

# **SPECIAL PROVISIONS**

## **FOR**

**CITY OF SAN LUIS OBISPO**

Cheng Park Revitalization

Specification No. 91385-10

JULY 2022



**PUBLIC WORKS DEPARTMENT  
ENGINEERING DIVISION**

**919 Palm Street  
San Luis Obispo, CA 93401  
(805) 781-7200**

**Cheng Park Revitalization**

**Specification No. 91385-10**

**Approval Date:  
July 19, 2022**



*July XX, 2022*

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## **NOTICE TO BIDDERS BID SUBMISSION**

Sealed bids will be received by the City of San Luis Obispo at the Public Works Administration Office located at 919 Palm Street, San Luis Obispo, CA 93401, until

**11:00 a.m. on August  
XX, 2022**

at which time they will be publicly opened and read aloud. Public bid opening may be viewed via Microsoft Teams video conference and conference call. In person attendance will be permitted. Attendees are encouraged to wear face masks and practice social distancing. Use the following link:

or join by phone with this number: XXX-XXX-XXXX with Conference ID:XXX XXX XXX#

Submit bid in a sealed envelope plainly marked:

### **Cheng Park Revitalization, Specification No. 91385-10**

Any bid received after the time and date specified will not be considered and will be returned to the bidder unopened. Bids received by Fax or Email will not be considered.

By submission of bid you agree to comply with all instruction and requirements in this notice and the contract documents.

All bids must be submitted on the Bid Item List form(s) provided and submitted with all other Bid Forms included in these Special Provisions.

Each bid must be accompanied by either a:

1. certified check
2. cashier's check
3. bidder's bond

made payable to the City of San Luis Obispo for an amount equal to ten percent of the bid amount as a guaranty. Guaranty will be forfeited to the City San Luis Obispo if the bidder, to whom the contract is awarded, fails to enter into the contract.

The City of San Luis Obispo reserves the right to accept or reject any or all bids or waive any informality in a bid.

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## NOTICE TO BIDDERS

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All bids are to be compared based on the City Engineer's estimate of the quantities of work to be done, as shown on the Bid Item List.

Bids will only be accepted from bidders that are licensed in compliance with the provisions of Chapter 9, Division III of Business and Professions Code.

The award of the contract, if awarded, will be to the lowest responsive bid submitted by a responsible contractor whose bid complies with the requirements prescribed. If the contract is awarded, the contract will be awarded within 60 calendar days after the opening of the bids.

Failure to raise defects in the notice to bidders or bid forms prior to bid opening constitute a waiver of those defects.

### BID DOCUMENTS

A copy of the plans and special provisions may be downloaded, free of charge, from the City's website at:

[www.slocity.org/government/department-directory/public-works/public-works-bids-proposals](http://www.slocity.org/government/department-directory/public-works/public-works-bids-proposals)

No printed copies are available for purchase at the City office.

Standard Specifications and Engineering Standards referenced in the Special Provisions may be downloaded, free of charge, from the City's website at:

[www.slocity.org/government/department-directory/public-works/documents-online/construction-documents](http://www.slocity.org/government/department-directory/public-works/documents-online/construction-documents)

You are responsible to obtain all issued addenda prior to bid opening. Addenda will be available to download at the City's website listed above or at the office of the City Engineer.

Contact the project manager, Shelsie Moore at 805-783-7735 or the Public Works Department at (805) 781-7200 prior to bid opening to verify the number of addenda issued.

### PROJECT INFORMATION

In general, the project consists of rehabilitation of an existing park.

The project estimated construction cost is \$400,000

Contract time is established as 60 working days.

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## NOTICE TO BIDDERS

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The fixed liquidated damages amount is established at \$500 per day for failure to complete the work within the contract time.

In compliance with section 1773 of the Labor Code, the State of California Department of Industrial Relations has established prevailing hourly wage rates for each type of workman. Current wage rates may be obtained from the Division of Labor at:

<https://www.dir.ca.gov/oprl/DPreWageDetermination.htm>

This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

### QUALIFICATIONS

You must possess a valid Class A Contractor's License at the time of the bid opening.

**You and any subcontractors required to pay prevailing wage must be registered with the Department of Industrial Relations pursuant to Section 1725.5 of the Labor Code.**

You must have experience constructing projects similar to the work specified for this project. Provide three similar reference projects completed as either the prime or subcontractor. All referenced projects must have been completed within the last five years from this project's bid opening date.

**One of the three reference projects must have been completed under contract with a city, county, state or federal government agency as the prime contractor.**

Failure to provide reference projects as specified in this section and as required on the qualification form is cause to reject a bid as being non-responsive.

The City reserves the right to reject any bid based on non-responsiveness if a bidder fails to provide a bid that complies with all bidding instructions.

The City reserves the right to reject a responsive bid based on the non-responsibility of the bidder if the Director of Public Works or Designee finds, after providing notice and a hearing to the bidder, that the bidder lacks the

1. knowledge
2. experience,
3. or is otherwise not responsible

as defined in Section 3.24 of the San Luis Obispo Municipal Code to complete the project in the best interest of the City.

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## NOTICE TO BIDDERS

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Rejected bidders may appeal this determination. Appeal must comply with the requirements in this Notice to Bidders.

It is the City of San Luis Obispo's intent to award the contract to the lowest responsive bid submitted by a responsible bidder. If in the bidder's opinion the contract has been or may be improperly awarded, the bidder may protest the contract award.

Protests must be filed no later than five working days after either:

1. bid opening date
2. notification of rejected bid.

Protest must be in writing and received by the project manager located at:  
919 Palm Street  
San Luis Obispo, CA 93401.

Valid protests must contain the following information:

1. the reasons for the protest
2. any supporting documentation
3. the ruling expected by the City to remedy the protest.

Any protest not containing all required information will be deemed invalid and rejected.

The City will consider additional documentation or other supporting information regarding the protest if submitted in compliance to the specified time limits. Anything submitted after the specified time limit will be rejected and not be considered.

The Director of Public Works or Designee may request additional information to be submitted within three days of the request, unless otherwise specified, and will notify the protester of ruling within ten days of determination.

If the protester is not satisfied with ruling, the protester may appeal the ruling to the City Council in compliance with Chapter 1.20 of the City of San Luis Obispo Municipal Code.

Pursuant to the Public Records Act (Government Code, § 6250, et seq.), the City will make public records available upon request.

## AWARD

The lowest bidder will be determined using the BID TOTAL.

As a condition to executing a contract with the City, two bonds each equal to one hundred percent of the total contract price are required in compliance with Section 3-1.05 of the Standard Specifications.

You may substitute securities for moneys withheld under the contract in compliance with the provisions of the Public Contract Code, Section 10263.

## **NOTICE TO BIDDERS**

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### **ACCOMMODATION**

If any accommodations are needed to participate in the bid process, please contact Argelia Chang at (805) 781-7200 or by Telecommunications Device for the Deaf at (805) 781-7107. Requests should be made as early as possible in the bidding process to allow time for accommodation.



## BID FORMS

All bid forms must be completed and submitted with your bid. Failure to submit these forms and required bid bond is cause to reject the bid as nonresponsive. Staple all bid forms together.

THE UNDERSIGNED, agrees that they have carefully examined:

1. the location of the proposed work
2. the plans and specifications
3. read the accompanying instructions to bidders

and propose to furnish all:

4. materials
5. labor

to complete all the required work satisfactorily in compliance with

6. plans
7. specifications
8. special provisions

for the prices set forth in the bid item list:

### BID ITEM LIST FOR CHENG PARK REVITALIZATION, SPECIFICATION NO. 91385-

10

Item No.	SS <sub>(1)</sub>	Item Description	Unit of Measure	Estimated Quantity	Item Price (in figures)	Total (in figures)
1						
2						
3						
4						
5						
6						
7						
Bid Total					\$	

(1) refers to section in the Standard Specifications, with modifications in the Special Provisions, that describe required work.

[illegible]

**PUBLIC CONTRACT CODE SECTION 10285.1 STATEMENT**

In compliance 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, or any subcontractor to be engaged by 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 check mark after "has" or "has not" in one of the blank spaces provided. The above Statement is part of the Bid. Signing this Bid on the signature portion 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 compliance with Public Contract Code Section 10162, the Bidder must 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, attach a letter explaining the circumstances

**PUBLIC CONTRACT CODE SECTION 10232 STATEMENT**

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

**LABOR CODE SECTION 1725.5 STATEMENTS**

The bidder has delinquent liability to an employee or the state for any assessment of back wages or related damages, interest, fines, or penalties pursuant to any final judgment, order, or determination by a court or any federal, state, or local administrative agency, including a confirmed arbitration award. Any judgment, order, or determination that is

## BID FORMS

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under appeal is excluded, provided that the contractor has secured the payment of any amount eventually found due through a bond or other appropriate means.

☐ Yes ☐ No

The bidder is currently debarred under Section 1777.1 or under any other federal or state law providing for the debarment of contractors from public works.

☐ Yes ☐ No

**NOTE:** The above Statements and Questionnaire are part of the Bid. Signing this Bid on the signature portion constitute signature of this Statement and Questionnaire. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

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## BID FORMS

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### NON-COLLUSION DECLARATION

I, \_\_\_\_\_, declare that  
I am \_\_\_\_\_ of \_\_\_\_\_,  
the party making the foregoing bid that the bid is not made in the interest of, or on behalf  
of, any undisclosed person, partnership, company, association, organization, or  
corporation; that the bid is genuine and not collusive 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 refrained 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.

Executed on \_\_\_\_\_, 20\_\_\_\_, in \_\_\_\_\_

I declare under penalty of perjury under the laws of the State of California that the foregoing  
is true and correct.

(SEAL)

\_\_\_\_\_  
(Signature and Title of Declarant)

Subscribed and sworn to before me  
this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_

\_\_\_\_\_  
Notary Public

Company Name: \_\_\_\_\_

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## BID FORMS

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### BIDDER ACKNOWLEDGEMENTS

By signing below, the bidder acknowledges and confirms that this bid is based on the information contained in all contract documents, including the notice to bidders, plans, specifications, special provisions, and addendum number(s)\_\_\_\_\_. **(Note: You are responsible to verify the number of addenda prior to the bid opening.)**

The undersigned further agrees that in case of default in executing the required contract, with necessary bonds, within eight days, (not including Saturdays, Sundays, and legal holidays), after having received a mailed notice that the contract is ready for signature, the proceeds of the check or bond accompanying his bid will become the property of the City of San Luis Obispo.

Licensed in accordance with an act providing for the registration of contractors, License No. , Expiration Date\_\_\_\_\_.

The above statement is made under penalty of perjury, and any bid not containing this information "will be considered non-responsive and will be rejected" by the City.

Signature of Bidder \_\_\_\_\_

\_\_\_\_\_  
(Print Name and Title of Bidder)

**DIR– Public Works**

**Registration No:** \_\_\_\_\_

Business Name (DBA): \_\_\_\_\_

Owner/Legal Name: \_\_\_\_\_

Indicate One:   ☐Sole-proprietor   ☐ Partnership   ☐Corporation

List Partners/Corporate Officers: \_\_\_\_\_

Name

Title

Name

Title

Name

Title

Business Address \_\_\_\_\_

Street Address \_\_\_\_\_

Mailing Address \_\_\_\_\_

City, State, Zip Code \_\_\_\_\_

Phone Number \_\_\_\_\_

Fax Number \_\_\_\_\_

Email Address \_\_\_\_\_

Date \_\_\_\_\_

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## BID FORMS

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### QUALIFICATIONS

Failure to furnish complete reference information **ON THIS FORM**, as specified in this project's Notice to Bidders and indicated below, is cause to reject the bid. Additional information may be attached but is not a substitute for this form.

#### Reference Number 1

Customer Name & Contact Individual	
Telephone & Email	
Project Name (Site Address):	
Is this similar to the project being bid and did this project include park rehabilitation? Yes <input type="checkbox"/> No <input type="checkbox"/>	Describe the services provided and how this project is similar to that which is being bid:    Date project completed:
Was this contract for a public agency? Yes <input type="checkbox"/> No <input type="checkbox"/>	

#### Reference Number 2

Customer Name & Contact Individual	
Telephone & Email	
Project Name (Site Address):	
Is this similar to the project being bid and did this project include park rehabilitation? Yes <input type="checkbox"/> No <input type="checkbox"/>	Describe the services provided and how this project is similar to that which is being bid:    Date project completed:
Was this contract for a public agency? Yes <input type="checkbox"/> No <input type="checkbox"/>	

#### Reference Number 3

Customer Name & Contact Individual	
Telephone & Email	
Project Name (Site Address):	
Is this similar to the project being bid and did this project include park rehabilitation? Yes <input type="checkbox"/> No <input type="checkbox"/>	Describe the services provided and how this project is similar to that which is being bid:    Date project completed:
Was this contract for a public agency? Yes <input type="checkbox"/> No <input type="checkbox"/>	

## BID FORMS

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### ATTACH BIDDER'S BOND TO ACCOMPANY BID

Know all men by these presents:

That we \_\_\_\_\_, AS PRINCIPAL, and

\_\_\_\_\_, AS SURETY, are held and firmly bound unto the City of San Luis Obispo in the sum of:

\_\_\_\_\_ Dollars (\_\_\_\_\_) to be paid to said City or its certain attorney, its successors and assigns; for which payment, well and truly to be made, we bind ourselves, our heirs, executors and administrators, successors or assigns, jointly and severally, firmly by these presents:

THE CONDITION OF THIS OBLIGATION IS SUCH, that if the certain bid of the above bounden \_\_\_\_\_

to construct \_\_\_\_\_  
(insert name of street and limits to be improved or project)

dated \_\_\_\_\_ is accepted by the City of San Luis Obispo, and if the above

bounden \_\_\_\_\_, his heirs, executors, administrators, successors, and assigns shall duly enter into and execute a contract for such construction and shall execute and deliver the two bonds described within ten (10) days (not including Saturdays, Sundays, or legal holidays) after the above bounden,

\_\_\_\_\_, has received notice by and from the said City of San Luis Obispo that said contract is ready for execution, then this obligation shall become null and void; otherwise, it shall be and remain in full force and virtue.

IN WITNESS WHEREOF, we hereunto set our hands and seals this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

#### Bidder Principal:

\_\_\_\_\_  
Signature  
Title:

\_\_\_\_\_  
Date

#### Surety:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Bidder's signature is not required to be notarized. Surety's signature must be notarized.  
Equivalent form may be substituted  
(Rev. 6-30-14)

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Special Provisions



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## **SPECIAL PROVISIONS**

### **SPECIAL PROVISIONS**

#### **ORGANIZATION**

Special provisions are under headings that correspond with the main section heading of the Standard Specifications. Each special provision begins with a revision clause that describes or introduces a revision to the Standard Specifications. Any paragraph added or deleted by a revision clause does not change the paragraph number of the Standard Specifications for any other reference to a paragraph of the Standard Specifications.

### **DIVISION I GENERAL PROVISIONS**

#### **1 GENERAL**

##### **Add to Section 1-1.01 GENERAL with:**

The work must be done in compliance with the City of San Luis Obispo, Department of Public Works:

1. Cheng Park Revitalization Special Provisions
2. City of San Luis Obispo Standard Specifications and Engineering Standards – 2020 edition
3. State of California, Department of Transportation Standard Specifications and Standard Plans – 2015 edition

In case of conflict between documents, governing ranking must comply with section 5-1.02 of the City of San Luis Obispo's Standard Specifications.

Failure to comply with the provisions of these sections is a material breach of contract:

1. Sections 5 through 8 of the Standard Specifications
2. Section 12 through 15 of the Standard Specifications
3. Section 77-1 of the Standard Specifications
4. Section 81 of the Standard Specifications
5. authorized working hours
6. OSHA compliance

#### **2 BIDDING**

##### **Replace Section 2-1.33A BID DOCUMENT COMPLETION AND SUBMITTAL, General with:**

Furnish bid using blank forms provided in the Special Provisions. Bid must include all forms and must be signed by the bidder.

#### **4 SCOPE OF WORK**

##### **Add to Section 4-1.03 WORK DESCRIPTION:**

Comply with the provisions of Section(s) 99 for general, material, construction, and payment specifics.

### **7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC**

## **SPECIAL PROVISIONS**

### **Replace last paragraph in Section 7-1.02K(3) Labor Code, Certified Payroll Records (Labor Code 1776) with:**

Furnish the Engineer one Portable Document Format (PDF) file which contains all certified payroll records for the prior month's work. Redact the PDF file making the employee's social security number illegible. Failure to submit PDF file with other monthly payroll records is considered an incomplete payroll submission and penalties will be assessed.

### **Add to Section 7-1.03B PUBLIC CONVENIENCE, Traffic Control Plan**

Provide traffic control plan and traffic control application at or before the preconstruction meeting. Traffic control plan must be drawn to scale. Traffic control application may be obtained on the City's website:

[www.slocity.org/government/department-directory/public-works/documents-online/construction-documents](http://www.slocity.org/government/department-directory/public-works/documents-online/construction-documents)

Upon approval of the traffic control plan, the City will issue a no-fee Encroachment Permit. Permittee is responsible to comply with all conditions of the traffic control plan. Complete work using due diligence to restore free flowing of traffic.

## **8 PROSECUTION AND PROGRESS**

### **Replace the 1<sup>st</sup> paragraph in Section 8-1.02A SCHEDULE, General with:**

Provide a Level 1 schedule for this work.

## **99 BUILDING CONSTRUCTION**

### **Add Section 1.01 GENERAL:**

See Appendix B for technical specifications for park rehabilitation.

## APPENDIX

### APPENDIX A - FORM OF AGREEMENT

**THIS AGREEMENT**, made on this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between the City of San Luis Obispo, a municipal corporation and charter city, San Luis Obispo County, California (hereinafter called the Owner) and **COMPANY NAME** (hereinafter called the Contractor).

#### WITNESSETH:

That the Owner and the Contractor for the consideration stated herein agree as follows:

**ARTICLE 1, SCOPE OF WORK:** The Contractor shall perform everything required to be performed, shall provide and furnish all of the labor, materials, necessary tools, expendable equipment, and all utility and transportation services required to complete all the work of construction of

#### NAME OF PROJECT, SPEC NO.

in strict compliance with the plans and specifications therefor, including any and all Addenda, adopted by the Owner, in strict compliance with the Contract Documents hereinafter enumerated.

It is agreed that said labor, materials, tools, equipment, and services shall be furnished and said work performed and completed under the direction and supervision and subject to the approval of the Owner or its authorized representatives.

**ARTICLE II, CONTRACT PRICE:** The Owner shall pay the Contractor as full consideration for the faithful performance of this Contract, subject to any additions or deductions as provided in the Contract Documents, the contract prices as follows:

Item No.	Item	Unit of Measure	Estimated Quantity	Item Price (in figures)	Total (in figures)
1.					
2.					
3.					

**BID TOTAL: \$ \_\_\_\_\_ .00**

Payments are to be made to the Contractor in compliance with and subject to the provisions embodied in the documents made a part of this Contract.

Should any dispute arise respecting the true value of any work omitted, or of any extra work which the Contractor may be required to do, or respecting the size of any payment to the Contractor, during the performance of this Contract, said dispute shall be decided by the Owner and its decision shall be final, and conclusive.

**ARTICLE III, COMPONENT PARTS OF THIS CONTRACT:** The Contract consists of the following documents, all of which are as fully a part thereof as if herein set out in full, and if not attached, as if hereto attached:

1. Notice to Bidders and Information for Bidders
2. Standard Specifications and Engineering Standards
3. Special Provisions, any Addenda, Plans and Contract Change Orders
4. Caltrans Standard Specifications and Standard Plans 2015
5. Accepted Bid and Bid Bond
6. List of Subcontractors
7. Public Contract Code Sections 10285.1 Statement
8. Public Contract Code Section 10162 Questionnaire
9. Public Contract Code Section 10232 Statement
10. Labor Code Section 1725.5 Statements
11. Bidder Acknowledgements
12. Qualifications
13. Non-collusion Declaration
14. Agreement and Bonds
15. Insurance Requirements and Forms

**ARTICLE IV INDEMNIFICATION:** The Contractor shall indemnify, defend with legal counsel approved by City, and hold harmless City, its officers, officials, employees and volunteers from and against all liability, loss, damage, expense, cost (including without limitation reasonable legal counsel fees, expert fees and all other costs and fees of litigation) of every nature arising out of or in connection with the Contractor's negligence, recklessness or willful misconduct in the performance of work hereunder or its failure to comply with any of its obligations contained in this Agreement, except such loss or damage which is caused by the sole or active negligence or willful misconduct of the City. Should conflict of interest principles preclude a single legal counsel from representing both the City and the Contractor, or should the City otherwise find the Contractor's legal counsel unacceptable, then the Contractor shall reimburse the City its costs of defense, including without limitation reasonable legal counsel fees, expert fees and all other costs and fees of litigation. The Contractor shall promptly pay any final judgment rendered against the City (and its officers, officials, employees and volunteers) with respect to claims determined by a trier of fact to have been the result of the Contractor's negligent, reckless or wrongful performance. It is expressly understood and agreed that the foregoing provisions are intended to be as broad and inclusive as is permitted by the law of the State of California and will survive termination of this Agreement.

The Contractor obligations under this section apply regardless of whether such claim, charge, damage, demand, action, proceeding, loss, stop notice, cost, expense, judgment, civil fine or penalty, or liability was caused in part or contributed to by an Indemnitee. However, without affecting the rights of the City under any provision of this agreement, the Contractor shall not be required to indemnify and hold harmless the City for liability attributable to the active negligence of AGENCY, provided such active negligence is

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**APPENDIX**

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determined by agreement between the parties or by the findings of a court of competent jurisdiction. In instances where the City is shown to have been actively negligent and where the City's active negligence accounts for only a percentage of the liability involved, the obligation of the Contractor will be for that entire portion or percentage of liability not attributable to the active negligence of the City.

**ARTICLE V.** It is further expressly agreed by and between the parties hereto that should there be any conflict between the terms of this instrument and the bid of said Contractor, then this instrument shall control and nothing herein shall be considered as an acceptance of the said terms of said bid conflicting herewith.

**IN WITNESS WHEREOF**, the parties to these presents have hereunto set their hands this year and date first above written.

CITY OF SAN LUIS OBISPO  
A Municipal Corporation

\_\_\_\_\_  
Derek Johnson, City Manager

APPROVED AS TO FORM

CONTRACTOR:

Name of Company

\_\_\_\_\_  
J. Christine Dietrick  
City Attorney

By: \_\_\_\_\_  
Name of CAO/President  
Its: CAO/PRESIDENT

**APPENDIX B – TECHNICAL SPECIFICATIONS**

**Section 02 4100**

**Demolition**

**PART 3 EXECUTION**

**1.1 GENERAL PROCEDURES AND PROJECT CONDITIONS**

- A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
  - 1. Obtain required permits.
  - 2. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
  - 3. Provide, erect, and maintain temporary barriers and security devices.
  - 4. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
  - 5. Do not close or obstruct roadways or sidewalks without permit.
  - 6. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
  - 7. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.
- B. Do not begin removal until receipt of notification to proceed from City.
- C. Protect existing structures and other elements that are not to be removed.
  - 1. Provide bracing and shoring.
  - 2. Prevent movement or settlement of adjacent structures.
  - 3. Stop work immediately if adjacent structures appear to be in danger.

**1.2 DEBRIS AND WASTE REMOVAL**

- A. Remove debris, junk, and trash from site.
- B. Leave site in clean condition, ready for subsequent work.
- C. Clean up spillage and wind-blown debris from public and private lands.

**End of Section**





**Section 05 5000**  
**Metal Fabrications**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Shop fabricated steel items.
  - 1. Guardrails and handrails.

**1.2 RELATED REQUIREMENTS**

- A. City of San Luis Obispo Standard Specifications, August 2020.
- B. Section 09 9113 - Exterior Painting: Paint finish.

**1.3 PRICE AND PAYMENT PROCEDURES**

- A. See General Provisions, Section 9 for additional requirements.
- B. Guardrail with Handrail:
  - 1. Basis of Measurement: By the unit.
  - 2. Basis of Payment: Includes fabrication, finishing, and installation.

**1.4 REFERENCE STANDARDS**

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.
- B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
- D. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.
- E. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.
- F. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.
- G. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2014.
- H. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015.
- I. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2008.
- J. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).
- K. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).

**1.5 SUBMITTALS**

- A. See General Provisions, Section 5, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
  - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- C. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

## **1.6 QUALITY ASSURANCE**

- A. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.2/D1.2M and dated no more than 12 months before start of scheduled welding work.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS - STEEL**

- A. Steel Sections: ASTM A36/A36M.
- B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.
- C. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.
- D. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- E. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

### **2.2 FABRICATION**

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- D. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- E. Furnish components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

### **2.3 FINISHES - STEEL**

- A. Prime paint steel items.
- B. Prepare surfaces to be primed in accordance with SSPC-SP2.
- C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- D. Prime Painting: Two coats.

### **2.4 FABRICATION TOLERANCES**

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify that field conditions are acceptable and are ready to receive work.

### **3.2 PREPARATION**

- A. Clean and strip primed steel items to bare metal where site welding is required.

### **33 INSTALLATION**

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Perform field welding in accordance with AWS D1.1/D1.1M.
- D. Obtain approval prior to site cutting or making adjustments not scheduled.
- E. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.
- F. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting. Apply or brush or spray to provide minimum dry film thickness of 0.051 mm (2.0 mils).
- G. At all galvanized products, clean all damaged areas and re-coat using specified galvanizing coating per manufacturer's criteria.

### **34 TOLERANCES**

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

**End of Section**



**Section 09 9113**  
**Exterior Painting**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Surface preparation.
- B. Field application of paints.
- C. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
  - 1. Exposed steel surfaces such as structural steel elements
  - 2. Exposed galvanized metal surfaces such as sheet metal flashing, vents, and trim.
- D. Do Not Paint or Finish the Following Items:
  - 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
  - 2. Items indicated to receive other finishes.
  - 3. Items indicated to remain unfinished.
  - 4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
  - 5. Stainless steel, anodized aluminum, bronze, terne-coated stainless steel, zinc, and lead.
  - 6. Floors, unless specifically indicated.
  - 7. Brick, glass unit masonry, architectural concrete, cast stone, integrally colored plaster and stucco.
  - 8. Glass.
  - 9. Concealed pipes, ducts, and conduits.

**1.2 DEFINITIONS**

- A. Comply with ASTM D16 for interpretation of terms used in this section.

**1.3 REFERENCE STANDARDS**

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2014.
- C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 2007.
- D. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition, [www.paintinfo.com](http://www.paintinfo.com).
- E. South Coast Air Quality Management District (SCAQMD) Rule 1113.
- F. SSPC-SP 1 - Solvent Cleaning; 2015.
- G. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

**1.4 SUBMITTALS**

- A. Product Data: Provide complete list of products to be used, with the following information for each:
  - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
  - 2. MPI product number (e.g. MPI #47).

3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
- B. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
  1. Where sheen is specified, submit samples in only that sheen.
  2. Paint color submittals will not be considered until color submittals for major materials not to be painted, such as factory finished metals and roof tiles, have been approved.
- C. Certification: By manufacturer that paints and finishes comply with VOC limits specified.
- D. Maintenance Materials: Furnish the following for City's use in maintenance of project.
  1. See Section 01 6000 - Product Requirements, for additional provisions.
  2. Extra Paint and Finish Materials: 1 gallon of each color; from the same product run, store where directed.
  3. Label each container with color in addition to the manufacturer's label.

## **15 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum three years experience and approved by manufacturer.

## **16 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

## **17 FIELD CONDITIONS**

- A. Do not apply materials when surface and ambient temperatures are outside the paint product manufacturer's temperature ranges.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply exterior paint and finishes during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- D. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

## **PART 2 PRODUCTS**

### **21 MANUFACTURERS**

- A. Provide paints and finishes from the same manufacturer.
- B. Paints:
  1. Dunn Edwards Paints, [www.dunnedwards.com](http://www.dunnedwards.com)
  2. Behr Process Corporation: [www.behr.com/#sle](http://www.behr.com/#sle).
  3. PPG Paints: [www.ppgpaints.com/#sle](http://www.ppgpaints.com/#sle).
  4. Sherwin-Williams Company: [www.sherwin-williams.com/#sle](http://www.sherwin-williams.com/#sle).

## **22 PAINTS AND FINISHES - GENERAL**

- A. Paints and Finishes: Ready-mixed, unless required to be a field-catalyzed paint.
  - 1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
  - 2. Supply each paint material in quantity required to complete entire project's work from a single production run.
  - 3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is described explicitly in manufacturer's product instructions.
- B. Volatile Organic Compound (VOC) Content:
  - 1. Provide paints and finishes that comply with the most stringent requirements specified in the following:
    - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
    - b. Architectural coatings VOC limits of California.
  - 2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
- C. Colors: match existing paint color of gazebo.
- D. Colorants: The use of colorants containing hazardous chemicals, such as ethylene glycol, is prohibited.

## **23 PAINT SYSTEMS - EXTERIOR**

- A. Exterior Surfaces to be Painted, Unless Otherwise Indicated: Including primed metal and plaster.
  - 1. Two top coats and one coat primer.
  - 2. Top Coat(s): Exterior Latex.
    - a. Sheen: Eggshell or equivalent.
  - 3. Primer: As recommended by top coat manufacturer for specific substrate.

## **24 ACCESSORY MATERIALS**

- A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
- C. Test shop-applied primer for compatibility with subsequent cover materials.
- D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
  - 1. Exterior Plaster and Stucco: 12 percent.
  - 2. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.

### **32 PREPARATION**

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.
- D. Seal surfaces that might cause bleed through or staining of topcoat.
- E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- F. Exterior Plaster: Fill hairline cracks, small holes, and imperfections with exterior patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.
- G. Galvanized Surfaces:
  - 1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
- H. Ferrous Metal:
  - 1. Solvent clean according to SSPC-SP 1.
  - 2. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.

### **33 APPLICATION**

- A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- C. Apply each coat to uniform appearance.
- D. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- E. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

### **34 CLEANING**

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

**End of Section**



**Section 10 7000**  
**Interpretive Exhibits**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Graphic Panels: High-pressure laminate full color panels. Digital artwork will be provided to contractor. Contractor shall procure and install graphic panels from manufacturer.
- B. Graphic panel mounting pedestal intalled with concrete footings.

**1.2 RELATED REQUIREMENTS**

- A. City of San Luis Obispo Standard Specifications, August 2020.
- B. Section 03 3000: Cast-in-Place Concrete - footings for mounting pedestals.

**1.3 PRICE AND PAYMENT PROCEDURES**

- A. See General Provisions for payment procedures.
- B. Provide the work under the lump sum method. Lump sum price for each interpretive exhibit includes excavation for footings, concrete footings and base material if necessary, mounting pedestal, graphic panel, and all necessary hardware for a complete installation.

**1.4 SUBMITTALS**

- A. See General Provisions for submittal procedures.
- B. Product Data: Provide manufacturer literature and shop drawings for fabricated parts, including mounting pedestal.
- C. Samples:
  - 1. Submit two samples for graphic panel, 4 x 4 inch minimum in size, illustrating specified finish, texture, and panel thickness. Samples shall depict print quality of similar representative panel artwork, including full color graphics, photographs, and typeface.
  - 2. Submit full-size full color manufacturer print proof for approval prior to manufacture.
    - a. Submit one print-proof for each panel to be installed.
    - b. Print proof shall be hard copy on paper.
- D. Warranty: Submit manufacturer warranty and ensure that forms have been completed in City's name and registered with manufacturer.

**1.5 WARRANTY**

- A. Graphic panels: Provide 10 year manufacturer warranty against delaminating, peeling, blistering, cracking, and fading.

**PART 2 PRODUCTS**

**2.1 GRAPHIC PANELS**

- A. Digital artwork files will be provided to the contractor for sign ordering.
- B. Acceptable manufacturers:
  - 1. iZone Imaging: [www.izoneimaging.com](http://www.izoneimaging.com).
  - 2. Fossil Industries: [www.fossilgraphics.com](http://www.fossilgraphics.com).
  - 3. Folia/Alto: [www.altoaluminum.com](http://www.altoaluminum.com).
- C. Graphic Panels:
  - 1. Material: High pressure resin laminate.
  - 2. Thickness: 1/2-inch.
  - 3. Size: see Drawings.

4. Mounting holes: pre-drilled on panel back for concealed hardware with matching pedestal.
5. Mounting hardware: stainless steel, tamper-resistant.

**22 MOUNTING PEDESTALS**

- A. 45-degree angled pedestal with double post.
  1. NPS Style Traditional Pedestal, "T45" by Fossil Industries.
  2. NPS Style Traditional Pedestal, "NPST3624IN" by iZone Imaging.
  3. Approved equal.
- B. Installation: direct bury/embedded in concrete per manufacturer's instructions.
- C. Finish: Powder coated.
- D. Color: Bronze or dark brown.
- E. Obtain mounting pedestal from same manufacturer as graphic panels.

**23 HARDWARE**

- A. Provide all hardware necessary for a complete installation per the manufacturer's instructions.
- B. Exposed fasteners shall be stainless steel, tamper-resistant.

**End of Section**

**Section 13 1200**

**Lake Summary of Work**

**PART 1 GENERAL**

**1.1 GENERAL REQUIREMENTS**

- A. The work to be performed under this Contract shall consist of furnishing parts, tools, equipment, materials, supplies and manufactured articles, and furnishing all labor, transportation, and services, including fuel, power, water, and essential communications, and performing all work or other operations required for the fulfillment of the Contract in strict accordance with the Contract Documents. The work shall be design/bid/build and require that all work, materials, and services not expressly indicated or called for in the Contract Documents, which may be necessary for the complete and proper construction of the work in good faith shall be provided.
- B. The work will conform to the "Green Book"
- C. Contractor shall meet qualifications pursuant to Section 13 1202 – Lake Submittals, Article 1.03, "Contractor Qualifications."

**1.2 WORK COVERED BY CONTRACT DOCUMENTS**

- A. Work included: Contractor shall provide all labor, materials, appurtenances, tools, equipment, facilities, transportation, and services necessary for and incidental to performing all construction activities and operations for the work described in this section, complete, as shown on the drawings or specified herein. The work includes but is not necessarily limited to the following:
  - 1. Construction survey and layout verification of subgrades, lake outline, pipelines and all associated facilities.
  - 2. Subgrade and grade modifications required for lake work. Finish grades to be as indicated on the plans.
  - 3. Lake liner.
  - 4. Reinforced concrete veneer where indicated on plans.
  - 5. Decorative stained and sculptured shoreline treatment.
  - 6. All piping systems including equalizer, recirculation, perforated drain and under drainpipe.
  - 7. Pump station, intake structures, mechanical and hydraulic systems installation, electrical and appurtenances, fabrication, and installation.
  - 8. Electrical conduits, wiring and hook-up of the control panel, pumps and control systems.
  - 9. Miscellaneous construction as shown on the drawings or required by these specifications.
  - 10. Start-up, testing, training, and operation and maintenance (O&M) manuals as required.
  - 11. As-Built Drawings
  - 12. The lake Contractor shall provide the Owner with a red-lined print indicating any and all changes, revisions, relocations, etc. done in the field during construction. As-built drawings shall include product data sheets on all parts and equipment used in the lake mechanical system.
  - 13. Project team definitions:
    - a. Client/Owner ("Owner")
    - b. Lake Contractor ("Contractor")
    - c. Construction Manager ("Construction Manager")
    - d. Lake Engineer ("Engineer")
    - e. Landscape Architect ("Landscape Architect")

- f. Civil Engineer ("Civil Engineer")

### **13 WORK BY OTHERS**

- A. Where two (2) or more Contracts are being performed at one time on the same Site or adjacent land in such manner that work under one (1) Contract may interfere with work under another, the sequence and order of the work in either or both Contracts to the agreement of both contracting entities shall be determined. When the Site of one (1) Contract is the necessary or convenient means of access for performance of work under another, the privilege of access or other reasonable privilege to the Contractor so desiring may be granted, to the extent, amount, and in manner and at a time that shall be determined. 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 allow continued safe access to their respective portions of the Site, as required to perform work under their respective contracts.
- B. Interference with Work on Utilities: Cooperate fully with all utility forces 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 to minimize interference with said relocation, altering or other rearranging of facilities. Any delays, reduction in work efficiency or hardships incurred shall be identified and resolved to the satisfaction of both parties.
- C. Related work to be provided and coordinated with the contractors:
1. Water for filling and testing the completed facility.
  2. Mass grading of the lake bottoms to the tolerances indicated on the plans.
  3. Power for operating the pumping and recirculating equipment during testing procedures.

### **14 USE OF SITE**

- A. Use of the Site shall be limited to its construction operations, including on-site storage of materials, on-site fabrication facilities and field offices.
- B. All or part of the existing Site may be utilized during the entire period of construction for the conduct of normal operations. Cooperate and coordinate to facilitate operations and to minimize interference with the operations at the same time. In any event, access to the site during the period of construction shall be allowed.

### **15 REQUIREMENTS OF REGULATORY AGENCIES TO BE FOLLOWED**

- A. The uniform building code, latest edition, where applicable.
- B. Construction safety orders of the federal, state, or local government.
- C. The ACI standard specifications for structural concrete, (ACI 30172, revised 1981) where applicable.
- D. The national electrical code, latest edition, where applicable.

### **16 GENERAL REQUIREMENTS AND SITE CONDITIONS**

- A. Verifications

Before accepting a contract or proceeding with any work, the Contractor shall verify quantities and dimensions and immediately inform the Engineer of any discrepancies between the drawings and actual conditions. No work shall be done in any area where there is a discrepancy until approval has been given by the Engineer.

- B. Existing Utility Locations

The Contractor shall follow the local "blue stake" requirements and other state regulations as applicable regarding the field locating of existing underground utilities. In the event of a

conflict, the Contractor shall take the necessary precautions, promptly notify the Contractor who will investigate the situation, take the necessary action and direct or inform the Contractor of the appropriate action to be taken. Failure of the Contractor to follow these procedures, places upon the Contractor the responsibility for making any and all repairs for damage of any kind at the Contractor's own expense.

**C. Existing Improvements**

The Contractor shall provide necessary safeguards and exercise caution against injury or defacement of any site improvements and shall be responsible for any damage resulting from his operations and shall repair or replace such damage at his own expense. No trucks or vehicles of any kind shall be allowed to pass over sidewalks, curbs, etc. unless adequate protection is provided.

**D. Responsibilities**

The Contractor shall furnish and install a complete and functional piping/pump system as described in the contract documents. All work shall be in strict accordance with the plan drawings, specifications, and existing codes and regulations as applicable.

**E. Discrepancies**

It is the intent of these drawings and specifications that the lake system be complete and functional. It is the Contractor's responsibility to make sure that the equipment furnished is compatible and adheres to all regulations. Any discrepancies shall be noted promptly and shall be reported immediately to the Engineer and/or General Contractor for clarifications prior to installation.

**F. System Clean-Up**

Water for filling the lake and power for operation of the system shall be furnished by the Owner and shall be available concurrently with the completion of the lake system. Debris and foreign materials shall be removed from the construction area by the Contractor, until substantial completion and final acceptance of the entire project by the Owner has taken place.

**G. Record Drawings**

Where required by the Contract Documents or where changes to the Contract Documents have been made by change order, revision to clarification drawings, or where minor changes to the Contract were required because of unforeseen conditions or as may be required by the Engineer, prepare accurate Record Drawings indicating all pertinent data and dimensions necessary to adequately describe the contract deviations to the Owner for his future use.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**End of Section**



**Section 13 1201**

**Lake Start Up and Guarantees**

**PART 1 GENERAL**

**1.1 WORK INCLUDED**

- A. Provide start-up and operation instructions to Owner until the Owner takes occupancy.

**1.2 STARTING OF SYSTEMS**

- A. Once the lake system has been completed and filled to the designated water level, all piping and mechanical/hydraulic systems have been installed and tested, all flow control structures and appurtenances have been constructed, all equipment has been properly installed and all electrical connections have been completed, the Contractor shall actuate the entire project system and be responsible for the proper operation of pumps, controls, and all other mechanical and electrical equipment included in the contract documents. Start-up commencement, timing, duration, and phasing shall be monitored and directed by the Owner and/or Engineer.
- B. The Contractor shall place the newly installed equipment and facilities into operation, and test, observe and adjust all items for a minimum period of one (1) week or until such time as all the units are properly adjusted and approved by the Owner and/or Engineer. The work performed by the Contractor shall include, but not limited to, the following items:
1. Label all equipment, valves, and controls including flow direction, system (for example: filtration system, recirculation system, etc.)
  2. Check all electrical and electronic equipment for proper operation.
  3. Make all equipment adjustments as required.
- C. Operator Training
1. The Contractor shall provide a factory employed manufacturer's representative to train Owner's staff in operation and maintenance procedures for all equipment items as specified by the Engineer during the start-up period, at no additional cost to the Owner. The representatives shall present training programs and on-site demonstrations designed to fully acquaint Owner's staff with all equipment features, routine scheduled maintenance procedures, alternative operational modes, spare parts inventories, and all other pertinent information.
    - a. The manufacturer's representative shall remain on-site to observe operation of the equipment and further advise Owner's staff for a minimum of one day.
    - b. A complete schedule of equipment, representatives, and dates for operator training shall be submitted to the Engineer for approval prior to commencement of the start-up period.
    - c. The Contractor shall record all equipment training sessions on high quality digital format with subjects indexed.
    - d. The Contractor shall provide two (2) duplicate sets of all copies to the Owner.

**1.3 GUARANTEES**

**A. Materials**

All construction materials and equipment shall have a minimum of one (1) year guarantee by the Contractor for defects in material and workmanship from the date of certified final completion and Owner acceptance of the entire project system. The membrane liner shall have a separate guarantee by the lining manufacturer as specified elsewhere in this specification.

**B. Geo Membrane Lining Guarantee**

The membrane lining material and the seam materials shall be guaranteed by the manufacturer/supplier to have an effective life of at least ten (10) years, provided they remain continuously protected against exposure and mechanical damage.

**C. Damage**

This warranty shall guarantee the complete 100% replacement cost of the defective materials deteriorating because of physical or chemical changes which render the lining ineffective as a waterproof membrane. Should defects or premature loss of use occur, the Contractor shall supply, repair, or replace the material on a complete basis, including all related costs of replacing or repairing the damage, refilling the lake system water to the designated water surface elevations, any required retesting of the facilities, and complete site restoration as needed. The Contractor shall also be responsible to provide whatever is necessary to maintain the ongoing operation of the lake systems, including the set-up of any temporary pumping facilities as needed. A certified guaranteed document including the above mentioned requirements, in writing, shall be submitted to the Owner with copies provided in the O&M manuals.

**D. Workmanship**

The Contractor shall guarantee his workmanship for a period of one (1) year. The entire lake system project including but not limited to pumps, pipes, equipment, lining, concrete shoreline, aeration units, flow control structures, etc. shall exhibit no measurable water loss from leakage. Should measurable losses, more than the Greenbook allowable water leakage for piping systems (Greenbook 306-1.4) and the calculated evaporation losses in the lake occur, after filling of the lake system and/or during the one (1) year guarantee period, the Contractor shall be responsible for locating and eliminating the leakage, at no additional cost to the Owner. If, due to the fault of the Contractor's workmanship, the lake and/or piping system must be drained to effect repairs, the Contractor shall be responsible for all associated costs of replacing or repairing the damage, refilling the lake water to designated water surface elevations, any required retesting of the facilities, and complete site restoration as needed. The Contractor shall also be responsible to provide whatever is necessary to maintain the ongoing operation of the lake systems, including the construction of temporary dams and the set-up of any temporary pumping facilities as needed. A certified guaranteed document including the above mentioned requirements, in writing, shall be submitted to the Owner with copies provided in the O&M manuals.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**End of Section**



**Section 13 1202**

**Lake Submittals**

**PART 1 GENERAL**

**1.1 GENERAL REQUIREMENTS**

- A. Submit to the engineer shop drawings, product data and samples required under the various Sections of these Specifications.
- B. Prepare and submit with Construction Schedule, a separate schedule listing dates for submission and dates reviewed shop drawings, product data and samples will be needed for each product.
- C. Make all submittals of Shop Drawings, Samples, and requests for substitution in accordance with the provisions of these Specifications.
- D. Contractor shall submit complete technical and product data on all construction materials and equipment. All submittals must be approved by the Engineer before any construction or installations will be allowed. The Contractor will submit a list of all construction materials and equipment to the Engineer required for submittal.
- E. All materials and equipment that are submitted and/or used for this project must be locally available for total replacement or for parts and certified as such with the submittal documents.

**1.2 RELATED REQUIREMENTS**

- A. City of San Luis Obispo Standard Specifications, August 2020.

**1.3 OPERATING AND MAINTANENCE MANUALS**

- A. Contractor to provide operation and maintenance manuals with the following information: (2) complete sets of operation and maintenance (O&M procedure manuals for all materials and equipment used on the project as listed and approved by the Contractor).
- B. All items shall have been submitted and approved through the submittal process as mentioned above.
- C. Manuals shall be provided in heavy duty 3-ring binders with a table of contents, labeled dividers and indexes.

**1.4 CONTRACTOR QUALIFICATIONS**

- A. The Lake Contractor and his supervisor to be assigned to the job shall have the following qualifications:
  - 1. Have successfully completed not less than three lake projects, each of a scope equal to or greater than this project, within the last five years.
  - 2. Submit to the Owner, with his formal bid, a list of at least three projects complete with names, addresses and telephone numbers, of the Landscape Architect/Engineer and the Owner's representative. Include a brief description of the lake facilities including size and scope of the mechanical system, list of subcontractors (if any), and the date of completion.
  - 3. Be capable of furnishing as a separate bid, labor, material, and performance bonds.
  - 4. The Owner will determine if the Lake Contractor is qualified to propose to work on this project and may refuse any bid.
- B. The Contractor, by submitting a bid, acknowledges that he understands the nature of this specialized artistic work. Also, that he understands basic hydraulic and flow requirements pertaining to streams and waterfalls and is ultimately responsible for the artistic result of his work.

## **15 IDENTIFICATION OF SUBMITTALS OR SUBSTITUTIONS**

- A. Completely identify each submittal and re-submittal by showing at least the following information:
  - 1. Name and address of entity submitting information, plus name and telephone number of individual who may be contacted for further information.
  - 2. Name of project for this Work.
  - 3. Drawing number and Specification Section number to which the submittal applies.
  - 4. Number of all submittals sequentially, whether this is an original submittal or a re-submittal, and if a re-submittal, what number re-submittal.

## **16 COORDINATION**

- A. Prior to submittal for Engineer's review:
  - 1. Fully coordinate all submittals by determining and verifying all field dimensions and conditions, materials, catalog numbers, and similar data.
  - 2. Coordinate as required with all other trades and with all public agencies involved.
  - 3. Secure all necessary prior approvals and signify by stamp, or other means, that they have been secured.
  - 4. Clearly indicate all deviations from Contract Documents.

## **17 TIMING OF SUBMITTALS**

- A. Make all submittals within thirty (30) days of the date of the award of the contract for the Work, and far enough in advance of scheduled dates of installation to provide adequate time for all required reviews, both by the Engineer and his consultants, for securing necessary approvals, for possible revision and re-submittal, and for placing of orders and securing delivery. In scheduling, allow a minimum of ten (10) full working days for the Engineer's review. Cost of delays occasioned by the tardiness of submittals will be back-charged as necessary.

## **18 ENGINEER'S REVIEW**

- A. The Engineer's review will be only for conformance with the design concept and with the information given in the Contract Documents. The Engineer's review and approval of Shop Drawings and Samples shall not relieve the Contractor of responsibility for deviation from the requirements of the Contract Documents unless the Contractor has informed the Engineer and Owner in writing of such deviation at the time of submittal and the Engineer has given written approval to the specific deviation, nor shall the Engineer's approval relieve the Contractor from responsibility for errors and omissions in the Shop Drawings and Samples. Should the Engineer be required to review any submittal more than three (3) separate times due to the inadequacy of the submittal and due to no fault of the Engineer, the Contractor shall render to the Engineer the Engineer's direct cost for review of all subsequent re-submittals.

## **19 COMPLIANCE WITH APPROVALS**

- A. Do not commence any portion of the Work requiring approval of Shop Drawings or Samples by the Landscape Architect until the submittal has been approved by the Engineer and Owner. All such portions of the Work shall be in accordance with the approved Shop Drawings and Samples.

## **PART 2 PRODUCTS**

### **21 SCHEDULE OF SUBMITTALS**

- A. Compile a complete schedule of all submittals required for the project, complete with major division and subdivision headings and broken into individual trades. Format shall be 8-1/2" x

11". The schedule shall be in such a form as to allow for notations next to each required submittal including, but not necessarily limited to, submission dates, action taken, approvals and re-submittals. Submit such a schedule to the Engineer for his comments and approval. The approved Schedule of Submittals shall be always kept current and an updated copy shall be kept in the Project Field Office for review.

## **22 SHOP DRAWINGS AND PRODUCT INFORMATION SUBMITTALS**

- A. Unless otherwise specifically directed by the Engineer, make all Shop Drawings accurately to a scale sufficiently large to show all pertinent features of the item and its method of connection and interface to the Work.
- B. Submit all Shop Drawings and Product Information in the form of Portable Document Format (PDF) of each Shop Drawing. Where contents of submitted product information include data not pertinent to the submittal, clearly indicate which portion is being submitted for review.
- C. Submittals are required on all items to ensure the latest and most complete manufacturer's data is available. The Contractor assumes full responsibility for problems which could have been noted on valid submittals not furnished.
- D. If an item or items specified by the Engineer will not be available in time for installation during orderly progress of the Work, so notify the Engineer prior to receipt of bids. Verify that all items specified will be available. Costs of delays because of non-availability of materials will be back-charged as necessary and shall not be borne by the Owner.
- E. Of the PDF required; A copy of file will be returned to the Contractor upon completion of the Engineer review, one copy will be sent to the Owner and the other will be kept on file in the Engineer office.

## **23 SAMPLES**

- A. Unless otherwise specifically directed by the Engineer, all Samples shall be of the precise article proposed to be furnished.
- B. Submit all Samples in the quantity, which is required to be returned, plus one (1) which will be retained by the Engineer.

## **24 CALCULATIONS**

- A. Where required, structural calculations shall be performed by a licensed Civil or Structural Engineer and shall be sufficient to show the adequacy of all members and connections to be reviewed.

## **25 COLORS**

- A. Unless the precise color and pattern is specifically described in the Contract Documents, whenever a choice of color or pattern is available in a specified product submit accurate color charts and pattern charts to the Engineer for his review and selection.
- B. Unless all available colors and patterns have identical costs and identical wearing capabilities and are identically suitable for the installation, completely describe the relative costs and capabilities of each.

## **26 OPERATIONS & MAINTENANCE MANUALS**

- A. Where manuals are required to be submitted upon completion of the installation, prepare all such manuals in durable plastic binders approximately 8-1/2" x 11" in size and with at least the following features:
  - 1. Identification readable through the outside of the cover, stating the general nature of the manual and the project to which it pertains.

2. Neatly typewritten Index near the front of the manual, furnishing immediate information as to location in the manual of all data regarding the installation.
  3. Complete instruction regarding operation and main-tenance of all equipment involved.
  4. Complete nomenclature of all replaceable parts, their part numbers, current cost and name and address of the Vendors of the parts.
  5. Copy of all guarantees and warranties issued on the installation.
  6. Copy of the approved Shop Drawings with all data concerning changes made during construction.
- B. Where contents of manuals include manufacturer's catalog, clearly indicate the precise items included in this installation and delete, or otherwise clearly indicate, all manufacturer's data with which this installation is not concerned.
- C. Provide information regarding the proper operation of a manmade lake system including care for the liner, shorelines, and water quality.
- D. Unless otherwise specifically directed by the Engineer, deliver two (2) copies of the manual to the Owner and one (1) copy to the Engineer.

## **27 SUBSTITUTIONS**

- A. Reference in the Contract Documents to any material, product, or process by name, make or catalog number shall be interpreted as establishing a standard of quality and design intent and not construed as prohibiting substitu-tions of any other such material, product, or process, provided such substitution is specifically approved by the Engineer prior to receipt of bids. Requests for substitutions shall be submitted no later than ten (10) working days prior to bid date.
- B. Acceptance of substitutions will not relieve the Contractor from responsibility for complying with the Contract Documents.
- C. At the discretion of the Engineer, testing of samples of materials proposed for substitutions may be required. The testing shall be done by an independent testing laboratory selected by the Owner, the costs of which shall be borne by the Contractor.
- D. At the discretion of the Engineer, the Contractor may be required to furnish a written guarantee, in addition to that already required, ensuring the satisfactory performance of the proposed substitutes.
- E. All additional labor and materials which may be required for the proper installation of any substitution, or required because of any substitution, will be provided at no additional cost to the Owner.
- F. Bids shall be based upon the data given in the Contract Documents, or upon previously approved items or techniques as "approved equals" by the Engineer. Where calculations or shop drawings are required for approval, allowance shall be made for meeting the requirements of the Contract Documents and all applicable codes and ordinances.
- G. Bidders may, in addition, submit separate bids using materials and equipment of other manufacturers, providing the difference in cost is stated for each item proposed to be substituted.
- H. Provide to the Engineer all information necessary and required to evaluate proposed substitutions. Do not base bid on the assumptions that a material will be approved as equal by the Engineer unless the item has been specifically approved for this Work by the Engineer prior to the receipt of bids.

- I. The Contractor assumes full responsibility that substituted items or procedures will meet the job requirements and is responsible for the cost of redesign and of modifications to this and all other parts of the work caused by substituted items.
- J. Submittals will be checked for general conformance with the design concept of the project, but acceptance does not guarantee quantities shown and does not supersede requirements to properly install work. Submittals for proposed alternatives will be judged not only for the acceptability of the items themselves, but of the items as they are used under the conditions of this particular project.

**PART 3 EXECUTION - NOT USED**

**End of Section**



**Section 13 1212**  
**Concrete Veneer**

**PART 1 GENERAL**

**1.1 GENERAL**

- A. Contractor shall provide all labor, materials, appurtenances, tools, equipment, facilities, transportation, and services necessary for and incidental to performing all construction activities and operations for the work described in this section, complete, as shown on the drawings or specified herein. The work includes but is not necessarily limited to all the section below.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- A. The concrete veneer shall consist of a minimum 6-sack mix, Type I or II, Portland Cement with a maximum aggregate size of 3/8".
- B. The concrete shall obtain a 28-day minimum compressive strength of 3,000 psi when prepared in accordance with ASTM C31 test method 231. Concrete failing to meet this specification shall be removed and replaced.
- C. It shall be the Contractor's responsibility to furnish a statement from the concrete supplier stating the mix proportions, the anticipated strength and a test report copy made in the last 90 days. After approval, the aggregates and cement shall remain the same throughout the job. The quantities of each may change to increase strength.
- D. The concrete shall be delivered to the site with a slump of not more than 4.0 inches.

**2.2 STEEL REINFORCEMENT**

- A. Wire Mesh: The concrete veneer reinforcement shall be 1.2 inch by 1.2-inch 20 gauge galvanized octagonal mesh wire.
- B. Reinforcing Bars: ASTM A615, Grade 40.

**PART 3 EXECUTION**

**3.1 GENERAL**

- A. A wire reinforced concrete veneer cover shall be installed over the membrane liner by the Contractor where shown on the plans.

**3.2 WIRE MESH**

- A. 1.2 inch by 1.2 inch by 20-gauge octagonal wire mesh shall be placed over the membrane liner in all areas to receive a concrete veneer. The wire shall be laid in a continuous layer, with adjacent edges over-lapping 8.0 inches (minimum) and secured to another by the use of hog rings or other appropriate clips which cannot puncture the liner.

**3.3 CONCRETE**

- A. The concrete shall be placed over the wire. All wire shall be covered with concrete so that no wire is visible on the surface or edge of the concrete except where indicated on the plans. The concrete shall be rough, broom finished, and water sprayed, chemical or membrane cured to prevent excessive cracking during or after curing. All cracks 1/4" and wider shall be caulked with an approved sealant. Curing operations shall be one or both of the following methods:
  - 1. Application of a light spray of water, three times a day for three consecutive days beginning the following a.m.
  - 2. Spray application of an approved exterior curing compound.

3. No concrete admixtures for curing will be allowed.

**3.4 CONCRETE PLACEMENT METHODS**

- A. Placement of the concrete for the veneer shoreline may be done by conventional form work, slip form or shotcrete application methods, all in accordance with the plans and specifications. Any method which is chosen by the Contractor shall require an "application method plan" submittal to be submitted to the Contractor for review and approval prior to construction of the shoreline. For any method chosen, the Contractor must meet the accepted industry standards for that type of concrete placement method, including but not limited to ASTM.

**End of Section**



**Section 13 1224**  
**RPE Liner and Testing**

**PART 1 - GENERAL**

**1.1 SCOPE**

- A. Furnish all labor, materials, supplies, equipment, tools, and transportation, and perform all operations in connection with and reasonably incidental to the complete installation of the lake lining and guarantee/warranty as shown on the drawings, the installation details, and as specified herein.

Items of work specifically included in this section are:

1. Procurement of all applicable licenses, permits, and fees.
2. Formally accept subgrade. The grade shall be turned over at line and grade with a tolerance of 1/10 foot. Confirm that all wet well, lake pipe systems and bridge or retaining wall structures are installed prior to acceptance.
3. Liner Contractor responsible for this section shall inspect subgrade to ensure that the soils are suitable for work of this section and issue a written acceptance prior to any work.
4. After acceptance, maintain lake subgrade for the duration of this section work and any de-watering necessary. Damage to the lake subgrade by Lake Lining Contractors operations or rain water runoff/erosion shall be repaired by the Lake Lining Contractor until the work is officially accepted by the city.
5. Furnishing all materials and labor for the installation of a 30-mil reinforced polyethylene liner and 8-ounce loose lay geotextile liner for the entire stream/water fall feature bottom as shown on the drawings. Lake Lining Contractor is responsible for supplying appropriate quantity of liner materials based on the construction drawings.
6. Furnish all materials and labor for the anchor trench liner installation around the entire perimeter of the lake, alongside the stream/water fall feature channel and waterstop joints at all pipe penetrations through the liner.
7. Furnish all materials and labor for the installation of pipe-boots and liner water proofing requirements at all pipe penetrations into the lake.
8. In the event lake slopes exceed 4:1, immediately cease installation and bring condition to the attention of the Project Site Representative.
9. Installation of the lining system to be performed by a qualified lining contractor meeting the requirements specified herein.
10. Provision of the lining manufacturer's Technical Field Representative for at least three (3) site visits during construction including all expenses to verify and document quality assurance and testing. At a minimum the Technical Field Representative shall:
  - a. Review and approve the liner subgrade prior to the installation of any geotextile or geomembrane material.
  - b. At the completion of liner seaming operations to review the nondestructive air lance test.
  - c. At the completion of an acceptable lake Leak Test to review and approve the completed liner installation and any repairs made as a result of the liner leak test.
11. Installation shall be performed by a contractor that has previously installed a minimum of 1,000,000 sq. ft. of this material, or by a contractor that has a Fabricator Field Service Representative in attendance during the entire installation process. Provide documentation of experience and presence at site during installation.
12. Leak testing contractor shall have qualifications and experience in conducting the propose leak detection method having tested a minimum of 5,000,000 sq. ft. of this material within

the previous three years. The leak location survey shall be supervised by a professional or technician with a minimum of 3 years and 5,000,000 square feet of liner testing experience using specified test method.

## **12 DISCREPANCIES**

- A. It is the intent of these plans and specifications that the lake lining system be complete and workable. It is the Lake Lining Contractor's responsibility to make sure that the material furnished is compatible and adheres to all regulations. Any discrepancies should be noted immediately and should be reported to the Project Site Representative for clarification.

## **13 SUBMITTALS**

- A. Deliver submittals to Project Site Representative within 10 working days from date of Notice to Proceed. Index sections for different components and label with specification section number and name of component. Furnish submittals for components on material list. Indicate which items are being supplied on catalog cut sheets when multiple items are shown on one sheet. Incomplete submittals shall be returned without review.
- B. Materials List: Include lake liner, extrusion rod, geotextile, waterstop. Quantities of materials need not be included.
- C. Manufacturers' Data: Submit manufacturers' catalog cuts, specifications, and maintenance and operating instructions for all material supplied.
- D. Qualifications of Liner Installer, Fabricator Field Service Representative, lining manufacturer's Technical Field Representative and Leak testing contractor.

## **14 RULES AND REGULATIONS**

- A. Work and materials shall be in accordance with liner manufactures written installation procedures and requirements.
- B. When the contract documents call for materials or construction of a better quality or larger size than required by the above-mentioned rules and regulations, provide the quality and size required by the contract documents.

## **15 TESTING**

- A. Notify the Project Site Representative three days (72 hours) in advance of testing.
- B. On completion of assembly of the lake lining, all field joints shall be tested.
- C. Nondestructive seam strength testing:
  - 1. All seams shall be visually inspected for compliance.
  - 2. All field seams shall be Air Lance Tested (ASTM D4437) using a minimum 50 psi air supply directed through a 3/32-inch (typical) nozzle, held not more than 2-inches from the seam edge and directed at the seam edge.
  - 3. Defective seams are located when the air jet causes the membrane to inflate, flutter, or show a disturbance not seen with properly seamed material.
- D. Destructive seam strength testing:
  - 1. One sample per 500 feet of field seam shall be provided and tested for bonded seam strength and peel adhesion values as specified.
  - 2. The sample can either be made from excess material or cut out from the installed lining.

## **16 CONSTRUCTION REVIEW**

- A. A review shall occur at the completion of the lake lining system installation and Project Record Drawing submittal.

**1.7 GUARANTEE/WARRANTY AND REPLACEMENT**

- A. The purpose of this guarantee/warranty is to ensure that the City receives materials of prime quality, installed and maintained in a thorough and careful manner.
- B. For a period of one year from commencement of the formal maintenance period, guarantee/warranty liner materials and workmanship against defects. Fill and repair depressions. Restore landscape or structural features damaged by the settlement of trenches or excavations. Repair damage to the premises caused by a defective item. Make repairs within seven days of notification from the Project Site Representative.
- C. Contract documents govern replacements identically as with new work. Make replacements at no additional cost to the contract price.
- D. Guarantee/warranty applies to originally installed materials and equipment and replacements made during the guarantee/warranty period.

**PART 2 MATERIALS**

**2.1 QUALITY**

- A. Materials used in the lake construction shall be new and without flaws or defects of any type and shall be the best of their class and kind.

**2.2 SUBSTITUTIONS**

- A. Make complete submittals of all manufacturers' data showing compliance with the Contract Documents.
- B. In making a request for a substitution, refer to Section 131202 Substitution procedures.

**2.3 LAKE LINER**

- A. RPE sheeting shall be manufactured from a composition of ingredients suitably compounded of 100% virgin polyethylene and specifically compounded for use in hydraulic structures. Reprocessed or reground materials are not acceptable. The use of water-soluble formulation ingredients is not acceptable.
- B. Certification test results showing the material meets the specifications shall be supplied by the manufacturer of the roll material on request.
- C. Furnish RPE 30-mil membrane lining consisting of 72-inch or greater widths of calendared sheeting fabricated into large sections by means of special factory-bonded seams into a single panel, or into the minimum number of large panels required to fit the job site.
  - 1. Furnish RPE sheeting constructed with a biocide at a viable formulation level.
  - 2. Furnish sheeting that is flexible, durable, and watertight, free of pinholes, blisters, holes, or other contaminants.
  - 3. Furnish material RPE membrane uniform in color, thickness, size, and surface texture.
  - 4. Furnish material having the following minimum average physical properties as specified by ASTM:
    - a. Nominal Thickness: 30 mil
    - b. Weight (lbs per MSF): 144 lbs
    - c. Tensile Elongation at Break: 30%
    - d. Tongue Tear Strength: 115lbf
    - e. Grab Tensile (Scrim Break): 280 lbf
    - f. Standard OIT: 150 min
    - g. High Pressure HPOIT: 2400 min
    - h. Minimum Static Use Temperature: -70°F

- i. Maximum Static Use Temperature: 180° F
  - j. Puncture resistance: 100 lbf
  - k. Hydraulic Conductivity:  $2.20 \times 10^{-10}$  cm/sec
- D. Furnish products Manufactured by Raven Industries, Colorado Linings, Layfield Group or equal.

## **24 GEOTEXTILE**

- A. Furnish 100% polypropylene, nonwoven, needle punch, geotextile. Furnish material having the minimum average roll values as specified by ASTM:
- 1. Fabric Weight: 8.0 ounces/sq. yard
  - 2. Thickness: 85 mils
  - 3. Grab Tensile Strength: 205 lbs MD.
  - 4. Grab Elongation: 50%
  - 5. Trapezoid Tear Strength: 80 lbs
  - 6. CBR Puncture Strength: 500 lbs
  - 7. Water Flow Rate: 95gpm/ft<sup>2</sup>
  - 8. U.V. Resistance: 70%
  - 9. Apparent Opening Size: US Sieve 80 mm
- B. Use products manufactured by SI Geosolutions, Mirafi, Inc., DuPont, Inc., Nicolon Corporation, Geotex, or Engineer approved equal.

## **25 OTHER MATERIALS**

- A. Provide any special tools, hardware, adhesives, boots, or any special materials necessary for the proper installation of the liner as recommended by the manufacturer.
- B. Use only stainless steel: fasteners, washers, strapping, and other hardware that is required.

# **PART 3 EXECUTION**

## **31 INSPECTIONS AND REVIEWS**

- A. Site Inspections:
- 1. Verify site conditions and note irregularities affecting work of this section. Report irregularities to the Project Site Representative prior to beginning work.
  - 2. Beginning work of this section implies acceptance of existing conditions.
- B. Utilities: Verify locations of underground utilities, pipe penetrations etc.

## **32 EXCAVATION, TRENCHING, AND BACKFILLING**

- A. Earthwork shall be performed by the Park Contractor per Section 13 200 Lake Summary.
- B. Park Contractor shall submit as constructed survey of subgrade for Project Site Representative for Lake Lining Contractors records.
- C. Subgrade of lake graded by Park Contractor to a tolerance of +/- 1/10 foot shall be accepted by Project Site Representative, Engineer, and Lake Lining Contractor at a slope not to exceed 4:1 in any circumstance, prior to installation of liner system.
- D. Where utilities conflict with lake excavation or anchor trenching, contact the Project Site Representative.

## **33 INSTALLATION OF NATURAL SOFT LAKE EDGES**

- A. Install lake edge treatments as required by the construction documents, details, and specifications.

### **34 INSTALLATION OF GEOTEXTILE**

- A. Install loose lay geotextile above and below RPE liner as shown in the details and as recommended by the manufacturer.
- B. Complete field seams at all overlapped joints. Heat weld or utilize manufacturer's recommended products and procedures.
- C. Secure the geotextile to pipe penetrations as shown in the details by overlapping fabric over the top of the RPE liner and under the batten strip.

### **35 INSTALLATION OF LAKE LINER**

- A. General:
  - 1. Installation shall be performed by a contractor that has previously installed a minimum of 1,000,000 sq. ft. of this material, or by a contractor that has a Fabricator Field Service Representative in attendance during the entire installation process. Provide documentation of experience and presence at site during installation.
  - 2. The surface (substrate) to receive the liner shall be compacted per the liner manufacturer's specifications, smooth and free from sharp objects that could puncture the lining.
  - 3. Remove all vegetation prior to installation of the liner.
  - 4. Subgrade shall be accepted by lining installation contractor at a slope not to exceed 4:1 in any circumstance, prior to installation of liner system.
  - 5. Structures and piping should be installed in the lake prior to the liner installation.
  - 6. Place the geotextile and RPE liner over the prepared surfaces corresponding to the interface test submittal and results in such a manner to assure minimum handling. Use sandbags (or similar ballast) to keep the panels in place during installation. Avoid wrinkles in the seam areas and around mechanical attachments.
  - 7. Place liner and geotextile material in the 'U'-shaped anchor trench as shown in the detail, extended through all three sides of the trench.
  - 8. Closely fit and seal the lining around inlets, outlets, and other projections through the lining using prefabricated fittings where possible.
  - 9. Closely fit and seal the lining around inlets, outlets, and other projections through the lining using prefabricated fittings/pipe boots where possible.
  - 10. Secure the liner to concrete structures as shown in the details with a continuous stainless steel batten strip (not in direct contact with the concrete) and stainless-steel concrete anchor bolts.
  - 11. Secure the RPE liner to pipe penetrations as shown in the details with a continuous stainless-steel batten, washer, and stainless-steel concrete anchor bolt. Apply a continuous bead of butyl caulk behind the batten strip.
  - 12. Do not drive any vehicle over the RPE liner.
  - 13. Perform all installation procedures, materials, workmanship, and testing in accordance with liner manufacturer's instructions and recommendations.
- B. Field Joints:
  - 1. Use lap joints to seal factory fabricated panels of RPE together in the field.
    - a. Form lap joints per manufacturer's requirements.
    - b. Remove all dirt, dust, and other foreign materials from the material and scrub the mating surfaces.
  - 2. Construct all joints in a manner recommended by the manufacturer and in accordance with accepted industry practices.

- C. Joints to Structures: Construct all joints in a manner recommended by the manufacturer and in accordance with accepted industry practices.
- D. Repairs to RPE: Make any necessary repairs in a manner recommended by the manufacturer.
- E. Quality of Workmanship:
  - 1. Any lining surface showing injury due to scuffing, penetration by foreign objects or distress from rough subgrade shall, as directed by Project Site Representative, be replaced or covered and sealed with an additional layer of RPE of the proper size.
  - 2. All joints upon completion of the work shall be tightly bonded.
- F. Quality Assurance: Furnish a Technical Field Representative from the liner manufacturer for at least three (3) site visits during construction to observe the installation, to prepare field reports documenting site visit observations, and to ensure compliance with the manufacturer's installation procedures. Submit field reports to by Project Site Representative within three (3) days offsite visit.

### **3.6 INSTALLATION OF OTHER COMPONENTS**

- A. Install other materials shown on the drawings or installation details to be part of the lake liner construction, even though such items may not have been referenced in these specifications.

### **3.7 PROJECT RECORD DRAWINGS**

- A. Record alterations. Record work that is installed differently than shown on the construction drawings.
- B. Document changes to design. Maintain on-site and separate from documents used for construction, one complete set of contract documents as Project Documents. Keep documents current. Do not permanently cover work until accurate "as-built" information is recorded.
- C. Record alterations on a daily basis. Record work that is installed differently than shown on construction drawings. Record accurate reference dimensions, measured from at least two permanent reference points of each liner penetration, and note areas where liner is attached with batten strip.
- D. Turn over the Project Documents to the Project Site Representative. Completion of the Project Documents shall be a prerequisite for the Review at the completion of the lake/stream water fall feature lining & edge treatment systems installation.

### **3.8 CLEANUP**

- A. Upon completion of Work, remove from the site all machinery, tools, excess materials, and rubbish.
- B. Remove all debris and foreign material from the construction area and wet well.

**End of Section**

**Section 13 1230**

**Shoreline**

**PART 1 GENERAL**

**1.1 WORK INCLUDES:**

- A. Concrete shoreline edge
- B. Boulder pockets

**PART 2 PRODUCTS**

**2.1 SHORELINE BOULDERS**

- A. Supplier:
  - Sanford Stone Co.
  - 325 Marquita Ave, Paso Robles, CA 93446
  - (805) 434-4244
- B. Material for exposed lake perimeter:
  - 1. "Sydney Peak" slabs.
  - 2. Slab thickness: between 8-12 inches.
  - 3. Slab size: between 30-48 inches long. Slab width shall be no less than 1/2 its length.
- C. Material for submerged boulders:
  - 1. "Sydney Peak" boulders.
  - 2. Sized to fit, see Drawings.

**PART 3 EXECUTION**

**3.1 FINISH LAKE GRADING**

- A. Prior to start of Work

Contractor and Owner's representative shall examine excavation by others for compliance with contract documents. Commencement of work by Contractor means acceptance of site conditions. All costs for finish grading work shall be included in the PVC liner unit price bid item provided in the bid schedule.

- B. Subgrade Preparation

The subgrade upon which the membrane lining is to be placed shall be prepared immediately prior to placing the liner. The Contractor shall prepare the subgrade such that it shall be free from earthen clods, rocks, and cobbles larger than ½ inch in diameter and rubbish or other foreign materials. The surface of the completed subgrade shall be smooth, uniform, and free from sudden changes in grade other than at designated slope areas and boulder nests. Should subgrade be found to be unsuitable, a minimum 2 inch plating depth with suitable material shall be provided. Or the subgrade shall be prepared (free of ½ inch foreign material) for a minimum depth of 2 inches, or a suitable geotextile placed on the subgrade under the liner.

- 1. The maximum slope for geomembrane with earth cover or in exposed condition shall not exceed 3.5 horizontal to 1 vertical unless approved by the manufacturer. Contractor to provide documentation of the manufacturer's approval.
- 2. The geomembrane installer and the Owner's representative shall inspect the surface to be covered with geomembrane on each day's operation, prior to placing the geomembrane to verify suitability.
- 3. The geomembrane installer and Owner's representative shall provide daily written acceptance for the surface to be covered in that day's operation. The surface shall be maintained in a manner to insure subgrade suitability.

4. All subgrade damaged by construction equipment and deemed unsuitable for geomembrane deployment shall be repaired prior to placement of the geomembrane. All repairs shall be approved by the Owner's representative. The responsibility for repairs and maintenance of the subgrade shall be defined in the preconstruction meeting.

**C. Grading Outside the Lake Edge**

It is the intent of these plans and specifications to provide adequate landscape areas outside the lake perimeter. The Contractor shall insure that rock placement outside the lake system does not hinder drainage. The Contractor shall coordinate his work with the grading Contractor and shall bring any discrepancies or problem areas to the attention of the Owner's representative, prior to the completion of the work.

**End of Section**



**Section 13 1250**  
**Mechanical System**

**PART 1 GENERAL**

**1.1 WORK INCLUDED**

- A. Contractor shall provide all labor, materials, appurtenances, tools, equipment, facilities, transportation, and services necessary for and incidental to performing all construction activities and operations for the work described in this section, complete, as shown on the drawings or specified herein. The work includes but is not necessarily limited to all the section below.
- B. Owner/Contractor to supply plan for electrical connection from power source. General Contractor to provide construction and installation of power source
- C. The system manufacturer shall submit individual pump curves for approval.
- D. Pumps shall be inter-connected to level controls in the wet well for high level "on" and low level shut-off.
- E. Piping and fittings in pump station shall be PVC schedule 40 piping and schedule 80 fittings unless otherwise noted or Engineer approved equal.

**1.2 REQUIREMENTS OF REGULATORY AGENCIES TO BE FOLLOWED**

- A. The uniform building code, latest edition, where applicable.
- B. Construction safety orders of the federal, state, or local government.
- C. The ACI standard specifications for structural concrete, (ACI 30172, revised 1981) where applicable.
- D. The national electrical code, latest edition, where applicable.

**PART 2 PRODUCTS**

**2.1 PUMP SPECIFICATIONS**

- A. Contractor shall provide, deliver, and install all items of work as indicated on the plans and/or described herein suitable for a complete and operational pump station. Contractor shall submit shop drawings and material specifications for all piping, valves, appurtenances, and other equipment to Engineer for review and approval. Shop drawings shall include all electrical information.
- B. The filter pump per Pentair Water Specialty Pump Model AFP-120 or approved equal. The pump shall be rated for a minimum system capacity of 100 GPM, at 17.5 FT. (TDH). The pump shall be single phases, 115V, 60 Hz service.

**2.2 FILTER SYSTEM**

- A. Cartridge Filter System shall be per Pentair Clean and Clear Plus Model CCP320 with 320 square feet of filter area with a maximum flowrate capacity of 120 gpm.

**2.3 MECHANICAL APPURTENANCES (as shown on plans)**

- A. Air Relief Valve: The air relief valve shall be of PVC construction and shall be per waterman AVP series or approved equal to size shown on plans.
- B. Repair Couplings: All repair couplings shall be per Smith-Blair or approved equal, unless otherwise noted on the plans and fitted for pipes as shown on the plans.
- C. Butterfly Valve(s): The butterfly valve(s) shall be for hand operation per Keystone, unless otherwise noted, or approved equal. They shall be wafer type for flange mounting; the

pressure rating shall be 125 lb. Valve bodies shall be high strength cast iron with carbon steel shafts.

- D. Check Valve(s): The check valve(s) shall be wafer type, spring loaded, butterfly type with dual springs and shall consist of a rubber lined insert in a cast iron body per Keystone or approved equal. When chlorine is applied, the check valve is to be epoxy coated.

## **24 CONTROL AND PUMP PANELS**

- A. The system will use the existing controls for the pump. No changes are anticipated.

## **25 CONDUITS**

- A. All conduits installed shall be galvanized and rigid, or flexible, meeting the following requirements:
1. Conduits shall be sized, and materials selected to accommodate the numbers of conductors in accordance with the tables and specifications given in the current edition of the National Electrical Code. The minimum size of any conduit shall be ½ inch. Joints shall be cut square, reamed smooth and drawn up tight. The galvanized conduit shall conform to the Federal Specification W C581 CJ American rigid steel conduit specification C80.1 1953 and Underwriter's Laboratories Specification.
  2. The inside diameter of the sleeve shall be the same as the outside diameter of the I.P.S. pipe used with it. The wall thickness of the sleeve shall be the same as the jacket of the pipe.
  3. All conduits to be run underground shall be an approved PVC type.
  4. Couplings and conduit unions shall be galvanized steel. They shall have the conventional dimensions of the trade and shall be internally threaded with a tapered thread at each end to fit the tapered thread specified for the corresponding size conduit.
    - a. The pump panels shall include externally operable disconnect switches, circuit breakers, and magnetic across-the-line starters with externally resettable overload relays.
    - b. Each pump will have an industrial type H-O-A selector switch and a green lensed motor run light, mounted on panel door. Indicating lights for motor overload and low voltage/phase fail shall also be provided. Indicating lights shall be of the 6-volt transformer type. Full voltage lights are not permitted.
    - c. Panel shall be protected from phase loss-reversal and failure, under-voltage, and shall have a lightning arrestor. The entire unit shall be factory assembled, wired, and tested with a complete electrical, hydrostatic, and performance test. It shall be cleaned and painted with high grade machinery enamel prior to shipment.

## **PART 3 EXECUTION**

### **3.1 INSTALLATIONS**

- A. The pump station, monitors, controls, equipment, and all other related materials shall be installed in accordance with Section 1.02.

**End of Section**

**Section 13 1251**

**Lake Piping and Pipeline Testing**

**PART 1 GENERAL**

**1.1 GENERAL**

- A. Contractor shall provide all labor, materials, appurtenances, tools, equipment, facilities, transportation, and services necessary for and incidental to performing all construction activities and operations for the work described in this section, complete, as shown on the drawings or specified herein. The work includes but is not necessarily limited to all the section below.

**PART 2 PRODUCTS**

**2.1 PIPE AND FITTINGS**

- A. Materials:
1. Pipe shall be polyvinyl chloride (PVC) and plastic irrigation pipe (pip) to size and pressure class indicated on the plans.
  2. 8" Ø and smaller - Schedule 40 IPS Solvent Weld PVC
- B. Schedule 40 IPS Solvent Weld PVC:
1. The pipe shall be listed with NSF and complies with NSF/ANSI Standard 14 and Standard 61. The Schedule 40 White pipe is dual marked, so it can be used both for Pressure and DWV applications. The dual marked pipe conforms to ASTM D1785 and ASTM D2665.
  2. The pipe shall be installed per ASTM D2855. The joints should conform to ASTM D2672, the solvent cement to ASTM D2564 and the primer to ASTM F656.
  3. Dimension: the outside diameter and wall thickness of Schedule 40 pipe are measured in accordance with ASTM D2122
- C. The pipe shall be homogenous throughout, and free from visible cracks, holes, foreign inclusions, or other defects.
- D. Joints shall be integral bell, and spigot type with rubber gaskets, conforming to ASTM D3139. The elastomeric ring shall be in accordance with ASTM F477.
- E. PVC pipe shall not be stored in the sun for any length of time and shall not be dropped or abused in a manner that can cause cracking. Discolored PVC material shall not be accepted or used.

**PART 3 EXECUTION**

**3.1 TRENCHING**

- A. Trenches shall be excavated to the width necessary to permit the pipe to be laid and jointed properly and the backfill to be placed as specified. In no case shall the trench width at and below the top of the pipe be such that the clean space between the pipe barrel and the trench wall exceed 12" on each side of the pipe. The trench shall be excavated to the proper depth, and the trench bottom shall be graded to provide uniform bearing and support for pipe for its entire length. A continuous trough shall be excavated to receive the bottom quadrant of the pipe, and bell holes shall be provided at each joint to permit the jointing to be performed properly, so that the pipe will be uniformly supported. Whenever soil is encountered in the bottom of the trench that is incapable of supporting the pipe, as determined by the Owner's representative, such soils shall be removed to the depth direction and the trench backfilled and compacted to the proper grade with approved material

### **32 INSTALLATION**

- A. The pipe shall be placed to lines and grades as shown on the plans. All lines shall have 3' of cover (minimum) outside the lake perimeter and 1' minimum cover within the lake perimeter except as they emerge from the ground or as otherwise indicated on the plans. Pipes shall vary below minimum grade where existing pipes are encountered. All pipes shall be inspected for cracks or defects just prior to installation. No faulty pipe shall be incorporated into the job. A joint lubricant as recommended by supplier may be used but must be free from harmful effects.

### **33 BEDDING AND BACKFILL**

- A. Backfill materials shall consist of the excavated material free of large stones (greater than 3-inch diameter) or foreign material. When the excavated material is unsuitable in the opinion of the Owner's representative, other approved material such as sand shall be provided by the Contractor to insure proper backfill and compaction. Any bracing installed to prevent cave-ins shall be withdrawn in a manner that will maintain the desired support during the backfilling operations.
- B. Backfill material in trenches shall be compacted to 90 percent of maximum density, except under roads and structures, which shall be compacted to 95 percent of maximum density. Maximum density shall be defined by the ASTM Specification D698, otherwise known as standard proctor, and ASTM 1557 respectively. The moisture content of the backfill material shall be such that the Contractor is able to meet the specification. Trenches backfill from the bottom of the trench to a point halfway up the side of the pipe shall consist of the excavated or approved material tamped to the required density in layers not exceeding 6 inches loose thickness. In lieu of the tamped material, the Contractor may use sand to the same depth. The sand shall be placed in the trench in such a manner that the pipe will not be damaged. The backfill material and/or sand shall be thoroughly worked under the sides of the pipe. Flooding or jetting of trenches will be permitted as a means of achieving compaction, but care should be taken to prohibit any lifting of the pipe due to buoyancy.

### **34 PIPELINE TESTING**

#### **A. Pipeline Pressure Test**

All gravity and recirculation pipelines shall be subjected to a field hydrostatic pressure of 50 psi for a period of four hours per Greenbook 306-1.4.5. One hundred percent of the pipeline lengths shall be tested. All concrete anchor blocks shall be per Greenbook specs and shall be allowed to cure a sufficient time to develop adequate thrust resistance prior to testing and the pipeline shall not be tested until it has been filled with water for a minimum of 24 hours. Before testing, the pipe shall be backfilled with 2-½ feet of material or center loaded to hold the pipe in place while testing. The water necessary to maintain this pressure shall be measured through a meter. Any noticeable leaks shall be repaired, and any defective pipe shall be replaced with new sections prior to commencing a retest. Test sections shall be physically isolated from previously tested pipelines, existing pipelines, or main lines prior to connecting the new line. Tests shall be conducted with the open ends of pipe, valves and fittings suitably closed with plugs or caps as necessary per Greenbook. Valves shall not be operated during the testing procedures. All testing shall be inspected by the Owner and/or Engineer.

#### **B. Field Testing Procedure**

The test shall be conducted in the following manner. All air shall be expelled from the pipe. To accomplish this, if air valves or other outlets are not available, taps shall be made at the high points to expel the air and these taps shall be tightly plugged afterwards. The pressure in the pipeline shall then be pumped up to the specified test pressure. When the test pressure in

the line has dropped to 10 PSI, at which time the pressure shall again be pumped up to the specified test pressure. This procedure shall be repeated until four (4) hours have elapsed from the time the specified test pressure was first applied. At the end of the four-hour period, the pressure shall be pumped up to the test pressure for the last time.

**C. Leakage Allowance**

1. The leakage shall be considered as the total amount of water pumped into the pipeline during the four (4) hour period including the amount required to reach the test pressure for the final time. Leakage shall not exceed the rate of 24 gallons per inch of diameter, per mile, per 24 hours.
2. The following table indicates the leakage allowance for various size pipes and is equal to the number of gallons per the four-hour test period per 1,000 feet of pipe being tested:

<b>Leakage Allowances</b>		
Gallons Per Four Hours per 1,000 Feet of Pipe		
Pipe Size (inches)	Test Pressure (PSI)	Allowable Leakage (gallons)
1	50	0.8
1-1/2	50	1.2
2	50	1.5
2-1/2	50	1.9
3	50	2.3
4	50	3.0
6	50	4.6
8	50	6.0
10	50	7.6
12	50	9.0
15	50	11.4
18	50	13.6
21	50	16.0
24	50	18.2
27	50	20.4

3. Any noticeable leak shall be stopped, and all defective pipes, fittings, valves, and other accessories discovered in consequence of the test shall be removed and replaced by the Contractor with sound material. The test shall then be repeated until the total leakage during a test of four hours duration does not exceed the rate specified above. All testing shall be inspected by the Owner's representative.

**End of Section**



**Section 13 1260**

**Lake Electrical**

**PART 1 GENERAL**

**1.1 WORK INCLUDED**

- A. This Specification and the associated Drawings cover the complete Lake electrical system and all related Work including but not limited to:
  - 1. A complete and operable system of service equipment, switchboards, panelboards, conduits, switches, time clocks, and lighting.
  - 2. Junction and/or pull boxes, conduits, disconnects, starters, contactors, wiring and connection of all motors and mechanical equipment, including connection and wiring of line voltage controls associated with the mechanical systems.
  - 3. Complete grounding system as required and shown on the Drawings.
  - 4. Testing and adjusting of the completed electrical system in the manner described herein.
  - 5. Cleaning of all completed Work and installation adjustment of all trim and decorative items.

**1.2 QUALITY ASSURANCE**

- A. Qualifications of Workers
  - 1. Provide at least one person who shall be always present during the execution of the Work of this Section and who shall be thoroughly familiar with the type of materials being installed and the best methods for the installation and who shall direct all Work performed under this Section.
  - 2. Use only experienced electricians completely familiar with the type of construction involved and the materials and techniques specified.
- B. Ordinances and Codes: Materials and construction shall conform with applicable sections of the:
  - 1. National Electrical Code; Department of Industrial Relations; regulations of the State Fire Marshal; and all applicable codes, ordinances, rules, and regulations which apply to the construction.
  - 2. In the event of conflict between the referenced codes, ordinances, Drawings and Specifications, the more stringent shall govern. Any changes required to the Drawings to conform with above mentioned "more stringent" requirement shall not be the cause for additional charges or claims by the Contractor.
- C. Verification of Conditions
  - 1. Before commencing Work the Contractor shall inspect the Project site and by submitting a bid for this work shall be deemed to have verified all existing conditions and accepted same as true and complete.
  - 2. The Work under this Section has been indicated on the Drawings in locations which should allow installation without interfering with the Work of other trades; however, the locations are diagrammatic only and the exact finish location of equipment and materials cannot be indicated. Therefore, locations of all Work and equipment shall be verified to avoid interferences, preserve head room and keep openings and passageways clear. Changes shall be made in locations of equipment and materials which may be necessary to accomplish these purposes.
- D. Preliminary Operations and Testing
  - 1. Motor driven equipment shall be tested for correct rotation and completion of all connections.

2. Wiring and connections shall be tested for continuity, shorts and improper grounds in accordance with the requirements of the National Electrical Code. Receptacle outlets shall be tested for proper grounding. Repairs resulting from the tests or preliminary operation of the equipment shall be made at the Contractor's expense and shall not be the cause for additional charges or claims by the Contractor.
3. Required tests, in addition to those mentioned above, include but are not limited to:
  - a. Ground resistance test.
  - b. Service and feeder conductors insulation resistance.
  - c. Motor controls and disconnecting devices.
  - d. Such other tests as may be required by the Construction Manager.

### **13 SUBMITTALS**

- A. Provide submittals in accordance with Section 13 1202

### **14 PRODUCT HANDLING**

- A. Protection: Use all means necessary to protect electrical materials before, during, and after installation and to protect the installed Work of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Owner and Landscape Architect and at no additional cost to the Owner.

## **PART 2 PRODUCTS**

### **21 MATERIALS, GENERAL**

- A. Materials shall be new, in unbroken packages and bear the U.L. label of approval.
- B. Equipment of one type shall be by same manufacturer. One type of equipment for classifications such as:
  1. Switchboards, panels, buss duct, disconnect switches, motor control centers and allied items.
  2. Conduit.
  3. Wire.
  4. Conduit fittings.
  5. Fixtures of the same general type.
  6. Wiring devices.

### **22 CONDUIT AND FITTINGS**

- A. Conduit within or under buildings or where exposed outdoors shall be rigid threaded, hot dipped, galvanized, or U.L. approved plastic except where noted otherwise on the Drawings. Metallic conduit shall be of the same metal between outlets or terminals.
- B. Use flexible metallic conduit only for short connections of motors and where specifically called for on Drawings. Maximum length shall be 40". Use only liquid tight flexible metal conduit. Install an unbroken code sized, green insulated copper grounding conductor in each liquid tight flexible conduit with permanent connection at motor junction box and service panel ground.
- C. Protect, before installation, metallic conduit runs in all slabs laid on grade or in contact with the earth or exposed in damp locations, with two (2) heavy coats of asphaltum rust-resisting compound.
- D. Encase conduits 1-1/2" or larger run underground, outside, or under buildings, in concrete envelopes a minimum of 3" thick, except as indicated otherwise on Drawings or stub outs.



Conduits 1-1/4" and smaller laid partially in the lower part of or under concrete shall have a minimum of 3" of concrete encasement all around.

- E. Low voltage runs underground outside buildings, 1-1/4" or smaller, may be G.I. or sherardized steel conduit, with machine applied wrapping equal to double wrap or Scotch-Wrap #50 tape, half lapped and quadrupled at joints in lieu of concrete encasement.
- F. Service conduits through foundations or concrete members shall run through metal sleeves with adequate clearances for full movement of the conduit. Do not run conduits through footings.
- G. Secure conduit runs exposed on surfaces with one-hole heavy-duty straps or fasten with matching fittings to inserts or trapezes, parallel to building walls and ceilings.
- H. Cap all conduit or duct stub-outs with standard factory caps; except cap threaded steel conduit with B.I. water pipe caps in outdoor locations.
- I. Use conduit fittings as manufactured by Crouse-Hinds Company, Appleton Electric Co..
- J. Employ U.L. liquid tight fittings for use with liquid tight flexible metal conduit.
- K. Use unions as manufactured by Appleton, O-Z/Gedney. The use of running threads will not be permitted.
- L. Exposed conduit in chemical rooms shall be rigid NEMA 3R Type suitable for installation in corrosive atmospheres.
- M. Provide code sized, insulated equipment ground conductor in all conduits with conductors.

## **23 WIRING CONNECTIONS**

- A. Make connections without strain on conductors, allowing the conductors to take a natural position after connections or taps are made. Include all strand of wire in making the connection.
- B. Make connections for wiring by one of the following means:
  - 1. Make all taps or connections to conductors with compression type connectors except those smaller than #8 B&S gauge may have soldered connections. Solderless connections for #10 AWG or smaller may be used and shall be "Scotchlok", Buchanan. For #8 AWG or larger, they shall be T&B "LockTite", Burndy "Versitaps".
  - 2. All cable or conductor terminal lugs shall be Burndy "Quicklug", Ilasco. Two piece stamped lugs and solder lugs will not be approved.
  - 3. Paint taped splices in damp or outdoor locations with two (2) coats of insulating paint.
  - 4. Tag all branch circuit wires with circuit number at the panel board and at each point of use with linen or plastic tags.

## **24 CONDUCTORS**

- A. Copper RHW or THW. Do not make splices between boxes.

## **25 COLOR CODING**

- A. Neutrals (identified conductors shall be white).
- B. Phase conductors shall be: Phase A – Black; Phase B - Red; and Phase C - Blue.
- C. Green shall be used for mechanical equipment and receptacle grounds only.

## **26 MOTOR WIRING**

- A. Make final connections to motors with the required AWG (Minimum #12), Flamenol machine tool wire, 19 strand. Control wiring for equipment shall be Flamenol machine tool wire, 19

strand of required AWG. Provide junction boxes at each item of equipment to change from standard building wiring to machine tool wire.

- B. Phase motors as proper in direction of rotation.

## **2.7 PANELBOARDS**

- A. Minimum interrupting rating of circuit breakers shall be 10,000 amps. Refer to Drawings for higher interrupt rating requirements. Series rated equipment will not be accepted.
- B. Panels shall be fully bussed.
- C. Busses shall be full length copper and shall be in the rear of the panel board cabinet. Circuit breakers shall be bolt-on to suitable supporting members at front of cabinet and connected with suitable lugs to the bussing in the rear of the cabinet. Individual circuit breakers shall be removable from the cabinet without disturbing the bussing in any way. Panel boards shall contain ground busses.
- D. Locks shall be provided on panel boards. Locks shall be keyed alike.
- E. Each panel shall have a two-column circuit index card set under glass or glass equivalent on inside of door. Each circuit shall be identified as to use or area.
- F. Tandem mounted or wafer type circuit breakers are not acceptable.
- G. Multi-pole breakers shall have one common trip handle or be internally connected. Handle ties are not acceptable.
- H. Breaker arrangements shown on the Drawings shall be maintained.
- I. Acceptable manufacturers are General Electric, Square D.

## **2.8 EXTERNALLY OPERATED SWITCHES**

- A. Disconnect switches shall meet Fed. Spec. W-S865 for type "A" switches and have full cover door interlock. The switch enclosure shall carry the NEMA rating for intended use as shown on the Drawings. The H.P. rating of the switch shall be suitable for its intended use. Switches shall be as manufactured by Square-D, Cutler Hammer.

## **2.9 TIME CLOCKS**

- A. Contacts shall have a minimum rating of 40 amperes at 277V.
- B. Timing motor shall be heavy duty synchronous, self starting, high torque type, and shall be rated at 120, 208, 240, 277-volt 60 Hz.
- C. Motor shall operate normally at temperature range of -60 degrees Fahrenheit to +120 degrees Fahrenheit.
- D. Dial shall be 3" diameter, clearly calibrated with day/night zones and 24-hour rotation, with gear to provide one revolution yearly which automatically varies the on/off settings each day according to seasonal changes. Day and month of the year shall show clearly through calendar window on the dial.
- E. Clock shall be equipped with 7-spoke omitting wheel marked with days of the week.
- F. Clock shall be housed in a flush enclosure where supply circuits emanate from a flush mounted panel board and surface enclosure when supply circuits are from a surface mounted panel.
- G. Acceptable manufacturers are Tork, Paragon.

## **2.10 GROUND FAULT CIRCUIT INTERRUPTERS**

- A. Minimum rating shall be 20 amperes, 125V, 5 milliampere trip setting, Class A per UL943.
- B. Manufacturer to be Crouse-Hinds, Leviton.

## **2.11 BOXES**

- A. Boxes shall be of the size required by ordinances or larger, and of pressed galvanized code gauge steel where concealed or exposed on ceilings. Exposed boxes on walls below 7'6" shall be cast steel similar to "FA" condulets.
- B. Outlets to be surface where wiring is exposed and flush in areas where conduit is concealed.
- C. Provide surface outlets with proper galvanized steel surface cover. Box and cover shall be deep enough to provide at least 1/4" clearance between back of device and back of box. Where box contains more than one device, use proper gang box with proper cover. Surface outlet boxes shall be of the threaded hub type wherever below 8'0".
- D. Provide exposed junction boxes with proper flat blank galvanized cover. If necessary for cable installation, additional pull boxes or junction boxes may be installed in 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 screws. Boxes exposed to the weather shall be approved for the purpose, and conduit entrances shall be on the bottom made by means of an interchangeable hub with gasket and adapter nut. Pull boxes not shown on Drawings may be added only after approval of size and location is obtained.
- F. For outlets exposed to weather or where noted, cast outlet boxes shall be Crouse-Hinds, Appleton. Boxes shall have proper number and size hubs. Device plates, covers, adapters and boxes shall be as manufactured by Crouse-Hinds, Appleton.
- G. Exposed junction boxes, outlet boxes and pull boxes for chemical rooms shall be NEMA 3R type suitable for corrosive atmosphere, non-metallic.

## **2.12 IDENTIFICATION MARKINGS**

- A. Plainly mark all motor and electrical appliance control equipment indicating the equipment controlled with engraved metal tags.
- B. Provide laminated plastic nameplates on panel boards on the outside of the door at the top indicating panel designation and feeder source.
- C. Provide laminated plastic nameplates on distribution switchboards and motor control centers at the top center indicating panel designation and feeder source.
- D. Identify each distribution switchboard and motor control center circuit breaker with a laminated plastic nameplate indicating its' use.
- E. Type panel board directories on the forms provided with the equipment, indicating the use of each branch circuit breaker.
- F. Fasten all laminated plastic nameplates to surfaces with two (2) or more screws.

## **PART 3 EXECUTION**

### **3.1 INSPECTION**

- A. Be responsible for providing all necessary wiring for the new electrical systems. Wherever wiring is being disrupted due to remodeling or changes, reconnect existing and provide new wiring circuits to accomplish a fully operable system at no additional cost to the Owner.

### **3.2 COORDINATION**

- A. The Drawings are essentially diagrammatic and indicate the desired location, size, routes, connection points, etc., and are to be followed as closely as possible. Proper judgment must be exercised in executing the Work so as to provide the best possible installation in the available space and to overcome difficulties, limitations or interference wherever encountered. Be

responsible for the correct placement of this Work, the proper location and connection in relation to Work of other trades, for determining the exact location of all conduits, outlets and equipment, and for installing the conduits in such a manner as to conform to the structure, avoid obstruction, preserve headroom and keep openings and passageways clear. Particular attention is directed to the close coordination required on exposed Work. Locations shown on Architectural or Mechanical Drawings if different than those shown on Electrical Drawings should be communicated to the Landscape Architect and Owner in writing for clarification.

### **33 INSTALLATION**

#### **A. Conduit Installation**

1. Conduit and metallic raceway systems shall be mechanically and electrically continuous from sources of current to all outlets in a manner to provide a continuous grounding path. Close ends of conduit during construction to prevent entrance of dirt or moisture.
2. Securely fasten conduit to the building construction within three feet of each outlet and within every ten feet thereafter. Secure it to boxes, cabinets, pull boxes, terminals with two locknuts and ends equipped with bushings or a terminal fitting. Cut square with ends carefully reamed.
3. Make bends or elbows so that the conduit will not be injured or flattened.
4. Use insulated metallic bushings in all places where bushings are required.
5. Run exposed conduits level or plumb and parallel to the construction members of the building. No cutting across or diagonal runs will be permitted. Neatly surmount structural obstructions encountered on conduit runs by the use of fittings or pull boxes.
6. Identify feeder conduits by stamped metal tags secured to exposed section of conduit in main or sub-panels.
7. Make up all threaded conduit joints gas and water-tight with conductive sealer except conduit above ground in dry indoor locations.
8. Rigidly support all boxes independently of the conduit system.

#### **B. Connections to Equipment**

1. Fully connect, in an approved manner, all electrical outlets, apparatus, motors, equipment, fixtures, wiring devices and appliances whether they are installed under the Electrical Contract or not, which require electrical connections, to the corresponding electrical system outlet.
2. Where the Work of this Section requires connections to be made to equipment that is furnished and set-in-place under other Sections, obtain such roughing-in dimensions from the manufacturer or supplier of each item as required and assume full responsibility for the installation of the connections thereto.

### **34 ADJUSTMENT AND CLEAN-UP**

- A. Preliminary Operation: Should the Landscape Architect deem it necessary to operate the electrical installation or any part thereof prior to Substantial Completion of the Work, consent to such preliminary operation and supervise conduction of same. Sub-Contractor to pay all costs occasioned by such operation. Preliminary operation shall not be construed as an acceptance of any Work installed under this Contract.
- B. Clean-up: Upon completion of the Work of this Section, immediately remove all electrical materials, debris and rubbish occasioned by this Work to the approval of the Landscape Architect and Owner.

**End of Section**

**SECTION 26 0500**

**COMMON WORK RESULTS FOR ELECTRICAL**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of this Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section Includes:
  - 1. Materials and equipment shall be furnished and installed in support of electrical work described in these plans and specifications including but not limited to, raceways, boxes, enclosures, branch circuiting, supports, lighting fixtures, in order to complete and make fully functional the systems described.
  - 2. Lighting systems, as shown on the plans and as specified herein, including lamps, drivers, supports, fasteners, straps, and miscellaneous mounting hardware and support structures for such equipment.
  - 3. Power and Lighting Distribution: Furnish and install power and lighting distribution systems including but not limited to branch circuits, fixtures, etc. for a complete working system.
  - 4. Lighting acceptance testing, documentation and completion of required forms as specified in Section 26 5670, LIGHTING ACCEPTANCE TESTING.
- B. Related Sections Under Other Divisions:
  - 1. Painting of electrical equipment where exposed and required by the Landscape Architect to be painted as described elsewhere in the specification.

**1.3 SYSTEM DESCRIPTION**

- A. The electrical plans indicate the general layout and arrangement; the architectural drawings and field conditions shall determine exact locations. Field verify all conditions and modify as required to satisfy design requirements as well as code minimums. Maintain all required working clearances as described in CEC Article 110 as well as other applicable articles.
- B. Discrepancies shall be brought immediately to the attention of the Landscape Architect for clarification. The Landscape Architect shall approve any changes.

**1.4 SUBMITTALS AND SHOP DRAWINGS**

- A. Before construction, submit in (accordance with the General Conditions of this Specification) a complete list of all materials proposed to be furnished and installed under this section. Any

material procured without review and approval of the engineer and/or owner's representative, will solely be at the contractor's risk.

- B. Manufacturers' specifications, catalog cuts and shop drawings as required to demonstrate compliance with the specifications. Identify specific intended use for each component where submittal may be ambiguous. Submit entire bound submittal at one time; partial submittals will not be accepted. At a minimum, submittals will be required for the following:
  - 1. Conduits, fittings, straps, supports, etc.
  - 2. Electrical equipment including raceways, straps, fittings, conductors, boxes, gutters, etc.
  - 3. Lighting equipment including fixtures, drivers, lamps, mounting accessories, color charts (where required), etc.
  - 4. Conduit including all fittings, etc.
  - 5. Wiring and cable, terminations, etc.
- C. The intent of these specifications is to establish a standard of quality for materials and equipment. Therefore, some items are identified by manufacturer or trade name designation. Substitutions shall be subject to the Landscape Architect's approval. Samples of the proposed and substitute materials may be required for inspection prior to approval. Costs, if any, for evaluation of substitutions shall be the Contractor's responsibility. The decision of the Landscape Architect shall be final. Where the substitution will affect other trades, coordinate all changes with those trades concerned and pay any additional costs incurred by them as a result of this substitution. Approval of substitutions shall not relieve the Contractor from providing an operational system in accordance with all applicable codes and ordinances.

## **1.5 DELIVERY, STORAGE AND HANDLING**

- A. Storage of equipment for the job is the responsibility of the Electrical Contractor and shall be scheduled for delivery to the site, as the equipment is required. Damage to the equipment delivered to the site or in transport to the job shall be the responsibility of the Electrical Contractor.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Materials shall be new and bear the label of or be listed by a nationally recognized testing laboratory. The quality and suitability of all materials shall conform to the standards and practices of this trade.
- B. Supplied materials shall be of a current manufactured product line. Discontinued products are not acceptable. Where products are identified on the contract documents by part number, supply the current product model or series which meets the specification and intended use of the specified component.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Professionalism and appearance of installations shall be in accordance with accepted practices of this trade. Installation methods shall conform to manufacturers' specifications and recommendations. The Contractor shall man the job with qualified journeymen and helpers in this trade for the duration of the job. It is the Contractor's responsibility to communicate with and keep the job superintendent apprised of changes or clarifications, etc.
- B. Employment of any person on any job in the capacity of an electrician is not permitted unless such person has qualified for and holds a valid Journeyman Electrician Pocket Card or General Journeyman Electrician Certificate issued by the State of California Division of Apprenticeship Standards except, Contractor may employ electrical helpers or apprentices on any job of electrical construction, new or existing, when the work of such helpers or apprentices is performed under the direct and constant personal supervision of a journeyman electrician holding a valid Pocket Card accepted by the State of California Division of Apprenticeship Standards.
  - 1. Each Pocket Card carrying journeyman electrician will be permitted to be responsible for the quality of workmanship for a maximum of one helper or apprentice during any same time period, provided the nature of work is such that good supervision can be maintained and the quality of workmanship is the best, as expected by Owner and implied by the latest edition of the National Electrical Code.
  - 2. Before each journeyman electrician commences work, deliver to Owner at the project site, a photocopy of the journeyman's valid Pocket Card.
- C. Materials shall be installed in accordance with the manufacturers' specification and recommendations. They must conform to the approval AHJ adopted codes and standards, but not less than the 2019 CEC and all applicable codes and standards, including but not necessarily limited to California Code of Regulations Title 24, NFPA, National Electrical Manufacturers Association, ANSI, CBC, and any other adopted ordinances of applicable agencies having jurisdiction. Refer to general conditions of specifications.
- D. Electrical Contractor shall lay work out in advance in order to avoid unnecessary cutting, chasing, and drilling of floors, walls, ceilings and other surfaces. Work of this nature shall be carefully done so as not to damage work already performed by other trades. Any damage which results must be properly repaired at no extra cost to the Owner. Such alterations shall not depreciate the integrity of the structure. Approval for cuts or penetrations in structural members shall be by the Architect.
- E. Supporting Devices:
  - 1. Verify mounting height of all luminaires or items prior to installation when heights are not detailed.
  - 2. Install vertical support members for equipment and luminaires, straight and parallel to building walls. Provide independent supports to structural member for electrical luminaires, materials, or equipment installed in or on ceilings.
  - 3. Do not use other trade's fastening devices as supporting means for electrical equipment, materials or luminaires. Do not use supports or fastening devices to support other than one particular item.

4. Support conduits within 18" of outlets, boxes, panels, etc. Maximum distance between supports not to exceed 36" spacing.
- F. Coordinate work with other trades as required to eliminate any delays during construction. Coordinate changes with other prime contractors to avoid construction conflicts.
- G. Engineer's Field Observation: Site visits during construction for field observations and reports will be conducted by electrical engineer when directed by the Architect. A list of items that need to be addressed will be submitted to the Architect for forwarding to the Contractor. A written response to all items shall be submitted for Owner's review once complete. When Electrical Engineering representative performs a field observation, the Electrical Contractor shall be present and available to remove equipment covers as needed.
- H. Drawings of Record: Provide a full and accurate set of field record drawings marked up in a neat and understandable manner submitted to the Owner Representative, Construction Manager, or Architect upon completion of the work and prior to issuance of a certificate of completion. The drawings shall dimension all electrical facilities including but not limited to underground conduit, vaults, boxes as well as conduit routing scaled to within 12" of actual field conditions and shall be kept up to date on a daily basis reflecting changes or deviations. Electrical facilities shall be accurately drawn on the plan to scale. Refer to the general conditions of these specifications for additional requirements. Record drawings shall be required to identify both horizontal and vertical dimensions to visible and fixed points such as concrete, asphalt, buildings, sidewalks, etc.
- I. Safety: The Electrical Contractor is responsible to maintain equipment in a safe and responsible manner. Keep dead front equipment in place while equipment is energized. Conduct construction operations in a safe manner for employees as well as other work persons or anyone visiting the job site. Provide barriers, trench plates, flags, tape, etc. The Contractor shall hold all parties harmless of negligent safety practices that may cause injury to others on or near the job site.
- J. Guarantees: Equipment and labor shall be guaranteed and warranted free of defects, unless otherwise stated to be more restrictive, for a period of one year from the date of final acceptance by the Owner. A written warranty shall be presented to the Architect at the time of completion prior to final acceptance. Equipment deemed to be damaged, broken or failed should be repaired or replaced at no additional cost to the Owner. Materials or system requiring longer than a one-year warranty as described herein shall be separately warranted in separate letters of guarantee stating the duration of warranty.
- K. Operating and Installation Manuals: Provide two copies each of manuals, operating and installation instructions for equipment indicated in submittal packages. Instruct the Owner's representative as to the operation and location of equipment necessary to allow them to operate the facility upon final acceptance. This instruction period shall be prearranged with the Owner's representative prior to occupancy of the facility and the weeks prior to training scheduled.
- L. Lighting Acceptance Testing: Provide two copies of lighting acceptance testing results and equipment operating manuals as specified in Section 26 5670, LIGHTING ACCEPTANCE TESTING. Instruct the Owner on operation of control systems.



END OF SECTION



**SECTION 26 0501**

**SELECTIVE ELECTRICAL DEMOLITION**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of this Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section Includes:
  - 1. Electrical demolition.

**PART 2 - PRODUCTS**

**2.1 MATERIALS AND EQUIPMENT**

- A. Materials and equipment for patching and extending work shall be as specified in individual sections.

**PART 3 - EXECUTION**

**3.1 EXAMINATION**

- A. Contractor to walk job to observe existing conditions and account for variance as needed.
- B. Verify field measurements, conduit routing and complete information as shown on drawings.
- C. Drawings are based on limited field observation and existing record documents. Report discrepancies to Owner/ Landscape Architect before disturbing existing installation.

**3.2 PREPARATION**

- A. Disconnect electrical systems scheduled for removal.
- B. When work must be performed on energized equipment or circuits, observe provisions of NFPA 70E and CALOSHA, use personnel experienced in such operations.

- C. Existing Electrical Service: Disable system only to perform new work. Obtain permission from Owner at least 48 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area as required.

### **3.3 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK**

- A. Demolish and extend existing electrical work under provisions of this section.
- B. Remove, relocate, and extend existing installations to accommodate new work.
- C. Allow the owner first right to retain ownership of all salvaged materials, otherwise the Electrical Contractor is responsible for its removal from the site and proper disposal or recycling.
- D. Remove abandoned wiring to source of supply.
- E. Remove exposed abandoned where indicated.
- F. Disconnect and remove abandoned luminaires. Remove supports and all fixture accessories.
- G. Discarded electrical components and lamps containing hazardous waste (i.e., mercury in fluorescent lamps) shall be disposed of as required by the State Laws and Local Ordinances regarding hazardous materials.
- H. Repair adjacent construction and finishes damaged during demolition and extension work.
- I. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

### **3.4 CLEANING AND REPAIR**

- A. Clean and repair existing materials and equipment which remain or are to be reused.

### **3.5 INSTALLATION**

- A. Install relocated materials and equipment as shown and/or as required.

**END OF SECTION**

## **SECTION 26 0519**

### **LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES**

#### **PART 1 - GENERAL**

##### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of this Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

##### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Wires and cables.
  - 2. Connectors.
  - 3. Lugs and pads.

##### **1.3 SYSTEM DESCRIPTION**

- A. Provide wires, cables, connectors, lugs, strain reliefs, racking insulators for a complete and operational electrical system.

##### **1.4 SUBMITTALS**

- A. Submit in accordance with Section 26 0500, COMMON WORK RESULTS FOR ELECTRICAL.
- B. Provide product data for the following equipment:
  - 1. Wires.
  - 2. Cables.
  - 3. Connectors.
- C. Provide the insulation cable testing report in the project closeout documentation, refer to Closeout Requirements in the General Conditions portion of this specification.

##### **1.5 REGULATORY REQUIREMENTS**

- A. Conform to requirements of the CEC, latest adopted version with amendments by local Authority Having Jurisdiction (AHJ).

- B. Furnish products listed by UL or other testing firm acceptable to AHJ.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Wires and Cables: General Cable, Okonite, Southwire, or approved equal.
- B. Connectors: Burndy, IlSCO, Thomas & Betts, or approved equal.
- C. Wire connectors shall be minimum 75 degree centigrade rated and properly sized for the number of conductors being connected, terminated, spliced etc. All above grade connectors shall be solderless lug or plastic wire nut type, screw on, pressure cable type (wire nut or spring nut type), 600 volt, 105 degree C, with skirt to cover all portions of stripped wires. Connector shall be U.L. rated for number and size of conductors being joined together as a splice.
- D. Splices:
  - 1. Branch Circuit Splices: Ideal, Scotch-Lock, 3M, or approved.

### **2.2 WIRES AND CABLES FOR LINE VOLTAGE SYSTEM AND CONTROLS. WIRE AND CABLE SHALL BE:**

- A. Copper, 600 volt rated throughout. Conductors 12AWG to 10AWG. Conductors 8AWG and larger, stranded.
- B. Phase color to be consistent at all feeder terminations; A-B-C, top to bottom, left to right, front to back.

C. Color Code Conductors as Follows:

<b>PHASE</b>	<b>208 VOLT</b>	<b>240 VOLT DELTA</b>
A	Black	Black
B.	Red	Orange (High Leg)
C.	Blue	Blue
Neutral	White	White
Ground	Green	Green

- D. All conductors shall be copper unless otherwise noted. Minimum size for individual conductors shall be #12 AWG unless otherwise noted. Sizes #8 AWG and larger shall be stranded conductor. Individual conductors shall be insulated with type, XHHW, THW, THHN/THWN 600-volt insulation unless otherwise noted. Insulation type shall be used for the proper environmental application (i.e., waterproof, wet location, temperature rated). If a condition exists where the application is uncertain, contact the Engineer for direction. Contractor is responsible to follow specific cabling requirements as shown on plans. If a discrepancy occurs, communicate such discrepancy to the Architect and Engineer immediately for resolution.
- E. Insulation types THWN, THHN or XHHW. Minimum insulation rating of 90C for branch circuits.

### **2.3 CONNECTORS**

- A. Copper Pads: Drilled and tapped for multiple conductor terminals.
- B. Lugs: Indent/compression type for use with stranded branch circuit or control conductors.
- C. Solid Conductor Branch Circuits: Spring connectors, wire nuts, for conductors 12 through 8AWG.

### **2.4 LUGS AND PADS**

- A. Ampacity: Cross-sectional area of pad for multiple conductor terminations to match ampere rating of panelboard bus or equipment line terminals.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Installation: Conductors shall not be installed until after conduit systems are permanently in place. Use an approved non hardening type wire pulling lubricant if lubricant is to be used. Maintain all conduits and wire pulls free from foreign material. If due to field conditions, more than a total of 360 degrees of bend are required; a pull box shall be furnished and installed for ease of installation. Said pull boxes must be sized and rated for the appropriate application and must remain easily accessible upon completion of the project (approval of the location shall be obtained from the Architect prior to installation). Conductors installed in underground raceways on site shall be duct sealed and taped where they exit the raceway to prevent the entrance of foreign material and moisture after the conductors are installed. Proper drainage shall be provided for underground pull and splice boxes.
- B. Insulation: Use proper insulation types where temperature and environment are a factor.
- C. All conductors, wiring, cable where installed below floor, slab or underground shall be considered wet locations, and shall be rated accordingly. Non waterproof cabling is not allowed in any below grade or wet application.
- D. Cables routed together in cable tray shall be stacked, organized and tie wrapped together in a neat and workman like manner. Random cable routing is not acceptable.
- E. Wires and Cables:
  - 1. Conductor Installation:
    - a. Install conductors in raceways having adequate, code size cross-sectional area for wires indicated.
    - b. Install conductors with care to avoid damage to insulation.
    - c. Do not apply greater tension on conductors than recommended by manufacturer during installation.
    - d. Use of pulling compounds is permitted. Clean residue from exposed conductors and raceway entrances after conductor installation.
  - 2. Conductor Size and Quantity:
    - a. Install no conductors smaller than 12AWG unless otherwise shown.
    - b. Provide all required conductors for a fully operable system.
  - 3. Provide dedicated neutrals (one neutral conductor for each phase conductor).
  - 4. Conductors in Cabinets:
    - a. Cable and train all wires in panels and cabinets for power and control neatly and uniformly. Use plastic ties in panels and cabinets.
    - b. Tie and bundle feeder conductors in wireways of panelboards.
    - c. Hold conductors away from sharp metal edges.
    - d. Connectors: Retighten mechanical type lugs and connectors for conductors to equipment prior to Notice of Completion.



**END OF SECTION**



## **SECTION 26 0526**

### **GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS**

#### **PART 1 - GENERAL**

##### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of this Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

##### **1.2 SUMMARY**

- A. This Section Includes:
  - 1. Grounding and bonding requirements of electrical installations for personnel safety and to provide a low impedance path for possible ground fault currents as described in CEC Article 250.
  - 2. “Grounding electrode system” refers to all electrodes required by CEC, as well as including made, supplementary, lightning protection system and telecommunications system grounding electrodes.
  - 3. The terms “connect” and “bond” are used interchangeably in this specification and have the same meaning.
- B. Related Work:
  - 1. Section 26 0500, COMMON WORK RESULTS FOR ELECTRICAL.
  - 2. Section 26 0519, LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES.

##### **1.3 SUBMITTALS**

- A. Submit in accordance with Section 26 0500, COMMON WORK RESULTS FOR ELECTRICAL.

#### **PART 2 - PRODUCTS**

##### **2.1 GROUNDING AND BONDING CONDUCTORS**

- A. Equipment grounding conductors shall be UL 83 insulated stranded copper, except that sizes No. 10 AWG and smaller shall be solid copper. Insulation color shall be continuous green for all equipment grounding conductors, except that wire sizes No. 4 AWG and larger shall be permitted to be identified per CEC.
- B. Bonding conductors shall be ASTM B8 bare stranded copper, except that sizes No. 10 AWG and smaller shall be ASTM B1 solid bare copper wire.

- C. Conductor sizes shall not be less than what is shown on the drawings and not less than required by the CEC, whichever is greater.

## **2.2 SPLICES AND TERMINATION COMPONENTS**

- A. Components shall meet or exceed UL 467 and be clearly marked with the manufacturer, catalog number, and permitted conductor size(s).

## **PART 3 - EXECUTION**

### **3.1 GENERAL**

- A. Ground in accordance with the CEC, as shown on drawings, and as hereinafter specified.

### **3.2 INACCESSIBLE GROUNDING CONNECTIONS**

- A. Make grounding connections which are buried or otherwise normally inaccessible (except connections for which periodic testing access is required) by exothermic weld.

### **3.3 SECONDARY EQUIPMENT AND CIRCUITS**

- A. Conduit Systems:
  - 1. Ground all metallic conduit systems. All metallic conduit systems shall contain an equipment grounding conductor sized per CEC.
  - 2. Non metallic conduit systems shall contain an equipment grounding conductor.
- B. Branch Circuits: Install equipment grounding conductors with branch circuits.
- C. Boxes, Cabinets, Enclosures, and Panelboards:
  - 1. Bond the equipment grounding conductor to each pullbox, junction box, outlet box, device box, cabinets, and other enclosures through which the conductor passes.
  - 2. Provide lugs in each box and enclosure for equipment grounding conductor termination.
- D. Ground lighting fixtures to the equipment grounding conductor of the wiring system when the green ground is provided; otherwise, ground the fixtures through the conduit systems. Fixtures connected with flexible conduit shall have a green ground wire included with the power wires from the fixture through the flexible conduit to the first outlet box.

### **3.4 CONDUCTIVE PIPING**

- A. Bond all conductive piping systems, to the building to the grounding electrode system. Bonding connections shall be made as close as practical to the equipment ground bus.

**END OF SECTION**

**SECTION 26 0533**

**RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of this Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section Includes:
  - 1. Conduit and fittings.
  - 2. Outlet boxes.
  - 3. Junction and pull boxes.
- B. Related Work:
  - 1. Installation of all wire, cable, conductor, boxes, raceways, conduits, as described on the plans and/or as specified here-in.
  - 2. Listed products for termination, coupling, extending, benching supports of raceways shall be used.
  - 3. Raceways/boxes described by this section shall include, but not be limited to lighting.
  - 4. Protection of and cleanliness of pathways and raceways must be assured during the construction process in order to eliminate the possibility of debris entering the conduit, duct, pathway resulting in decreased wire capacity and potential damage to installed conductors and cables.
  - 5. Pathways are shown in a diagrammatic way and are generally accurate as to routing, however, it is the Contractor's responsibility as a means and methods process to coordinate with all other trades that require space.
  - 6. Minimum conduit size shall be 1/2" except if plan shows or code requires larger size.  
Exception:
  - 7. Exterior installations: After conductors are installed, seal conduit ends to prevent entrance of foreign material using pliable duct seal, caps or waterproof expanding foam.
  - 8. No single conduit run of any type shall exceed 360 degrees of radius bend from termination box to termination box.
  - 9. Code Compliance: Comply with CEC as applicable to construction and installation of electrical boxes and fittings and size boxes according to CEC 312, 314 and 366.

**1.3 SUBMITTALS**

- A. Provide Shop Drawings and Product Data for the Following Equipment:
  - 1. Conduit and fittings.
  - 2. Junction and pull boxes.

## **1.4 REGULATORY REQUIREMENTS**

- A. Conform to requirements of the CEC, latest adopted version with amendments by local AHJs.
- B. Furnish products listed by UL or other independent and nationally recognized testing firm.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Galvanized Rigid Steel (GRS) conduit shall be hot dipped galvanized, zinc coated and shall comply with Underwriters Laboratories UL-6, ANSI Specification C-80.1 and Federal Specification WW-C-581E.
- B. Manufacturers:
  - 1. Conduit Fittings: O-Z Gedney, Thomas & Betts, or equal.
  - 2. Galvanized Rigid Steel (GRS) conduit shall be hot dipped galvanized, zinc coated and shall comply with Underwriters Laboratories UL-6, ANSI Specification C-80.1 and Federal Specification WW-C-581E.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Conduit systems listed below are for use in installations where they are permitted to be used by CEC and/or other occupancy restrictions. The below installation methods do not intend to suggest that these materials be installed in conflict with any applicable code. Special attention to applications shall be made in building types such as Educational, Health Care, wet location, hazardous locations, assembly occupancy and multi-story, but not limited to these. Requirements which are more restrictive than the CEC may be called for by the drawings and / or these specifications. These requirements must be adhered to. The Electrical Contractor shall be responsible to use the proper conduit system for the application. Exposed conduit shall be run square and plumb with building lines in an approved manner. Spacing of support shall be a minimum as provided for in the CEC. All exposed conduit shall be strapped at a maximum of 36' spacing.
- B. Galvanized Rigid Steel (GRS) conduit shall be used for this project. Conduits shall be cut square and reamed to remove burrs and sharp edges. Strap conduit at 36" maximum spacing. Unless otherwise noted, threadless setscrew and threadless weathertight fittings may be used in lieu of threaded fittings. All threaded ends entering a junction box of any type shall require one locknut on the inside and one on the outside of the enclosure and be provided with a plastic bushing or grounding bushing where necessary for proper grounding. Where exposed to moisture, a watertight hub or other approved method shall be required. All conduits shall be properly supported and strapped. All GRS conduit shall be painted per Landscape Architects direction.

- C. Conduit Supports: Conduit runs may be supported by two-hole pipe straps.
- D. Bends and offsets shall be made with approved tools for the type of conduit being utilized. Bends shall be made without kinking or destroying the smooth bore of the conduit. Parallel conduits shall be run straight and true with bends uniform and symmetrical. Minimum radii shall be per CEC 344-24.
- E. Anchoring: Secure boxes rigidly to the tube steel upon which they are being mounted.

**END OF SECTION**





**SECTION 26 5600**  
**EXTERIOR LIGHTING**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This section specifies the furnishing, installation, and connection of exterior luminaires, controls, poles and supports.

**1.2 RELATED WORK**

- A. Section 26 0500, COMMON WORK RESULTS FOR ELECTRICAL.
- B. Section 26 0533, RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS: Conduits, fittings, and boxes for raceway systems.
- C. Section 26 0519, LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES (600 VOLTS AND BELOW): Low voltage power and lighting wiring.
- D. Section 26 0526, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS: Requirements for personnel safety and to provide a low impedance path for possible ground fault currents.
- E. Section 26 5670, LIGHTING ACCEPTANCE TESTING.

**1.3 SUBMITTALS**

- A. Submit in accordance with Section 26 0500, COMMON WORK RESULTS FOR ELECTRICAL.
- B. Shop Drawings:
  - 1. Sufficient information, clearly presented, shall be included to determine compliance with drawings and specifications.
  - 2. Include electrical ratings, dimensions, mounting, details, materials, required clearances, terminations, wiring and connection diagrams, photometric data, ballasts, poles, luminaires, effective projected area (EPA), lamps and controls.

**1.4 APPLICABLE PUBLICATIONS**

- A. Publications listed below (including amendments, addenda, revisions, supplements) form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.

- B. American Society for Testing and Materials (ASTM).
- C. American Concrete Institute (ACI).
- D. American National Standards Institute (ANSI).
- E. Aluminum Association Inc. (AA).
- F. Illuminating Engineering Society of North America (IESNA).
- G. National Electrical Manufacturers Association (NEMA).
- H. National Fire Protection Association (NFPA).
- I. Underwriters Laboratories, Inc. (UL).

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS AND EQUIPMENT**

- A. Materials and equipment shall be in accordance with CEC, UL, ANSI, as shown on the drawings and as specified.

### **2.2 LUMINAIRES**

- A. UL 1598 and ANSI C136.17. Luminaires shall be weatherproof, heavy duty, outdoor types designed for efficient light utilization, adequate dissipation of lamp and ballast heat and safe cleaning and relamping.
- B. Light emitting diode (LED)-based solid state lighting (SSL) products shall be factory tested in accordance to the International Engineering Society (IES) LM-79 recommendations and meet ANSI C78.377-2008 standards.
- C. LED light sources shall be factory tested in accordance to IES LM-80 recommendations.
- D. LED-based SSL product shall incorporate an external heat sink, integral to the luminaire.
- E. IESNA HB-9 and RP-8 light distribution pattern types shall be as indicated on the drawings.
- F. Incorporate associated ballasts and drivers within the luminaire housing.
- G. Lenses shall be frame-mounted heat-resistant, borosilicate glass, prismatic refractors. Attach the frame to the luminaire housing by hinges or chain.
- H. Pre-wire internal components to terminal strips at the factory.
- I. Bracket mounted luminaires shall have leveling provisions and clamp type adjustable slip-fitters with locking screws.

- J. Materials shall be rustproof. Latches and fittings shall be non-ferrous metal.
- K. LED-based SSL luminaires shall be manufactured specifically for LED lamps with drivers integral to the luminaire housing.

### **2.3 LAMPS**

- A. Luminaires shall be listed for the lamp specified on the associated electrical plans. Install the proper lamps in every luminaire installed.

### **2.4 LED-BASED SOLID STATE DRIVERS**

- A. Shall be listed by either U.L. or equal listing agency and comply with IEEE C.62.41-1991, Class A operation.
- B. Provide a minimum power factor of 0.9.
- C. Minimum operating temperature appropriate for outdoor environments.
- D. Shall operate at a frequency greater than or equal to 120Hz.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Install lighting in accordance with the CEC, as shown on the drawings, and in accordance with manufacturer's recommendations.
- B. Ground noncurrent-carrying parts of equipment including luminaries, mounting arms, brackets, and metallic enclosures as specified in Section 26 0526, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS. Where copper grounding conductor is connected to a metal other than copper, provide specially treated or alloyed connectors suitable and listed for this purpose.

**END OF SECTION**



**SECTION 26 5670**

**LIGHTING ACCEPTANCE TESTING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of this Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section Includes:
  - 1. The Contractor shall be responsible for the Certificate of Acceptance, but coordinate with the Certified California Lighting Controls Test Technician to assure that all required documents have been filed with and approved by the enforcement agency prior to receiving a final occupancy permit. The Certificate of Acceptance will indicate that the Contractor has demonstrated acceptance requirements of the plans and specifications, that current requirements for installation certificates are met, and that currently required operating and maintenance information (as well as the Certificate of Acceptance) were provided to the building Owner.
  - 2. Testing, evaluation and calibration of lighting controls equipment provided, installed and connected in Division 26.
  - 3. Documentation of test results, completion of "Certificate of Acceptance" and "Certificate of Installation" forms and filing with the enforcement agency for approval.
  - 4. Specific Jobsite Conditions:
    - a. Acceptance testing must be tailored for each specific design, job site, and climactic conditions. While the steps for conducting each test remain consistent, the application of the tests to a particular site may vary. The Contractor shall review the construction documents and include all required time, material, testing equipment, etc. as required to complete the requirements of this section.
- B. Related Work:
  - 1. Section 26 0500, COMMON WORK RESULTS FOR ELECTRICAL.
  - 2. Section 26 5600, EXTERIOR LIGHTING.

**1.3 REFERENCES**

- A. Acceptance Testing Criteria: 2019 Building Energy Efficiency Standards Non-Residential Compliance Manual.

**1.4 SYSTEM DESCRIPTION**

- A. Performance Requirements:

1. All material, equipment, labor and technical supervision to perform tests, calibrations and documentation specified herein.
- B. Scope of Testing, Evaluation and Calibration (as applicable):
  1. Existing Automatic time clock.
  2. Existing Photo electric sensor.

## **1.5 SUBMITTALS**

- A. Submit in accordance with Section 26 0500, COMMON WORK RESULTS FOR ELECTRICAL.
- B. Test Reports:
  1. Written record of all tests and completion of forms included in this section.
  2. At completion of project, assemble a final test report. Submit report to the enforcement agency and the Owner prior to final occupancy to include:
    - a. Summary of project.
    - b. Description of systems and equipment tested.
    - c. Visual inspection report.
    - d. Description of tests.
    - e. Test results.
    - f. Conclusions and recommendations.
  3. Report shall be bound in booklet form, include on the Contractor's letterhead the title of the report and the systems tested.

## **PART 2 - PRODUCTS**

### **2.1 FORMS**

- A. Lighting Installation forms and verification procedures for lighting systems that require acceptance testing can be downloaded from the following website:  
[www.energy.ca.gov/2015publications/CEC-400-2015-033/appendices/forms/NRCI](http://www.energy.ca.gov/2015publications/CEC-400-2015-033/appendices/forms/NRCI)
- B. Lighting Acceptance forms are to be provided by a Certified California Lighting Controls Acceptance Test Technician. The California Energy Commission adopted changes to the California building Efficiency Standards (Title 24, Parts 1 and 6) that require lighting controls and devices to be certified as properly installed and operational, prior to issuance of occupancy permits. All Acceptance Technicians must be employed by an Acceptance Test employer that provides support as well as quality control. Certified California Lighting Controls Acceptance Test Technicians can be found at the following website: [www.calctp.org/acceptance-technicians/contractors](http://www.calctp.org/acceptance-technicians/contractors)
- C. These completed forms will be the deliverable product to the enforcement agency and Owner as described in 1.4 of this section.

## **PART 3 - EXECUTION**

### **3.1 FIELD QUALITY CONTROL**

- A. Tests:
  - 1. Contractor's Responsibilities:
    - a. Perform all required tests required by this section.
    - b. Schedule testing with building Owner.
    - c. Provide Installation forms
    - d. Acceptance forms provided by California Certified Lighting Controls Technician hired by Contractor.
    - e. Calibration of equipment such as light meters, photo electric controls, etc.
    - f. Programming of time switches (interior/exterior lighting) for operations as directed by the Owner.

### **3.2 ADJUSTING**

- A. Final Settings: The Contractor shall be responsible for implementing all final settings and adjustments on controls equipment as required for a complete and operating system.

**END OF SECTION**





**Section 31 1000**

**Site Clearing**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Clearing and protection of vegetation.
- B. Removal of existing debris.

**1.2 RELATED REQUIREMENTS**

- A. City of San Luis Obispo Standard Specifications, August 2020.

**PART 2 PRODUCTS -- NOT USED**

**PART 3 EXECUTION**

**3.1 SITE CLEARING**

- A. Minimize production of dust due to clearing operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

**3.2 EXISTING UTILITIES AND BUILT ELEMENTS**

- A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Protect existing structures and other elements that are not to be removed.

**3.3 VEGETATION**

- A. Scope: Remove trees, shrubs, brush, groundcovers and stumps in areas to be covered by building structure, paving, playing fields, lawns, and planting beds.
- B. Do not remove or damage vegetation beyond the limits indicated on drawings.
- C. Install substantial, highly visible fences to prevent inadvertent damage to vegetation to remain:
  - 1. At vegetation removal limits.
- D. In areas where vegetation must be removed but no construction will occur other than pervious paving, remove vegetation with minimum disturbance of the subsoil.
- E. Vegetation Removed: Do not burn, bury, landfill, or leave on site, except as indicated.
  - 1. Chip, grind, crush, or shred vegetation for mulching, composting, or other purposes; preference should be given to on-site uses.
  - 2. Trees: Sell if marketable; if not, treat as specified for other vegetation removed; remove stumps and roots to depth of 18 inches.
  - 3. Sod: Re-use on site if possible; otherwise sell if marketable, and if not, treat as specified for other vegetation removed.
  - 4. Fill holes left by removal of stumps and roots, using suitable fill material, with top surface neat in appearance and smooth enough not to constitute a hazard to pedestrians.
- F. Restoration: If vegetation outside removal limits or within specified protective fences is damaged or destroyed due to subsequent construction operations, replace at no cost to City.

**3.4 DEBRIS**

- A. Remove debris, junk, and trash from site.
- B. Leave site in clean condition, ready for subsequent work.

- C. Clean up spillage and wind-blown debris from public and private lands.

**End of Section**

**Section 32 1313**  
**Concrete Paving**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Concrete curbs.

**1.2 RELATED REQUIREMENTS**

- A. City of San Luis Obispo Standard Specifications, August 2020.

**1.3 PRICE AND PAYMENT PROCEDURES**

- A. Provide concrete paving by the unit price method.
- B. Concrete Placed: Measurement by the linear foot. Includes preparing base, formwork, reinforcement, placing, floating and finishing, testing.

**1.4 REFERENCE STANDARDS**

- A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; 1991 (Reapproved 2009).
- B. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000.
- C. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement; 2015.
- D. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2015.
- E. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2016.
- F. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2015a.
- G. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2015.
- H. ASTM C150/C150M - Standard Specification for Portland Cement; 2016.
- I. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a.
- J. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2011.
- K. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2013.
- L. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2015.
- M. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2014.
- N. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004 (Reapproved 2013).
- O. ASTM D1752 - Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction; 2004a (Reapproved 2013).

**1.5 SUBMITTALS**

- A. See Special Provisions for Submittal Requirements.

## **PART 2 PRODUCTS**

### **21 FORM MATERIALS**

- A. Wood form material, profiled to suit conditions.
  - 1. Materials shall be free from defects which would impair the appearance of structural quality of the completed work
  - 2. Provide stakes and bracing materials as required to hold forms securely in place.
- B. Joint Filler: Preformed; non-extruding bituminous type (ASTM D1751) or sponge rubber or cork (ASTM D1752).
  - 1. Thickness: 1/2 inch.

### **22 REINFORCEMENT**

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) yield strength; deformed billet steel bars; unfinished.
- B. Steel Welded Wire Reinforcement: Plain type, ASTM A1064/A1064M; in flat sheets; unfinished.
- C. Dowels: ASTM A615/A615M, Grade 40 - 40,000 psi yield strength; deformed billet steel bars; unfinished finish.

### **23 CONCRETE MATERIALS**

- A. Obtain cementitious materials from same source throughout.
- B. Concrete Materials: Provide in accordance with State of CA Highways standards.

### **24 ACCESSORIES**

- A. Curing Compound: ASTM C309, Type 1, Class A.
- B. Integral Color Pigment: to match existing concrete paving, as approved by the City.

### **25 CONCRETE MIX DESIGN**

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
- B. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.
- C. Concrete Properties:
  - 1. Compressive strength, when tested in accordance with ASTM C39/C39M at 28 days; 3000 psi.
  - 2. Water-Cement Ratio: Maximum 50 percent by weight.
  - 3. Maximum Slump: 3 inches.

### **26 MIXING**

- A. On Project Site: Mix in drum type batch mixer, complying with ASTM C685/C685M. Mix each batch not less than 1-1/2 minutes and not more than 5 minutes.
- B. Transit Mixers: Comply with ASTM C94/C94M.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify compacted subgrade is acceptable and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.

**32 PREPARATION**

- A. Moisten base to minimize absorption of water from fresh concrete.

**33 FORMING**

- A. Place and secure forms to correct location, dimension, profile, and gradient.
- 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.

**34 REINFORCEMENT**

- A. Place reinforcement as indicated on the Drawings.

**35 PLACING CONCRETE**

- A. Place concrete in accordance with ACI 304R.
- B. Do not place concrete when base surface is wet.
- C. Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.
- D. Place concrete continuously over the full width of the panel and between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.

**36 JOINTS**

- A. Align curb, gutter, and sidewalk joints.
- B. Provide Control joints:
  - 1. At 3 feet intervals along curbs.
  - 2. Between sidewalks and curbs.
  - 3. Between curbs and pavement.

**37 FINISHING**

- A. Curbs and Gutters: Light broom, texture parallel to pavement direction.
- B. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

**38 TOLERANCES**

- A. Maximum Variation of Surface Flatness: 1/4 inch in 10 ft.
- B. Maximum Variation From True Position: 1/4 inch.

**39 PROTECTION**

- A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.
- B. Do not permit pedestrian traffic over pavement until 75 percent design strength of concrete has been achieved.

**End of Section**



**Section 32 8423**  
**Irrigation System**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Pipe and fittings, and accessories.
- B. Automatic valves
- C. Manual valves
- D. Control system.
- E. Drip Irrigation
- F. Pop-up rotor systems

**1.2 DESCRIPTION**

- A. Provide all material, labor, equipment transportation, and services necessary for the furnishing and installation of the complete automatic sprinkler irrigation system as shown on the drawings and as specified herein. The work includes, but is not limited to:
  - 1. Trenching, stockpiling excavation materials and refilling trenches.
  - 2. Providing a complete system including piping, valves, fittings, backflow prevention device(s), rotors, sprinklers, automatic controls, dripline, and emitters and final adjustment of heads to ensure complete coverage.
  - 3. Line voltage connections to all irrigation controllers; low voltage control wiring from controller to remote control valves.
  - 4. Electrical service and hookup to automatic controller
  - 5. Automatic controller assembly and installation.
  - 6. Thrust Blocking
  - 7. Submittals, tests, as-built and record drawings.
  - 8. Erosion control and repair of damage due to over watering and erosion.
  - 9. Warranty replacement.
  - 10. Cleanup, inspection and approval.

**1.3 RELATED REQUIREMENTS**

- A. City of San Luis Obispo Standard Specifications, August 2020.
- B. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables.
- C. Section - Exterior Plants.

**1.4 REFERENCE STANDARDS**

- A. ASTM D2241 - Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series); 2015.
- B. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems; 2012.
- C. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2014.

**1.5 SUBMITTALS**

- A. See Section 5 of the General Provisions for submittal procedures.
- B. Detail Drawings: Submit detailed drawings for Owner approval, for all assemblies not detailed on the drawings.
- C. Controller Charts:

1. The Landscape Architect shall accept Record drawings before controller charts are prepared. Provide one controller chart for each controller supplied. The chart shall show the area controlled by the automatic controller and shall be the maximum size that the controller door will allow.
  2. The chart is to be a reduced drawing of the actual "as-built" system. However, in the event the controller sequence is not legible when the drawing is reduced, it shall be enlarged to a size that will be readable when reduced. The chart shall be a black line or blue line ozalid print and a different color shall be used to indicate the area of coverage for each station. When completed and approved, the chart shall be hermetically sealed between two pieces of plastic, each piece being a minimum of 10 mils. These charts shall be completed by the Contractor and approved by the Landscape Architect prior to final observation of the irrigation system.
- D. Operation and Maintenance Data:
1. Provide instructions for operation and maintenance of system and controls, seasonal activation and shutdown, and manufacturer's parts catalog.
  2. Provide schedule indicating length of time each valve is required to be open to provide a determined amount of water.
- E. Maintenance Materials: Provide the following for City's use in maintenance of project.
1. See Section 01 6000 - Product Requirements, for additional provisions.
  2. Extra Sprinkler/Rotor Heads: One of each type and size.
  3. Extra Valve Keys for Manual Valves: One.
  4. Extra Valve Box Keys: One.
  5. Extra Quick Coupler Keys: One.
  6. Prepare and deliver to the Landscape Architect, within 10 calendar days prior to completion of construction, two hardcover binders with three rings containing the following information:
    - a. Index sheet stating Contractor's address and telephone number, list of equipment with name and addresses of local manufacturer's representative.
    - b. Catalog and part sheets on every material and equipment installed under this contract.
    - c. Contractor's Guarantee statement that all equipment has been installed per plans and specifications.
    - d. Complete operating and maintenance instruction on all major equipment.
- F. Irrigation Schedule:
1. Watering schedule shall include watering times and start times for each valve. Schedule shall indicate watering times for each day of the week as applicable. The schedule shall be broken out to include seasonal adjustments.
  2. Submit the Watering Schedule to the Landscape Architect for approval. The amount of water used per the irrigation schedule shall not exceed the projected water usage shown on the irrigation calculations and plans.

## **16 PRODUCT DELIVERY, STORAGE AND HANDLING**

- A. Handling of PVC Pipe and Fittings: The Contractor is cautioned to exercise care in handling, loading, unloading, storing and installation of PVC pipe and fittings. All PVC pipe shall be transported in a vehicle that allows the length of pipe to lie flat so as not to subject it to undue bending or concentrated external load at any point. Any section of pipe that has been dented or damaged will be discarded and, if installed, shall be replaced with new piping.



**1.7 JOB CONDITIONS**

- A. The Contractor shall not willfully install the irrigation system as shown on the drawings when it is obvious in the field that obstructions, grade differences or discrepancies in area dimensions exist that might not have been considered in engineering. Such obstructions or differences should be brought to the attention of the Landscape Architect. In the event this notification is not performed, the irrigation Contractor shall assume full responsibility for any revision necessary.

**1.8 SUBSTITUTIONS**

- A. Procedure: Submit information in conformance with Section 5 of the General Provisions.
- B. Provide descriptive catalog literature, performance charts and flow charts for each item to be substituted.

**1.9 REGULATORY REQUIREMENTS**

- A. Requirements of Regulatory Agencies: All work and materials shall be in full conformance with the latest rules and regulations of the California Plumbing and Electric codes.
- B. Manufacturer's Directions: Manufacturer's directions and detailed drawings shall be followed in all cases where the manufacturers of articles used in this contract furnish directions covering points not shown in the drawings and specifications.
- C. Underwriters Laboratories: Electrical wiring, controls, motors, and devices shall be UL listed, and so labeled.

**1.10 INSTALLATION MEETINGS**

- A. Contractor shall be responsible for notifying the Landscape Architect or Designated Representative in advance for the following observation meetings, according to the time indicated: (Certain meetings may be grouped if prior approval is granted).
  - 1. Coordinate one week prior to commencing work of this Section.
  - 2. Pressure supply line installation and testing: 48 hours.
  - 3. Automatic controller location: 48 hours.
  - 4. Coverage test: 48 hours.
  - 5. Final site review: 7 days.
- B. When observations have been conducted by other than the Landscape Architect or Designated Representative, show evidence in writing of when and by whom these observations were made.
  - 1. Final Observation:
    - a. The Contractor shall operate each system in its entirety for the Landscape Architect or Designated Representative at time of final observation. Any items deemed not acceptable by the Landscape Architect or Designated Representative, or not in compliance with these specifications and drawings, shall be reworked to the complete satisfaction of the Landscape Architect or Designated Representative.
    - b. The Contractor shall show evidence to the Landscape Architect or Designated Representative that the City has received all accessories, charts, record drawings, and equipment as required before final observation can occur.

**1.11 COORDINATION**

- A. Coordinate the work with site backfilling, landscape grading and delivery of plant life.

**1.12 WARRANTY**

- A. The warranty for the sprinkler irrigation system shall be made in accordance with the following form.

- B. A copy of the warranty form shall be included in the operations and maintenance manual.
- C. The warranty form shall be retyped onto the Contractor's letterhead and contain the following information

<b>WARRANTY FOR SPRINKLER IRRIGATION SYSTEM</b>	
We hereby warrant that the sprinkler irrigation system we have furnished and installed is free from defects in materials and work quality, and the work has been completed in accordance with the drawings and specification. We agree to repair or replace any defects in material or work quality that may develop during the period of one year from the date of acceptance, except those that may be caused by ordinary wear and tear, unusual abuse or neglect. We also agree to repair or replace any damage resulting from the repairing or replacing of such defects at no additional cost to the City. We shall make such repairs or replacements within a reasonable time, as determined by the City, after receipt of written notice. In the event of our failure to make such repairs or replacements within a reasonable time after receipt of written notice from City, we authorize the City to proceed to have said repairs or replacements made at our expense, and we will pay the costs and charges therefore upon demand.	
PROJECT: Cheng Park Revitalization, City Specification No. 91385-10	
CONTRACTOR:	PHONE:
ADDRESS:	
DATE OF ACCEPTANCE:	BY:

## **PART 2 PRODUCTS**

### **21 IRRIGATION SYSTEM**

- A. Manufacturers:
  - 1. As shown on plans.
- B. Substitutions: See Section 01 6000 - Product Requirements.

### **22 PIPE MATERIALS**

- A. PVC Pipe (Sizes up through 3"): ASTM D 2241; 200 psi pressure rated upstream from controls, 160 psi downstream; solvent welded sockets.
- B. PVC Pipe (3" - 6" sizes): ASTM D 2241; 200 psi (1.38 MPa) pressure rated upstream from controls, 160 psi (1.10 MPa) downstream; rubber gasketed joints.
- C. Pressure and Non-Pressure Main Line Piping and Fittings: Sizes 2 1/2 inches and smaller shall be Schedule 80 PVC.
- D. Non-pressure lines (buried): Shall be PVC Schedule 40.
- E. Fittings: Type and style of connection to match pipe and shall meet the requirements for service at an operating pressure of 150 pounds per square inch, unless otherwise specified.
- F. Pipe Risers at Valves: 160 psi PVC pipe.
- G. Solvent Cement: ASTM D2564 for PVC pipe and fittings.
- H. Sleeve Material: PVC Material per plan.
- I. PVC nipples: Schedule 80 with molded threads.
- J. All PVC pipe must bear the following markings:
  - 1. Manufacturer's name.

2. Nominal pipe size.
3. Schedule or class.
4. Pressure rating in AST (not required on drip tubing).
5. NSF (National Sanitation Foundation) approval (not required on drip tubing).
6. Date of extrusion.
7. Colored Purple (Pantone #522) and embossed or integrally stamped/marked continuously on two sides with the words "CAUTION: RECYCLED WATER - DO NOT DRINK" and identified in accordance with AWWA Guidelines for the Distribution of Non-Potable Water.

## **23 OUTLETS**

- A. Manufacturer:
  1. As indicated on the drawings.
  2. Substitutions: See Division 01, General Provisions
- B. Emitter: Non-clogging, self-cleaning per the model numbers shown on the drawings.
- C. Tree Bubbler: Fixed outlet capable of watering deep root systems directly.
- D. Quick Coupler: Two piece body with purple cover .
- E. All outlets used shall have an exposed surface colored purple to associate them with recycled water use. The exposed surface may be colored purple through the use of weatherproof paint, or dyed plastic/rubber.
- F. Where possible, the exposed surface shall have the following warnings molded or hot-stamped upon it: (1)"DO NOT DRINK" in English and Spanish, and (2) the international "DO NOT DRINK" warning symbol. Sprinklers unable to meet these specifications shall be identified with purple bilingual recycled water warning tags.

## **24 VALVES**

- A. Manufacturers:
  1. As indicated on the drawings
  2. Substitutions: See Division 01, General Provisions
- B. Ball Valves: Brass construction with locking lever..
- C. Backflow Preventers: Bronze body construction, reduced pressure zone type.
- D. Backflow Enclosure: Vandal and weather resistant nature manufactured entirely of marine grade aluminum alloy 5052-H32. The mounting base shall be manufactured entirely of stainless steel. The length of the enclosure shall be expandable to allow for site adjustment. The enclosure shall have a mounting lip on one end and a locking mechanism on the other end. The handle controlling the locking mechanism shall be concealed within the surface of the enclosure and provide for a padlock.
- E. Quick Coupling Valves: Two-piece brass body construction, 150-pound class, with 1-inch female threads opening at base permitting operation with a special connecting device (coupler) designed for this purpose.
  1. Coupler threads: Lug type.
  2. Hinge cover: Provide with rubber-like locking and non-potable (purple) vinyl cover.
  3. The words "NON-POTABLE" or "RECYCLED WATER" and "DO NOT DRINK" marked in English and Spanish with the International "DO NOT DRINK" warning symbol located on the cover.
- F. Master Valves

1. Valve Type: Spring loaded, packless diaphragm activated, normally closed type with brass body, equipped with flow control and pressure regulation capabilities where noted.
  2. Valve Solenoid: 24 volt AC, 4.5 watt maximum, 500 milli-amp maximum surge, corrosion-proof, stainless steel construction, epoxy encapsulated to form a single integral unit unless otherwise noted on plans.
  3. Provide bleeder valve to permit operation in the field without power at the controller.
- G. Remote Control Valves
1. Valve Type: Spring loaded, packless diaphragm activated, normally closed type with brass body, equipped with flow control and pressure regulation capabilities where noted.
  2. Valve Solenoid: 24 volt AC, 4.5 watt maximum, 500 milli-amp maximum surge, corrosion-proof, stainless steel construction, epoxy encapsulated to form a single integral unit unless otherwise noted on plans.
  3. Provide bleeder valve to permit operation in the field without power at the controller.
- H. Valve Boxes
1. Remote control Valves: 14" x 19" of concrete material with locking cover.
  2. Gate valves, ball valves and quick couplers: 10" round of concrete material with locking cover.
  3. Valve box extensions shall be by the same manufacturer as the valve box.
  4. Emboss, letters on valve boxes to indicate contents of valve box. (ie. GV = Gate Valve, QC = Quick Coupler, RC = Remote Control Valve, MV = Master Valve, BV = Ball Valve)
  5. Valve boxes shall be of purple color (Pantone #522) with warning labels permanently molded into or affixed onto the lid. Warning labels shall be constructed of a purple weatherproof material with the warning permanently stamped or molded into the label. The warning shall contain the following information:
    - a. "NON-POTABLE" or "RECYCLED WATER"
    - b. "DO NOT DRINK" in English and Spanish
    - c. The international "DO NOT DRINK" warning symbol such as a glass of water with a slash through it.
- I. Station Decoders
1. Shall match manufacturer of controller.
  2. Provide minimum one (1) decoder per valve. The station decoder shall be a 2-station decoder and shall be able to operate up to 2-solenoids using unique colored wires for each. Utilizing decoder to support multiple valves is acceptable in accordance with manufacturer's instructions.
  3. Include POC decoders for master valve and flow sensor per manufacturer's instructions.
  4. Provide grounding rods or plates per manufacturer's instructions.

## **25 CONTROLS**

- A. Manufacturers:
1. Calsense or approved equal. City maintenance approval required for substitutions.
  2. Substitutions: See Division 01, General Provisions.
- B. Controller:
1. Automatic controller shall support up to 128-stations when using 2-Wire.
  2. A single controller shall be able to operate up to 70, 2-station decoders and it shall be intended that all wire runs between valves and 2-Wire decoders shall be direct pulls and have no splices except at the decoder location.

- C. Controller Enclosure: The enclosure shall be of a vandal and weather resistant nature manufactured entirely of 304-grade stainless steel, and the top shall be 12 gauge and the body 14 gauge with lockable hinged door. The main housing shall be louvered upper and lower body to allow for cross flow ventilation.
  - 1. Controller(s) shall be labeled inside and outside, warning that the system is utilizing recycled water. The labels shall also alert the system's maintenance personnel of any important constraints on the operation of the system.
- D. Flow Sensor
  - 1. Shall match manufacturer of controller.
  - 2. The flow sensor shall be wired back to the irrigation controller using two #14 AWG wires, one red, and one black in 1" PVC conduit to connect to the irrigation controller. The maximum wire run between flow meter and controller shall be 2000 ft. The flow meter shall send low voltage digital pulses back to the controller and therefore all electrical connections must be waterproof and be resistant to any moisture entry.
  - 3. Housing to be a Sch 80 polyvinyl chloride tee or bronze tee.

## **26 ELECTRICAL (LOW VOLTAGE)**

- A. The 2-Wire cable shall either be Paige P7354D or Regency's Hunter® Decoder cable with a maximum length of 7,000 ft.
- B. All electrical connections must be waterproof and moisture-resistant and shall be done with 3M™ Scotchcast™ 3570G Connector Sealing Packs.

## **27 ACCESSORIES**

- A. Do Not Drink Signage
  - 1. Aluminum 8"x8" sign shall read "RECYCLED WATER IN USE DO NOT DRINK. WASH HANDS AFTER CONTACTING. NO TOME EL AGUA LAVASE LAS MANOS DESPUÉS DE HACER CONTACTO CON EL AGUA"
  - 2. Quantity five (5) signs.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify location of existing utilities.
- B. Verify that required utilities are available, in proper location, and ready for use.

### **3.2 PREPARATION**

- A. Drawings are generally diagrammatic and indicative of the work to be installed. Due to the scale of drawings, it is not possible to indicate all offsets, fittings, sleeves, etc., which may be required. The Contractor shall carefully investigate the structural and finished conditions affecting all of his work and plan accordingly, furnishing such fittings, etc., as may be required.
- B. All scaled dimensions are approximate. The Contractor shall check and verify all size dimensions and receive Landscape Architect or Designated Representative's approval prior to proceeding with work under this section.
- C. Coordinate installation of irrigation system, including pipe, so there will be NO interference with utilities or other construction or difficulty in planting trees, shrubs, and ground covers. The Contractor shall carefully check all grades to satisfy him/her that he may safely proceed before starting work on the irrigation system.

- D. All piping or equipment shown diagrammatically on drawings outside planting areas shall be installed inside planting areas whenever possible.
- E. Layout and stake locations of system components.
- F. Review layout requirements with other affected work. Coordinate locations of sleeves under paving to accommodate system.

### **33 TRENCHING**

- A. Trench and backfill in accordance with City Standard Specifications.
- B. Excavate trenches to required depths. Follow approved layout for each system.
- C. Trench bottom shall be flat to ensure piping is supported continuously on an even grade.
- D. Where lines occur under paved areas, consider dimension to be below the subgrade.
- E. Trench Size:
  - 1. As indicated on the drawings.
- F. Trench to accommodate grade changes and slope to drains.
- G. Maintain trenches free of debris, material, or obstructions that may damage pipe.

### **34 INSTALLATION**

- A. Assemblies:
  - 1. Install pipe, valves, controls, and outlets in accordance with manufacturer's instructions.
  - 2. Line Clearance: All lines shall have a minimum clearance of 6 inches from each other and from lines of other trades. Parallel lines shall not be installed directly over one another.
  - 3. Connect to utilities.
  - 4. Install all assemblies specified herein in accordance with respective detail. In absence of detail drawings or specification pertaining to specific items required to complete work, perform such work in accordance with best standard practice, with prior approval from Landscape Architect or Designated Representative.
  - 5. PVC pipe and fittings shall be thoroughly cleaned of dirt, dust and moisture before installation. Installation and solvent welding methods shall be as recommended by the pipe and fitting manufacturer.
  - 6. On PVC to metal connections, the Contractor shall work the metal connections first. Teflon tape or approved equal shall be used on all threaded PVC to PVC, and on all threaded PVC to metal joints. Light wrench pressure is all that is required. Where threaded PVC connections are required, use threaded PVC adapters into which the pipe may be welded.
  - 7. Quick Coupling Valves: Unless otherwise indicated, locate valves within 12 inches of hardscape.
  - 8. Set outlets and box covers 1 inch above finish grade in turf areas and 2 inches above finish grade in shrub planters.
  - 9. Provide for thermal movement of components in system.
  - 10. Use threaded nipples for risers to each outlet.
- B. Mechanical Joints:
  - 1. Use for pipe sizes 4" and larger.
- C. Thrust Blocks:
  - 1. For 4" pipe and larger install thrust blocks at fittings per plans.
- D. Electrical Supply:

1. Low voltage wiring shall be placed in the same ditch and taped on bottom side of main lines unless otherwise approved.
  2. Wire is to be taped a maximum 12 feet on center.
  3. Provide a minimum 12-inch expansion loop at each connection and directional change.
  4. Use a continuous wire between controller and remote control valves. Except as otherwise approved, do not splice wire at any point. All approved splices shall be enclosed in an acceptable box.
  5. Each controller shall be provided with separate 2-wire path.
- E. Automatic Controller:
1. Install as per manufacturer's instructions. Remote control valves shall be connected to controller in numerical sequence as shown on the drawings.
  2. Controller shall be mounted inside lockable electrical cabinet.
  3. Controller shall be programmed to read flows from valve stations.
  4. Manufacturer's representative shall be on site for initial programming and startup of controller.
  5. Contractor shall coordinate controller communication service plan, connectivity and startup with manufacturer and City.
- F. Flow Sensor:
1. Flow sensor tee assembly shall be installed with minimum required length of unobstructed straight pipe run per manufacturer's instructions.
  2. Install flow sensor wiring from flow sensor to controller. Connect wiring to flow sensor terminal at controller.
- G. Mark valves with neoprene valve markers containing locking device. Set valve markers in pipe risers extending from top of valve to finish grade.
- H. System Flush: After piping is installed, but before outlets are installed and backfilling commences, open valves and flush system with full head of water.
- I. Sprinkler Heads:
1. Install the sprinkler heads as designated on the drawings and in accordance with their respective detail.
  2. Spacing of heads shall not exceed the maximum indicated on the drawings. In no case shall the spacing exceed the maximum recommended by the manufacturer.
- J. Valve Boxes:
1. All buried valves and equipment shall be installed with a proper box as specified in part 2 - products.
  2. Fill area under box with a minimum of 1 cubic feet of pea gravel before box is installed.
    - a. Identification tags shall be attached to each remote control valve, showing number that corresponds with controller sequence. Tags shall be manufactured of polyurethane Behr Desopaid, yellow in color with black letters 2-3/4 inches by 2-1/4 inches.
    - b. All boxes shall be permanently marked on top, designating type of equipment installed as noted in drawing.

### **35 FIELD QUALITY CONTROL**

- A. Prior to backfilling, test system for leakage at main piping to maintain 100 psi pressure for two hours.
- B. System is acceptable if no leakage or loss of pressure occurs and system self drains during test period.

- C. Testing of pressure main lines shall occur prior to installation of electrical control valves, quick couplers or any other equipment that might prevent a proper test from being performed.
- D. All piping under paved areas shall be tested under hydrostatic pressure of 150 pounds per square inch, and proved watertight, prior to paving.
- E. If leaks develop, replace joints and repeat test until entire system is proven watertight.
- F. All hydrostatic tests shall be made only in the presence of the Landscape Architect or Designated Representative of the City. No pipe shall be completely backfilled until it has been inspected, tested and approved in writing.
- G. Furnish necessary force pump and all other test equipment.
- H. Upon completion of each phase of work, entire system shall be tested and adjusted to meet site requirements.
- I. Low voltage wire under paving shall be tested for continuity, prior to paving.

### **3.6 BACKFILLING**

- A. Backfill trench and compact to specified subgrade elevation. Protect piping from displacement.
- B. Buried pipe in trenches shall be center loaded only until all required tests are performed. Trenches shall be carefully backfilled with the excavated materials approved for backfilling, consisting of earth, loam, sandy clay, sand or other approved materials, free from large clods of earth or stones. Backfill shall be mechanically compacted in landscaped areas to a dry density equal to adjacent undisturbed soil in planting areas. Backfill will conform to adjacent grades without dips, sunken areas, humps or other surface irregularities.
- C. A fine granular material backfill will be initially placed on all lines. No foreign matter larger than 1/2 inch in size will be permitted in the initial backfill.
- D. Flooding of trenches will be permitted only with approval of the Landscape Architect or Designated Representative.
- E. If settlement occurs and subsequent adjustments in pipe, valves, sprinkler heads, lawn or planting, or other construction are necessary, the Contractor shall make all required adjustments without cost to the City.

### **3.7 TEMPORARY REPAIRS**

- A. The City reserves the right to make temporary repairs as necessary to keep the sprinkler system equipment in operating condition. The exercise of this right by the City shall not relieve the Contractor of his responsibilities under the terms of the warranty as herein specified.

### **3.8 SYSTEM STARTUP**

- A. Prepare and start system in accordance with manufacturer's instructions.
- B. Adjust control system to achieve time cycles required.
- C. Pump Start-up
  - 1. The initial pump start-up shall be performed in the presence of a representative from the pump manufacturer. Prior to startup, the manufacturer's representative shall provide an inspection of the installation to insure the pump is properly installed and will function per the manufacturer's specifications. Failure to provide the initial start up of the pump in the presence of the manufacturer's representative means the contractor will be held liable should damage or failure occur.
  - 2. Pump shall be in good working order before setting it to an automatic schedule.



3. Contractor shall familiarize the City maintenance personnel with operation and maintenance procedures of the pump system prior to handing over of project site back to owner. Familiarity of pump systems should occur while manufacturer's representative is on-site.

**3.9 MAINTENANCE**

- A. The entire sprinkler irrigation system shall be under full automatic operation for a period of seven days prior to any planting.
- B. The Landscape Architect or Designated Representative reserves the right to waive or shorten the operation period.

**3.10 CLEANUP**

- A. Cleanup shall be performed as each portion of the work progresses. Refuse and excess dirt shall be removed from the site, all walks and paving shall be broomed or washed down, and any damage sustained to the work of others shall be repaired and work returned to its original condition.

**3.11 OPERATING INSTRUCTIONS**

- A. The Contractor shall be required to train City's maintenance personnel in proper operation of all major equipment. Provide written evidence of the person or persons so trained to the Landscape Architect or Designated Representative.

**3.12 CLOSEOUT ACTIVITIES**

- A. Instruct City's personnel in operation and maintenance of system. Use operation and maintenance material as basis for demonstration.
- B. Irrigation Schedule: See Submittal Requirements above.
- C. Irrigation Audit: Shall be performed by a third party representative hired by the City. Contractor shall coordinate keys to controllers and valve boxes for use by the auditor.

**3.13 MAINTENANCE**

- A. See Section 01 7000 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.

**End of Section**



**Section 32 9300**

**Plants**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Preparation of subsoil and topsoil.
- B. Topsoil bedding.
- C. Bioswale Soil Mix
- D. New plants.
- E. Mulch and Fertilizer.
- F. Plants in pots/containers
- G. Maintenance through final acceptance.
- H. Warranty Replacement
- I. Tree Pruning.

**1.2 RELATED REQUIREMENTS**

- A. City of San Luis Obispo Standard Specifications, August 2020.
- B. Section 32 8200 - Irrigation

**1.3 DEFINITIONS**

- A. Weeds: Include Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.
- B. Plants: Living trees, plants, and ground cover specified in this Section, and described in ANSI Z60.1.

**1.4 REFERENCE STANDARDS**

- A. ANSI/ANLA Z60.1 - American National Standard for Nursery Stock; 2004.
- B. ANSI A300 Part 1 - American National Standard for Tree Care Operations -- Tree, Shrub and Other Woody Plant Maintenance -- Standard Practices; 2008.

**1.5 SUBMITTALS**

- A. See Section 01 3300 - Submittals, for submittal procedures.
- B. Submit list of plant life sources.
- C. Submit purchase invoices from nurseries for review.
- D. Samples: Submit the following to the City for acceptance:
  - 1. Soil Separator: One square foot minimum, accompanied by product data.
  - 2. Drain Rock: One-half cubic foot.
  - 3. Wood Bark Mulch: One-half cubic foot.
  - 4. Root Control Barrier: One square foot sample panel, accompanied by product data.
- E. Product Data: Submit the following product information to the City for acceptance:
  - 1. Tree Staking Materials: Manufacturer's literature.
  - 2. Herbicides: Schedule for application of herbicides must be approved by the City.

- F. Test Reports: Soil tests shall be performed by a certified soils analyst by the state of California. Provide the following tests and submit the results to the City:
  - 1. Existing Site Soil: Provide two separate tests at distinctly separate on-site locations, for agricultural suitability, fertility, particle size analysis; including recommendations for soil amendment, and fertilization during the maintenance period.
  - 2. Import Soil: Submit test reports of representative sample(s) for approval prior to delivery and for every 100 yards delivered to the site. Test for agricultural suitability, fertility, particle size analysis; including recommendations for soil amendment, and fertilization during the maintenance period.
  - 3. Organic Amendments, Fir Bark: Test for partial organic amendment evaluation.
  - 4. All Other Fertilizers and Amendments: For standard products, submit manufacturer's analysis. For all other products, submit analysis by testing laboratory.
- G. Soil Mix - Planters: Submit cut-sheets of each accepted planter soil mix component and one-ounce samples of the fertilizers to the Inspector.
- H. Soil Mix - Bioswales: Submit cut-sheets of bioswale soil mix indicating type and breakdown in percentages of sand, silt, and compost materials.

## **16 QUALITY ASSURANCE**

- A. Nursery Qualifications: Company specializing in growing and cultivating the plants with three years documented experience.
- B. Installer Qualifications: Company specializing in installing and planting the plants with five years experience.
- C. Testing Laboratory: Recognized laboratory for soil and plant disease analysis for ornamental horticulture, approved by the Inspector. Testing laboratory is to perform all work in accordance with the current methods of the Association of Official Agricultural Chemists.

## **17 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer. Store fertilizers and amendments, bark mulch, soil mixes, and other materials which could stain concrete and similar surfaces in such a manner that staining does not occur.
- B. Plants: Maintain all plant material in a healthy growing condition prior to and during planting operations. Protect plants at all times from sun and drying winds. Plants that cannot be planted immediately upon delivery shall be kept in the shade, well protected and watered. Plant material delivered to the site must be planted within 3 days of site delivery. Plants that cannot be installed on this work schedule shall be returned to the grower until installation requirements can be met.

## **18 SUBSTITUTIONS, ADDITIONS, DELETIONS**

- A. General: Submit proposals for substitutions in accordance with the requirements of Division 1 Specification Sections. Acceptance by the Inspector is required prior to proceeding with the work under this Section.
- B. The Landscape Architect reserves the right to substitute plant material of sizes equal to material specified, as the work progresses, at no additional cost to the City.
- C. When requesting substitutions for plant material, the Contractor shall provide the Landscape Architect with the following:
  - 1. Contact information for nurseries Contractor was unable to obtain plant material. Minimum of three are required.

2. Three (3) alternate plant suggestions as part of the initial request. Provide foliage/flower color, growth habit, and sunset zone of each.
3. Substitution requests which do not include the above requirements will be denied until requirements have been met.

## **19 FIELD CONDITIONS**

- A. General: Become familiar with the anticipated growing conditions prior to commencement of work. Notify the Inspector immediately in writing of any conditions, which will prevent the proper execution of the warranty responsibilities specified. Failure to so notify the Inspector constitutes acceptance of the growing conditions. Any removal, repair or replacement of plant material required by unsuitable conditions found after work has begun shall be done at no additional cost to the City.
- B. Do not install plant life when ambient temperatures may drop below 35 degrees F or rise above 90 degrees F.
- C. Do not install plant life when wind velocity exceeds 30 mph.

## **1.10 WARRANTY**

- A. Plant Material: Warrant that all trees under this Contract will be vigorous, healthy, free of dead or dying branches and branch tips, bearing foliage of normal density and color, and will otherwise comply with the requirements of this Section, for a period of one year from date of Final Acceptance. Any delay in completion of planting operations which extends the planting into more than one growing season shall extend the warranty period correspondingly.
- B. Replacements: Without cost to the City, in a timely manner and as directed by the Inspector, replace all plants not meeting the requirements above throughout the course of the warranty period. Replacements shall closely match adjacent specimens of the same species in size and shall comply with all requirements of this specification.
- C. Species: Replace all plant material determined by the City within two years following the final acceptance of the project, to be untrue to the species, clone and/or variety specified, to the equal condition of adjacent plants at the time of replacement, at no additional cost to the City.

## **PART 2 PRODUCTS**

### **2.1 PLANTS**

- A. Trees, Plants, and Ground Cover: Species and size identifiable in plant schedule, grown in climatic conditions similar to those in locality of the Work.
  1. Size:
    - a. Plants shall conform to measurements specified. Measure plants when branches are in their normal position. Height and spread dimensions specified refer to the main body of plant and not branch tip to tip. Take caliper measurements at a point on the trunk 6 inches above natural ground line for trees up to 4 inches in caliper, and at a point 12 inches above the natural ground line for trees over 4 inches in caliper.
    - b. The measurements specified are the measurements after pruning, where pruning is required. Plants that meet the measurements specified, but do not possess a normal balance between height, spread, and caliper, shall be rejected.
    - c. Plants larger than specified may be used if approved by the City, and if provided at no additional cost to the City. If larger plants are approved, the root ball shall be increased in proportion to the size of the plant; irrigation system shall also be adjusted as required to accommodate larger plants.

- B. Acclimatization: The General Contractor is responsible for supplying plant material that has been properly acclimated and conditioned, in accordance with good horticultural practices, for the exposure, wind and humidity levels, soil conditions, etc., encountered at the project site and in the proposed plant location.
- C. Coordination: The Contractor shall coordinate his acclimatization schedule with the City as to allow an adequate conditioning period for the plant material prior to the approved date of planting commencement. Notify the City in writing prior to proceeding with any acclimatization work if approved work schedule allows insufficient time to acclimate the material.
- D. Quality: Plants shall be superior in form, compactness and symmetry; sound, healthy and vigorous, well branched and densely foliated when in leaf; free of disease, insect pests, eggs or larvae, and free from physical damage or adverse conditions that would prevent thriving growth.
- E. Species: Tag one of each plant prior to delivery to the site; label with genus, species and variety. Any plants not so identified will be subject to rejection by the City. Plants may be cross referenced with nurseries invoice at the discretion of the Landscape Architect.
- F. Root Ball:
  - 1. Do not supply any bare root or ball and burlapped stock unless approved by the City.
  - 2. Sizes: As specified on the plans. Where no root ball dimensions have been specified, supply material in container sizes specified.
  - 3. Material: Root ball shall consist of a soil or soil mix that is compatible with the soil or soil mix into which the plant will be planted, and that provides for thorough drainage, aeration, and adequate moisture and nutrient retention. Having sufficient density and firmness that when planted, the plant will stand upright and stable without need for additional support.
  - 4. Containers: All plant material shall have been grown in the containers in which delivered for at least six months, but not over two years. Stock appearing to not have been in their containers for this term shall be rejected.
  - 5. Root Pruning: Where root pruning is required to provide material of the specified size, or for planting in the sloped containers, the pruning is to be done under the direction of a Certified Arborist. No root pruning is to be done within one year of installation unless approved by the City.
- G. Trunks and Branches: Do not prune plants before delivery. All trunks are to be straight and of uniform taper, larger at the bottom unless otherwise specified. Plants with damaged or crooked leaders, or multiple leaders, unless specified, will be rejected. Plants with abrasions of the bark, sun scalds, disfiguring knots, or fresh cuts of limbs over 3/4 inch, which have not completely callused, will be rejected. Any plant unable to stand upright without support will be rejected.

## **22 SOIL MATERIALS**

- A. General: All soils to be used in areas to be planted on the project shall be free of rocks over one inch in diameter, and free of foreign debris. Soil shall be free from sub-base/aggregate, refuse, plants or roots, clods, weeds, viable weed seeds, sticks, solvents, petroleum products, concrete, base rock, or other deleterious or extraneous material. Soil shall be free of soil-borne diseases, and capable of sustaining healthy plant life.
- B. Imported Topsoil:

1. Topsoil shall be fertile, friable soil of loamy character, containing an amount of organic matter normal to the region. All imported topsoil used on the job shall be from the same source.
  - a. Make all arrangements for obtaining and testing imported topsoil. Submit test reports of a representative sample of the proposed supply for approval by the City well in advance of its scheduled delivery to the site. The approved sample will establish the standards to which all imported topsoil used on the job must conform.
  - b. Transport imported topsoil directly from source to final position. If stockpiling is required, locations and amounts of stockpiles will be designated by the City.
  - c. The City reserves the right to take additional samples of imported topsoil at the site. If subsequent testing proves material to be at variance with the approved sample, remove rejected soil from the site and replace immediately at no additional cost to the City.
- C. Existing On-Site Soils: Existing site soils shall be amended per the recommendations of the approved soils testing laboratory. The following soil amendments and fertilizers are to be used FOR BIDDING PURPOSES ONLY.
  1. Site Soil: Top 6 inches of site soil shall be amended with following blend of amendments per 1000 square feet.

Amount	Ingredient
6 cubic yards	Nitrogen Stabilized 0" - 1/4" Fir Bark
15 lbs	12-12-12 Commercial Fertilizer as approved
15 lbs	Soil Sulfur
100 lbs	Agricultural Gypsum

2. Backfill Mix (on-grade locations): Amend site soil as follows per cubic yard.

Amount	Ingredient
3/5 cubic yard	Surface Soil
2/5 cubic yard	Nitrogen Stabilized 0" to 1/4" Fir Bark
1 lb	12-12-12 Commercial Fertilizer as Specified
2 lbs	Iron Sulfate as Specified
10 lbs	Agricultural Gypsum

3. Additional Amendments: Soil amendment recommendations will vary for planting areas if imported topsoil is required to establish finish grade. Provide all additional amendments as may be required by subsequent soil testing of approved imported topsoil and as directed by the Inspector.

## **23 SOIL AMENDMENT MATERIALS**

- A. Nitrogen Stabilized Fir Bark On-Grade: Meeting the following specifications:

1. Particle Size (dry weight basis):

Sieve Size	Percent Passing
6.35 mm (1/4 inch)	95 - 100
2.38 mm (No. 8, 8 mesh)	50 - 80
500 micron (No. 35, 32 mesh)	0 - 25

2. Organic Content: Determined by ash analysis. Minimum 92% based on dry weight.
3. Nitrogen: Minimum 0.8% nitrogen based on dry weight.

4. Salinity: Maximum saturation extract conductivity 3.5 millimhos per cm at 25 degrees centigrade.
5. Iron: Minimum 0.08% dilute acid soluble Fe based dry weight, if iron treated.
6. Bulk Density: 400 pounds per cubic yard.
- B. Fertilizer: Containing fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil, as indicated in analysis.
  1. Fertilizers shall be approved by the Organic Materials Review Institute (OMRI).
  2. Contractor shall obtain City's written approval of proposed fertilizer(s) prior to use.
- C. Water: Clean, fresh, and free of substances or matter that could inhibit vigorous growth of plants.
- D. Pre-Emergent Herbicide: For all on-grade ground cover and shrub areas, provide "Surflan A.S." as manufactured by Elanco Products Co., Indianapolis, IN, with no acceptable substitutions. Apply per manufacturer's instructions.

## **24 MULCH MATERIALS**

- A. Non Bioswale Planter Mulching Material: Cedar species wood shavings, free of growth or germination inhibiting ingredients. Mulch shall have been baked to remove unwanted seed growth.

## **25 ACCESSORIES**

- A. Drain Rock: 3/4" diameter river rock or approved equal.
- B. Soil Separator: Soil Separator: "Mirafi 140N", as manufactured by Mirafi, Charlotte, NC, "Trevira Spunbond 1120", as manufactured by Hoechst Fibers Industries, Spartanburg, SC, or approved equal.
- C. Stakes: Softwood lumber, pointed end.
  1. Lodgepole stakes. Length as required to meet dimensions required per plans.
- D. Root Control Barrier: "Deep Root Control Barrier", stock number UB24-2 as manufactured by Deep Root Corp., 15040 Golden West Circle, Westminster, CA 92683 (714) 898-0563, or approved equal.

## **26 SOURCE QUALITY CONTROL**

- A. Analyze to ascertain percentage of nitrogen, phosphorus, potash, soluble salt and organic matter; pH value and any deficiencies.
- B. Submit minimum 10 oz sample of topsoil proposed. Forward sample to testing laboratory in sealed containers to prevent contamination.
- C. Testing is not required if recent tests are available for imported topsoil. Submit these test results to the testing laboratory for approval. Indicate, by test results, information necessary to determine suitability.

## **PART 3 EXECUTION**

### **3.1 ORDERING, REVIEW AND ACCEPTANCE OF PLANT MATERIAL**

- A. Ordering:
  1. Within 30 days after award of contract, submit written certification to the City of the quantity and species of plant material ordered, and the nursery(s) supplying the material.
  2. The Contractor is responsible for providing all plant material in the quantities and sizes specified on the drawings, and for making all arrangements in advance that may be



required to obtain these materials. If any material specified will be unavailable at the time of planting, submit written verification to the City along with the bid.

- B. Review of Plant Material: Before planting operations begin, all plant materials shall be reviewed for conformance to the design intent of the Contract Documents by the City. Submit written request for review of plant material at least 10 days prior to commencement of planting operations. Review by the City does not waive the right of rejection during planting or any time thereafter.
- C. Rejection of Material: The City reserves the right to review and reject plant material at any time, and at the place of growth, for nonconformance to the Specifications. Do not install plant material, which has not been reviewed at the project site by the City.

### **32 EXAMINATION**

- A. Verify that prepared subsoil and planters are ready to receive work.
- B. Saturate soil with water to test drainage.
- C. Verify that required underground utilities are available, in proper location, and ready for use.

### **33 GRADING**

- A. General: All areas to be planted on the project shall be free of rocks over one inch in diameter to a depth of 8" minimum below finish grade, and free of foreign debris, subsoil, refuse, plants or roots, clods, weeds, sticks, solvents, petroleum products, concrete, base rock, or other deleterious or extraneous material. Areas to be planted shall be free of soil-borne diseases and capable of sustaining healthy plant life. Do all work necessary to bring site soil, import soil and planter backfill to compliance with these requirements. Remove from the project site and dispose of in a legal manner any soils and material not meeting these requirements. Subject to acceptance of the City, all soil and material not meeting these requirements shall be the property of the Contractor.
  - 1. Surface Drainage: Contractor is responsible for proper surface drainage of planted areas. Report in writing to the City any discrepancies in the Contract Documents, obstructions on the site, or any other conditions, which the Contractor feels prevent establishing proper drainage, and obtain the Inspector's instructions prior to proceeding with the work affected.
  - 2. Final Contouring:
    - a. Handle and place the soil to depths required. Remove all rocks and clods over one inch in diameter. Provide for surface drainage and cut all necessary drain swales.
    - b. Work soil sufficiently so that after rolling and after full settlement has occurred, the site will be graded to within  $\pm 0.10$  of a foot from the lines, grades and elevations shown, and as may be directed by the Inspector. Finished surface shall be smooth and uniform and shall be free of depressions that retain standing water or any surface irregularities that would impede proper drainage. Unless otherwise noted, all soil finish grades shall be 1-1/2 inches below finish grade of adjacent walks, pavements and curbs, and top of wall elevations.
  - 3. Erosion Repair: Repair all erosion damage that occurs until Final Acceptance. Take all measures necessary to prevent erosion occurring during work under this Section. Provide and amend replacement soil in accordance with this Section.

### **34 PREPARATION OF SUBSOIL**

- A. Amend subsoil as indicated in analysis.

- B. Prepare subsoil to eliminate uneven areas. Maintain profiles and contours. Make changes in grade gradual. Blend slopes into level areas.
- C. Remove foreign materials, weeds and undesirable plants and their roots. Remove contaminated subsoil.
- D. Scarify subsoil to a depth of 3 inches where plants are to be placed. Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted subsoil.
- E. Dig plant pits and beds twice the size of the rootball as directed per the drawings.

**35 PLACING TOPSOIL - NON BIOSWALE PLANTERS**

- A. Spread topsoil to a minimum depth of 6 inches over area to be planted. Rake smooth.
- B. Place topsoil during dry weather and on dry unfrozen subgrade.
- C. Remove vegetable matter and foreign non-organic material from topsoil while spreading.
- D. Grade topsoil to eliminate rough, low or soft areas, and to ensure positive drainage.
- E. Install topsoil into pits and beds intended for plant root balls, to a minimum thickness of 6 inches.
- F. Place topsoil mix to the depths specified to obtain finish grades shown on the drawings. Soil mix shall be handled in a manner so as to prevent segregation of ingredients. Thoroughly water planter backfill mix after placement to compact and settle mix.

**36 FERTILIZING**

- A. Apply fertilizer in accordance with manufacturer's instructions.
- B. Apply after initial raking of topsoil.
- C. Mix thoroughly into upper 2 inches of topsoil.
- D. Lightly water to aid the dissipation of fertilizer.

**37 EXCAVATION OF PLANTING PITS ON-GRADE**

- A. General: Excavate plant pits by hand or with a backhoe; use of augers will not be permitted. Prior to planting and backfill, scarify the sides and bottom of the pit as required to eliminate any glazed surfaces. Excavate container-grown tree, shrub, and vine holes to the following dimensions:
  - 1. 1, 5, and 15 gallon containers: Two times the size of the root ball in width and depth.
  - 2. 24-inch boxes and larger: Large enough to allow one foot of space around the ball in all directions.
  - 3. Holes on mounds: Dig plant holes on mounds deeper than normal.
  - 4. Excess Soil: Transport and dispose of off-site in a legal manner any excess excavated soil.
  - 5. Obstructions: If rocks, underground construction work, tree roots or other unknown obstructions are encountered in the excavation of plant holes, alternate locations may be selected by City. Report all such conditions in writing to the City. If a change in the location of the planting pit is unacceptable to the City, the original planting pit shall be over-excavated to remove the obstructions to a minimum dimension of 12" beyond the sides and bottom of the tree pit as typically specified. Obtain the City's instructions prior to proceeding with the work affected.

**38 DETRIMENTAL SOILS AND DRAINAGE**

- A. General: Prior to planting, test drain all planting areas as follows:

1. On-Grade Plant Pits: Fill with 12 inches of water. Water should drain completely in 48 hours.
2. Plant Beds: Irrigate until soil is saturated. Saturated condition should not remain after 24 hours.
- B. Drainage Chimneys:
  1. General: For plant pits failing the initial drainage test, provide drainage chimneys as shown on the drawings and as directed by the City.
  2. Neatly auger drainage chimneys to a depth directed by the City. Remove loose soil from hole and plant pit. Locate chimneys at perimeter of plant pit. Repeat test for proper drainage.
  3. Once required drainage test has been passed, backfill chimneys with drain rock, flush with bottom of pit. Cover chimneys with soil separator.
- C. Failure of Drainage Test: report in writing to the City all areas not passing these tests and all soil conditions that the Contractor considers detrimental to growth of plant material. State condition and proposal and cost estimate for correcting the condition. Obtain the City's instructions prior to proceeding with the work affected. Repeat drainage testing and correction of conditions in this manner as necessary until tests are passed. Failure to perform drainage tests and/or to notify the City in writing of the conditions specified above renders the Contractor responsible for all plant failure that occurs as a result of inadequate drainage or detrimental soil conditions, as determined by the City.

### **39 PLANTING**

- A. General: Do not plant any material that has not been reviewed by the Inspector upon delivery to the project site or that has been rejected for any reason. Do not plant under unfavorable weather conditions.
- B. Place plants for best appearance.
- C. Set plants vertical.
- D. Remove non-biodegradable root containers. After removing plants from their containers, disentangle any small roots that encircle the container. Do not cut or otherwise disturb the root ball. Inspect all plants for rootbound condition; do not install rootbound plants or plants found to have cracked or broken root balls when taken from the container.
- E. Care should be exercised to prevent damage or breakage to limbs, and ropes or other lines should not be allowed to damage bark.
  1. Container Stock:
    - a. General: Do not lift or handle container plants by tops, stems, or trunks at any time.
    - b. Boxed Stock: Remove bottom of box prior to placement of plant in planting pit. Cut bands and remove box sides just prior to backfilling.
    - c. Canned Stock: Remove canned stock carefully after cans have been cut on two sides with acceptable cutter. Do not use spade to cut cans.
    - d. Ball and Burlap Stock: Dig ball and burlap (B & B) plants with firm balls of earth of diameter not less than that recommended by the American Standard for Nursery Stock, and of sufficient depth to include the fibrous and feeder roots. Plants moved with ball will not be accepted if the ball is cracked or broken before or during planting operations.
- F. Set plants in pits or beds, partly filled with prepared plant mix, at a minimum depth of 6 inches under each plant. Remove burlap, ropes, and wires, from the root ball.

- G. Place bare root plant materials so roots lie in a natural position. Backfill soil mixture in 6 inch layers. Maintain plant life in vertical position.
- H. Saturate soil with water when the pit or bed is half full of topsoil and again when full.
- I. Top-dress Fertilizing On-Grade: When plant installation is complete, fertilize all planting areas (excluding lawn areas) with top-dress fertilizer at the rate of 4 lbs. per 100 square feet.
- J. Anti-Desiccant: At Contractor's option, spray all evergreen and deciduous plant material in full leaf with anti-desiccant, in accordance with manufacturer's instructions. Apply an adequate film over trunks, branches, twigs and foliage. Take precautions as necessary to prevent damage, particularly from sun scald.
- K. Mulching: Mulch all planting areas (excluding lawn areas) with 3 inch layer of wood bark mulch unless otherwise shown. Spread mulch uniformly to form a smooth cover free of bare spots and mounds.
  - 1. Settlement: As shown on the drawings, the crowns of all plants shall be at least 1/2 inch above the surrounding grade after all settlement has occurred.
  - 2. Watering Basins On-Grade: Form a watering basin, an excavated ring around the root ball of the plant for each tree and shrub. Do not form watering basins in lawn areas.

### **3.10 GROUND COVER PLANTING**

- A. Pre-emergent herbicide Application On-Grade Only: Apply pre-emergent herbicide, Surflan A.S. at the rate of 5-1/3 pounds per acre applied in 25 gallons of water to all on-grade locations. Apply before wood bark mulch application.
- B. Planting: Plant ground cover plants through wood bark mulch at the specified triangular spacings. Make planting hole with a hand mattock avoiding mixing surface applied herbicide into planting hole.
  - 1. Activation of Herbicide On-Grade Only: After planting, irrigate with at least one inch of water to activate the herbicide. Water areas carefully taking care to avoid erosion. Repair erosion occurring from careless watering immediately. Remove, repair and replace adjacent planting and soil damaged by careless watering and translocation of herbicide.

### **3.11 LAYOUT OF PLANT MATERIAL**

- A. General: The City will review for conformance to the design intent of the Contract Documents locations of all plants in the field prior to planting. Notify the City and schedule layout review sufficiently in advance of planting to allow for review and adjustment without disrupting construction schedule.
- B. Adjustments: The City reserves the right to make minor adjustments in the layout of all plant material; adjust irrigation system as necessary.

### **3.12 INSTALLATION OF ACCESSORIES**

- A. Install trunk protectors on all new trees located in turf areas.

### **3.13 PLANT SUPPORT**

- A. General: Complete staking and guying immediately after planting. Perform in accordance with reference standards, unless otherwise shown on the drawings or directed by the City. Securely stake or guy all trees planted on the site using staking or guying type shown on the drawings. The City reserves the right to make modifications to staking and guying procedures as required to accommodate field conditions at no additional cost to the City.
  - 1. Staking: Stake trees with one as shown on the drawings.

**3.14 PRUNING**

- A. Prune plants only at the direction of the City and according to reference standards to preserve the natural character of the plant. Remove all dead wood, suckers and broken or badly bruised branches. Remove sucker basal and lateral growth to prevent resprouting; retain normal side branching. Use only disinfected, sharp tools. Improperly pruned trees will be subject to rejection by the City. Apply tree seal to cuts over one inch diameter in accordance with manufacturer's instructions.
- B. Prune trees as recommended in ANSI A300 Part 1.
- C. Prune newly planted trees as required to remove dead, broken, and split branches.

**3.15 FIELD QUALITY CONTROL**

- A. Plants will be rejected if a ball of earth surrounding roots has been disturbed or damaged prior to or during planting.
- B. Deficient Soils: Remove all soils determined by the City to be deficient and provide all additional amendments as directed to modify deficient soils at no additional cost to the City.

**3.16 MAINTENANCE**

- A. Provide maintenance at no extra cost to City; City will pay for water.
- B. Maintain plant life for three months after Date of Substantial Completion.
- C. Irrigate sufficiently to saturate root system and prevent soil from drying out.
- D. Remove dead or broken branches and treat pruned areas or other wounds.
- E. Neatly trim plants where necessary.
- F. Immediately remove clippings after trimming.
- G. Control growth of weeds. Apply herbicides in accordance with manufacturer's instructions.
- H. Control insect damage and disease. Apply pesticides in accordance with manufacturers instructions.
- I. Remedy damage from use of herbicides and pesticides.
- J. Replace mulch when deteriorated.
- K. Maintain wrappings, guys, turnbuckles, and stakes. Adjust turnbuckles to keep guy wires tight. Repair or replace accessories when required.

**3.17 CLEANUP**

- A. Sweep site clean of all excess materials used in these operations. Excess soils shall be swept up and removed off site. Do not wash excess materials into adjacent drainage facilities.

**End of Section**

