based on the potential for damage to the vapor retarder during its installation and placement of slab reinforcement and concrete.
5. Several recent studies, including those of ACI Committee 302 (ACI, 2015), have concluded that excess water above the vapor retarder increases the potential for moisture damage to floor coverings and could increase the potential for mold growth or other microbial contamination. The studies also concluded that it is preferable to eliminate the typical sand layer beneath the slab and place the slab PCC in direct contact with a Class “A” vapor retarder, particularly during wet weather construction. However, placing the PCC directly on the vapor retarder requires special attention to using the proper vapor retarder, a very low water-cement ratio in the PCC mix, and special finishing and curing techniques.
6. Another option for vapor protection would be the use of vapor-inhibiting admixtures in the slab PCC mix and/or application of a sealer to the surface of the slab. This would also require special PCC mixes and placement procedures, depending upon the recommendations of the admixture or sealer manufacturer.



7. A third option that may be a reasonable compromise between effectiveness and cost considerations is the use of a subslab vapor retarder protected by a sand layer. If a Class “A” vapor retarder is specified, the retarder can be placed directly on the compacted soil material. The retarder should be covered with a minimum 2 inches of *clean* sand. If a less durable vapor retarder is specified (Class “B” or “C”), a minimum of 4 inches of clean sand should be provided, and the retarder should be placed in the center of the clean sand layer. Clean sand is defined as a well or poorly graded sand (ASTM D2487-17) of which less than 3 percent passes the No. 200 sieve.

Construction Considerations

8. If sand is used between the vapor retarder and the slab, it should be moistened only as necessary to promote concrete curing; saturation of the sand should be avoided, as the excess moisture would be on top of the vapor retarder, potentially resulting in vapor transmission through the slab for months or years.
9. Regardless of the underslab vapor retarder selected, proper installation of the retarder is critical for optimum performance. Where utilized, the vapor retarder should be placed a minimum of 1-inch above the flow line of the drainage path surrounding the structures, or 1-inch above the area drain grates if area drains are used to collect runoff around the structures. All seams must be properly lapped, and all seams and utility penetrations properly sealed in accordance with the vapor retarder manufacturer’s recommendations and ASTM E1643-18a. At the terminating edges of the vapor retarder, the vapor retarder should be effectively sealed with accessories specifically designed to seal the material to new or existing concrete; details for edge sealing of the vapor retarder should be provided by the architect/engineer.
10. In conventional construction, it is common to use 4 to 6 inches of sand beneath exterior light-duty PCC slabs-on-grade and exterior flatwork. Another measure that can be taken to reduce the risk of movement of flatwork is to provide thickened edges or grade beams



around the perimeters of the flatwork. The thickened edges or grade beams could be up to 6 to 12 inches deep with the deeper edges or grade beams providing better protection. At a minimum, the thickened edge or grade beam should be reinforced by two No. 4 rebar, one near the top and one near the bottom.

11. It is recognized that the measures discussed above for protecting exterior flatwork are expensive; possibly more expensive than simply replacing the flatwork that has heaved and/or cracked. Accordingly, the above measures for protecting exterior flatwork should be implemented unless the client's preference is to replace exterior flatwork that is damaged over time. Therefore, the degree to which the exterior flatwork is protected from expansive soil damage is left to the discretion of the client.
12. Flatwork should be constructed with frequent joints to allow articulation as flatwork moves in response to seasonal moisture and/or temperature variations causing minor expansion and contraction of the soil, or variable bearing conditions. The soil in the subgrade should be moistened to at least optimum moisture content and no desiccation cracks should be present prior to casting the flatwork.
13. Where maintaining the elevation of the flatwork is desired, the flatwork should be doweled to the perimeter foundation as specified by the architect/engineer. In other areas, the flatwork may be doweled to the foundation or the flatwork may be allowed to "float free," at the discretion of the architect/engineer. Flatwork that is intended to float free should be separated from foundations by a felt joint or other means.
14. To reduce shrinkage cracks in PCC, the PCC aggregates should be of appropriate size and proportion, the water/cement ratio should be low, the PCC should be properly placed and finished, contraction joints should be installed, and the PCC should be properly cured. PCC materials, placement, and curing specifications should be at the direction of the



architect/engineer. The Guide for Concrete Floor and Slab Construction (ACI, 2015) is suggested as a resource for the architect/engineer in preparing such specifications.

Drainage and Maintenance

1. Per Section 1804.4 (CBSC, 2022), unpaved ground surfaces should be *finish graded* to direct surface runoff away from foundations and other improvements at a minimum 5 percent grade for a minimum distance of 10 feet. The site should be similarly sloped to drain away from foundation, slopes, and other improvements during construction. Where this is not practicable due to property lines, other improvements, etc., swales with improved surfaces, area drains, or other drainage facilities, should be used to collect and discharge runoff.
2. To reduce the potential for planter drainage from gaining access to subslab areas, any raised planter boxes adjacent to foundations should be installed with drains and sealed sides and bottoms. Drains should also be provided for areas adjacent to the foundations that would not otherwise freely drain.
3. The building roof should be fitted with roof gutters. Runoff from flatwork, roof gutters, downspouts, planter drains, area drains, etc. should discharge in a nonerosive manner away from foundations and other improvements in accordance with the requirements of the governing agencies.
4. The on-site soils are highly erodible; stabilization of soils disturbed during construction by vegetation or other means *during* and *following* construction, is essential to reduce erosion damage. Care should be taken to establish and maintain vegetation. The landscaping should be planned and installed to maintain the surface drainage recommended above. Surface drainage should also be maintained during construction.
5. To reduce migration of surface drainage into the subgrade, maintenance of pavement areas is critical. Any cracks that develop in the pavement should be promptly sealed.



6. The owner or site maintenance personnel should periodically observe the areas within and around the site for indications of rodent activity and soil instability. The owner or site maintenance personnel should also implement an aggressive program for controlling the rodent activity in the general area.

Construction Observation and Testing

1. It must be recognized that the recommendations contained in this report are based on a limited number of borings and a CPT sounding, and relies on continuity of the subsurface conditions encountered. It is assumed that the geotechnical engineer will be retained to provide consultation during the design phase, to review final plans once they are available, to interpret this report during construction, and to provide construction monitoring in the form of testing and observation.
2. At a minimum, the geotechnical engineer should be retained to provide:
 - Consultation during the design phase
 - Review of the project plans as they near completion
 - Professional observation during grading and backfill
 - Oversight of soil special inspection
3. Special inspection of grading should be provided as per Section 1705.6 and Table 1705.6 (CBSC, 2022). The special inspector should be under the direction of the geotechnical engineer. It is our opinion that none of the grading construction is of a nature that should warrant continuous special inspection; periodic special inspection should suffice. Subject to approval by the Building Official, the exception to continuous special inspection is described in Section 1704.2 (CBSC, 2022) and should be specified by the architect/engineer and periodic special inspection of the following items should be provided by the special inspector.
 - Stripping and clearing of vegetation and debris



- Overexcavation to the recommended depths
 - Scarification, moisture conditioning, and compaction of the soil
 - Fill quality, placement, and compaction
 - Utility trench backfill
 - Foundation excavations
 - Retaining wall drains and backfill
 - Subgrade and AB compaction and proofrolling
4. A program of quality control should be developed prior to beginning grading. The contractor or project manager should determine any additional inspection items required by the architect/engineer or the governing jurisdiction.
 5. Locations and frequency of compaction tests should be as per the recommendation of the geotechnical engineer at the time of construction. The recommended test location and frequency may be subject to modification by the geotechnical engineer, based upon soil and moisture conditions encountered, size and type of equipment used by the contractor, the general trend of the results of compaction tests, or other factors.
 6. A preconstruction meeting should be convened by the contractor, including the owner, the geotechnical engineer, the governing jurisdiction, the special inspector, the project inspector, and the architect/engineer to discuss planned construction procedures and quality control requirements.
 7. The geotechnical engineer should be notified at least 48 hours prior to beginning construction operations. If Earth Systems Pacific is not retained to provide construction observation and testing services, it shall not be responsible for the interpretation of the information by others or any consequences arising therefrom.



9.0 CLOSURE

Our intent was to perform the investigation in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in the locality of this project under similar conditions. No representation, warranty, or guarantee is either expressed or implied. This report is intended for the exclusive use by the client as discussed in the “Scope of Services” section of this report. Application beyond the stated intent is strictly at the user's risk.

This report is valid for conditions as they exist at this time for the type of project described herein. The conclusions and recommendations contained in this report could be rendered invalid, either in whole or in part, due to changes in building codes, regulations, standards of geotechnical or construction practice, changes in physical conditions, or the broadening of knowledge.

If changes with respect to development type or location become necessary, if items not addressed in this report are incorporated into plans, or if any of the assumptions used in the preparation of this report are not correct, this firm shall be notified for modifications to this report. Any items not specifically addressed in this report shall comply with the CBC (CBSC, 2022) and the requirements of the governing jurisdiction.

The preliminary recommendations of this report are based upon the geotechnical conditions encountered at the site and may be augmented by additional requirements of the architect/engineer, or by additional recommendations provided by this firm based on conditions exposed at the time of construction.

This document, the data, conclusions, and recommendations contained herein are the property of Earth Systems Pacific. This report shall be used in its entirety, with no individual sections reproduced or used out of context. Copies may be made only by Earth Systems Pacific, the client, and the client's authorized agents for use exclusively on the subject project. Any other use is subject to federal copyright laws and the written approval of Earth Systems Pacific.



City of Guadalupe Central Park Renovation
West of Pacheco Street Between 9th and 10th Streets
Guadalupe, California

January 27, 2023

Thank you for this opportunity to have been of service. If you have any questions, please feel free to contact this office at your convenience.

End of Text



TECHNICAL REFERENCES

ACI (American Concrete Institute). 2015. *Guide for Concrete Floor and Slab Construction*. Documents 302.1R04, ACI.

ACI (American Concrete Institute). 2014. *Building Code Requirements for Structural Concrete*. Document 318, ACI.

ASCE (American Society of Civil Engineers). 2017. *Minimum Design Loads for Buildings and other Structures* (7-16). Standards ASCE/SEI 7-16, ASCE.

ASCE (American Society of Civil Engineers). 2018. *Minimum Design Loads for Buildings and other Structures, Supplement 1*, Effective December 12, 2018.

ASTM International. 2023. *Annual Book of Standards*. ASTM.

CBSC (California Building Standards Commission). 2022. *California Building Code (CBC)*. CBSC.

CBSC (California Building Standards Commission). 2022. "Title 24." *California Code of Regulations*. CBSC.

CGS (California Geological Survey [1997] 2008. Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication 117a.

Cal/OSHA *Pocket Guide for the Construction Industry - Excavation, Trenches, and Earthwork*. 2019

Caltrans (California Department of Transportation). 2018. *Standard Specifications*. Caltrans.

Caltrans (California Department of Transportation). 2020. "Flexible Pavement, Chapter 630." Highway Design Manual.

ESP (Earth Systems Pacific). 2007. "Guadalupe Elevated Water Storage Tank." Soils Engineering Report, dated December 7, 2007, Document Number 0712-016.SER

Google. 2023. U.S. Department of State Geographer. *Google Earth Website*. Retrieved from: <http://www.google.com/earth/index.html>

SEAOC (Structural Engineers Association of California). 2023. "Seismic Design Map Tool." Retrieved from: <https://seismicmaps.org/>

USGS (United States Geological Survey). 2023. *Unified Hazard Tool*. United States Geological Survey. Retrieved from: <https://earthquake.usgs.gov/hazards/interactive/>

APPENDIX A

Exploration Location Map

Boring Log Legend

Boring Logs

Graphical CPT Data



LEGEND

- 3  Boring Location (Approx.)
- 1  Cone Penetrometer Test Sounding Location (Approx.)
- B  Infiltration Test Location (Approx.)



BASE MAP PROVIDED BY: GOOGLE EARTH (2023)

NOT TO SCALE



Earth Systems

2049 Preisker Lane, Suite E, Santa Maria, CA 93454
www.earthsystems.com
 (805) 928-2991

EXPLORATION LOCATION MAP
CITY OF GUADALUPE CENTRAL PARK RENOVATION
 West of Pacheco Street Between 9th and 10th Streets
 Guadalupe, California

Date
 January 2023

Project No.
 305572-001



Earth Systems Pacific

BORING LOG LEGEND

SAMPLE / SUBSURFACE WATER SYMBOLS	GRAPH. SYMBOL
CALIFORNIA MODIFIED	
STANDARD PENETRATION TEST (SPT)	
SHELBY TUBE	
BULK	
SUBSURFACE WATER DURING DRILLING	
SUBSURFACE WATER AFTER DRILLING	

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2487)

MAJOR DIVISIONS	GROUP SYMBOL	TYPICAL DESCRIPTIONS	GRAPH. SYMBOL
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN #200 SIEVE SIZE	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	
	GP	POORLY GRADED GRAVELS, OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	
	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES, NON-PLASTIC FINES	
	GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES, PLASTIC FINES	
	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	
	SP	POORLY GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES	
	SM	SILTY SANDS, SAND-SILT MIXTURES, NON-PLASTIC FINES	
	SC	CLAYEY SANDS, SAND-CLAY MIXTURES, PLASTIC FINES	
FINE GRAINED SOILS HALF OR MORE OF MATERIAL IS SMALLER THAN #200 SIEVE SIZE	ML	INORGANIC SILTS AND VERY FINE SANDS, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY	
	CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
	OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS	
	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
	OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
	PT	PEAT AND OTHER HIGHLY ORGANIC SOILS	

OBSERVED MOISTURE CONDITION

DRY	SLIGHTLY MOIST	MOIST	VERY MOIST	WET (SATURATED)

CONSISTENCY

COARSE GRAINED SOILS			FINE GRAINED SOILS		
BLOWS/FOOT		DESCRIPTIVE TERM	BLOWS/FOOT		DESCRIPTIVE TERM
SPT	CA SAMPLER		SPT	CA SAMPLER	
0-10	0-16	LOOSE	0-2	0-3	VERY SOFT
11-30	17-50	MEDIUM DENSE	3-4	4-7	SOFT
31-50	51-83	DENSE	5-8	8-13	MEDIUM STIFF
OVER 50	OVER 83	VERY DENSE	9-15	14-25	STIFF
			16-30	26-50	VERY STIFF
			OVER 30	OVER 50	HARD

GRAIN SIZES

U.S. STANDARD SERIES SIEVE				CLEAR SQUARE SIEVE OPENING		
# 200	# 40	# 10	# 4	3/4"	3"	12"
SILT & CLAY	SAND			GRAVEL		COBBLES
	FINE	MEDIUM	COARSE	FINE	COARSE	
						BOULDERS

TYPICAL BEDROCK HARDNESS

MAJOR DIVISIONS	TYPICAL DESCRIPTIONS
EXTREMELY HARD	CORE, FRAGMENT, OR EXPOSURE CANNOT BE SCRATCHED WITH KNIFE OR SHARP PICK; CAN ONLY BE CHIPPED WITH REPEATED HEAVY HAMMER BLOWS
VERY HARD	CANNOT BE SCRATCHED WITH KNIFE OR SHARP PICK; CORE OR FRAGMENT BREAKS WITH REPEATED HEAVY HAMMER BLOWS
HARD	CAN BE SCRATCHED WITH KNIFE OR SHARP PICK WITH DIFFICULTY (HEAVY PRESSURE); HEAVY HAMMER BLOW REQUIRED TO BREAK SPECIMEN
MODERATELY HARD	CAN BE GROOVED 1/16 INCH DEEP BY KNIFE OR SHARP PICK WITH MODERATE OR HEAVY PRESSURE; CORE OR FRAGMENT BREAKS WITH LIGHT HAMMER BLOW OR HEAVY MANUAL PRESSURE
SOFT	CAN BE GROOVED OR GOUGED EASILY BY KNIFE OR SHARP PICK WITH LIGHT PRESSURE, CAN BE SCRATCHED WITH FINGERNAIL; BREAKS WITH LIGHT TO MODERATE MANUAL PRESSURE
VERY SOFT	CAN BE READILY INDENTED, GROOVED OR GOUGED WITH FINGERNAIL, OR CARVED WITH KNIFE; BREAKS WITH LIGHT MANUAL PRESSURE

TYPICAL BEDROCK WEATHERING

MAJOR DIVISIONS	TYPICAL DESCRIPTIONS
FRESH	NO DISCOLORATION, NOT OXIDIZED
SLIGHTLY WEATHERED	DISCOLORATION OR OXIDATION IS LIMITED TO SURFACE OF, OR SHORT DISTANCE FROM, FRACTURES; SOME FELDSPAR CRYSTALS ARE DULL
MODERATELY WEATHERED	DISCOLORATION OR OXIDATION EXTENDS FROM FRACTURES, USUALLY THROUGHOUT; Fe-Mg MINERALS ARE "RUSTY", FELDSPAR CRYSTALS ARE "CLOUDY"
INTENSELY WEATHERED	DISCOLORATION OR OXIDATION THROUGHOUT, FELDSPAR AND Fe-Mg MINERALS ARE ALTERED TO CLAY TO SOME EXTENT, OR CHEMICAL ALTERATION PRODUCES IN SITU DISAGGREGATION
DECOMPOSED	DISCOLORATION OR OXIDATION THROUGHOUT, BUT RESISTANT MINERALS SUCH AS QUARTZ MAY BE UNALTERED; FELDSPAR AND Fe-Mg MINERALS ARE COMPLETELY ALTERED TO CLAY



Earth Systems Pacific

Boring No. 1

PAGE 1 OF 1

LOGGED BY: L. Johnson

DRILL RIG: Mobile B-53 with Automatic Hammer

JOB NO.: 305572-001

AUGER TYPE: 6" Hollow Stem

DATE: 12/15/2022

DEPTH (feet)	USCS CLASS	SYMBOL	CITY OF GUADALUPE CENTRAL PARK RENOVATION West of Pacheco Street Between 9 th and 10 th Streets Guadalupe, California	SAMPLE DATA				
			SOIL DESCRIPTION	INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	CL		SANDY LEAN CLAY: very dark brown, soft, moist					
1	ML		SANDY SILT: brown, soft, moist	0.5 - 5.0	○			
2								
3								
4								
5	SM		SILTY SAND: brown, medium dense, moist, trace fine gravel	5.0 - 6.5	■	109.0	5.5	6 13
6				5.0 - 10.0	○			20
7								
8								
9								
10			loose, increase in gravel content, fine and coarse gravel	10.0 - 11.5	■	105.9	5.1	6 8 6
11								
12								
13								
14								
15	CL		SANDY LEAN CLAY: brown, very soft, moist	15.0 - 16.5	●			0 1 1
16								
17			End of Boring @ 16.5'					
18			No subsurface water encountered					
19								
20								
21								
22								
23								
24								
25								
26								

LEGEND: ■ Ring Sample ○ Grab Sample □ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.



LOGGED BY: L. Johnson
 DRILL RIG: Mobile B-53 with Automatic Hammer
 AUGER TYPE: 6" Hollow Stem

PAGE 1 OF 1
 JOB NO.: 305572-001
 DATE: 12/15/2022

DEPTH (feet)	USCS CLASS	SYMBOL	CITY OF GUADALUPE CENTRAL PARK RENOVATION West of Pacheco Street Between 9 th and 10 th Streets Guadalupe, California	SAMPLE DATA				
				INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
			SOIL DESCRIPTION					
0	CL		SANDY LEAN CLAY: dark brown, soft, moist					
1				0.5 - 5.0	○			
2	SM		SILTY SAND: brown, medium dense, slightly moist					
3								
4								
5				5.0 - 6.5	■	105.2	11.3	5 7 14
6				5.0 - 10.0	○			
7	SC		CLAYEY SAND: dark brown, medium dense, moist					
8	CL		SANDY LEAN CLAY: very dark brown, medium stiff, moist					
9								
10			very moist, some debris (trash and nails)	10.0 - 11.5	■	91.7	22.7	3 4 6
11								
12								
13								
14								
15			very soft, increase in sand content, trace fine gravel	15.0 - 16.5	■	94.7	25.2	1 1 2
16								
17								
18								
19								
20	CL		LEAN CLAY: gray with brown mottling, soft, moist	20.0 - 21.5	●			1 1 2
21								
22								
23								
24								
25	ML		SILT: light brown, soft, moist					
26								

LEGEND: ■ Ring Sample ○ Grab Sample □ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.



Earth Systems Pacific

Boring No. 2

PAGE 2 OF 2

LOGGED BY: L. Johnson

DRILL RIG: Mobile B-53 with Automatic Hammer

JOB NO.: 305572-001

AUGER TYPE: 6" Hollow Stem

DATE: 12/15/2022

DEPTH (feet)	USCS CLASS	SYMBOL	CITY OF GUADALUPE CENTRAL PARK RENOVATION West of Pacheco Street Between 9 th and 10 th Streets Guadalupe, California	SAMPLE DATA				
			SOIL DESCRIPTION	INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
27	ML		SILT: same as above					
28								
29								
30			very moist	30.0 - 31.5	●			1 2 2
31								
32								
33								
34								
35								
36								
37	ML							
38								
39								
40			SANDY SILT: brown, medium stiff, very moist	40.0 - 41.5	●			1 3 4
41								
42								
43								
44								
45								
46								
47								
48								
49								
50			gray, increase in sand content	50.0 - 51.5	●			2 3 3
51								
52			End of Boring @ 51.5'					
53			Subsurface water encountered @ 40.0' after drilling					

LEGEND: ■ Ring Sample ○ Grab Sample □ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.



Earth Systems Pacific

Boring No. 3

LOGGED BY: L. Johnson
DRILL RIG: Mobile B-53 with Automatic Hammer
AUGER TYPE: 6" Hollow Stem

PAGE 1 OF 1
JOB NO.: 305572-001
DATE: 12/15/2022

DEPTH (feet)	USCS CLASS	SYMBOL	CITY OF GUADALUPE CENTRAL PARK RENOVATION West of Pacheco Street Between 9 th and 10 th Streets Guadalupe, California	SAMPLE DATA				
			SOIL DESCRIPTION	INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0			2.0" AC / 4.0" AB					
1	CL		SANDY LEAN CLAY: very dark brown, soft, moist	0.5 - 4.0				
2								
3								
4			brown, medium stiff					
5				5.0 - 6.5		99.4	14.6	3 5 6
6								
7			End of Boring @ 6.5'					
8			No subsurface water encountered					
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								

LEGEND:  Ring Sample  Grab Sample  Shelby Tube Sample  SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

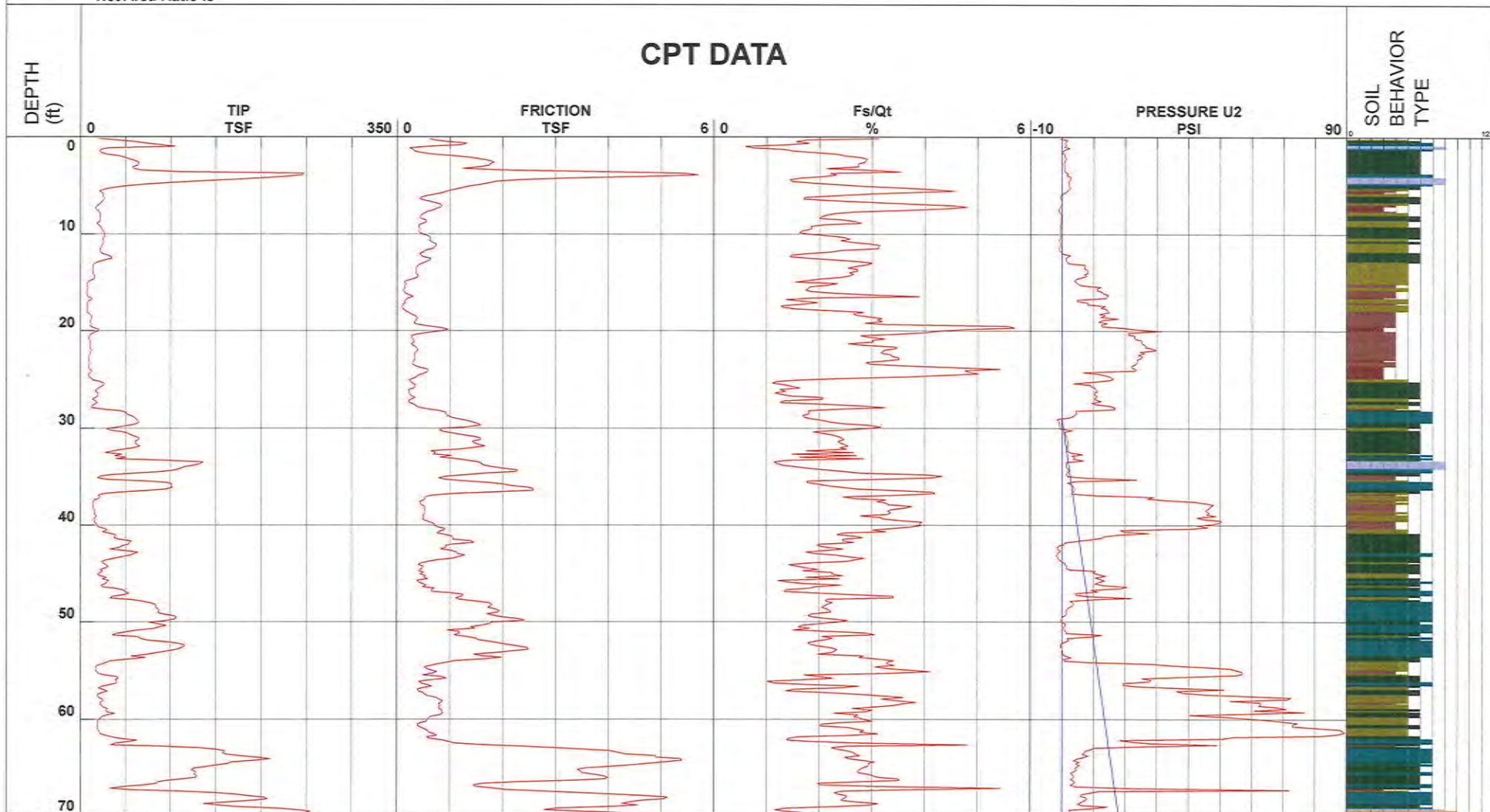


Earth Systems

Project City of Guadalupe Central Park RenovatioOperator
Job Number 305572-001 Cone Number DDG1587
Hole Number CPT-01 Date and Time 12/6/2022 11:05:51 AM
EST GW Depth During Test 28.90 ft

Filename SDF(368).cpt
GPS
Maximum Depth 70.54 ft

Net Area Ratio .8



1 - sensitive fine grained	4 - silty clay to clay	7 - silty sand to sandy silt	10 - gravelly sand to sand
2 - organic material	5 - clayey silt to silty clay	8 - sand to silty sand	11 - very stiff fine grained (*)
3 - clay	6 - sandy silt to clayey silt	9 - sand	12 - sand to clayey sand (*)

Cone Size 15cm squared

S*Soil behavior type and SPT based on data from UBC-1983

APPENDIX B

Laboratory Test Results

BULK DENSITY TEST RESULTS

ASTM D 2937-17 (modified for ring liners)

January 6, 2023

BORING NO.	DEPTH feet	MOISTURE CONTENT, %	WET DENSITY, pcf	DRY DENSITY, pcf
1	6.0 - 6.5	5.5	114.9	109.0
1	11.0 - 11.5	5.1	111.3	105.9
2	6.0 - 6.5	11.3	117.1	105.2
2	11.0 - 11.5	22.7	112.5	91.7
2	16.0 - 16.5	25.2	118.5	94.7
3	6.0 - 6.5	14.6	114.0	99.4

EXPANSION INDEX TEST RESULTS

ASTM D 4829-19

BORING NO.	DEPTH feet	EXPANSION INDEX
3	0.5 - 4.0	5

MOISTURE-DENSITY COMPACTION TEST

ASTM D 1557-12 (Modified)

PROCEDURE USED: B

January 6, 2023

PREPARATION METHOD: Moist

Boring #2 @ 0.5 - 5.0'

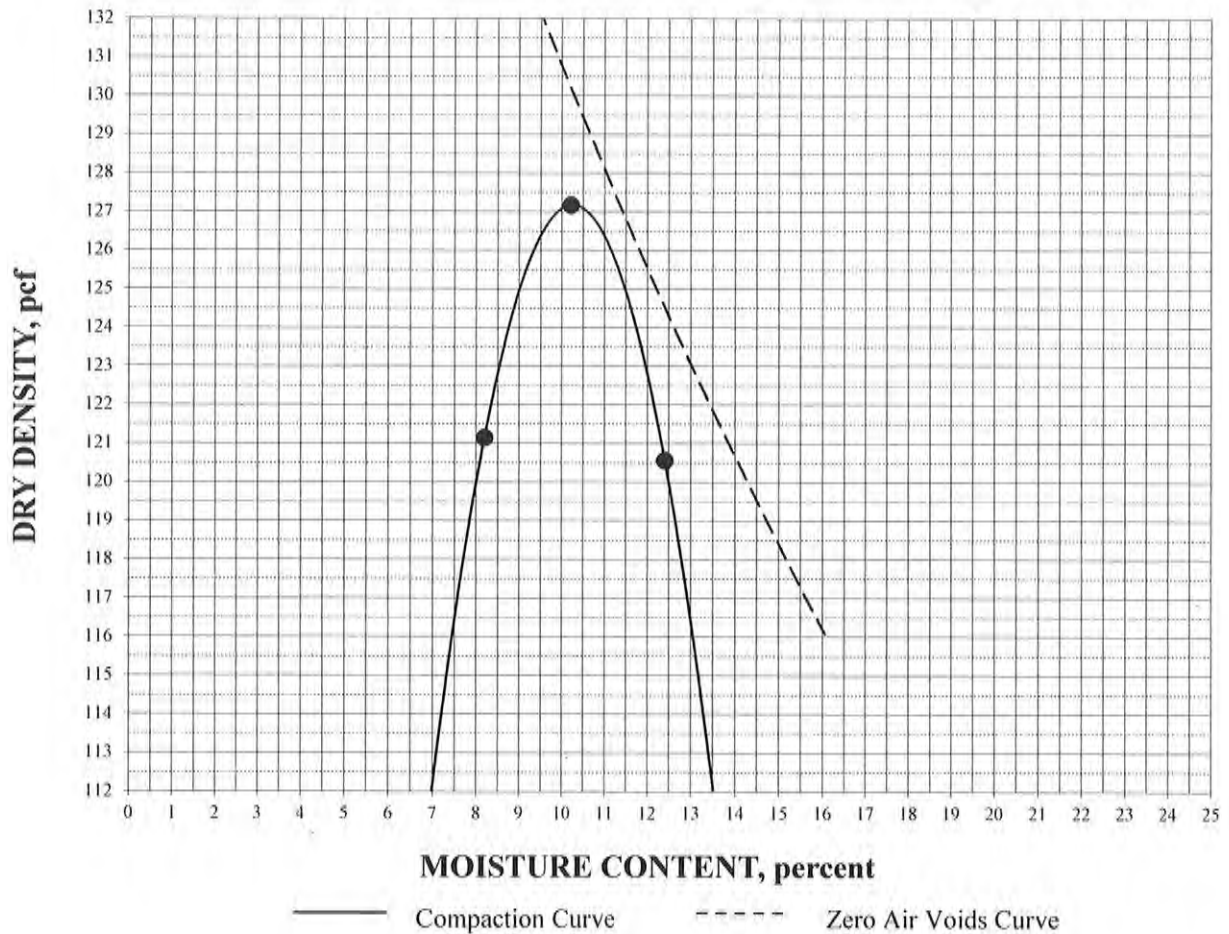
RAMMER TYPE: Mechanical

Silty Sand (SM)

SPECIFIC GRAVITY: 2.65 (assumed)

SIEVE DATA:

Sieve Size	% Retained (Cumulative)
3/4"	1
3/8"	3
#4	7

MAXIMUM DRY DENSITY: 127.2 pcf**OPTIMUM MOISTURE: 10.2%**

DIRECT SHEAR

ASTM D 3080/D3080M-11 (modified for consolidated, undrained conditions)

January 6, 2023

Boring #2 @ 0.5 - 5.0'

Silty Sand (SM)

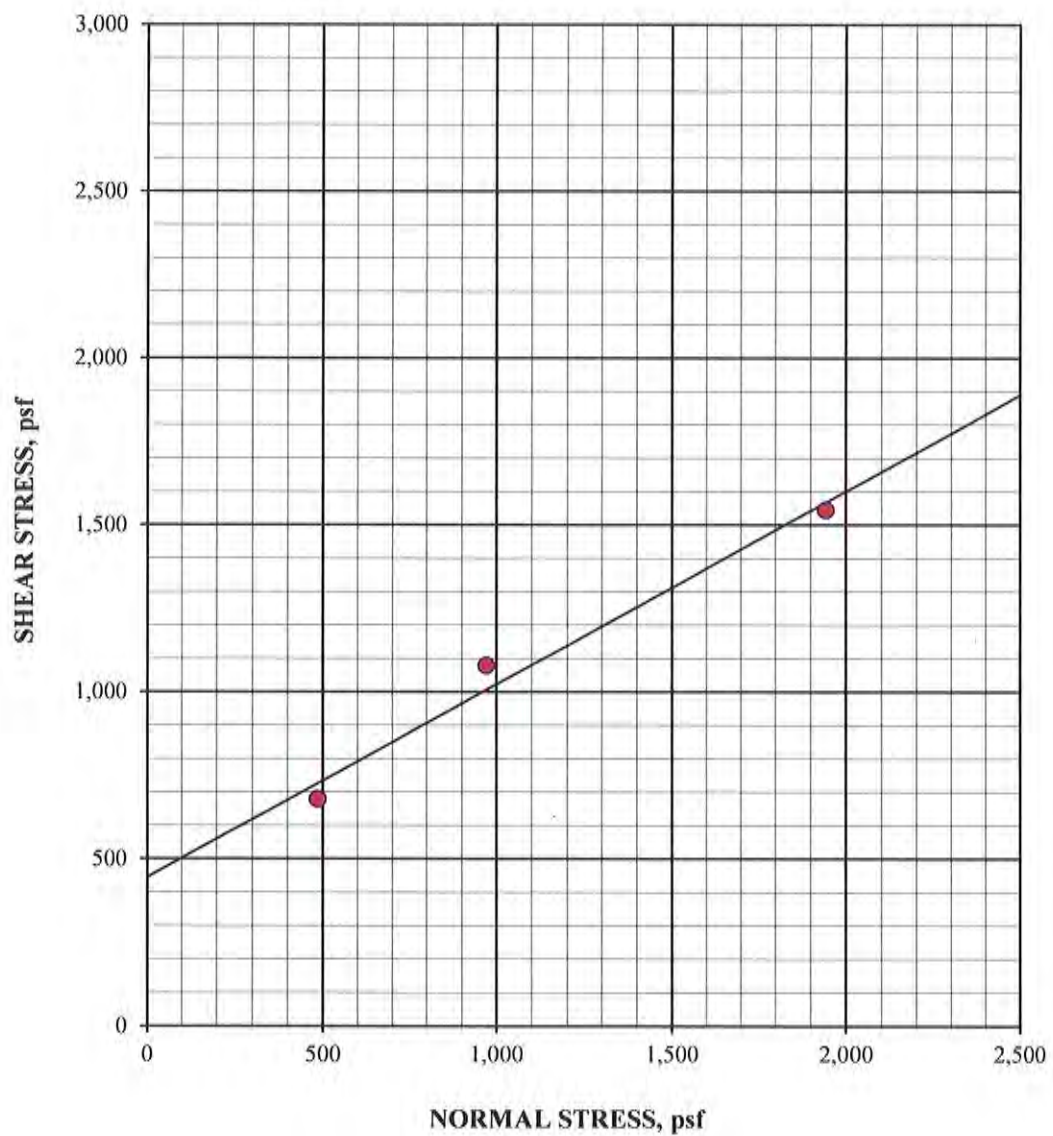
Compacted to 90% RC, saturated

INITIAL DRY DENSITY: 114.5 pcf

INITIAL MOISTURE CONTENT: 10.2 %

PEAK SHEAR ANGLE (ϕ): 30°

COHESION (C): 446 psf

SHEAR vs. NORMAL STRESS

DIRECT SHEAR continued

ASTM D 3080/D3080M-11 (modified for consolidated, undrained conditions)

Boring #2 @ 0.5 - 5.0'

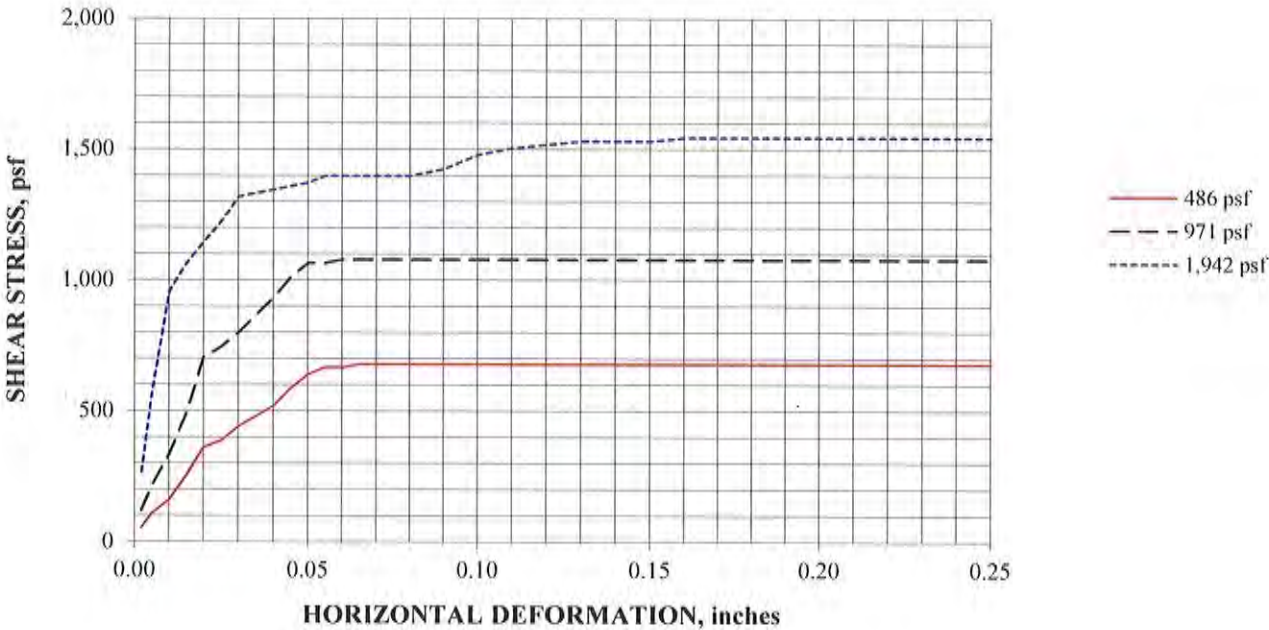
January 6, 2023

Silty Sand (SM)

Compacted to 90% RC, saturated

SPECIFIC GRAVITY: 2.65 (assumed)

SAMPLE NO.:	1	2	3	AVERAGE
INITIAL				
WATER CONTENT, %	10.2	10.2	10.2	10.2
DRY DENSITY, pcf	114.5	114.5	114.5	114.5
SATURATION, %	60.8	60.8	60.8	60.8
VOID RATIO	0.445	0.445	0.445	0.445
DIAMETER, inches	2.410	2.410	2.410	
HEIGHT, inches	1.00	1.00	1.00	
AT TEST				
WATER CONTENT, %	17.5	16.5	18.1	
DRY DENSITY, pcf	115.8	118.4	121.4	
SATURATION, %	100.0	100.0	100.0	
VOID RATIO	0.427	0.397	0.362	
HEIGHT, inches	0.99	0.97	0.94	



CONSOLIDATION TEST

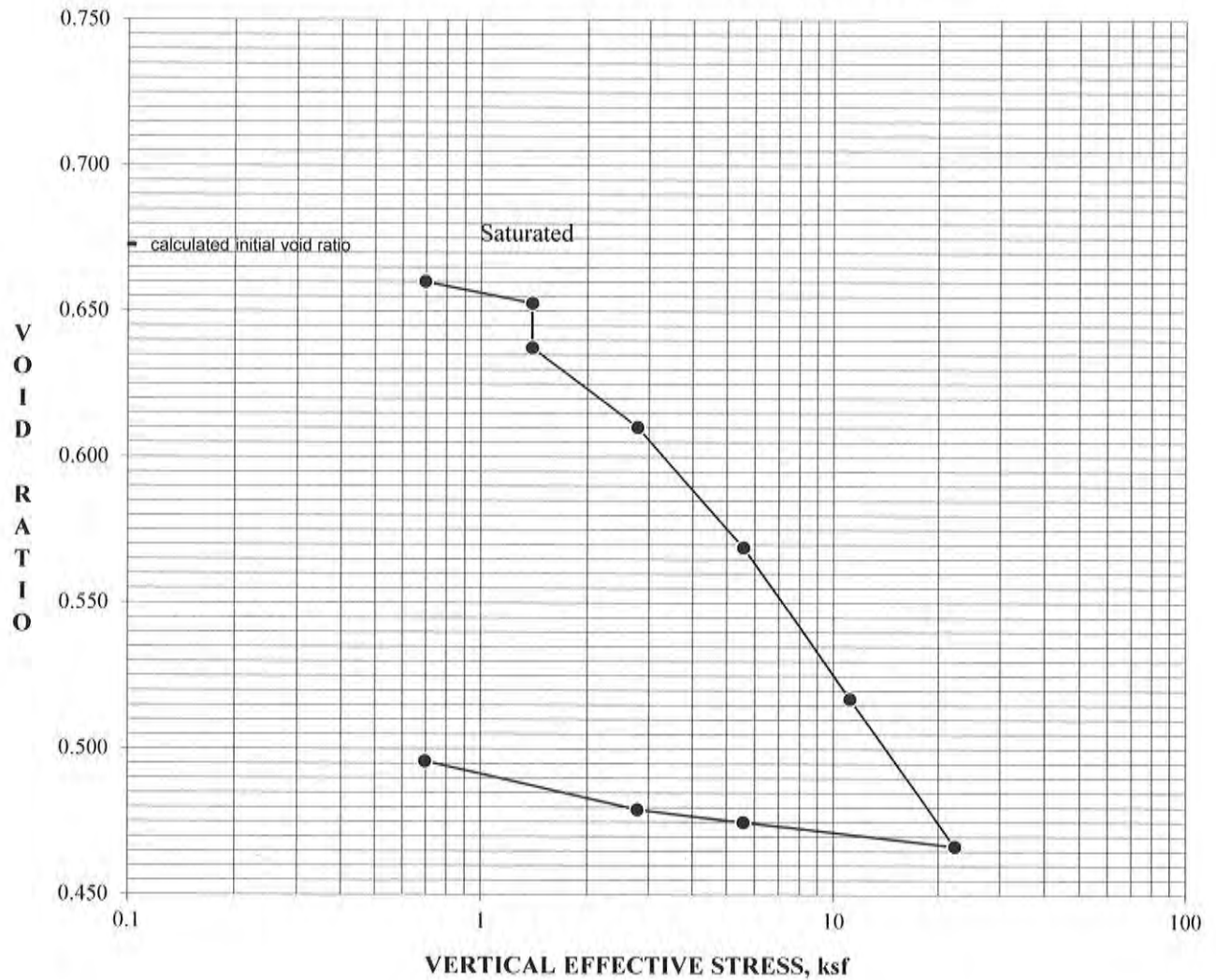
ASTM D 2435/D2435M-11(2020)

January 6, 2023

Boring #3 @ 6.0 - 6.5'
Sandy Lean Clay (CL)
Ring Sample

DRY DENSITY: 100.8 pcf
MOISTURE CONTENT: 14.6%
SPECIFIC GRAVITY: 2.70 (assumed)
INITIAL VOID RATIO: 0.673

VOID RATIO vs. NORMAL PRESSURE DIAGRAM



APPENDIX C

Infiltration Test Results

INFILTRATION TEST RESULTS

INFILTRATION TEST: A

DATE DRILLED: 12/15/22

DATE TESTED: 12/15/22

TECHNICIAN: LJ/PR

TEST HOLE DIAMETER: 6 inches

TEST HOLE DEPTH: 60 inches

TEST DURATION: 190 minutes

CONSTANT HEAD DATA

Time of Constant Head: 30 minutes

Volume Added During Constant Head: 15 gallons (2 cu.ft.)

FALLING HEAD DATA

INTERVAL (Minutes)	READING (Inches)	INCREMENTAL FALL (Inches)	INFILTRATION RATE (Minutes / Inch)	INFILTRATION RATE (Inches / Hour)
Begin	8.00	---	---	---
1	10.50	2.50	0.40	150
1	13.00	2.50	0.40	150
1	15.25	2.25	0.44	135
1	17.25	2.00	0.50	120
1	19.25	2.00	0.50	120
1	21.00	1.75	0.57	105
1	22.75	1.75	0.57	105
1	24.25	1.50	0.67	90
1	25.75	1.50	0.67	90
1	27.25	1.50	0.67	90
1	28.50	1.25	0.80	75
1	29.50	1.00	1.00	60
1	30.25	0.75	1.33	45
1	31.00	0.75	1.33	45
1	31.75	0.75	1.33	45
2	33.00	1.25	1.60	38
2	34.25	1.25	1.60	38
2	35.50	1.25	1.60	38
2	36.50	1.00	2.0	30
2	37.50	1.00	2.0	30
5	39.50	2.00	2.5	24
5	41.50	2.00	2.5	24
5	43.25	1.75	2.9	21
5	45.00	1.75	2.9	21
5	46.50	1.50	3.3	18
5	47.75	1.25	4.0	15
5	49.00	1.25	4.0	15

INFILTRATION TEST RESULTS (Continued)

INFILTRATION TEST: A

DATE DRILLED: 12/15/22

DATE TESTED: 12/15/22

TECHNICIAN: LJ/PR

TEST HOLE DIAMETER: 6 inches

TEST HOLE DEPTH: 60 inches

TEST DURATION: 190 minutes

CONSTANT HEAD DATA

Time of Constant Head: 30 minutes

Volume Added During Constant Head: 15 gallons (2 cu.ft.)

FALLING HEAD DATA

INTERVAL (Minutes)	READING (Inches)	INCREMENTAL FALL (Inches)	INFILTRATION RATE (Minutes / Inch)	INFILTRATION RATE (Inches / Hour)
5	50.25	1.25	4.0	15
5	51.00	0.75	6.7	9
5	51.75	0.75	6.7	9
5	52.25	0.50	10	6
10	53.00	0.75	13	5
10	53.75	0.75	13	5
10	54.25	0.50	20	3
10	54.75	0.50	20	3
10	55.25	0.50	20	3
10	55.75	0.50	20	3
10	56.25	0.50	20	3
10	56.75	0.50	20	3

INFILTRATION TEST RESULTS

INFILTRATION TEST: B

DATE DRILLED: 12/15/22

DATE TESTED: 12/15/22

TECHNICIAN: LJ/PR

TEST HOLE DIAMETER: 6 inches

TEST HOLE DEPTH: 55 inches

TEST DURATION: 270 minutes

CONSTANT HEAD DATA

Time of Constant Head: 30 minutes

Volume Added During Constant Head: 0.5 gallons (0.1 cu.ft.)

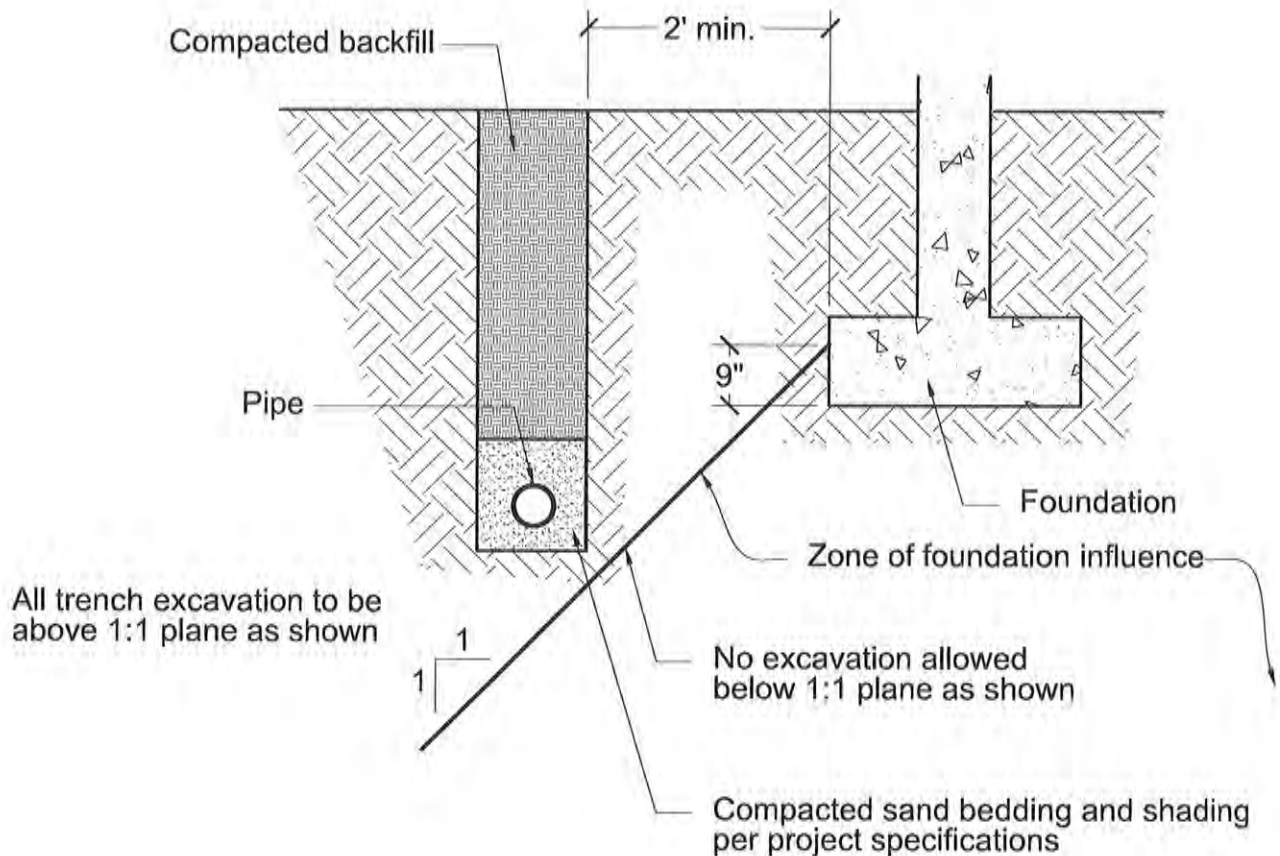
FALLING HEAD DATA

INTERVAL (Minutes)	READING (Inches)	INCREMENTAL FALL (Inches)	INFILTRATION RATE (Minutes / Inch)	INFILTRATION RATE (Inches / Hour)
Begin	2.00	---	---	---
15	3.50	1.50	10	6
15	5.00	1.50	10	6
15	6.50	1.50	10	6
15	7.75	1.25	12	5
15	9.00	1.25	12	5
15	10.00	1.00	15	4
15	11.00	1.00	15	4
15	12.00	1.00	15	4
15	13.00	1.00	15	4
15	14.00	1.00	15	4
15	15.00	1.00	15	4
15	15.75	0.75	20	3
15	16.50	0.75	20	3
15	17.00	0.50	30	2
30	17.75	0.75	40	2

APPENDIX D

Typical Detail A: Pipe Placed Parallel to Foundations

TYPICAL DETAIL A: PIPE PLACED PARALLEL TO FOUNDATIONS



SCHEMATIC ONLY
NOT TO SCALE



Earth Systems

2049 Preisker Lane, Suite E
Santa Maria, California 93454

(805) 928-2991 • FAX (805) 928-9253

E-mail: esc@earthsystems.com

APPENDIX B
ARBORIST REPORT

October 2, 2022

Eric Berg-Landscape Architect
 Pacific Coast Land Design, Inc.
 461 East Main Street | Ventura, CA 93001
 eric@pc-ld.com / (805) 715-4175

PRELIMINARY TREE ASSESSMENT at Guadalupe Central Park

BACKGROUND

I was retained to inventory and assess the trees at the project site and prepare a report with my findings and recommendations. I was on the site during September 28, 2022. This preliminary report is to provide the project team with information so they may continue in development of the project.

OBSERVATIONS & FINDINGS

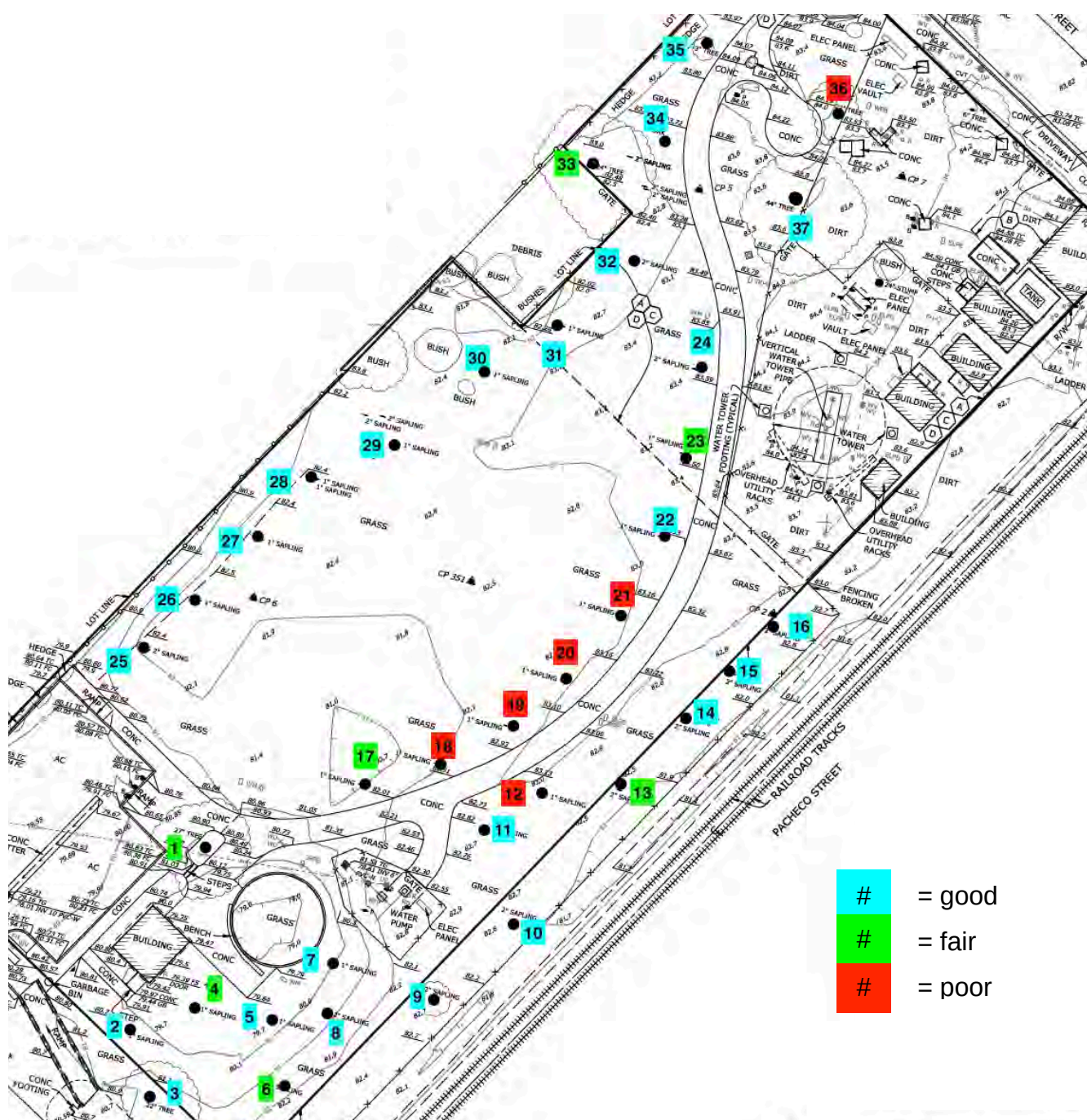
1. There are 37 trees of 9 species. Only the oaks are native trees.
2. Two of the trees are large, at approximately 50' tall, the Bunya-Bunya (#37) and the Canary Island Pine (#3). The pine is very close to the bridge that crosses above the railroad tracks. Limb growth needs to be monitored and pruned as needed to avoid conflict with the fencing.
3. An American Holly (#33), the only medium sized tree at approximately 25' tall, is in fair condition. It's not a specimen and removal with a replacement is not a loss.
4. A Brazilian pepper (#1) and a Walnut (#36), are two small trees at approximately 15'-20'. The pepper is in fair condition and the walnut is in poor condition. The walnut should be removed. The pepper appears to be causing damage to the surrounding concrete. Removal and replacement may be the best option.
5. The remaining 23 trees are saplings, including oaks, Magnolias, Ficus, and Pines.
6. The two large trees were pruned and look good.
7. All other trees warrant pruning, especially the saplings which are in dire need of structural pruning and stake/tie removal. The grass and weeds around the base of the saplings must be removed. Adding a few inches of mulch will be beneficial to reduce weed growth, provided mulch is not piled onto the base of the trees.
8. Some of the saplings may survive relocation with a large enough root ball. New box trees of like size would be a reasonable replacement if necessary. Any ground work around the saplings to be retained should be at least 3' front the trunks.

Quantity	Common Name	Botanical Name	Height
22	California Live Oak	<i>Quercus agrifolia</i>	Sapling
5	Canary Island Pine	<i>Pinus canariensis</i>	1 Large/4 Sapling
3	Camphor	<i>Cinnamomum camphora</i>	Sapling
2	Southern Magnolia	<i>Magnolia grandiflora</i>	Sapling
1	American Holly	<i>Ilex opaca</i>	Med
1	Brazilian Pepper	<i>Schinus terebinthefolius</i>	Small
1	Bunya	<i>Aruacaria bidwillii</i>	Large
1	Indian Laurel Fig	<i>Ficus microcarpa nitida</i>	Sapling
1	Walnut	<i>Juglans sp.</i>	Small

TREE INVENTORY

#	Type	Height	DBH	Health	Structure	Form	Comment
1	Brazilian Pepper	Small	24	Fair	Fair	Fair	Dieback on north side, compact crown, prior root damage, expendable
2	California Live Oak	Sapling	4	Good			Structural prune, clear vegetation around root crown
3	Canary Island Pine	Large	17	Good	Good	Good	Note lower lateral to east and then vertical, close to bridge
4	California Live Oak	Sapling	3	Fair			
5	California Live Oak	Sapling	4	Good			
6	California Live Oak	Sapling	2	Fair			
7	California Live Oak	Sapling	5	Good			
8	California Live Oak	Sapling	4	Good			
9	California Live Oak	Sapling	6	Good			
10	California Live Oak	Sapling	5	Good			
11	Indian Laurel Fig	Sapling	4	Good			
12	Camphor	Sapling	3	Poor			
13	Canary Island Pine	Sapling	4	Fair			Some trunk damage
14	Canary Island Pine	Sapling	5	Good			
15	Canary Island Pine	Sapling	4	Good			
16	Canary Island Pine	Sapling	5	Good			
17	California Live Oak	Sapling	2	Fair			
18	California Live Oak	Sapling	1/1	Poor			
19	California Live Oak	Sapling	1/1	Poor			
20	California Live Oak	Sapling	2	Poor			
21	California Live Oak	Sapling	1	Poor			
22	California Live Oak	Sapling	4	Good			
23	California Live Oak	Sapling	3	Fair			
24	California Live Oak	Sapling	3	Good			
25	Southern Magnolia	Sapling	4	Good			
26	Southern Magnolia	Sapling	3	Good			
27	Camphor	Sapling	3	Good			
28	California Live Oak	Sapling	3/2	Good			
29	California Live Oak	Sapling	4	Good			

#	Type	Height	DBH	Health	Structure	Form	Comment
30	California Live Oak	Sapling	4	Good			
31	California Live Oak	Sapling	3	Good			
32	California Live Oak	Sapling	4	Good			
33	American Holly	Med	22	Good	Fair	Fair	note tree house
34	California Live Oak	Sapling	2/2	Good			
35	Camphor	Sapling	2/2	Good			Codom trunks
36	Walnut	Small	14	Poor	Poor	Poor	Remove, lots of decay
37	Bunya	Large	36	Good	Good	Fair	Grows to SE toward tracks



ARBORIST'S DISCLOSURE AND CERTIFICATION OF PERFORMANCE

Arborists are tree specialists who use their education, knowledge, training and experience to examine trees, recommend measures to enhance the beauty and health of trees, and attempt to reduce the risk of living near trees. Clients may choose to accept or disregard the recommendations of the arborist, or to seek additional advice.

Arborists cannot detect every condition that could possibly lead to structural failure of a tree. Trees are living organisms that fail in ways we do not fully understand. Conditions are often hidden within trees and below ground. Arborists cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specified period of time. Likewise, remedial treatments, like any medicine, cannot be guaranteed.

Treatment, pruning and removal of trees may involve considerations beyond the scope of the arborist's services such as property boundaries, property ownership, site lines, disputes between neighbors, and other issues. Arborists cannot take such considerations into account unless complete and accurate information is disclosed to the arborist. An arborist should then be expected to reasonably rely upon the completeness and accuracy of the information provided.

Trees can be managed, but they cannot be controlled. To live near a tree is to accept some degree of risk. The only way to eliminate all risk associated with trees is to eliminate all trees.

I Bill Spiewak, certify:

That I have personally inspected the trees on the property referred to in this report and have stated my findings accurately.

The analysis, opinions and conclusions stated herein are my own and are based on current scientific procedures and commonly accepted arboricultural practices.

Bill Spiewak

Bill Spiewak
Registered Consulting Arborist #381
American Society of Consulting Arborists
Qualified Tree and Plant Appraiser

Board Certified Master Arborist #310B
International Society of Arboriculture
Qualified Tree Risk Assessor



PHOTOS

= good

= fair

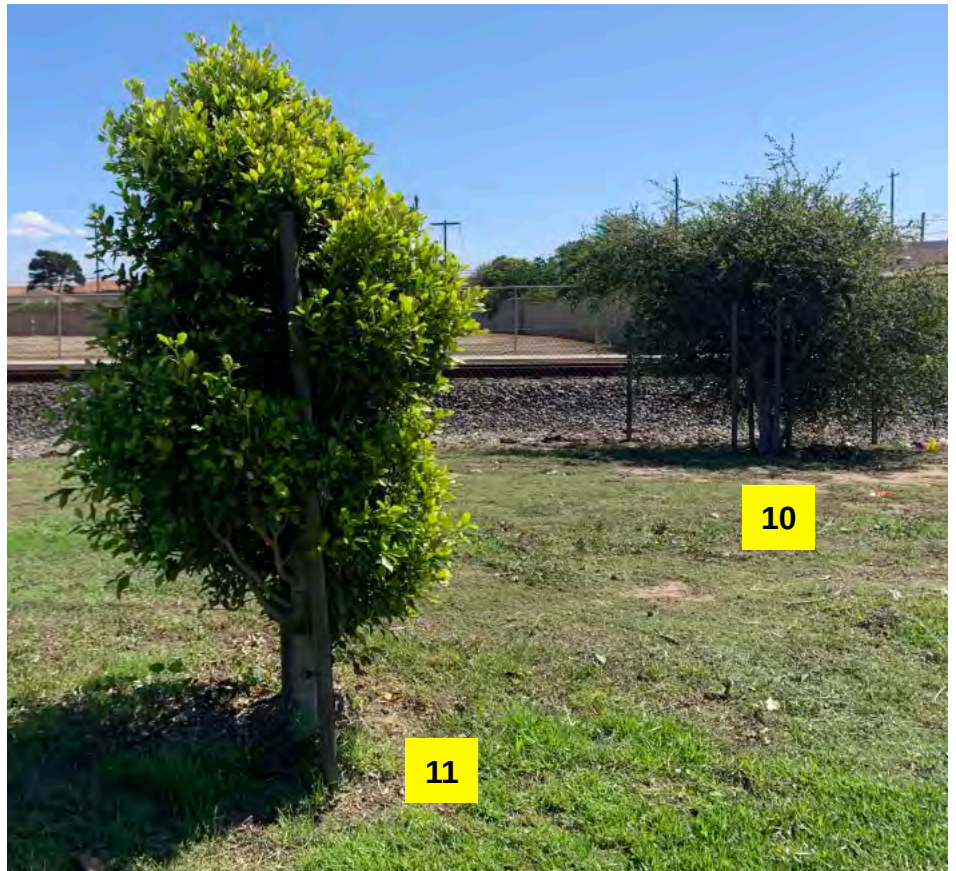
= poor



Brazilian pepper #1 has done some minor damage to concrete. It will get worse.

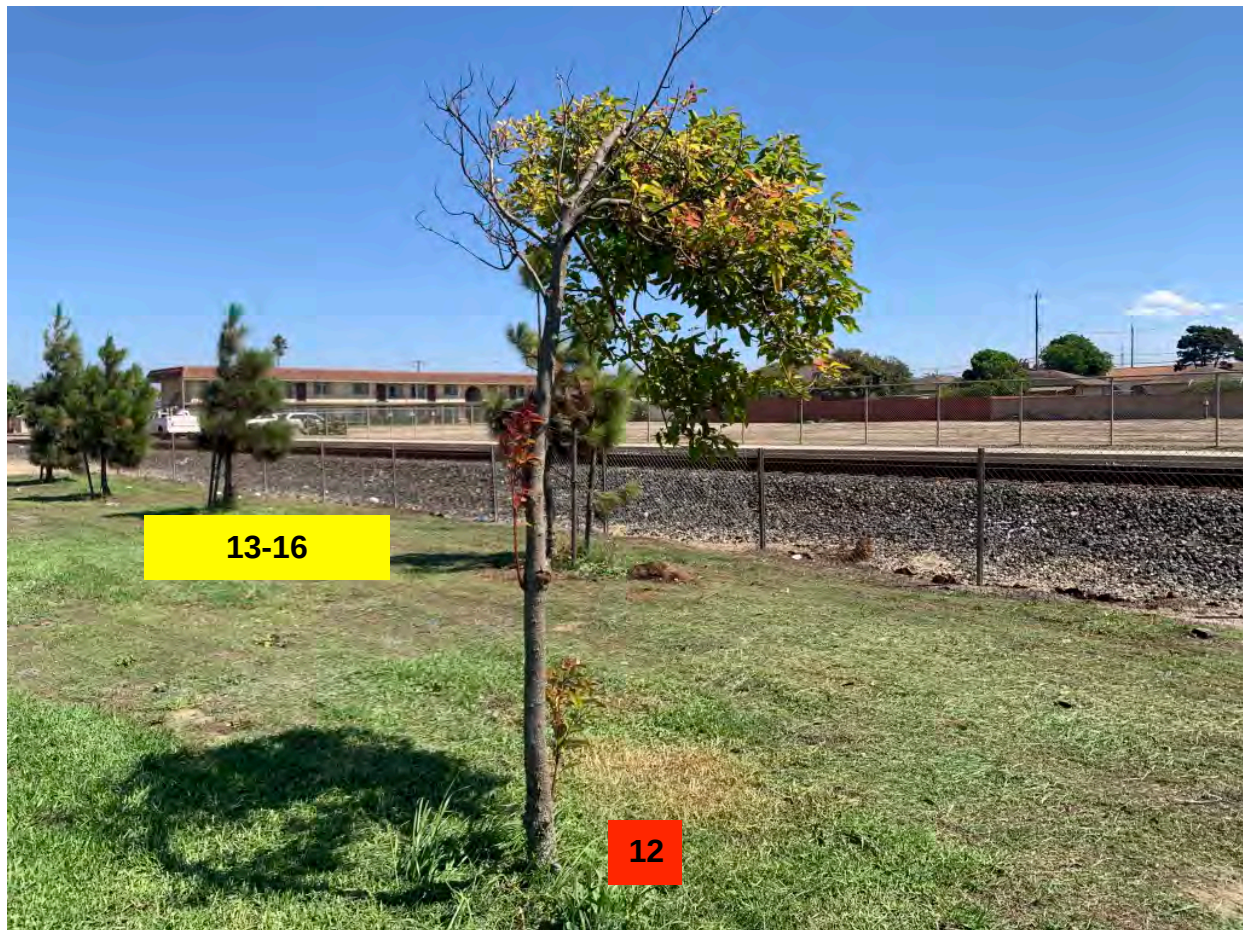
Note pine branches by upper fence. Oak #6 is missing in photos.





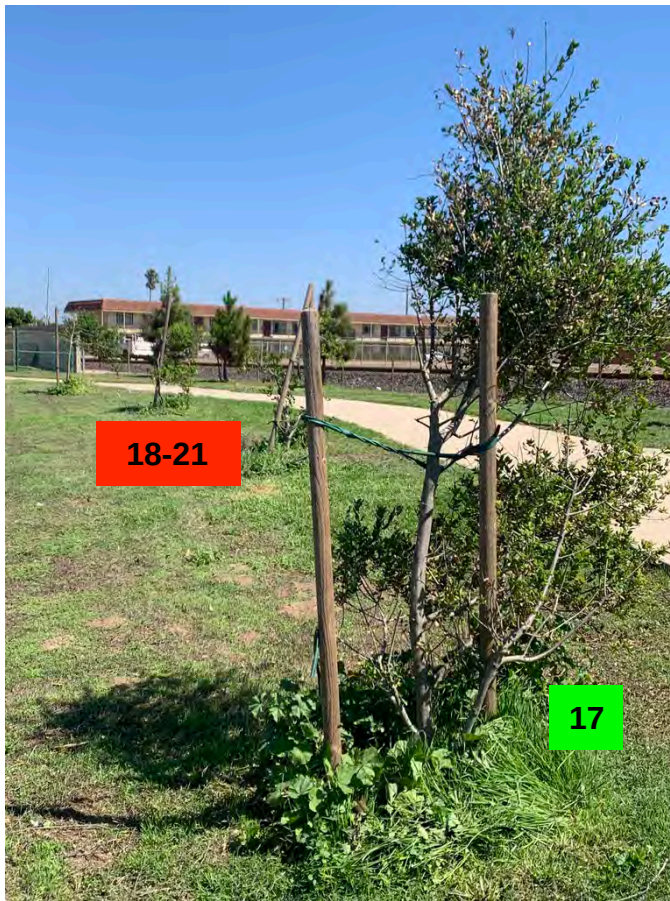
Codominant limb on pine #3 may warrant cabling.
Note density of saplings in oaks and ficus above and below.





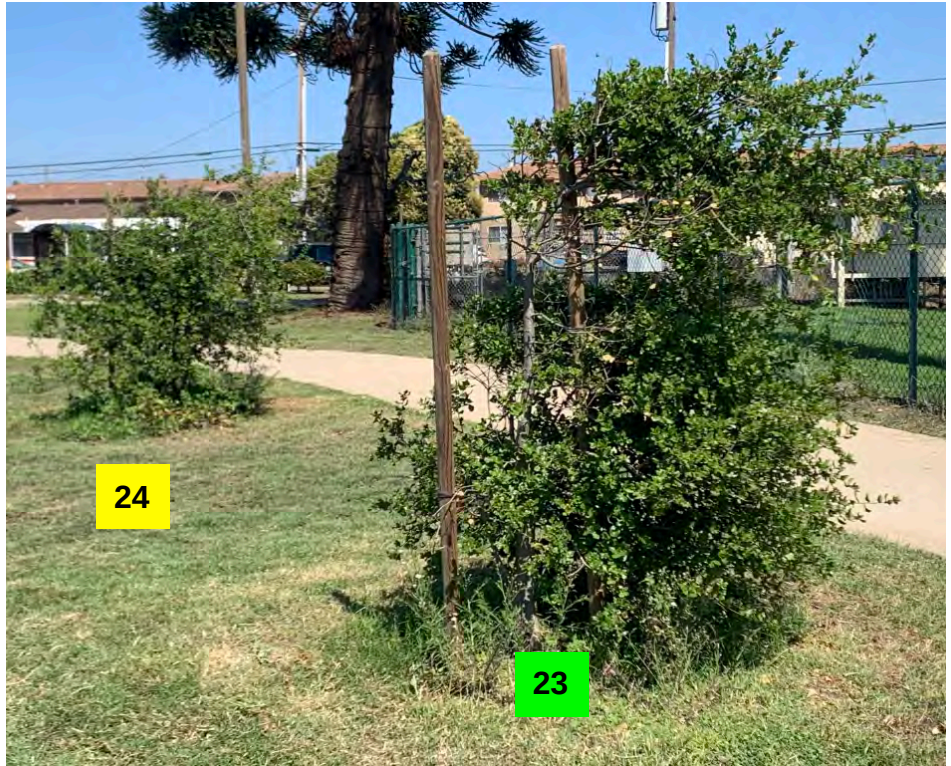
Predominant wind from west has affected growth on some of the saplings.

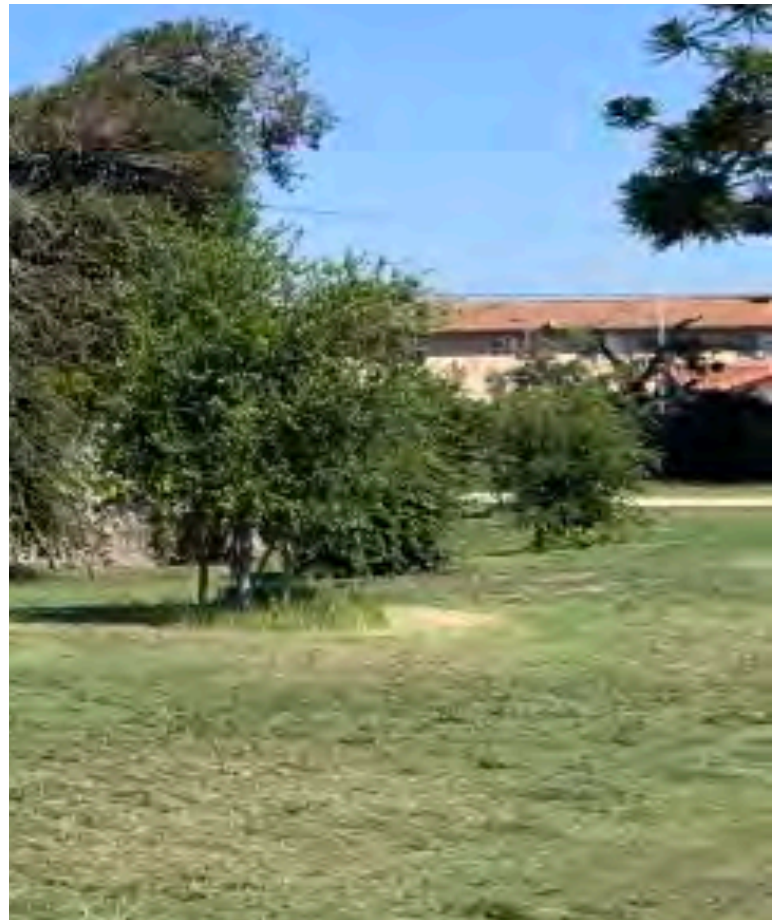


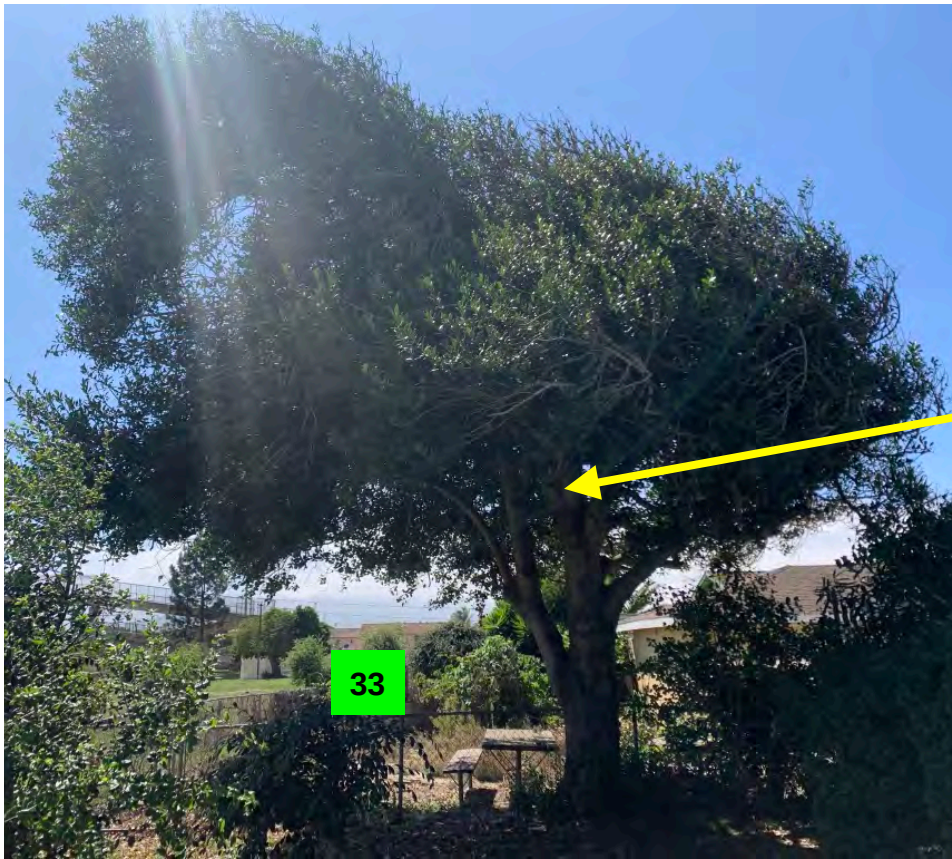


Typical of most saplings in all conditions are the poor staking methods and the dense weeds around the base of the trees. Structural pruning is necessary for these trees to develop a sound framework of branches before they get to large.



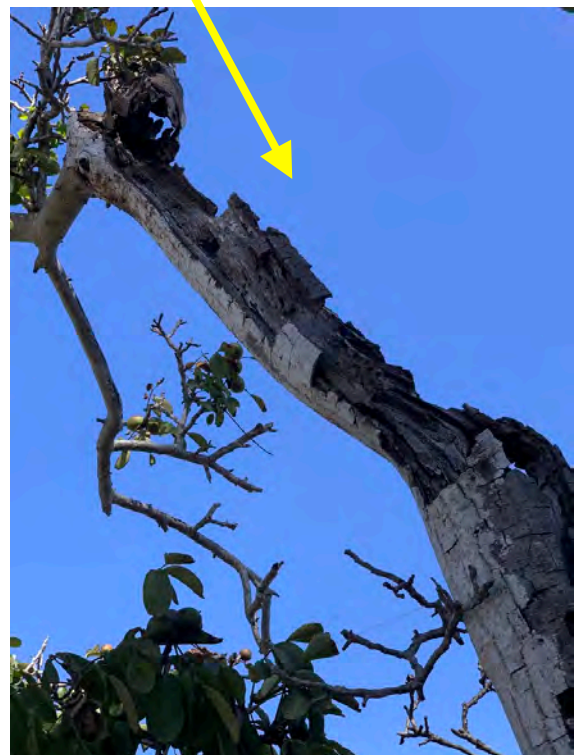






Type to enter text







Type to enter text

PRELIMINARY REPORT OF TITLE EXCEPTIONS BELOW WERE PROVIDED IN EXCEPTIONAL COVERAGE IN THE PRELIMINARY REPORT OF TITLE ISSUED BY FIDELITY NATIONAL TITLE COMPANY AS PART OF FILE #15C-03200200900ML, DATED AUGUST 30, 2022. NOT ALL EXCEPTIONS ARE SHOWN HEREON.

(A) AN UNRECORDED LEASE WITH CERTAIN TERMS, COVENANTS, CONDITIONS AND COVENANTS OF WARRANTY, DATED 01/01/2018, BETWEEN THE PARTIES ENTITLED "MEMORANDUM OF AGREEMENT BETWEEN CITY OF GADALUPE AND SANTA BARBARA CELLULAR SYSTEMS, LTD. A GEORGIA PARTNERSHIP," AND THE PARTIES ENTITLED "CITY OF GADALUPE," IS REFLECTED IN THE PUBLIC RECORDS. THE PRESENT OWNERSHIP OF THE LEASEHOLD CREATED BY SAID LEASE AND OTHER MATTERS AFFECTING THE INTEREST OF THE LEASEHOLD ARE NOT REFLECTED IN THE PUBLIC RECORDS. THE AREA DESCRIBED IN THE DOCUMENT IS SPECIFICALLY NOTED.

1. MAPPING
TOPOGRAPHIC MAPPING WAS COMPILED AT A SCALE OF 1"=20'. WITH A 1' FOOT CONTOUR INTERVAL FROM DATA COLLECTED IN A FIELD SURVEY PERFORMED USING CONVENTIONAL SURVEYING EQUIPMENT AND PROCEDURES IN AUGUST 1922, AT THE REQUEST OF THE CITY OF GUADALUPE.
2. RECORD COMPILED BOUNDARY AND EASEMENTS
THE RIGHT OF WAY, LOT LINES, AND EASEMENTS SHOWN HEREON ARE BASED UPON INFORMATION PROVIDED IN A PRELIMINARY REPORT OF TITLE ISSUED BY FIDELITY NATIONAL TITLE INSURANCE COMPANY, DATED 11/1/20. THE INFORMATION SHOWN ON THIS MAP IS BASED UPON NOTES HEREON FOR ADDITIONAL TITLE INFORMATION AFFECTING THE PROPERTY, AND RECORDS COMPILED INFORMATION SHOWN ON MAPS FILED IN THE COUNTY OF SANTA

(ITEMS LISTED BELOW MAY NOT BE SHOWN ON MAP)

(ITEMS LISTED BELOW MAY NOT BE SHOWN ON /

LINETYPES

[illegible]