

**DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION**

**GENERAL PROVISIONS, NOTICE TO BIDDERS,
SPECIAL PROVISIONS, PROPOSAL AND CONTRACT
FOR**

**Ken Mercer Skatepark
Project No. 20774**

Bid Opening Date – March 21, 2024

11:00 a.m.

To be used in conjunction with the City Standard Specifications and Details dated November 2016, the State Standard Specifications and Plans dated 2015 and all updates at the time of bid, and the Labor Surcharge and Equipment Rental Rates in effect on the date the work is accomplished.



APPROVED



Adam Nelkie
City Engineer
No. 78830
Expires: 9/30/2025

TABLE OF CONTENTS

	<u>PAGE NO.</u>
NOTICE TO BIDDERS	1
BID PROPOSAL.....	5
BID BOND FORM	11
CERTIFICATION OF BIDDER'S	13
EXPERIENCE AND QUALIFICATIONS.....	13
BIDDER'S CONTRACT EXPERIENCE	14
BIDDER'S Labor Classifications	16
INSTRUCTIONS TO BIDDERS.....	20
AWARD AND EXECUTION OF CONTRACT	23
CONTRACT	25
CONTRACTOR'S BOND FOR FAITHFUL PERFORMANCE.....	29
LABOR AND MATERIAL BOND.....	31
CONTRACTOR'S BOND FOR ONE YEAR MAINTENANCE.....	33
GENERAL PROVISIONS.....	35
SECTION 1. DEFINITIONS AND TERMS.....	35
SECTION 2. SCOPE OF WORK.....	36
SECTION 3. CONTROL OF WORK AND MATERIALS.....	36
SECTION 4. LEGAL RELATIONS AND RESPONSIBILITY.....	37
SECTION 5. PROSECUTION AND PROGRESS	43
SECTION 6. MEASUREMENT AND PAYMENT	43
SECTION 7. DISPUTE RESOLUTION.....	45
SPECIAL PROVISIONS	51

NOTICE TO BIDDERS

Proposals Sought; Time for Receipt

Sealed Bid Proposals will be received by the City Clerk's Office of the City of Pleasanton, Civic Center, in-person at 123 Main Street (or by mail to P.O. Box 520), Pleasanton, CA 94566, until **11:00 a.m., March 21, 2024**, for work as described in the Plans and Specifications entitled:

Ken Mercer Skatepark Project No. 20774

At the above-mentioned time, date and address, the Bid Proposals will be publicly opened and read.

Please review the City website and/or bidnetdirect.com for addendum(s) prior to submission.

Scope of Work and Project Location

This work will consist of clearing and grubbing, demolition, erosion control, grading and drainage, electrical and skatepark lighting, permeable pavers, concrete and specialty skatepark concrete, shotcrete, asphalt, site furnishings, irrigation, and landscape improvements. The skatepark is just under 1 acre in size and the landscape and hardscape improvements are a little over 1 acre.

The contractor or subcontractor installing the skatepark improvements must have constructed at least 5 skateparks of at least 20,000 square feet in the last 5 years. If an alternative to the specified Musco lighting is proposed, the Bidder shall submit the submittal form required by the Special Provisions a minimum of 10 days before bids are due.

The Engineer's cost estimate for the project is \$5.38 million.

Copies of Plans and Specifications

In order to be an eligible bidder, plans, specifications and all bid proposal and contract documents must adhere to the latest version of all bid documents as amended through any addendums. Plans may be purchased from the Engineering Division of the City of Pleasanton, Civic Center, 200 Old Bernal Avenue, at a cost of **\$100 per set** plus shipping. Plans will be electronically available on the City's website and bidnetdirect.com at no charge. The City requires all parties interested in this bid opportunity to email the City and request to be added to the plan holder list. Any addenda will be sent electronically to those on the plan holder list prior to the bid opening date. To request plans or to be added to the plan holder list, please email:

mgruber@cityofpleasantonca.gov and kroberts@cityofpleasantonca.gov

Bid Security and Contract Bonds

Each Bid Proposal shall be accompanied by either cash, a cashier's check or a certified check, amounting to not less than ten percent of the bid, payable to the order of the City of Pleasanton or by a bond for that amount and payable in the form contained in this bid package. The successful Bidder will be required to furnish performance and payment bonds, each in an amount not less than one hundred percent (100%) of the contract price, and a maintenance bond not less than ten percent (10%) of the contract price.

Bid Forms

The Contractor is responsible for reviewing the City of Pleasanton's City Bids website (and/or bidnetdirect.com) to ensure they have the latest addendums and utilize all updated documents issued through addendum. Bidders must complete bid proposal and submit it in its entirety. Failure to do so will cause the bid to be deemed nonresponsive.

City of Pleasanton's City Bids Website:

<http://www.cityofpleasantonca.gov/business/bids.asp>

Bids Received After Deadline

Bids received after the time established for receiving bids will not be considered. Except as provided in Section "Instruction to Bidders," no Bidder may withdraw a bid after the time established for receiving bids or before the award and execution of the contract, unless the award is delayed for a period of ninety (90) calendar days after the date of the City's opening of bids.

Rejection of Bids

The City reserves the right to reject any or all bids and to determine which bid is, in the City's judgment, the lowest responsive and responsible bid of a Bidder or group of Bidders. The City also reserves the right to waive any inconsequential omissions or discrepancies in any bid and to delete certain items listed in the bid as set forth therein. Costs for developing, submitting, and presenting bids are the sole responsibility of the Bidder and claims for reimbursement will not be accepted by the City.

Contractor's License Classification

As provided in California Business & Professions Code Section 7028.15, the City has determined that at the time of bid, the Contractor shall possess a valid **Class A General Engineering Contractor** license. The Contractor's failure to possess the specified license shall render the Bid as non-responsive and shall act to bar award of the contract to any Bidder not possessing said license at the time of bid, unless exempted by federal or state law.

Contractor's Department of Industrial Relations Registration

Bidder and its Subcontractors must be registered and qualified to perform public work pursuant to section 1725.5 of the Labor Code, subject to limited legal exceptions under Labor Code section 1771.1.

This Contract will be subject to compliance monitoring and enforcement by the California Department of Industrial Relations, pursuant to Labor Code section 1771.4.

Substitution of Securities in Lieu of Retention

At the successful Contractor's option, securities may be substituted for the required retention, in accordance with provisions of Section 22300 of California Public Contract Code.

Prevailing Wage

In accordance with California Labor Code Sections 1770 et seq., the Contractor shall pay general prevailing rate of per diem wages to all workers employed under this contract.

Labor Nondiscrimination

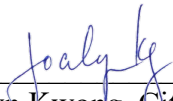
The awarded Contractor shall comply with the requirements of the State of California's Standard Specification Code Section 7-1.01A(4) "Labor Nondiscrimination" under this contract.

Questions

Questions should be directed to the project engineer either in-person at 200 Old Bernal Avenue, Pleasanton, California, by mail at P.O. Box 520, Pleasanton, California 94566-0802, by phone at (925) 931-5650, or by email at mgruber@cityofpleasantonca.gov. Questions will only be answered by reference to particular sections of these bid documents. If interpretation is deemed necessary, then the question shall be addressed in writing and a clarification shall be given to all prospective Bidders through addenda. To allow time for issuance of addenda, questions shall only be accepted prior to seven (7) calendar days before the bid opening date.

CITY OF PLEASANTON

Date: 2/21/2024

By: 
Jocelyn Kwong, City Clerk

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BID PROPOSAL

Project Name
Project No. 20774

DATE: _____

Proposal of _____ (hereinafter called "Bidder") a _____ organized and existing under the laws of the State _____, doing business as _____, to the City of Pleasanton, City Clerk, 123 Main Street, Pleasanton, California (hereinafter called "City").

Ladies and Gentlemen:

The Bidder, in compliance with the invitation for bids for the **KEN MERCER SKATEPARK, PROJECT NO. 20774**, City of Pleasanton, having examined the Plans and Specifications and related documents and the premises of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project including the availability of materials and supplies, declares that this proposal is made without collusion with any other person, firm or corporation and agrees to construct the project in accordance with the contract documents, within the time set forth therein, and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the Contract Documents, of which this Bid Proposal is a part.

Bidder shall agree to commence work under this Contract within fifteen (15) calendar days after the date of written "Notice to Proceed" and fully complete the project within **one-hundred-sixty (160)** working days after start of work. Bidder shall pay as liquidated damages in the sum of **\$2,000.00** per working day should the successful Bidder fail to complete the work within this time limit unless the successful Bidder is granted a time extension.

Bidder acknowledges receipt of the following addendum:

<u>No.</u>	<u>Date</u>	<u>No.</u>	<u>Date</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Bidder to perform all of the work described in the Contract Documents for the total bid amount entered.

Bid Table On Next Page

ITEM NO.	ITEM	UNIT OF MEASURE	APPROX. QNTY	UNIT PRICE (In Dollars)	AMOUNT (In Dollars)
1	BONDING AND MOBILIZATION	LS	1		
2	EROSION CONTROL	LS	1		
3	DEMOLITION	LS	1		
4	TREE PROTECTION	LS	1		
5	CONSTRUCTION FENCING	LS	1		
6	EARTHWORK AND GRADING	LS	1		
7	DRAINAGE AND STORMWATER	LS	1		
8	PUMP STATION	LS	1		
9	WATER LINES	LS	1		
10	LIGHTING SYSTEM	LS	1		
11	CONCRETE CURB	LF	102		
12	12" MOW CURB	LF	137		
13	STANDARD CONCRETE PAVING	SF	500		
14	SITE FURNISHING CONCRETE PADS	SF	191		
15	HANDRAIL	EA	2		
16	CONCRETE STEPS	SF	91		
17	ADA VEHICULAR RAMP	EA	1		
18	ADA SIGNS	LS	1		
19	METAL LEANING RAIL	LF	352		
20	SITE PERMEABLE PAVERS	SF	10,919		
21	PERMEABLE PAVING CURB EDGE	LF	1,345		
22	SKATEPARK EXCAVATION AND ROUGH GRADING	LS	1		
23	SKATEPARK FINEGRADE AND SUBBASE	LS	1		
24	SKATEPARK DRAIN INLET ASSEMBLIES	LS	1		
25	SKATEPARK PLACE AND FINISH UPPER AND LOWER DECK	LS	1		
26	SKATEPARK PLACE AND FINISH RAMPS AND BOWLS	LS	1		
27	SKATEPARK FORM AND POUR CAST-IN-PLACE WALLS AND CURBS	LS	1		
28	SKATEPARK SETUP TRANSITIONS AND DECK	LS	1		
29	SKATEPARK COPING AND RAILS	LS	1		
30	SKATEPARK REBAR	LS	1		
31	ASPHALT	SF	600		
32	TYPE 1 BOLLARD	EA	3		
33	TYPE 2 BOLLARD	EA	6		
34	TABLE	EA	3		
35	BIKE RACK	EA	5		
36	DRINKING FOUNTAIN	EA	1		
37	CHAINLINK FENCING AND GATE	LF	62		
38	IRRIGATION	LS	1		
39	LANDSCAPE AND BIORETENTION SOIL PREP.	LS	1		

ITEM NO.	ITEM	UNIT OF MEASURE	APPROX. QNTY	UNIT PRICE (In Dollars)	AMOUNT (In Dollars)
40	TREE, 15 GALLON	EA	24		
41	SHRUB, 5 GALLON	EA	37		
42	GROUNDCOVER, 1 GALLON	EA	1,255		
43	MULCH	SF	9,450		
44	TURF FROM SOD	SF	27,008		
45	LANDSCAPE BOULDER	EA	9		
46	LANDSCAPE MAINTENANCE	LS	1		
TOTAL BASE BID				\$	

BID ALTERNATES					
47	SHADE STRUCTURE ENTRY PLAZA - BID ALTERNATE #1	LS	1		
48	SHADE STRUCTURE SPECTATOR AREA - BID ALTERNATE #2	LS	1		
49	ARCHWAY SIGN - BID ALTERNATE #3	LS	1		
50	PLANTING AREAS - NE & NW CORNERS - BID ALTERNATE #4 (DEDUCT)	LS	1		
51	ENTRY MONUMNET SIGN - BID ALTERNATE #5 (DEDUCT)	LS	1		
TOTAL BID ALTERNATES				\$	

TOTAL BASE BID + BID ALTERNATES				\$	
--	--	--	--	----	--

The project will be awarded based on the TOTAL BASE BID amount.

Note: The Bidder acknowledges that the total amount set forth above is for the entire project as represented by the Contract Documents regardless of itemization.

Attached is a bid guaranty bond duly completed by a guaranty company authorized to carry on business in the State of California in the amount of at least ten percent (10%) of the total amount of the bid, or alternately, there is attached a certified or cashier's check payable to the City in the amount of at least ten percent (10%) of the total amount of the bid.

If this Bid Proposal is accepted, bidder agrees to sign the contract and to furnish the performance bond, labor and materials bond, maintenance bond, and the required evidences of insurance within ten (10) working days after receiving written notice of the award of the contract. If bidder fails to contract as provided herein or fails to provide the bonds and/or evidence of insurance, the City may at its option, determine the acceptance thereof shall be null and void, and the forfeiture of such security accompanying this Bid Proposal shall operate and the same shall be the property of the City of Pleasanton.

This Bid Proposal shall be good and may not be modified, withdrawn or canceled for a period of ninety (90) calendar days after the date of the City's opening of bids.

Bidder hereby certifies that the licensing information hereinafter stated is true and correct. Bidder further agrees, if the bid is accepted and a contract for performance of the work is entered into with the City, to so plan work and to prosecute it with such diligence that the work shall be completed within the time stipulated in the agreement. Under the penalty of perjury bidder affirms that, to the best of bidder's knowledge, the representations made in this bid are true.

Bidders are required by law to be licensed and regulated by the contractors' State License Board. Any questions concerning a contractor may be referred to the Registrar, Contractors' State License Board.

It is a misdemeanor for any person to submit a bid to a public agency in order to engage in the business or act in the capacity of a contractor within this state without having a license therefor, except for specific cases outlined in Business and Professions Code, Section 7028.15.

Name of Bidder

Contractor's License Number

Signature of Bidder

Expiration Date

Print Name

Address of Bidder

Title of Signatory

()

State of Incorporation

Telephone Number

DIR Registration Number

Contractor's Email Address

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BID BOND FORM

Note: Bidders must use this form if a bid bond is to be used as bidder's security. This form is not necessary if cash, cashier's check made payable to the City, or certified check made payable to the City, accompanies the bid.

We, the undersigned, _____ (“Principal”), and _____ a corporation organized and existing under and by virtue of the laws of the State of _____ and authorized to do business in the State of California as a surety, (“Surety”), acknowledge ourselves jointly and severally bound to the CITY OF PLEASANTON for ten percent (10%) of the total bid amount.

Contractor’s Bid \$ _____
10% Bid Bond \$ _____

The above amount to be paid to the CITY OF PLEASANTON as follows: If Principal’s bid for the work required for the project, described below,

KEN MERCER SKATEPARK PROJECT NO. 20774

shall be accepted and the proposed contract awarded to Principal, and if Principal shall fail to execute the contract within the time specified in the Award and Execution of Contract section of this Contract Document, and to furnish the required faithful performance and labor and material bonds; otherwise, the obligation shall be void. Bid errors shall not constitute a defense to forfeiture.

If the City of Pleasanton brings suit upon this bond and judgment is recovered, Surety shall pay all costs incurred by the CITY OF PLEASANTON in bringing such suit, including reasonable attorney's fees.

IN WITNESS WHEREOF, we hereunto set our hands and seals this ____ day of _____, 20__.

Principal

By:

Surety:

By:

(Notarization of Surety's signature required)

(corporate seal)

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CERTIFICATION OF BIDDER'S EXPERIENCE AND QUALIFICATIONS

The undersigned Bidder certifies that the Bidder is, at the time of the bidding, and shall be, throughout the period of the contract, licensed by the State of California to do the type of work required under the terms of the contract documents. Bidder further certifies that the Bidder is skilled and regularly engaged in the general class and type of work called for in the contract documents.

The Bidder represents that the Bidder is competent, knowledgeable and has special skills in the nature, extent and inherent conditions of the work to be performed. The bidder, or their sub-contractor, shall have satisfactorily completed the installation of a minimum of five (5) similar skate park projects of at least 20,000 square feet in size over the last five (5) years. Refer to the Skate Park Contractor Qualifications Appendix of the Special Provisions for further requirements.

Bidder further acknowledges that there are certain peculiar and inherent conditions existent in the construction of the particular facilities which may create, during the construction program, unusual or peculiar unsafe conditions hazardous to persons and property. Bidder expressly acknowledges that the Bidder is aware of such peculiar risks and has the skill and experience to foresee and to adopt protective measures to adequately and safely perform the construction work with respect to such hazards.

Bidder has been engaged in the contracting business, under the present business name, for _____ years. Experience in work of a similar nature to that called for in the contract documents extends over a period of _____ years.

BIDDER'S CONTRACT EXPERIENCE

The Bidder shall list below five (5) projects completed in the last five (5) years of similar size and complexity that indicate the Bidder's experience as a Contractor.

1.

Project	Amount
Owner	Contact
Telephone	Completion Date

2.

Project	Amount
Owner	Contact
Telephone	Completion Date

3.

Project	Amount
Owner	Contact
Telephone	Completion Date

4.

Project	Amount
Owner	Contact
Telephone	Completion Date

5.

Project	Amount
Owner	Contact
Telephone	Completion Date

Name of Bidder _____

Signed this _____ day of _____, 20_____.

BIDDER'S Labor Classifications

The Bidder shall list below the anticipated labor classifications completed by Bidder. List Subcontractor's classifications under List of Subcontractors.

- | | | | |
|--|--|---|--|
| <input type="checkbox"/> ASBESTOS | <input type="checkbox"/> BOILERMAKER | <input type="checkbox"/> BRICKLAYERS | <input type="checkbox"/> CARPENTERS |
| <input type="checkbox"/> CARPET/LINOLEUM | <input type="checkbox"/> CEMENT MASONS | <input type="checkbox"/> DRYWALL FINISHER | <input type="checkbox"/> DRYWALL/LATHERS |
| <input type="checkbox"/> ELECTRICIANS | <input type="checkbox"/> ELEVATOR MECHANIC | <input type="checkbox"/> GLAZIERS | <input type="checkbox"/> IRON WORKERS |
| <input type="checkbox"/> LABORERS | <input type="checkbox"/> MILLWRIGHTS | <input type="checkbox"/> OPERATING ENG | <input type="checkbox"/> PAINTERS |
| <input type="checkbox"/> PILE DRIVERS | <input type="checkbox"/> PIPE TRADES | <input type="checkbox"/> PLASTERERS | <input type="checkbox"/> ROOFERS |
| <input type="checkbox"/> SHEET METAL | <input type="checkbox"/> SOUND/COMM | <input type="checkbox"/> SURVEYORS | <input type="checkbox"/> TEAMSTER |
| <input type="checkbox"/> TILE WORKERS | <input type="checkbox"/> _____ | <input type="checkbox"/> _____ | <input type="checkbox"/> _____ |

B. BIDDER'S FINANCIAL RESPONSIBILITY

Reference is hereby made to the following banks and surety companies as to the financial responsibility and general reliability of the Bidder:

1. Name of Bank _____
Address _____
2. Name of Bank _____
Address _____
3. Surety Company _____
Address _____
4. Surety Company _____
Address _____

C. LIST OF SUBCONTRACTORS

In conformance with Section 2.1 – 1.10 of the Caltrans Standard Specifications and § 4100 of California Public Contract Code, the Bidder shall provide the following information for each Subcontractor to whom the Bidder proposes to subcontract portions of the work in an amount in excess of one-half of one percent of the total Bid Proposal OR \$10,000, whichever is greater.

1. Name of Subcontractor _____
Contractor License Number _____
Address _____ Phone No. _____
Individual, Partnership or Corporation _____
Dollar Value of work to be Performed _____
Work to be Performed _____
Labor Classification/s _____
DIR Registration # _____
CSLB# _____ Email _____

2. Name of Subcontractor _____

Contractor License Number _____

Address _____ Phone No. _____

Individual, Partnership or Corporation _____

Dollar Value of work to be Performed _____

Work to be Performed _____

Labor Classification/s _____

DIR Registration # _____

CSLB# _____ Email _____

3. Name of Subcontractor _____

Contractor License Number _____

Address _____ Phone No. _____

Individual, Partnership or Corporation _____

Dollar Value of work to be Performed _____

Work to be Performed _____

Labor Classification/s _____

DIR Registration # _____

CSLB# _____ Email _____

4. Name of Subcontractor _____

Contractor License Number _____

Address _____ Phone No. _____

Individual, Partnership or Corporation _____

Dollar Value of work to be Performed _____

Work to be Performed _____

Labor Classification/s _____

DIR Registration # _____

CSLB# _____ Email _____

5. Name of Subcontractor _____

Contractor License Number _____

Address _____ Phone No. _____

Individual, Partnership or Corporation _____

Dollar Value of work to be Performed _____

Work to be Performed _____

Labor Classification/s _____

DIR Registration # _____

CSLB# _____ Email _____

6. Name of Subcontractor _____

Contractor License Number _____

Address _____ Phone No. _____

Individual, Partnership or Corporation _____

Dollar Value of work to be Performed _____

Work to be Performed _____

Labor Classification/s _____

DIR Registration # _____

CSLB# _____ Email _____

Signature of Bidder: _____

INSTRUCTIONS TO BIDDERS

General

The City of Pleasanton, hereinafter referred to as "City," will receive at the City Clerk's Office of the City of Pleasanton, Civic Center, 123 Main Street, Pleasanton, California, until the hour and day specified in the "Notice to Bidders," sealed Bid Proposals for furnishing materials, equipment and/or labor for performing the work described in these Contract Documents. All Bid Proposals shall be submitted in accordance with the provisions of the "Proposal Requirements and Conditions" set forth under Section 2 of the Standard Specifications of the State of California, except as modified herein.

Plan Holder List

The City requires all Bidders to be on the project's plan holder list prior to submitting the Bid Proposal. Please see Notice to Bidders for instructions on how to request to be added to the plan holder list.

Bid Proposal Form

All Bid Proposals shall be submitted on the Bid Proposal forms which are bound herein. All Bid Proposal forms shall be filled in completely in ink with all signature blocks signed by the Bidder. The completed Bid Proposal forms shall remain bound with the Contract Documents provided and shall be sealed in an envelope addressed to the City of Pleasanton, California and clearly labeled with identifying project name and number, and bid opening date.

Delivery of Bid Proposal

The Bid Proposal shall be delivered by the time and to the place set forth in the "Notice to Bidders." It is the Bidder's sole responsibility to see that his or her Bid Proposal is received in proper time. Any proposal received after the time fixed for opening of bids shall be returned to the Bidder unopened.

Opening of Bid Proposals

The Bid Proposals shall be publicly opened and read at the time and place fixed in the "Notice to Bidders."

Modifications and Alternative Proposals

Each Bidder represents that his or her Bid Proposal is based upon the materials and equipment described in the Contract Documents. Unauthorized conditions, limitations or provisions attached to a Bid Proposal will render it non-responsive and may cause its rejection. The completed Bid Proposal forms shall be without interlineations, alterations or erasures. Alternative Bid Proposals will not be considered unless written request has

been submitted to the Engineer for approval at least seven (7) calendar days prior to the date for receipt of Bids. The request shall include the name of substitute material or equipment drawings, cut sheets, performance and test dates and any other data or information necessary for complete evaluation. If the Engineer approves any proposed substitution, such approval shall be set forth in an Addendum. Oral, telegraphic, or telephonic Bid Proposals or modifications will not be considered.

If the Bidder is proposing **an alternative to the Musco Lighting** specified on the plans, the Bidder shall provide the submittal form on pages 8 and 9 of Section 26 56 68 Exterior Athletic Lighting Lighting System with LED Light Source of the Special Provisions a minimum of **ten (10) days** prior to the bid. Refer to Special Provisions, Section 26 56 68 - 4.1 Pre-Bid Submittal Requirements for more information.

Contractor's Department of Industrial Relations Registration

A bid will not be accepted nor any contract entered into without proof that the bidder and its subcontractors are registered with the California Department of Industrial Relations to perform public work pursuant to Labor Code Section 1725.5, subject to limited legal exceptions.

Discrepancies in Bid Proposals

In the event there is more than one bid item on a Bid Proposal form, the Bidder shall furnish a price for all items and failure to do so will render the Bid Proposal non-responsive and may cause its rejection. In the event there are unit price bid items on a Bid Proposal form and the "amount" indicated for a unit price bid item does not equal the product of the unit price and quantity, the unit price shall govern and the amount will be corrected accordingly. In the event there is more than one bid item on the Bid Proposal form and the total indicated on the Bid Proposal form does not agree with the sum of the amounts bid on the individual items, the price bid on the individual items shall govern and the total on the proposal will be corrected accordingly.

Bid Security

Each Bid Proposal shall be accompanied by cash, a cashier's check or a certified check, amounting to ten percent (10%) of the Bid, payable to the order of the City of Pleasanton or by a bond for that amount and so payable in the form contained in this bid package. The amount so posted shall be forfeited to the City if the successful bidder does not, within ten (10) working days not including Saturday, Sunday and legal holidays after date of postage of mailed written notice that the contract has been awarded, enter into a contract with the City for the work.

After the contract is duly entered into by the successful bidder, the amount of the deposit will be returned to the Bidder. All certified checks, cashier's checks, and cash deposits of the unsuccessful bidders will be returned to the bidders within two (2) weeks after the contract is entered into by the successful bidder.

Miscellaneous

For requirements on Bidder's examination of site, withdrawal of proposals, and disqualification of bidders, refer to Section 2 of the Standard Specifications of the State of California.

AWARD AND EXECUTION OF CONTRACT

General

Award and execution of Contract shall be in accordance with "Award and Execution of Contract" set forth under Section 3 of the Standard Specifications of the State of California except as modified herein.

Award of Contract

The City reserves the right to reject for any reason any or all Bid Proposals.

No Bidder shall modify, withdraw or cancel a Bid Proposal or any part thereof for ninety (90) calendar days after the time designated for the opening of Bids in the "Notice to Bidders." Within this time period of ninety (90) days and if the City so chooses, the Contract shall be awarded to the lowest responsible Bidder.

In accordance with the provisions of California Business & Professions Code Section 7028.5, the City has determined that at the time that a bid is submitted, the bidder shall possess a valid **Class A General Engineering Contractor** license. Failure to possess the specified license shall render the bid as non-responsive and shall act to bar award of the Contract to any Bidder not possessing said license at the time of bid.

Execution of Contract

Within ten (10) working days, not including Saturday, Sundays and legal holidays, after date of postage of mailed notice of award to the lowest responsible Bidder, the following documents shall be submitted to the City.

- Executed contract
- Contract bonds as required by the forms contained herein including:
 - ◇ Faithful Performance Bond for 100% of contract price
 - ◇ Labor and Material Bond for 100% of contract price
 - ◇ Maintenance Bond for 10% of contract price
- Certificates of insurance
- Evidence of a current business license to conduct business in the City of Pleasanton

Failure to submit the above shall be just cause for forfeiture of the Bid Proposal security.

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CONTRACT

KEN MERCER SKATEPARK PROJECT NO. 20774

THIS CONTRACT is made and entered into this _____ day of _____, 20__
by and between _____, ("Contractor"), whose address is _____
and the CITY OF PLEASANTON, a municipal corporation ("City").

WITNESSETH:

WHEREAS, the City has awarded to the Contractor a contract for **KEN MERCER SKATEPARK, PROJECT NO. 20774**

NOW, THEREFORE, in consideration of the mutual promises set forth herein, the parties agree as follows:

1. Work to be Performed. The work will generally consist of:

This work will consist of clearing and grubbing, demolition, erosion control, grading and drainage, electrical and skatepark lighting, permeable pavers, concrete and specialty skatepark concrete, shotcrete, asphalt, site furnishings, irrigation, and landscape improvements. The skatepark is just under 1 acre in size and the landscape and hardscape improvements are a little over 1 acre.

The contractor or subcontractor installing the skatepark improvements must have constructed at least 5 skateparks of at least 20,000 square feet in the last 5 years. If an alternative to the specified Musco lighting is proposed, the Bidder shall submit the submittal form required by the Special Provisions a minimum of 10 days before bids are due.

Said work is more particularly shown in the following documents which are on file with the Public Works Department, Engineering Division of the City and are incorporated herein by this reference:

- A. Approved Plans and Specifications entitled the **KEN MERCER SKATEPARK, PROJECT NO. 20774** and addenda thereto, if any.
- B. Contract Change Orders approved by the City Engineer, done in accordance with the Standard Specifications.
- C. The elements of the proposal submitted to the City by the Contractor, which the City has accepted.

2. Compensation. The City shall pay the Contractor for work actually performed at the unit prices set out in the Contractor's proposal to the City as set forth in Exhibit A of this agreement and incorporated herein. The quantities of work stated therein are estimates only; actual quantities will be measured for payment in accordance with the specifications.
3. Method of Payment.
 - A. Progress Payments. As of the twentieth day of each month, the Contractor may submit for review a request for progress payment, listing the amount and value of work actually performed during the preceding month, or part thereof. Upon the City Engineer's review and approval, including adjustments if any, City shall make a progress payment to the Contractor.
 - B. 5% Retention. Five percent (5%) of the amount due shall be retained by the City as retention. The City shall retain five percent (5%) of the contract amount for thirty-five (35) days after the Notice of Completion for the work is recorded. The Contractor may elect to receive 100 percent of payments due under the contract documents from time to time, without retention from any portion of the payment by the City, by depositing securities of equivalent value with the City in accordance with the provisions of Section 22300 of the California Public Contract Code. Such securities, if deposited by the Contractor, shall be valued by the City, whose decision on valuation of the securities shall be final. Securities eligible for investment under this provision shall be limited to those listed in Section 16430 of the California Government Code.
 - C. Time of Payment. Requests submitted promptly as of the 20th day of each month will be paid by the 10th day of the following month.
4. Incorporation of Contract Documents. This Contract expressly incorporates all terms and conditions contained in the Contract Documents. In the event there is any conflict between this Contract and the Contract Documents, this Contract shall control.
5. Indemnification. **Contractor shall indemnify, save and hold harmless from and defend the City, members of the City Council and their agents, servants and employees, against any and all claims, costs, demands, causes of action, suits, losses, expense or other detriment or liability arising from or out of acts or omissions of Contractor, its agents, sub-contractors, officials or employees, in connection with the execution of the work covered by this Contract or any amendments thereto.**

6. Certification re: Workers' Compensation. In accordance with Section 1861 of the California Labor Code, each contractor to whom a public works contract is awarded shall sign and file with the awarding body the following certification prior to performing the work of the contract: "I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract."
7. Department of Industrial Relations: Pursuant to Labor Code section 1771.1, the Bidder and its Subcontractors must be registered and qualified to perform public work pursuant to section 1725.5 of the Labor Code, subject to limited legal exceptions.
8. Independent Contractor. The Contractor is an independent contractor retained by the City to perform the work described herein. All personnel employed by the Contractor, including subcontractors, and personnel of said subcontractors, are not and shall not be employees of the City.
9. Warranty Against Defects. The Contractor hereby warrants all work done under this contract against all defects in materials and workmanship for a period of 12 months following City's acceptance of said work. If any defects occur within said 12 months, the Contractor shall be solely responsible for the correction of those defects.
10. Counterparts and Electronic Signatures. This contract may be executed in multiple counterparts, each of which shall be an original and all of which together shall constitute one agreement. Counterparts may be delivered via facsimile, electronic mail (including pdf or any electronic signature complying with U.S. federal E-Sign Act of 2000 (15 U.S. Code §7001 et seq.), California Uniform Electronic Transactions Act (Cal. Civil Code §1633.1 et seq.), or other applicable law) or other transmission method, and any counterpart so delivered shall be deemed to have been duly and validly delivered and be valid and effective for all purposes.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement the date and year first above written.

CONTRACTOR:

By: _____
Its Authorized Agent

By: _____
Its Authorized Agent
(Second signature required if a corporation)

CITY OF PLEASANTON:

By: _____
Gerry Beaudin, City Manager

ATTEST:

Jocelyn Kwong, City Clerk

APPROVED AS TO FORM:

Daniel G. Sodergren, City Attorney

CONTRACTOR'S BOND FOR FAITHFUL PERFORMANCE

KNOW ALL PERSONS BY THESE PRESENTS:

Whereas, The City Council of the City of Pleasanton, State of California, and _____ (“Principal”) have entered into an agreement whereby Principal agrees to install and complete certain designated public improvements, which said agreement, dated _____, 20__, and identified as **KEN MERCER SKATEPARK, PROJECT NO. 20774**, is hereby referred to and made a part hereof; and

Whereas, Said Principal is required under the terms of said agreement to furnish a bond for the faithful performance of said agreement.

Now, therefore, we, Principal and _____ (“Surety”), are held and firmly bound unto the City of Pleasanton, in the penal sum of _____ dollars (\$ _____) lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, successors, executors and administrators, jointly and severally, firmly by these presents.

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

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

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

In witness whereof, this instrument has been duly executed by the Principal(s) and Surety above named, on _____, 20__..

Contractor

Surety

By: _____

By: _____

By: _____

By: _____

Date Signed: _____

Surety Address

Surety's Phone No.

(attach acknowledgments)

LABOR AND MATERIAL BOND

Whereas, the City Council of the City of Pleasanton, State of California, and _____ (“Principal”) have entered into an agreement whereby Principal agrees to install and complete certain designated public improvements, which agreement, dated _____, 20____, and identified as **KEN MERCER SKATEPARK, PROJECT NO. 20774**, is hereby referred to and made a part hereof; and

Whereas, Under the terms of the agreement, Principal is required before entering upon the performance of the work, to file a good and sufficient payment bond with the City of Pleasanton to secure the claims to which reference is made in Title 3 (commencing with Section 9000) of Part 6 of Division 4 of the Civil Code.

Now, therefore, Principal and the undersigned as corporate surety, are held firmly bound unto the City of Pleasanton and all contractors, subcontractors, laborers, material suppliers, and other persons employed in the performance of the agreement and referred to in Title 3 (commencing with Section 9000) of Part 6 of Division 4 of the Civil Code in the sum of _____ dollars (\$ _____), for materials furnished or labor thereon of any kind, or for amounts due under the Unemployment Insurance Act with respect to this work or labor, that the surety will pay the same in an amount not exceeding the amount hereinabove set forth, and also in case suit is brought upon this bond, will pay, in addition to the face amount thereof, costs and reasonable expenses and fees, including reasonable attorney’s fees, incurred by City of Pleasanton in successfully enforcing this obligation, to be awarded and fixed by the court, and to be taxed as costs and to be included in the judgment therein rendered.

It is hereby expressly stipulated and agreed that this bond shall inure to the benefit of any and all persons, companies, and corporations entitled to file claims under Title 3 (commencing with Section 9000) of Part 6 of Division 4 of the Civil Code, so as to give a right of action to them or their assigns in any suit brought upon this bond.

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

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

In witness whereof, this instrument has been duly executed by Principal and surety above named, on _____, 20____.

Principal

Surety

By: _____

By: _____

(signature of Principal and Surety must be notarized)

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CONTRACTOR'S BOND FOR ONE YEAR MAINTENANCE

KEN MERCER SKATEPARK PROJECT NO. 20774

KNOW ALL PERSONS BY THESE PRESENTS:

WHEREAS, the City of Pleasanton has awarded and _____ (“Contractor”) is about to execute a Contract for the above-referenced Project ("Contract") and the terms thereof, which are incorporated herein by reference, require the furnishing of a bond with said Contract providing for maintenance for a period of one (1) year from the date of acceptance by the City Council of said contract by the Contractor.

NOW, THEREFORE, WE, Contractor and _____ (“Surety”), are held firmly bound unto the City of Pleasanton, as Agency in the penal sum of:

_____ DOLLARS, (\$ _____), lawful money of the United States of America, said sum being ten percent (10%) of the estimated amount payable by Agency under the terms of the contract, for payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that if the above bounden _____, Principal(s), within a period of one (1) year after the completion and acceptance of the project fulfills the provisions of the Contract and complies with any necessary repairs or replacement of faulty materials to the **KEN MERCER SKATEPARK, PROJECT NO. 20774** and related facilities, then the above obligation shall be void; otherwise to remain in full force and effect.

No cancellation or termination of this bond by Surety shall be effective unless thirty (30) days prior written notice thereof has been delivered to the City Engineer, provided that no cancellation or termination shall affect any liability incurred or accrued hereunder prior to the expiration of said thirty (30) day period or any work performed under any Contract issued by the City.

This bond is executed in accordance with the rules, regulations, standards, specifications and policies of the City of Pleasanton.

Bond No. _____

IN WITNESS WHEREOF, the Principal(s) and Surety have caused these presents to be executed, and corporate names and seals to be hereunto attached by proper officers hereunto duly authorized, the day and year first herein-above written.

Contractor

Surety

By:

By: _____

By:

By: _____

Date Signed

Surety Address:

Surety Phone No. () _____

(attach acknowledgments)

GENERAL PROVISIONS

Unless otherwise stated in these Contract Documents or deemed inapplicable by the Engineer, the General Provisions of the State of California Standard Specifications are hereby incorporated with the following General Provisions.

SECTION 1. DEFINITIONS AND TERMS

As used in these Contract Documents unless the context otherwise requires, the following terms have the meanings indicated:

Addenda: Are written or graphic instruments, clarifications or corrections, issued prior to the execution of the contract, which modify or interpret the Contract Documents.

Bidder: Any individual, partnership or corporation submitting a Bid Proposal for the work described in the Contract Documents.

Bidding Documents: Includes the Notice to Bidders, the Bid Proposal, Bid Bond, Contractor's Information Forms including the Contractor's past experience, financial responsibility and Subcontractors, and Instructions to Bidders.

City: The City of Pleasanton.

City Standard Specifications and Standard Details: Means the November 2016 edition of the City's Standard Specifications and Standard Details.

Contractor: Any individual, partnership or corporation that has entered into a Contract with the City to perform the work described in the Contract Documents.

Contract Documents: Includes the Bidding Documents, the Award and Execution of Contract Requirements, the Contract, the Labor and Material Bond, the Performance Bond, the Maintenance Bond, the City General Provisions, the Special Provisions, Project Plans, the City of Pleasanton Standard Specifications, and Standard Details, the State Standard Specifications and Plans, all Addenda issued by the City and all Change Orders executed by the City.

Engineer: The City Engineer of the City of Pleasanton, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties entrusted to them.

General Provisions: Those Specifications that apply to all projects unless specifically modified by Special Provisions.

Project Plans: Drawings specifically prepared for a particular project.

Special Provisions: Specifications specifically prepared for a particular project.

State Standard Specifications and Standard Plans: Means the May 2015 edition of the Standard Specifications and Standard Plans of the State of California, Department of Transportation. Any reference therein to the State of California or a State agency, office or officer shall be interpreted to refer to the City or its corresponding agency, office or officer acting under this contract.

Subcontractor: Any individual, partnership or corporation that has contracted with the Contractor to provide labor, equipment and/or materials described in the Contract Documents which is an amount in excess of one-half of one (1) percent of the Contractor's total Bid.

Work: Material, equipment and labor to be provided to City by the Contractor as defined by the Contract Documents.

SECTION 2. SCOPE OF WORK

The Work presented in these Contract Documents shall be done in accordance with: 1) the Special Provisions and Project Plans, 2) the City Standard Specifications and Standard Details and 3) the State Standard Specifications and Standard Plans. In case of conflicting portions, the above order of precedence shall prevail. In case of conflict between the specifications and drawings, the specifications shall prevail.

SECTION 3. CONTROL OF WORK AND MATERIALS

3-01. Protection of Workers in Trench Excavations: As required by Section 6705 of the California Labor Code and in addition thereto, whenever work under the Contract involves the excavation of any trench or trenches 5 feet or more in depth, the Contractor shall submit for acceptance by the City or by a registered civil or structural engineer, employed by the City, to whom authority to accept has been delegated, in advance of excavation, a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation, of such trench or trenches. If such plan varies from the shoring system standards established by the Construction Safety Orders of the Division of Industrial Safety, the plan shall be prepared by a registered civil or structural engineer employed by the Contractor, and all costs therefore shall be included in the price named in the Contract for completion of the Work as set forth in the Contract Documents. Nothing in this Section shall be construed to impose tort liability on the City, the Engineer, nor any of their officers, agents, representatives, or employees.

3-02. Substitution of Materials; Assignment of Certain Rights: In accordance with the provisions of Section 3400 of the California Public Contract Code, a Contractor shall be provided a period of not less than 35 days after award of the contract for submission of data substantiating a request for a substitution of "an equal" item.

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

SECTION 4. LEGAL RELATIONS AND RESPONSIBILITY

4-01. Travel and Subsistence Payments:

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

4-02. State Wage Determination:

- (a) As required by Sections 1770 et seq., of the California Labor Code, the Contractor shall pay not less than the prevailing rate of per diem wages as determined by the Director of the California Department of Industrial Relations. Copies of such prevailing rate of per diem wages are on file at the City's Engineering Counter, which copies shall be made available to any interested party on request. The Contractor shall post a copy of such determination at each job site.
- (b) As provided in Section 1775 of the California Labor Code, the Contractor shall, as a penalty to the City, forfeit \$50.00 for each calendar day, or portion thereof, for each worker paid less than the prevailing rates as determined by the City Engineer for such work or craft in which such worker is employed for any public work done under the contract by it or by any subcontractor under it.

4-03. Payroll Records; Retention; Inspection; Compliance Penalties; Rules and Regulations

- (a) As required under the provisions of Section 1776 of the California Labor Code, each Contractor and subcontractor shall keep an accurate payroll record, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by him or her in connection with the public work.
- (b) The payroll records enumerated in Paragraph 4-03(a), herein, shall be certified and shall be available for inspection at all reasonable hours at the principal office of the Contractor on the following basis:
 - 1. A certified copy of an employee's payroll record shall be made available for inspection or furnished to the employee or his or her authorized representative on request.
 - 2. A certified copy of all payroll records enumerated in Paragraph 4-03(a), herein, shall be made available for inspection or furnished upon request to a representative of the body awarding the contract, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the Department of Industrial Relations.
 - 3. A certified copy of all payroll records enumerated in Paragraph 4-03(a), herein, shall be made available upon request by the public for inspection or copies thereof made; provided, however, that a request by the public shall be made through either the body awarding the contract, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the requested payroll records have not been provided pursuant to subparagraph 4-03(b2), herein, the requesting party shall pay the costs of preparation by the Contractor, subcontractors, and the entity through which the request was made. The public shall not be given access to the records at the principal offices of the Contractor.
- (c) Each Contractor shall file a certified copy of the records, enumerated in Paragraph 4-03(a) with the entity that requested the records within 10 days after receipt of a written request.
- (d) Any copy of records made available for inspection and copies furnished upon request to the public or any public agency by the awarding body, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement, shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address, and social security number. The name and address of

the Contractor awarded the contract or performing the contract shall not be marked or obliterated.

- (e) The Contractor shall inform the body awarding the contract of the location of the records enumerated under Paragraph 4-03(a) including the street address, city and county, and shall, within five (5) working days, provide a notice of change of location and address.
- (f) In the event of noncompliance with the requirements of this Article, the Contractor shall have ten (10) days in which to comply subsequent to receipt of written notice specifying in what respects the Contractor must comply with this Article. Should noncompliance still be evident after the 10-day period, the Contractor shall, as a penalty to the state or political subdivision on whose behalf the Contract is made or awarded, forfeit \$25.00 dollars for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due. Responsibility for compliance with these Paragraphs 4-03(a) through 4-03(f) lies with the Contractor.
- (g) In conformance with State Bill 854 all contractors and subcontractors must furnish electronic certified payroll records directly to the Labor Commissioner (aka Division of Labor Standards Enforcement) as of projects awarded on or after April 1, 2015 unless exempted by federal or state law.

4-04. Apprentices: Attention is directed to Sections 1777.5 and 1777.6 and 1777.7 of the California Labor Code and Title 8, California Administrative Code Section 200 et seq. To insure compliance and complete understanding of the law regarding apprentices, and specifically the required ratio thereunder, the Contractor (and subcontractors) should, where some question exists, contact the Division of Apprenticeship Standards prior to commencement of the work. Responsibility for compliance with this Section 4.04 lies with the Contractor. The City policy is to encourage the employment and training of apprentices on its construction contracts as may be permitted under local apprenticeship standards.

4-05. Working Hours. The Contractor shall comply with all applicable provisions of Section 1810 to 1815, inclusive, of the California Labor Code relating to working hours. The Contractor shall, as a penalty of the City, forfeit \$25.00 for each worker employed in the execution of the contract by the Contractor or by any Subcontractor for each calendar day during which such worker is required or permitted to work more than eight (8) hours in any one calendar day and 40 hours in any one calendar week, unless such worker receives compensation for all hours worked in excess of eight (8) hours at not less than 1-1/2 times the basic rate of pay.

4-06. Workers' Compensation:

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

4-07. Prime Contractor Job Site Postings. Pursuant to Labor Code Section 1771.4, Contractor is required to post all job site notices prescribed by law or regulation. The contractor shall comply with all applicable provisions of section 16451 (d) of California Labor Code relating to the posting of job site notices prescribed by regulation.

4-08. Insurance Requirements for Contractors: BIDDER'S ATTENTION IS DIRECTED TO THE INSURANCE REQUIREMENTS BELOW. IT IS HIGHLY RECOMMENDED THAT BIDDERS CONFER WITH THEIR RESPECTIVE INSURANCE CARRIERS OR BROKERS TO DETERMINE IN ADVANCE OF BID SUBMISSION THE AVAILABILITY OF INSURANCE CERTIFICATES AND ENDORSEMENTS AS PRESCRIBED AND PROVIDED HEREIN. IF AN APPARENT LOW BIDDER FAILS TO COMPLY STRICTLY WITH THE INSURANCE REQUIREMENTS, THAT BIDDER MAY BE DISQUALIFIED FROM AWARD OF THE CONTRACT.

Contractor shall procure and maintain for the duration of this contract, including one year maintenance period, contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, the Contractor's agents, representatives, employees or subcontractors. The cost of such insurance shall be included in the Contractor's bid.

(a) Minimum Scope of Insurance

Coverage shall be at least as broad as:

1. Insurance Services Office form number CG 00 01 (ED. 1/96) covering Commercial General Liability and name the City as additional insured.
2. Insurance Services Office form number CA 00 01 (Ed. 12/93) covering Automobile Liability, Code 1 "any auto."

3. Workers' Compensation insurance as required by the Labor Code of the State of California and Employers Liability insurance, and an endorsement for waiver of subrogation.

(b) Minimum Limits of Insurance

Contractor shall maintain limits no less than:

1. General Liability: \$2,000,000 per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit.
2. Automobile Liability: \$2,000,000 per accident for bodily injury and property damage.
3. Workers' Compensation and Employers Liability: Workers' compensation limits as required by the Labor Code of the State of California and Employers Liability limits of \$2,000,000 per accident.

(c) Deductibles and Self-Insured Retentions

Any deductibles or self-insured retentions must be declared to and approved by the City. At the option of the City, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the City, its officers, officials, employees and volunteers; or the Contractor shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

(d) Other Insurance Provisions

The policies are to contain, or be endorsed to contain, the following provisions:

1. General Liability and Automobile Liability Coverages
 - a. The City, its officers, officials, employees and volunteers are to be covered as additional insureds as respects: liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor; premises owned, occupied or used by the Contractor; or automobiles owned, leased, hired or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the City, its officers, officials, employees or volunteers.

- b. The Contractor's insurance coverage shall be primary insurance as respects the City, its officers, officials, employees and volunteers. Any insurance or self-insurance maintained by the City, its officers, officials, employees or volunteers shall be excess of the Contractor's insurance and shall not contribute with it.
- c. The specific coverage obligations set forth in this Section 4-07 are minimums only, and the Contractor shall have the obligation to provide the minimum coverages stated in these Specifications or such greater or broader coverage, if available in the Contractor's policies.
- d. Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the City, its officers, officials, employees or volunteers.
- e. The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

2. Workers' Compensation and Employers Liability Coverage

The insurer shall agree to waive all rights of subrogation against the City, its officers, officials, employees and volunteers for losses arising from work performed by the Contractor for the Agency.

3. All Coverages

Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, reduced in coverage or in limits except after thirty (30) days' prior written notice by certified mail, return receipt requested, has been given to the City.

(e) Acceptability of Insurers

Insurance is to be placed with insurers with a Best's rating of no less than A:VII.

(f) Verification of Coverage

The Contractor shall furnish the City with certificates of insurance and with original endorsements effecting coverage required by this clause. The certificates and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The certificates and endorsements may be on forms provided by the City. Where by statute, the City's workers' compensation-related forms cannot be used, equivalent forms approved by the Insurance Commissioner are to be

substituted. All certificates and endorsements are to be received and approved by the City before work commences. The City reserves the right to require insurance policies, at any time.

(g) Subcontractors

The Contractor shall include all subcontractors as insureds under its policies or shall furnish separate certificates and endorsements for **each subcontractor. All coverages for subcontractors shall be subject** to all of the requirements stated herein.

4-09. Department of Industrial Relations: **This Contract** will be subject to compliance monitoring and enforcement by the California Department of Industrial Relations, pursuant to Labor Code section 1771.4 Attention is directed to Section 1725.5 of the California Labor Code. To insure compliance and complete understanding of the law regarding contractor registration the Contractor (and subcontractors) should, where some question exists, contact the Department of Industrial Relations prior to submission of bid. Responsibility for compliance with this Section lies with the Contractor and Subcontractors.

SECTION 5. PROSECUTION AND PROGRESS

5-01. Removal, Relocation, or Protection of Existing Utilities: In accordance with the provisions of Section 4215 of the California Government Code, the Contractor shall not be assessed liquidated damages for delay in completion of the project, when such delay was caused by the failure of the City or owner of the utility to provide for the removal or relocation of such utility facilities.

5-02. Preconstruction Conference: Following award of contract, submittal of executed contract, and approval of certificates of insurance and bonds, but before start of work, a preconstruction conference shall be held at a mutually agreed time and place. The conference shall be arranged by the City and attended by City representatives including the inspector, and the Contractor, Contractor's superintendent and major subcontractors. Contractor shall present at the conference the progress and submittal schedules, and progress payment format, and provide emergency phone numbers.

The purpose of the conference is to designate responsible personnel and establish a working relationship. Matters requiring coordination will be discussed and procedures for handling such matters established.

5-03. Beginning of Work: The Contractor shall be prepared to begin work within fifteen (15) calendar days after "Notice to Proceed".

SECTION 6. MEASUREMENT AND PAYMENT

6-01. Payments: Attention is directed to Section 9-1.16, "Partial Payments," and 9-1.17, "Payment After Acceptance," of the State Standard Specifications and these City General Provisions.

As of the 20th day of each month, requests for progress payment listing amount and value of work performed during that month may be submitted for review. Upon review and approval or adjustment by the Engineer, progress payment will be made, retaining five percent (5%) of the amount due. Requests submitted promptly as of the twentieth of the month will be paid normally by the tenth of the following month.

The Bidder's attention is directed to the provisions of Section 9 of the Standard Specifications and the following modification, all of which are applicable to this Contract:

Upon receipt of written notice that the work is ready for final inspection and acceptance, the Engineer shall, within five (5) days, make such inspection, and when the Engineer finds the work acceptable under the Contract and the Contract fully performed, the Engineer will recommend to the City Council (at the next following Council meeting) that the Contract be accepted and a "Notice of Completion" be prepared and recorded. The entire balance found to be due the Contractor, including the retained percentage, shall be paid to the Contractor by the City within fifteen (15) days after the expiration of thirty (30) days following the date of recordation of the Notice of Completion.

The Contractor shall supply with each progress payment request (with the exception of the first progress payment submittal) an email, fax or letter from each subcontractor stating: (a) the date that he/she has received his/her portion of the preceding payment; and (b) if the payment received was the total amount then due. Should the payment not include the total amount invoiced due to a dispute, the subcontractor shall include the details of such dispute in his/her letter with enough information for the City to verify that the provisions of Section 7108.5 of the CA Business and Professions Code have been met.

Before the final payment is due, the Contractor shall submit evidence satisfactory to the Engineer that all payrolls, material bills, and other indebtedness connected with the work have been paid, except that in case of disputed indebtedness or liens, the Contractor may submit in lieu of evidence of payment, a surety bond satisfactory to the City guaranteeing payment of all such disputed amounts when adjudicated in cases where such payment has not already been guaranteed by surety bond.

6-02. Substitution of Securities in Lieu of Retention: Pursuant to Section 22300 of the Public Contract Code, the Contractor may substitute securities for any money held by the City to insure performance of the contract. At the request and expense of the Contractor, securities equivalent to the amount withheld shall be deposited with the City or federally-chartered banks as an escrow agent, who shall return such securities to the Contractor upon satisfactory completion of the contract. Deposit of securities with an escrow agent shall be subject to written agreement in accordance with the provisions of Section 22300. The City shall not certify that the contract has been completed until at least 35 days after

filing by the City of a Notice of Completion. Securities shall be limited to those listed in Section 16430 of the California Government Code, bank or savings and loan certificates of deposit, interest bearing demand deposit accounts, standby letters of credit, or any other security mutually agreed upon by the Contractor and the City.

SECTION 7. DISPUTE RESOLUTION

7-01. Claims. This Section applies to and provides the exclusive procedures for any Claim arising from or related to the Contract or performance of the Work.

(A) *Definition*. “Claim” means a separate demand by Contractor, submitted in writing by registered or certified mail with return receipt requested, for change in the Contract Time, including a time extension or relief from liquidated damages, or a change in the Contract Price, that has previously been submitted to City as a Change Order in accordance with the requirements of the Contract Documents, and which has been rejected or disputed by City, in whole or in part.

(B) *Limitations*. A Claim may only include the portion of a previously rejected demand that remains in dispute between Contractor and City. With the exception of any dispute regarding the amount of money actually paid to Contractor as Final Payment, Contractor is not entitled to submit a Claim demanding a change in the Contract Time or the Contract Price, which has not previously been submitted to City in full compliance with this Section, and subsequently rejected in whole or in part by City.

(C) *Scope of Section*. This Section is intended to provide the exclusive procedures for submission and resolution of Claims of any amount, and applies in addition to the provisions of Public Contract Code Section 9204 and Sections 20104 et seq., which are incorporated by reference herein.

(D) *No Work Delay*. Notwithstanding the submission of a Claim or any other dispute between the parties related to the Project or the Contract Documents, Contractor must perform the Work and may not delay or cease Work pending resolution of the Claim or other dispute, but must continue to diligently prosecute the performance and timely completion of the Work, including the Work pertaining to the Claim or other dispute.

7-02. Claims Submission. The following requirements apply to any Claim subject to this Section:

(A) *Substantiation*. The Claim must be submitted to City in writing, clearly identified as a “Claim” submitted pursuant to this Section 7, and must include all of the documents necessary to substantiate the Claim including the Change Order request that was rejected in whole or in part, and a copy of City’s written rejection that is in dispute. The Claim must clearly identify and describe the dispute, including relevant references to applicable portions of the Contract Documents, and a chronology of relevant events. Any Claim for additional payment must include a complete, itemized breakdown of all labor, materials, taxes, insurance,

and subcontract, or other costs. Substantiating documentation such as payroll records, receipts, invoices, or the like, must be submitted in support of each claimed cost. Any Claim for an extension of time or delay costs must be substantiated with schedule analysis and narrative depicting and explaining claimed time impacts.

(B) *Claim Format.* A Claim must be submitted in the following format:

(1) General introduction, specifically identifying the submission as a “Claim” submitted under this Section 7.

(2) Relevant background information, including identification of the specific demand at issue, and the date of City's rejection of that demand.

(3) Detailed explanation of the issue(s) in dispute. For multiple issues, separately number and identify each issue and include the following for each separate issue:

(a) The background of the issue, including references to relevant provisions of the Contract Documents;

(b) A succinct statement of the matter in dispute, including Contractor’s position and the basis for that position;

(c) A chronology of relevant events;

(d) The identification and attachment of all supporting documents (see subsection (A), above, on Substantiation); and

(e) Use of a separate page for each issue.

(4) Summary of issues and damages.

(5) The following certification, executed by the Contractor’s authorized representative:

“The undersigned Contractor certifies under penalty of perjury that its statements and representations in this Claim are true and correct. Contractor warrants that this Claim is comprehensive and complete as to the matters in dispute, and agrees that any costs, expenses, or delay claim not included herein are deemed waived. Contractor understands that submission of a Claim which has no basis in fact or which Contractor knows to be false may violate the False Claims Act (Government Code Section 12650 et seq.)”

(C) *Submission Deadlines.*

(1) A Claim must be submitted within 15 days of the date that City notified the Contractor in writing that a request for a change in the Contract Time or Contract Price has been rejected in whole or in part.

(2) With the exception of any dispute regarding the amount of Final Payment, any Claim must be filed on or before the date of Final Payment, or will be deemed waived.

(3) A Claim disputing the amount of Final Payment must be submitted within 15 days of the effective date of Final Payment.

(4) Strict compliance with these Claim submission deadlines is necessary to ensure that any dispute may be mitigated as soon as possible, and to facilitate cost-efficient administration of the Project. *Any Claim that is not submitted within the specified deadlines will be deemed waived by the Contractor.*

7-03. City's Response. City will respond within 45 days of receipt of the Claim with a written statement identifying which portion(s) of the Claim are disputed, unless the 45-day period is extended by mutual agreement of City and the Contractor or as otherwise allowed under Public Contract Code section 9204. However, if City determines that the Claim is not adequately documented, City may first request in writing, within 30 days of receipt of the Claim, any additional documentation supporting the Claim or relating to defenses to the Claim that City may have against the Claim. If the Contractor fails to submit the additional documentation to City within 15 days of receipt of City's request, the Claim will be deemed waived.

(A) *Additional Information.* If additional information is thereafter required, it may be requested and provided upon mutual agreement of City and Contractor.

(B) *Non-Waiver.* Any failure by City to respond within the times specified above may not be construed as acceptance of the Claim in whole or in part, or as a waiver of any provision of these Contract Documents.

7-04. Meet and Confer. If the Contractor disputes City's written response, or City fails to respond within 45 days of receipt of the Claim with, the Contractor may notify City of the dispute in writing of the sent by registered or certified mail, return receipt requested, and demand an informal conference to meet and confer for settlement of the issues in dispute. If the Contractor fails to dispute City's response in writing within the specified time, the Contractor's Claim will be deemed waived.

(A) *Schedule Meet and Confer.* Upon receipt of the demand to meet and confer, City will schedule the meet and confer conference to be held within 30 days, or later if needed to ensure the mutual availability of each of the individuals that each party requires to represent its interests at the meet and confer conference.

(B) *Location for Meet and Confer.* The meet and confer conference will be scheduled at a location at or near City's principal office.

(C) *Written Statement After Meet and Confer.* Within ten working days after the meet and confer has concluded, City will issue a written statement identifying which portion(s) of the Claim remain in dispute, if any.

(D) *Submission to Mediation.* If the Claim or any portion remains in dispute following the meet and confer conference, within ten working days after the City issues the written statement identifying any portion(s) of the Claim remaining in dispute, the disputed portion(s) will be submitted for mediation, as set forth below.

7-05. Mediation and Government Code Claims.

(A) *Mediation.* Within ten working days after the City issues the written statement identifying any portion(s) of the Claim remaining in dispute following the meet and confer, City and Contractor will mutually agree to a mediator, as provided under Public Contract Code section 9204. Mediation will be scheduled to ensure the mutual availability of the selected mediator and all of the individuals that each party requires to represent its interests. The parties will share the costs of mediation equally, except costs incurred by each party for its representation by legal counsel or any other consultants.

(B) *Government Code Claims.*

(1) Timely presentment of a Government Code Claim is a condition precedent to filing any legal action based on or arising from the Contract.

(2) The time for filing a Government Code Claim will be tolled from the time the Contractor submits its written Claim until the time that Claim is denied in whole or in part at the conclusion of the meet and confer process, including any period of time used by the meet and confer process. However, if the Claim is submitted to mediation, the time for filing a Government Code Claim will be tolled until conclusion of the mediation, including any continuations, if the Claim is not fully resolved by mutual agreement of the parties during the mediation or any continuation of the mediation.

7-06. Tort Claims. This Section does not apply to tort claims and nothing in this Section is intended nor will be construed to change the time periods for filing tort-based Government Code Claims.

7-07. Arbitration. It is expressly agreed, under California Code of Civil Procedure Section 1296, that in any arbitration to resolve a dispute relating to this Contract, the arbitrator's award must be supported by law and substantial evidence.

7-08. Damages. The Contractor bears the burden of proving entitlement to and the amount of any claimed damages. The Contractor is not entitled to damages calculated on a total cost basis, but must prove actual damages. The Contractor is not entitled to recovery of any alleged home office overhead. The Eichleay Formula or similar formula may not be used for any recovery under the Contract. The Contractor is not entitled to consequential damages, including home office overhead or any form of overhead not directly incurred at the Worksite; lost profits; loss of productivity; lost opportunity to work on other projects; diminished bonding capacity; increased cost of financing for the Project; extended capital costs; non-availability of labor, material or equipment due to delays; or any other indirect loss arising from the Contract.

7-09. Multiple Claims. In the interest of efficiency, City, acting in its sole discretion, may elect to process multiple Claims concurrently, in which case the applicable procedures above will be based on the total amount of such Claims rather than the amount of each individual Claim. Any such election will not operate to change or waive any other requirements of this Section.

7-10. Other Disputes. The procedures in this Section 7 will apply to any and all disputes or legal actions, in addition to Claims, arising from or related to this Contract, unless and only to the extent that compliance with a procedural requirement is expressly and specifically waived by City.

ATTENTION BIDDERS:

Your bid shall represent the cost of performing all Work described in the Contract Documents including:

Special Provisions and Project Plans,
City Standard Specifications and Details,
State Standard Specifications and Plans, and
all Addenda and Change Orders.

CITY STANDARD SPECIFICATIONS AND DETAILS

(Approved November 2016)

is a separate document that is
available at the City of Pleasanton
Engineering Division,
Civic Center

200 Old Bernal Avenue (physical
location) or

P.O. Box 520 (mailing address)
for a non-refundable cost of \$20.

**Call (925) 931-5650 to request a copy of the
*City Standard Specifications and Details.***

*The City Standard Specifications and Details can be viewed online at the
City's Web Page, <http://www.cityofpleasantonca.gov/>
(Select: Our Government, Public Works, Engineering, Standard
Specifications & Details)*

SPECIAL PROVISIONS

(These Special Provisions are to be used in conjunction with the City Standard Specifications and Standard Details, and the State Standard Specifications and Standard Plans)

All work shall be constructed in accordance with the City of Pleasanton Standard Specifications and Details dated November 2016, and as augmented by these Special Provisions. The Sections noted are those in the Standard Specifications except for the new Section(s) added. Where conflict exists between these documents and existing conditions, request clarification from the Project Engineer.

CITY OF PLEASANTON
PUBLIC WORKS DEPARTMENT, ENGINEERING DIVISION

KEN MERCER SKATEPARK

Project No. CIP-20774

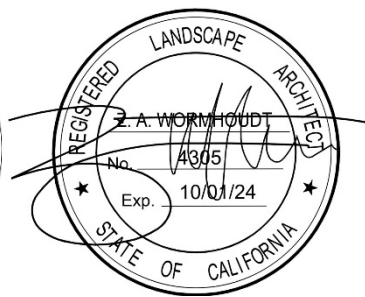
SPECIAL PROVISIONS

February 2024

Prepared By:

Gina Chavez, Principal Landscape Architect

RLA #6040



SIGNED: 02/15/2024

KEN MERCER SKATE PARK

CIP NO. 20774

City of Pleasanton

DEFINITION OF BID ITEMS

Bid Submittal

February 16, 2024

TS = Technical Specifications

Bid Item 1: Bonding & Mobilization (Section 1-19, City Standard Specifications)

The contract lump sum price paid for Bonding and Mobilization shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Bonding and Mobilization, complete in place, including construction staking, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 2: Erosion Control (Section 5, City Standard Specifications)

The contract lump sum price paid for Erosion Control shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Erosion Control, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 3: Demolition (Section 3, City Standard Specifications TS 02 41 00)

The contract lump sum price paid for Demolition shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Demolition including clearing and grubbing, disposal, abandonment, clear and grub, protecting in place existing features, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 4: Tree Protection (TS 32 31 15)

The contract lump sum price paid for Tree Protection shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Tree Protection, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 5: Construction Fencing (TS 02 41 00)

The contract lump sum price paid for Construction Fencing shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Construction Fencing, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 6: Earthwork & Grading (Section 4, City Standard Specifications, TS 31 22 00, TS 31 23 23)

The contract lump sum price paid for Earthwork & Grading shall include full compensation for furnishing all labor, lime treatment, off haul, root barrier, materials, tools, equipment, and incidentals and for doing all work involved in Earthwork & Grading, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 7: Drainage and Stormwater (Section 12, City Standard Specifications, TS 33 42 11)

The contract unit price paid per lump sum for storm drain piping (solid and perforated pipes and associated fittings), structures (catch basins, manholes, drains, grates, and lids), adjusting to grade, and bioretention basin shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Drainage and Stormwater, including trenching, placement of storm drains and filter fabric, trench backfill, bioretention basin installation, culvert connections, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 8: Pump Station (TS 33 42 11)

The contract unit price paid for each pump station (aka storm drain lift station) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Pump Station, associated housing, structures, lids, concrete pad, piping, electrical components, mechanical components, and utility connections complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 9: Water Lines (Section 14, City Standard Specifications, TS 33 42 11)

The contract unit price paid per lump sum for Water Lines shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Water Lines, including trenching, trench backfill, fittings, tees, connections, valves, valve boxes, adjusting to grade, disinfection, and quick couplers complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 10: Lighting System (TS 26 58 68)

The contract unit price paid per lump sum for Lighting System shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Lighting System, including concrete foundations, drivers and supporting electrical equipment, conductors, enclosures, wire harness, luminaires, visors, cross-arm assemblies, control cabinet, poles, pull boxes, receptacles, grounding, and trenching as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 11: Concrete Curb (Section 15, City Standard Specifications)

The contract unit price paid per linear foot for Concrete Curb shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Concrete Curb, including transition curb, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 12: 12" Mow Curb (Section 15, City Standard Specifications)

The contract unit price paid per linear foot for Mow Curb shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Mow Curb, including transition curb, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 13: Standard Concrete Paving (Section 15, City Standard Specifications)

The contract unit price paid per square foot for Standard Concrete Paving shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Standard Concrete Paving, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 14: Site Furnishing Concrete Pads (Section 15, City Standard Specifications)

The contract unit price paid per square foot for Site Furnishing Concrete Pads shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Site Furnishing Concrete Pads, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 15: Handrail (TS 05 50 00)

The contract unit price paid per unit for Handrail shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Handrail, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 16: Concrete Steps (Section 15, City Standard Specifications)

The contract unit price paid per square foot for Concrete Steps shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Concrete Steps, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 17: ADA Vehicular Ramp (Section 15, City Standard Specifications)

The contract unit price paid unit for ADA Vehicular Ramp shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in ADA Vehicular Ramp, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 18: ADA Signs (Section 16, City Standard Specifications)

The contract unit price paid per lump sum ADA Signs shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in ADA Signs, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 19: Metal Leaning Rail (TS 05 50 00)

The contract unit price paid linear foot for Metal Leaning Rail shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Metal Leaning Rail, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 20: Site Permeable Pavers (Section 15, City Standard Specifications, TS 32 14 13)

The contract unit price paid per square foot for Site Permeable Pavers shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Site Concrete Paving including pavers, joint filler, bedding, base, subbase, and liner complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 21: Permeable Paving Curb Edge (Section 15, City Standard Specifications)

The contract unit price paid per linear foot for Permeable Paving Curb Edge shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Permeable Paving Curb Edge including pavers, joint filler, bedding, base, subbase, and liner complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 22: Skate Park Excavation and Rough Grading (Section 4, City Standard Specifications, TS 31 22 00, TS 31 23 23)

The contract lump sum price paid for Skate Park Excavation and Rough Grading shall include full compensation for furnishing all labor, lime treatment, off haul, materials, tools, equipment, and incidentals and for doing all work involved in Skate Park Excavation and Rough Grading, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 23: Skate Park Finegrade and Subbase (Section 4, 6, and 7, City Standard Specifications, TS 02 52 53, TS 03 37 13)

The contract lump sum price paid for Skate Park Finegrade and Subbase shall include full compensation for furnishing all labor, lime treatment, materials, tools, equipment, and incidentals and for doing all work involved in Skate Park Finegrade and Subbase, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 24: Skate Park Drain Inlet Assemblies (Section 15, City Standard Specifications)

The contract lump sum price paid for Skate Park Drain Assemblies shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Skate Park Drain Assemblies, including grates, fittings, and pipe connections, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 25: Skate Park Place and Finish Upper and Lower Deck (TS 02 52 53, TS 03 37 13)

The contract unit price paid per lump sum for Skate Park Place and Finish Upper and Lower Deck shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Skate Park Place and Finish Upper and Lower Deck, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 26: Skate Park Place and Finish Ramps and Bowls (TS 02 52 53, TS 03 37 13)

The contract unit price paid per lump sum for Skate Park Place and Finish Ramps and Bowls shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Skate Park Place and Finish Ramps and Bowls, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 27: Skate Park Form and Pour Cast-in-Place Walls and Curbs (TS 02 52 53, TS 03 37 13)

The contract unit price paid per lump sum for Skate Park Form and Pour Cast-in-Place Walls and Curbs shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Skate Park Form and Pour Cast-in-Place Walls and Curbs, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 28: Skate Park Setup Transitions and Deck (TS 02 52 53, TS 03 37 13)

The contract unit price paid per lump sum for Skate Park Setup Transitions and Deck shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Skate Park Setup Transitions and Deck, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 29: Skate Park Coping and Rails (TS 02 52 53, TS 03 37 13)

The contract unit price paid per lump sum for Skate Park Coping and Rails shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Skate Park Coping and Rails, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 30: Skate Park Rebar (TS 02 52 53, TS 03 37 13)

The contract unit price paid per lump sum for Skate Park Rebar shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Skate Park Rebar, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 31: Asphalt (Section 8 + 9, City Standard Specifications)

The contract unit price paid per square foot for Asphalt shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Asphalt, including subgrade leveling and compaction, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 32: Type 1 Bollard (TS 32 33 00)

The contract unit price paid for each Bollard shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Type 1 Bollard, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 33: Type 2 Bollard (TS 32 33 00)

The contract unit price paid for each Bollard shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Type 2 Bollard, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 34: Table (TS 32 33 00)

The contract unit price paid for each Table shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Table, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 35: Bike Rack (TS 32 33 00)

The contract unit price paid for each Bike Rack shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Bike Rack, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 36: Drinking Fountain (Section 13 and 14, City Standard Specifications)

The contract unit price paid for each Drinking Fountain shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Drinking Fountain, including dry well, concrete footing, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 37: Chainlink Fencing and Gate (Section 15, City Standard Specifications; TS 32 31 13)

The contract unit price paid per linear foot for Chainlink Fencing and Gate shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Chainlink Fencing and Gate, including fence components, gate components, fence footings, and gate footings, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 38: Irrigation ((Section 19, City Standard Specifications))

The contract lump sum price paid for Irrigation shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Irrigation, including but not limited to, irrigation controllers, irrigation points of connection, irrigation main line and laterals, irrigation modifications, installing control wire to controller and valves, hose bibs, drip irrigation and components, spray irrigation and components, valves, and sleeving, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 39: Landscape and Bioretention Soil Preparation (Section 20, City Standard Specifications)

The contract lump sum price paid for Landscape and Bioretention Soil Preparation shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Landscape and Bioretention Soil Preparation, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 40: Tree, 15 Gallon (Section 20, City Standard Specifications)

The contract unit price paid for each Tree, 15 Gallon shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Tree, 15 Gallon, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 41: Shrub, 5 Gallon (Section 20, City Standard Specifications)

The contract unit price paid for each Shrub, 5 Gallon shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Shrub, 5 Gallon, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 42: Groundcover, 1 gallon (Section 20, City Standard Specifications)

The contract unit price paid for each Groundcover, 1 Gallon shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Groundcover, 1 Gallon, including 1 gallons for basket planting, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 43: Mulch (Section 20, City Standard Specifications)

The contract unit price paid per square foot for Mulch shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Mulch, installed to the depth described on the drawings, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 44: Turf from Sod (Section 20, City Standard Specifications)

The contract unit price paid per square foot for Turf from Sod shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Turf from Sod, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 45: Landscape Boulders (TS 32 40 00)

The contract lump sum unit price paid for each Landscape Boulder shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Landscape Boulder, including concrete footing ,complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 46: Landscape Maintenance (Section 20, City Standard Specifications)

The contract lump sum price paid for Landscape Maintenance shall include full compensation for furnishing all labor, materials, tools, equipment, temporary fencing, and incidentals and for doing all work involved in Landscape Maintenance, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 47: Shade Structure Entry Plaza (TS 13 30 00) BID ALTERNATE #1

The contract lump sum price paid for Shade Structure Entry Plaza shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in each Shade Structure Entry Plaza, including concrete footing, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 48: Shade Structure Spectator Area (TS 13 30 00) BID ALTERNATE #2

The contract lump sum price paid for Shade Structure Spectator Area shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in each Shade Structure Spectator Area, including concrete footing ,complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 49: Archway Sign (TS 10 14 00) BID ALTERNATE #3

The contract lump sum price paid for Archway Sign shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Archway Sign, including concrete footing ,complete in place, as

shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

**Bid Item 50: Planting Areas - NE & NW Corners BID ALTERNATE #4 (DEDUCT)
(Section 20, City Standard Specifications)**

The contract lump sum price paid for Planting Area in Northeast (NE) Corner shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Planting Area in Northeast (NE) Corner, including soil preparation, planting, and irrigation complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract lump sum price paid for Planting Area in Northwest (NW) Corner shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Planting Area in Northwest (NW) Corner, including soil preparation, planting, mulch, irrigation, and mow curb complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item 51: Entry Monument Sign BID ALTERNATE #5 (DEDUCT) (TS 32 33 00)

The contract lump sum price paid for Entry Monument Sign shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Entry Monument Sign, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Table of Contents

DIVISION 02 - EXISTING CONDITIONS

02 41 00 Demolition

DIVISION 03 - CONCRETE

03 30 53 Skatepark Structure Concrete Paving

03 37 13 Skatepark Structure Shotcrete

DIVISION 05 - METALS

05 50 00 Skatepark Metal Fabrication

DIVISION 10 - SPECIALTIES

10 14 00 Architectural Signage

DIVISION 13 - SPECIAL CONSTRUCTION

13 30 00 Pre-Fabricated Metal Structure

DIVISION 26 - ELECTRICAL

26 05 19 Low-Voltage Electrical Power Conductor and Cables

26 05 26 Grounding and Bonding for Electrical Systems

26 05 33 Raceways and Boxes for Electrical Systems

26 05 43 Underground Ducts & Raceway

26 05 53 Identification for Electrical Systems

26 08 00 Electrical System Cx

26 08 00b Electrical System Cx Exhibit B

26 24 13 Switchboards

26 27 26 Wiring Devices

26 56 68 Exterior Athletic Lighting

DIVISION 31 - EARTHWORK

31 10 00 Site Clearing

31 22 00 Grading

31 23 16.13 Trenching

31 23 16 Excavation

31 23 23 Fill

DIVISION 32 - EXTERIOR IMPROVEMENTS

32 01 90 Maintenance of Landscape

32 11 23 Aggregate Base Courses

32 14 13 Precast Concrete Unit Paving

32 31 15 Tree Protection and Temporary Fencing

32 33 00 Site Furnishings

32 40 00 Landscape Boulders and Stone

DIVISION 33 - UTILITIES

33 42 11 Stormwater Gravity Piping

APPENDICES

SKATEPARK CONTRACTOR QUALIFICATIONS

GEOTECHNICAL INVESTIGATION REPORT

GEOTECHNICAL ADDENDUM LETTER

ARBORIST REPORT

PUMP QUOTE AND SPECIFICATIONS

Section 02 41 00

Demolition

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Selective demolition of built site elements, including but not limited to concrete paving, concrete curb and gutter, concrete seatwall, asphalt paving, skatepark features, regulation signs, footings, trees, and vegetation as shown on the Drawings.
- B. Abandonment and removal of existing utilities and utility structures as shown on Drawings.

1.2 RELATED REQUIREMENTS

- A. Arborist Report 5800 Parkside Drive, Pleasanton, CA Ken Mercer Skate Park prepared by Hort Science June 2021, updated July 18, 2023.
- B. Section 31 10 00 - Site Clearing: Vegetation and existing debris removal.
- C. Section 31 22 00 - Grading: Topsoil removal.
- D. Section 31 23 23 - Fill: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

1.3 REFERENCE STANDARDS

- A. All work shall conform to ANSI A10.6, Safety Requirements for Demolition Operations and to the codes and regulations of the City.
- B. Section 3 of the City's Standard Specifications - Clearing and Grubbing
- C. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.
- D. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

1.4 SCHEDULE

- A. Submit schedule indicating proposed methods and sequence of operations for selective demolition work for review prior to commencement of work. Include coordination for shut-off, capping, and continuation of irrigation system operation during construction. Provide detailed sequence of demolition and removal work to ensure uninterrupted use of adjacent fields.

1.5 SUBMITTALS

- A. Prior to the start of any demolition activities the Contractor shall take pre-construction photos and videos documenting existing conditions within the limit of work and along the on-site construction access route.
- B. See Section 01 33 00 - Submittals, for submittal procedures.
- C. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

PART 3 EXECUTION

2.1 SCOPE

- A. Remove paving and curbs as required to accomplish new work.
- B. Remove items indicated, for salvage, relocation, recycling, and disposal.
- C. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill.

2.2 SITE CONTROL AND SCREENING

- A. Construction Fencing: Shall be 6-foot high chain link fence installed at limit of work line shown on the drawings, and shall be maintained until the project is complete. The fencing shall be in good condition, staked into the ground or set in concrete blocks and installed with galvanized steel posts. The fence fabric shall be 11-gauge with knuckled barbs on the top edges.
Contractor to relocate fencing during construction as necessary to conduct various phases of the work.
- B. Fence Screen Fabric: Shall be full height of construction fence and hemmed with grommets on all sides. Color to be green. Screen fabric shall be on road and driveway side of fence.

2.3 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. Comply with applicable requirements of NFPA 241.
 - 3. Use of explosives is not permitted.
 - 4. 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.

5. Provide, erect, and maintain temporary barriers and security devices.
 6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
 7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 8. Do not close or obstruct roadways or sidewalks without permit.
 9. 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.
 10. 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.
- D. If hazardous materials are discovered during removal operations, stop work and notify Landscape Architect and City; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.
- E. Hazardous Materials: Comply with 29 CFR 1926 and state and local regulations.
- F. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.
- G. Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level. Comply with governing regulations pertaining to environmental protection.

2.4 EXISTING UTILITIES

- 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. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to City.
- E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to City.
- F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
- G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities unless noted otherwise on the drawings.

2.5 DEBRIS AND WASTE REMOVAL

- A. Remove debris, junk, and trash from site.
- B. Leave site in clean condition, ready for subsequent work.
- C. Daily Cleaning: Thoroughly clean the entire area under active asbestos disturbance at the end of each workday.
- D. Clean up spillage and wind-blown debris from public and private lands.

2.6 CLEARING AND GRUBBING

- A. Contractor shall strip the site of all remaining materials not to remain as part of the finished work. All such materials shall be legally disposed of off-site at Contractor's expense except as otherwise noted on drawings. Items to be disposed of off-site include but are not limited to the following:
 - 1. Lawn, weeds, roots and other organic material, wood and trash.
 - 2. Asphalt pavement
 - 3. Irrigation equipment
- B. Strip and remove weeds and trash from unpaved areas to be improved. Leave intact ornamental shrubs and trees as identified by The Engineer. The contractor shall protect surrounding areas from damage by equipment or construction operations.
- C. If removals are required, tree stumps shall be removed to a minimum of (2) feet below existing grade and deeper if necessary to accomplish construction.
- D. All edges of existing paving to remain shall be sawcut in a neat clean manner.

- E. All excavation within the drip line of trees to remain shall be accomplished in a careful manner. No roots greater than the one-inch diameter shall be cut. Where excavation reveals roots greater than one-inch diameter that will interfere with construction, Contractor shall notify the Engineer for direction prior to proceeding.
- F. Where any marked or unmarked utility lines or other underground obstruction or piping may be encountered within the work area, notify the Engineer, and take necessary measures to prevent interruption of service (if live). Should such lines or service be damaged, broken, or interrupted, those services shall be repaired immediately and restored by him at their own expense.
- G. Abandoned lines, meters and boxes, obstructions or piping shall be removed, plugged or capped in accordance with the requirements and approval of the agencies affected. It shall be the responsibility of the Contractor to ascertain whether any public facilities exist along the line of work, whether or not shown on the plans; and Contractor shall, at the Contractor's expense, do any necessary work to save from damage all such property in or adjacent to the work, and shall repair all damage thereto caused by the Contractor's operations.
- H. Prior to commencement of site grading work the Contractor shall notify the Engineer that the site has been cleared. Site grading shall not commence until the Engineer has completed review of the site and has given approval to proceed.

END OF SECTION

Section 03 30 53
Skatepark Structure Concrete Paving

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes exterior concrete pavement for the following:

1. Skatepark structure slabs on grade.
2. Skatepark structure vertical walls and footings.
3. Skatepark structure Flatwork

1.2 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, expansive hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume.

1.3 SUBMITTALS

- A. Submit to City Representative; concrete mix design and letters from material suppliers certifying that materials comply with the standards referenced herein.
- B. Submit to City Representative; shop drawings for all fabricated steel edging and steel accessories.
- C. Submit to City's Representative: Cut sheets for Evaporation Retardant and Finishing Aid.

1.4 QUALITY ASSURANCE

- A. Comply with provisions of the following standards, except where more stringent requirements are indicated.
1. Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice".
 2. American Concrete Institute (ACI) "Manual of Standard Practice".
- B. Installer Qualifications: The Contractor or an experienced installer who has completed pavement work similar in material, design, and extent to that indicated for this Contract.
- C. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
- D. Concrete Testing: The City's Independent Testing Agency shall perform material evaluation tests.

1.5 PROJECT CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

- B. Do not install concrete work over saturated, muddy or frozen subgrade.

1.6 QUALITY INSURANCE

- A. Perform all work in accordance with all rules and standards as required by the City's Representative.

PART 2 PRODUCTS

2.1 EDGE FORMS AND SCREED CONSTRUCTION

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.
 - 1. Use flexible or curved forms for horizontal curves of a radius 100-feet or less.
- B. Form-Release Agent: Commercially formulated form-release agent with a maximum of 350 mg/L volatile organic compounds (VOCS) that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
- C. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24-hours after concrete placement. Forms shall provide a continuous straight, smooth surface. Forms shall be of sufficient thickness to withstand pressure of newly placed concrete without bowing or deflecting.
- D. Clean forms after each use and coat with form release agent to ensure separation from concrete without damage.
- E. Check completed formwork and screeds for grade and alignment to the following Tolerances:
 - 1. Top of Forms: Not more than 1/8-inch in ten feet.
 - 2. Vertical Face on Longitudinal Axis: Not more than 1/8-inch in 10-feet.
- F. Moisten wood forms immediately prior to placing concrete.

2.2 STEEL REINFORCEMENT MATERIALS

- A. Reinforcement Bars shall be Grade 40, #4 deformed bars at 18-inches on center both directions with 24-inch overlap for all flat work and sized, space for the skate features per the plan details.
- B. General: Comply with CRSI's "Manual of Standard Practice" for fabricating reinforcement.
- C. Clean reinforcement of loose rust, oil and mill scale, earth, ice, or other bond-reducing materials.
- D. Deformed steel bars shall be located in both directions, continuous throughout the entire structure and as indicted on the plan details. Steel rebars shall extend out from the features for 24-inches, 2-inches above base rock. (Rebars for the flat work shall tie onto the rebars extending for 24-inches from the features.) Lap rebars 24-inches and tie. Stagger joints. Do not heat to bend.

- E. Provide dobie supports for rebars at 36-inches on center. Supports must keep the rebars at 2-inches above base rock and 2-inches below finish surfaces of concrete. Rebars shall be 2-inches away from outside surfaces of concrete in all locations. Rebars shall be free of rust, oil and other deleterious conditions.

2.3 FABRICATED STEEL EDGING AND COPING

- A. All edging and coping shall be per the plan details with all connections welded and ground smooth.

2.4 CONCRETE MATERIALS

- A. Portland Type II Cement.
- B. Fly Ash: ASTM C 618, Class F or C.
- C. Aggregate: ASTM C 33, Class 4, from a single source, with coarse aggregate as follows:
Aggregate Size: ¾-inch min.; 1-1/2-inches max. nominal. Do not use fine or coarse aggregates containing substances that cause spalling.
- D. Water: Fresh, clean, potable water free of foreign materials.

2.5 REQUIRED CURING AND FINISHING MATERIALS

- A. Non-permeable Burlene™ curing blankets or approved equal; ASTM C 171. The concrete should be hard enough to prevent surface damage when covering with concrete blankets.
- B. Water: Potable.
- C. Evaporation Retardant and Finishing Aid: Burke Film Concentrate – Available from WhiteCap Inc. Burk Film Concentrate shall be used in accordance with the manufacture recommendations. All finishing of concrete surfaces must be completed with this product, finishing with water is not allowed.

2.6 CONCRETE MIXES

- A. Prepare design mixes, proportioned according to ACI 211.1 and ACI 301, for each type and strength of normal-weight concrete determined by either laboratory trial mixes or field experience.
- B. Proportion mixes to provide concrete with the following properties:
 - 1. Compressive Strength (28-Days): 4000-psi (6.5 sac min.)
 - 2. Slump Limit: no less than 2-inch and no more than 4-inch.
- C. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having air content as follows within a tolerance of plus or minus 1.5-4.0 percent.
- D. Ready-Mixed Concrete: Comply with requirements and with ASTM C 94 and ASTM C 1116.

- E. When air temperature is between 85-degrees Fahrenheit and 90-degrees Fahrenheit, reduce mixing and delivery time from 1-1/2-hours to 75-minutes; when air temperature is above 90-degrees Fahrenheit, reduce mixing and delivery time to 60-minutes. Do not use concrete that has been in transport or pump hoses for more than 90-minutes from time of initial mix.
- F. Concrete mix design shall be submitted to City's Representative for review and approval.

PART 3 EXECUTION

3.1 PREPARATION

- A. Proof-roll prepared subbase surface to check for unstable areas and verify need for additional compaction. (Crushed rock base shall be 3/4-inch: Class II Aggregate Base placed at a minimum depth of 6-inches in all locations to receive concrete or as noted otherwise. Proceed with pavement only after nonconforming conditions have been corrected and subgrade is ready to receive pavement and sample pour has been approved.
- B. Remove loose material from compacted subbase surface immediately before placing concrete.
- C. The Contractor shall keep the project area as clean as possible during construction. The Contractor shall be responsible to clean up and remove all spillage, overpour, discarded forming material, rejected work or material and all refuse or debris resulting from the installation work.

3.2 JOINTS

- A. Cold Joints: Construct true to line with faces perpendicular to surface planes of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.
- B. Sawcut Joints: Form weakened-plane contraction joints, sectioning concrete into areas of approximately 200-square feet. See Sawcut Plan for depth and locations:
 - 1. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades within 12-hours of any said pour. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.

3.3 CONCRETE PLACEMENT

- A. Inspection: Before placing any transitional concrete, the City's Representative will inspect the completed formwork installation, screed forms, templates, reinforcement steel, and any other items to be embedded or cast in place.
- B. Remove snow, ice, frost or standing water from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.
- C. Moisten subbase to provide a uniform dampened condition at the time concrete is placed. Do not place concrete around manholes or other structures until they are at the required finish elevation and alignment.

- D. Deposit and spread concrete in a continuous operation between transverse joints. When concrete placing is interrupted more than two hours, place a cold joint.
- E. Consolidate concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures to consolidate concrete according to recommendations in ACI 309R.
- F. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand-spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels and joint devices.
- G. Screed pavement surfaces with a straightedge and strike off. Commence initial floating using bull floats or darbies to form an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations.
- H. Concrete paving shall be a minimum of five 5-inches thick in all locations or as indicated per the plan details.

3.4 CONCRETE FINISHING

- A. General: Wetting of concrete surfaces during screeding, initial floating, or finishing operations is prohibited.
- B. Finish: The finished surface of all concrete shall be a hard troweled, smooth finish.
- C. All horizontal and vertical edges of concrete shall have 1/2-inch radii.
- D. All connections between pours must be absolutely flush and smooth.
- E. Grinding finished concrete to achieve the specified finishes will not be accepted.

3.5 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.
- D. Apply Burleen Curing Blankets or approved equal, 2-hours after finishing concrete. Overlap blankets two 2-feet all sides. Do not use fine or coarse aggregates containing substances that cause spalling.
- E. Maintain ongoing moisture of concrete by drip irrigation lines located under curing blankets. Provide ongoing moisture for a minimum of 14-days per finished area of concrete.

- F. Concrete shall be protected from any traffic for 30-days.
- G. The Contractor shall take necessary actions to protect the concrete from any vandalism or damage that may occur as a result of trespassing.

3.6 PAVEMENT TOLERANCES

Comply with tolerances of ACI 117 and as follows:

1. Elevation: 1/8-inch.
2. Thickness: minus 1/4-inch.
3. Surface: Gap below 10-foot-long, unlevelled straightedge not to exceed 1/4-inch.
4. Lateral Alignment and Spacing of Tie Bars and Dowels: 1-inch.
5. Vertical Alignment of Tie Bars and Dowels: 1/4-inch.
6. Alignment of Tie-Bar End Relative to Line Perpendicular to Pavement Edge: 1/2-inch.
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge.
8. Length of dowel 1/4-inch per 12-inches.
9. Joint Spacing: 3-inches.
10. Contraction Joint Depth: Plus 1/4-inch, no minus.
11. Joint Width: Plus 1/8-inch, no minus.
12. Plan Dimension 1-inch.
13. Vertical Radii: 1/4-inch over length of transition as checked with true template.

3.7 FIELD QUALITY CONTROL

- A. Independent Testing Agency: The City's Independent Testing Agency shall sample materials, perform tests, and submit test reports during concrete placement according to requirements specified.
- B. Testing Services: Testing will be performed according to the following requirements:
 1. Sampling Fresh Concrete: Representative samples of fresh concrete shall be obtained according to ASTM C172, except modified for slump to comply with ASTM C94.
 2. Slump: AASHTO T119; one test at point of placement for each compressive-strength test, but not less than one test for each day's pour of each type of concrete. Additional tests will be required when concrete consistency changes.
 3. Air Content: ASTM C173 or AASHTO T152, pressure method; one test for each compressive-strength test, but not less than one test for each day's pour of each type of air- entrained concrete.
 4. Concrete Temperature: ASTM C1064; one test hourly when air temperature is 40-degrees Fahrenheit and below and when 80-degrees Fahrenheit and above, and one test for each set of compressive- strength specimens.
 5. Compression Test Specimens: ASTM C31; 1 set of 4-standard cylinders for each compressive-strength test, unless otherwise indicated. Cylinders shall be molded and stored for laboratory-cured test specimens unless field-cured test specimens are required.
 6. Compressive-Strength Tests: ASTM C39; one set for each day's pour of each concrete class exceeding 5-cubic yards, but less than 25-cubic yards, or 1-set for each 300-cubic yards. 1-specimen shall be tested at 7-days and 2-specimens at 28-days; one specimen shall be retained in reserve for later testing if required.

- C. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by the City's Representative, but will not be used as the sole basis for approval or rejection.
- D. Additional Tests: Testing agency shall make additional tests of the concrete when test results indicate slump, air entrainment, concrete strengths, or other requirements have not been met, as directed by City's Representative. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with AASHTO 501.24(b), or by other methods as directed.

3.8 REPAIRS AND PROTECTION

- A. Remove and replace concrete pavement that is broken, under strength, spalling, damaged, or defective, or does not meet requirements in this Section.
- B. Drill test cores where directed by Testing Agency when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with Portland concrete bonded to pavement with epoxy adhesive.
- C. Protect concrete from damage. Exclude traffic from pavement for at least 14-days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material.
- E. The Contractor shall remove the curing blankets and the temporary drip irrigation system, as well as hose and sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.
- F. Grinding concrete to achieve specified finishes will not be allowed.

END OF SECTION

Section 03 37 13
Skatepark Structure Shotcrete

PART 1 GENERAL

1.1 SUMMARY

- A. Work included: Provide sprayed-on concrete (concrete conveyed into place by air pressure through a flexible tube or gun with controlled nozzle) referred to herein as shotcrete, complete as shown and as specified for skate park radius and banked transition work only.
- B. Related Work: Skatepark Structure Concrete Paving Section 03 30 53

1.2 QUALITY ASSURANCE

- A. Standards: Comply with the requirements of the current edition of the following codes and standards, except as herein modified:
 - 1. Current ICC.
 - 2. American Concrete Institute (ACI): 506, Chapter 13, Wet Method; Chapter 5, Shotcrete Crew.
 - 3. American Concrete Institute (ACI) "Manual of Standard Practice" Concrete Reinforcing.
 - 4. Steel Institute (CRSI) "Manual of Standard Practice".
 - 5. American Society for Testing Materials (ASTM).
 - a. Concrete Testing:
 - i. Prepare test specimens by each application crew using the equipment materials and mix proportions proposed for the Project. Owner's Representative shall observe preparation of test panels noting placement of shotcrete by applications crew.
 - b. Maintain and protect sample transition during construction and test for compliance with Specifications.
 - c. Test strength of the shotcrete as work progresses as follows:
 - i. Provide test panels and test in accordance with ASTM42. Test panels shall be taken not less than once each shift or less than one for each 50-cubic yards of shotcrete placed through the nozzle.
 - d. Shotcrete core grade-2 required.
- B. Do not install concrete work over wet, saturated, muddy or frozen subgrade.
- C. No trucks shall be allowed within the areas that have been graded.
- D. Acceptance: Final acceptance of the shotcrete will be based upon the results obtained from testing.
- E. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
- F. Shotcrete Application shall be done by certified nozzle operator.

1.3 SUBMITTALS

- A. Manufacturer's Data: Current printed specifications with application and installation instruction for proprietary materials including concrete admixtures such as finishing agents/hardener, paint, and Stain.
- B. Shop Drawings: shop drawings for all fabricated steel edging and steel accessories.
- C. Mix Design: Submit to Owner's Representative; concrete mix design and letters from material suppliers certifying that materials comply with the standards referenced herein.
- D. Pour Schedule: Contractor to indicate on plans locations to be shot within a day's work and sequence of pours for review by Owner's Representative.

PART 2 PRODUCTS

2.1 CONCRETE MATERIALS

- A. Portland Cement: ASTM C150, Types I or II, one brand only.
- B. Fly Ash: ASTM C618
- C. Normal Weight Aggregates: ASTM C33 and herein specified. Aggregate shall comply with gradation No. 2 as shown in ACI 506R Table 2.1 if the contractor can show satisfactory performance of an alternate grading under similar conditions of use, the engineer may waive the requirement for gradation No. 2.

- 1. Combined gradation of coarse and fine aggregate as follows:

Sieve Size U.S. Standard Square Mesh	Percent by Weight Passing Individual Sieves
3/8 in	90-100
No. 4	70-85
No. 8	50-70
No. 16	35-55
No. 30	20-35
No. 50	8-20
No. 100	2-10

- 2. Batch fine coarse aggregates separately to avoid segregation.
- 3. Aggregates shall be free from clay, mud, loam, or other deleterious substances.
- 4. Dune sand, bank run sand, and manufactured sand are not acceptable for fine aggregate. Use one source of sand only for entire project.
- 5. Coarse aggregate shall be clean, un-coated, heavy media processed aggregate of crushed stone or river washed aggregate.

2.2 ACCESSORIES

- A. Water: Fresh, clean, potable, and free of deleterious acids, mixing, and curing water, as available from Owner's Representative. Transport as required. Water shall not be used to finish, see admixtures.
- B. Admixtures: Use only accepted admixtures meeting the following requirements:
 - 1. Chemical Admixtures: ASTM C494.

2. Evaporation Retardant and Finishing Aid: Burke Film Concentrate – Available from Whitecap Inc. Burk Film Concentrate shall be used in accordance with the manufacture recommendations. All finishing of concrete surfaces must be completed with this product, finishing with water is not allowed.
3. Air-entraining Admixtures: ASTM C1141. Air entraining prior to shooting shall be 1.5-percent to 3.0-percent with a plus-or-minus 1-percent tolerance.
4. Contractor shall submit cut sheets for all proposed admixtures with the concrete mix design.

2.3 PROPORTIONING AND DESIGN OF CONCRETE MIXES

- A. Mix: Prepare design mix to achieve an in-place 28 day compressive strength of 4,000-pounds per square inch and an air content of 4-percent at 28-days. Maximum aggregate size shall not exceed 3/8-inch. Unit weight of in-place shotcrete shall be 494-pounds per cubic yard. Owner will test the proposed mix designs at his/her expense.
- B. Test Data: Submit for acceptance proportioning and test data from prior experience if available. If data from prior experience are not available or accepted, make and have tested specimens from three or more different mix proportions in accordance with pre-construction testing requirements of this Specification.
- C. Strength: Selected mix proportions on the basis of compressive strength tests of specimens shall be cut from the shotcreted sample transition not earlier than 5-days after shotcreting. For mix acceptance purposed, average core strengths shall be at least equal to f'_c for cores with L/D of 2.0. For cores with L/D between 1.0 and 2.0, use correction factors given in ASTM C42.
- D. Review: Mix design shall be reviewed for acceptance by Owner's Representative.

2.4 CONCRETE APPLICATION EQUIPMENT

- A. For Wet Mix Shotcrete:
 1. Mixing Equipment: capable of thoroughly mixing aggregate, cement and water in sufficient quantity to maintain continuous placement.
 2. Air Supply: Clean air adequate for maintaining sufficient nozzle velocity for parts of work, and for simultaneous operation of blow pipe for cleaning away rebound.
 3. Delivery Equipment: capable of discharging aggregate-cement-water mixture accurately, uniformly, and continuously through delivery hose.

2.5 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.
 1. Use flexible or curved forms for horizontal curves of a radius 100-feet or less.
- B. Form-Release Agent: Commercially formulated form-release agent with a maximum of 350 mg/L volatile organic compounds (VOCS) that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
- C. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24-hours after concrete placement. Forms shall provide a continuous straight, smooth surface. Forms shall be of sufficient thickness to withstand pressure of newly placed concrete without bowing or deflecting.
- D. Clean forms after each use and coat with form release agent to ensure separation from concrete without damage.

- E. Check completed formwork and screeds for grade and alignment to the following Tolerances:
 - 1. Top of Forms: Not more than 1/8-inch in ten feet.
 - 2. Vertical Face on Longitudinal Axis: Not more than 1/8-inch in 10-feet.
 - F. Moisten wood forms immediately prior to placing concrete.
- 2.6 STEEL REINFORCEMENT MATERIALS
- A. Reinforcement Bars shall be Number 4, Grade 40, deformed and as per the plan details.
 - B. General: Comply with CRSI's "Manual of Standard Practice" for fabricating reinforcement.
 - C. Clean reinforcement of loose rust, oil and mill scale, earth, ice, or other bond-reducing materials.
- 2.7 REQUIRED CURING AND FINISHING MATERIALS
- A. Non-permeable Burleen™ curing blankets or approved equal; ASTM C 171. The concrete should be hard enough to prevent surface damage when covering with concrete blankets.
 - B. Water: Potable.
 - C. Evaporation Retardant and Finishing Aid: Burke Film Concentrate – Available from WhiteCap Inc. Burk Film Concentrate shall be used in accordance with the manufacture recommendations. All finishing of concrete surfaces must be completed with this product, finishing with water is not allowed.

PART 3 EXECUTION

3.01 INSPECTION

- A. Examination: Skate Park designer shall examine concrete formwork and verify that it is true to line and dimension, adequately braced against vibration, and constructed to permit escape of air and rebound but to prevent leakage during shotcreting.
- B. Inspection: Skate Park designer shall inspect reinforcement steel and items to be embedded in concrete. Correct any deviations from the accepted shop drawings.
- C. Notification: Notify other trades involved in ample time to permit the proper installation of their work.
- D. Existing Surfaces: Examine existing concrete surfaces for unsound material. Correct deficiencies.

3.02 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating reinforcement.
- B. Clean reinforcement of loose rust, oil and mill scale, earth, ice, or other bond-reducing materials.
- C. Deformed steel bars shall be located as distances on center as indicated on the plans, both directions, continuous throughout the entire structure and as indicted on the plans. Steel rebar shall extend out from the features for 24-inches, 2-inches above base rock. (Rebar for the flat

work shall tie onto the rebar extending for 24-inches from the features.) Lap rebar 24-inches and tie. Stagger joints. Do not heat to bend.

- D. Provide dobie supports for rebar at 36-inches on center. Supports must keep the rebar at 2-inches above base rock and 2-inches below finish surfaces of concrete. Rebar shall be 2-inches away from outside surfaces of concrete in all locations. Rebar shall be free of rust, oil and other deleterious conditions.

3.3 PREPARATION FOR INSTALLATION OF CONCRETE

Forms: Use a form-release agent on removable forms to prevent absorption of moisture and to prevent bond with shotcrete.

3.4 CONCRETE BATCHING AND MIXING

Proportions: Mix proportions shall be controlled by weight batching. Owner's Testing Laboratory shall maintain quality control records during shotcrete production.

3.5 CONCRETE PLACEMENT

- A. Placement: Use suitable delivery equipment and procedures that will result in shotcrete in place meeting the requirement of the Specification. Determine operation procedures for placement in extended distances, and around any obstructions where placement velocities and mix consistency must be adjusted.
- B. Placement Techniques: Do not place shotcrete if drying or stiffening of the mix takes place at any time prior to delivery to the nozzle.
 1. Control thickness, method of support, air pressure, and/or water content of shotcrete to preclude sagging or sloughing off. Discontinue shotcreting or provide suitable means to screen the nozzle stream if wind or air currents cause separation of the nozzle stream during placement.
 2. Hold nozzle as perpendicular to surface as work will permit, to secure maximum compaction with minimum rebound.
 3. In shotcreting walls, begin application at bottom. Ensure work does not sag.
 4. Layering:
 - a. Build up layers by making several passes of nozzle over work area.
 - b. Broom or scarify the surface of freshly placed shotcrete to which, after hardening additional layers of shotcrete are to be bonded. Dampen surface just prior to application of succeeding layers.
 - c. Allow each layer of shotcrete to take initial set before applying succeeding layers.
 - d. Use templates fabricated to the specified finish surfaces to insure exact radii from flat bottom of Skate Park to face of coping. Template shall be fabricated from steel or 3/4-inch Plywood. Check every horizontal foot when applying shotcrete for conformance of intended wall radii. Brace template and place levels at arc to tangent connections to insure no kinks will be formed. Kinks at the bottom of bowls will not be acceptable. Slumping of the shotcrete causing coping setback will not be acceptable.
 5. Placement Around Reinforcement:
 - a. Hold the nozzle at such distance and angle to place materials behind reinforcement before any material is allowed to accumulate on its face.
 - b. Test to ascertain if any void or sand pockets have developed around or behind reinforcement by probing with an awl or other pointed tool after the shotcrete has achieved its initial set, by removal of randomly selected bars, or coring of other suitable standards.

- C. Finishing: Shotcrete installation crews must have appropriate scaffolding and radial ladders or equal to ensure access for application and finishing of shotcrete.

3.6 REMOVAL OF SURFACE DEFECTS IN CONCRETE

- A. General: Remove and replace shotcrete that lacks uniformity, exhibits segregation honeycombing, or lamination. Or which contains any dry patches, slugs, voids, or pockets. Remove defective areas.
- B. Sounding: Sound work with hammer for voids. Remove and replace damaged in-place shotcrete.

3.7 CONCRETE FINISH

- A. Finish-General: Smooth hard trowel finish that is uniform and free of kinks and irregularities.
- B. Transitions: Floated finish on radial face of wall shall consist of a smooth, hard, uniform surface of smooth trowel. Level the transition to a tolerance of ¼-inch in 10-feet when vertical with a radial template using the appropriate radii. If horizontal, use a straight edge. Grinding the surfaces will not be an acceptable means of achieving the intended radii.
- C. All horizontal and vertical edges of concrete shall have ½-inch radii.
- D. All connections between pours must be absolutely flush and smooth.
- E. Grinding finished concrete to achieve the specified finishes will not be accepted.

3.8 CONCRETE JOINTS

- A. Cold Joints: Construct true to line with faces perpendicular to surface planes of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.
- B. Sawcut Joints: Form weakened-plane contraction joints, sectioning concrete into areas of approximately 100-square feet. See Construction Plan for depth and locations.
 - 1. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades within 48-hours of any said pour. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.
- C. Expansion Joints:
 - 1. Fill all expansion joints flush with polyurethane elastomeric sealant per plan or approved equal. See Expansion Joint detail in plans.

3.9 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed shotcrete from premature drying and excessive cold or hot temperatures.
- B. Evaporation Retarder: Apply evaporation retarder according to manufacturer's written instructions after placing, screeding, and bull floating or darbying shotcrete, but before float finishing.

- C. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.
- D. Apply curing blankets 2-hours after finishing concrete. Overlap blankets 2-feet on all sides. The concrete should be hard enough to prevent surface damage when covering with concrete blankets.
- E. Maintain ongoing moisture of concrete by drip irrigation lines located under curing blankets. Provide ongoing moisture for a minimum of 14-days per finished area of concrete.
- F. Concrete shall be protected from any traffic for 30-days.
- G. The Contractor shall take necessary actions to protect the concrete from any vandalism or damage that may occur as a result of trespassing.
- H. Remove and replace concrete pavement that is broken, under strength, spalling, damaged, or defective, or does not meet requirements in this Section.
- I. Drill test cores where directed by Testing Agency when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with Portland cement concrete bonded to pavement with epoxy adhesive.
- J. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material.
- K. The Contractor shall remove the curing blankets and the temporary drip irrigation system, as well as hose and sweep concrete pavement not more than 2- days before date scheduled for Substantial Completion inspections.
- L. Grinding concrete to achieve specified finishes will not be allowed.

3.10 PAVEMENT TOLERANCES

Comply with tolerances of ACI 117 and as follows:

- 1. Elevation: 1/8-inch.
- 2. Thickness: minus 1/4-inch.
- 3. Surface: Gap below 10-foot-long, unlevelled straightedge not to exceed 1/4-inch.
- 4. Lateral Alignment and Spacing of Tie Bars and Dowels: 1-inch.
- 5. Vertical Alignment of Tie Bars and Dowels: 1/4-inch.
- 6. Alignment of Tie-Bar End Relative to Line Perpendicular to Pavement Edge: 1/2-inch.
- 7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge.
- 8. Length of dowel 1/4-inch per 12-inches.
- 9. Contraction Joint Depth: Plus 1/4-inch, no minus.
- 10. Joint Width: Plus 1/8-inch, no minus.
- 11. Plan Dimension 1-inch.
- 12. Vertical Radii: 1/4-inch over length of transition as checked with true template.

3.11 FIELD QUALITY CONTROL

- A. Independent Testing Agency: The City's Independent Testing Agency shall sample materials, perform tests, and submit test reports during concrete placement according to requirements specified.
- B. Testing Services: Testing will be performed according to the following requirements:
 - 1. Sampling Fresh Concrete: Representative samples of fresh concrete shall be obtained according to ASTM C172, except modified for slump to comply with ASTM C94.

2. Slump: AASHTO T119; one test at point of placement for each compressive-strength test, but not less than one test for each day's pour of each type of concrete. Additional tests will be required when concrete consistency changes.
 3. Air Content: ASTM C173 or AASHTO T152, pressure method; one test for each compressive-strength test, but not less than one test for each day's pour of each type of air- entrained concrete.
 4. Concrete Temperature: ASTM C1064; one test hourly when air temperature is 40-degrees Fahrenheit and below and when 80-degrees Fahrenheit and above, and one test for each set of compressive- strength specimens.
 5. Compression Test Specimens: ASTM C31; 1 set of 4-standard cylinders for each compressive-strength test, unless otherwise indicated. Cylinders shall be molded and stored for laboratory-cured test specimens unless field-cured test specimens are required.
 6. Compressive-Strength Tests: ASTM C39; one set for each day's pour of each concrete class exceeding 5-cubic yards. 1-specimen shall be tested at 7-days and 2-specimens at 28-days; one specimen shall be retained in reserve for later testing if required.
- C. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by the Owner's Representative, but will not be used as the sole basis for approval or rejection.
- D. Additional Tests: Testing agency shall make additional tests of the concrete when test results indicate slump, air entrainment, concrete strengths, or other requirements have not been met, as directed by Owner's Representative. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with AASHTO 501.24(b), or by other methods as directed.

END OF SECTION

**Section 05 50 00
Skatepark Metal Fabrication**

PART 1 GENERAL

1.1 SCOPE

- A. Provide labor, material and equipment for the installation of the Skatepark Metal Work as shown on the drawings and as specified.

1.2 RELATED SECTIONS

- A. Skatepark Structure Concrete Paving Section 03 30 53
- B. Skatepark Shotcrete Section 03 37 13

1.3 QUALITY ASSURANCE

- A. Qualification of Fabricators: Experienced in fabrication of miscellaneous metals.
- B. Qualifications of Welders: Welding shall be done only by certified welding operators currently qualified, according to AWS D1.1.
- C. Qualifications of Workmen: Provide at least one person who shall be present at all times during execution of this portion of the Work, and who shall be thoroughly familiar with the type of materials being installed, the referenced standards, the requirements of the Work, and who shall direct all work performed under this Section. Welds indicated may be made in shop or field with approval.
- D. Reference Standards:
 - 1. Steel: Meet requirements of AISC "Specifications of Architecturally Exposed Structural Steel," latest edition.
 - 2. Welding: Meet requirements of AWS "Structural Welding Code," D1.1, latest edition.

1.4 SUBMITTALS

- A. Shop Drawings:
 - 1. Submit shop drawings for all custom fabricated items under this section. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners and accessories. Indicate welded connections using standard AWS welding symbols.
 - 2. Verification: Verify all measurements at the job. Show dimension, sizes, thickness, gauges, finishes, joining, attachments, and relationship of work to adjoining construction. Where items must fit and coordinate with finished surfaces and/or constructed spaces, take measurements at site and not from drawings.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Storage of Materials: Materials which are stored at the project site shall be above ground on platforms, skids, or other supports. Protect steel from corrosion. Store other material in a weather-tight and dry place until ready for use.

- B. Protection:

1. Use all means necessary to protect miscellaneous metal before, during and after installation and to protect the installed work and materials of all other trades.
 2. Protect any adjacent materials or areas below from damage due to weld splatter of sparks during field welding.
- D. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Owner's Representative and at no additional cost to the Owner.

1.6 JOB CONDITIONS

- A. Examine existing conditions in which the work is to be installed. Notify Owner's Representative if conditions are unacceptable to begin work.
- B. Do not proceed with the work until unsatisfactory conditions have been corrected.

1.7 COORDINATION

- A. Templates and Built-ins: Furnish all anchors, fastenings, sleeves, setting templates and layouts affecting or installed in the work of other trades.
- B. Delivery: Where items must be incorporated or built into adjacent work, deliver to trade responsible for such work in sufficient time that progress of work is not delayed. Be responsible for proper location of such items.
- C. Approved sample(s) shall be used as the standard of workmanship and shall remain on site until work has been completed and approved by the Owner's Representative.

PART 2 PRODUCTS

2.1 MATERIALS

- A. See plan details.
- B. WELDING RODS: E-70 series low hydrogen unless otherwise noted on drawings.

2.2 GROUT

- A. Non-shrinking Master Builder's "Embedco", Conrad Sovig's "metel-Mxs Grout", Sonneborn's "Ferrolith G Redi-Mixed Grout" or approved equal.

2.03 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation for miscellaneous metals, shall be new, first quality of their respective kinds and subject to the approval of the Owner's Representative.

PART 3 EXECUTION

3.1 EXISTING CONDITIONS

- A. Inspection: Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- B. Discrepancies: In the event of discrepancy, immediately notify the City's Representative.

3.2 COORDINATION

- A. General: Install metal fabrications in strict accordance with the Drawings, the approved Shop Drawings, and all pertinent codes, regulations and standards.
- B. Delivery: Insure timely delivery of all metal fabrications that must be installed in other work so as not to delay that work.

3.3 INSTALLATION

- A. General:
 - 1. Install metal fabrications in strict accordance with the drawings, the approved Shop Drawings, and all pertinent codes, regulations and standards.
 - 2. Obtain City Representative review prior to site cutting or making adjustments which are not part of scheduled work.
 - 3. Install items square and level, accurately fitted and free from distortion or defects.
 - 4. Align all metal fabrications as shown on the Drawings, and where vertical or horizontal members are shown, align them straight, plumb and level within a tolerance of 1 in 500
 - 5. Make provisions for erection stresses by temporary bracing. Keep work in alignment.
 - 6. Replace items damaged in course of installation.
 - 7. Perform field welding in accordance with AWS D1.1
 - 8. After installation, grind and touch-up field welds.

3.4 WORKMANSHIP

- A. Layout: Set all work plumb, true, rigid, and neatly trimmed out. Miter corners and angles of exposed molding and frames unless otherwise noted.
- B. Fitting: Fit exposed connections accurately together to form tight hairline joints.
- C. Labor: Employ only workmen specifically skilled in such work.

3.5 FABRICATION

- A. Shop assemble in largest practicable dimensions, making members true to length so assembling may be done without fillers.
- B. Provide all surfaces free of file marks, dents, hammer marks, wire edges or any unsightly surface defects.
- C. Roll pipe to conform to top radius curve of each bowl and ledge as shown on drawings. Refer to drawings for relational tolerance to concrete surface and other steel.

3.6 ATTACHMENTS AND REINFORCEMENTS

- A. Do all cutting, shearing, drilling, punching, threading, tapping, etc., required for site metalwork or for attachment of adjacent work. If applicable, drill or punch holes; do not use cutting torch.

3.7 OTHER CONNECTORS

- A. Make all permanent connections in ferrous metal surfaces using welds where at all possible; do not use bolts or screws.

3.8 WELDING

- A. Preparation: Remove all rust, paint, scale and other foreign matter. Wire-brush all flame-cut edges. Clamp members as required and alternate welds, all as necessary to prevent warping or misalignment.
- B. Exposed Welds: Uniformly grind smooth (no tolerance) all welds normally exposed to view and feel in the finished work.
- C. Faulty and Defective Welding: Chip out and replace all welding showing cracks, slag inclusion, lack of fusion, bad undercut or other defects ascertained by visual or other means of inspection. Replace and re-weld at no cost to City.
- D. Field Welding:
 - 1. Procedure: Comply with AWS code of manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding work. Cold Spray Galvanize when complete.
 - 2. Protection: Protect all adjacent surfaces from damage due to weld sparks, spatter, or tramp metal.

3.9 SURFACE TREATMENT AND PROTECTIVE COATINGS

- A. Cleaning:
 - 1. Thoroughly clean all mill scale, rust, dirt, grease and other foreign matter from ferrous metal prior to painting.
 - 2. Conditions that are too severe to be removed by hand cleaning, shall be cleaned using appropriate methods for solvent cleaning, power tool cleaning and brush-off blast cleaning.
- B. Exterior Ferrous Metal:
 - 1. Grind smooth all welds, burrs, and rough surfaces. Clean all coping from grease.
 - 2. Shop coat iron metal items; using anti-rust primer (red color).
 - 3. All welds to be painted with primer after appropriate connections and grinding has taken place. Touch-up all scratched primer prior to shotcrete application.
- C. Paint:
 - 1. Paint all metals per the Skatepark Materials Plan.
 - 2. Provide 2 coats of specified paint per manufacturers instructions.

3.10 CLEAN-UP

- A. Keep all areas of work clean, neat and orderly at all times. Keep paved areas clean during installation.
- B. Clean up and remove all debris from the entire work area prior to Final Acceptance to satisfaction of City's Representative.

END OF SECTION

Section 10 14 00
Architectural Signage

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Archway Sign - BID ALTERNATE 3

1.2 RELATED REQUIREMENTS

- A. Section 15 of the City's Standard Specifications - Concrete Improvements

1.3 REFERENCE STANDARDS

- A. ASTM D522: Test Methods for Mandrel Bend Test of Attached Organic Coatings.
- B. ASTM D609: Practice for Preparation of Cold-Rolled Steel Panels for Testing Paint, Varnish, Coatings, and related Coating Products.
- C. ASTM D714: Test Method for Evaluating Degree of Blistering of Paints.
- D. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
- E. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

1.4 SUBMITTALS

- A. See Section 1-14 for Shop Drawing and Product Data Submittals.
- B. Contractor to submit Shop Drawings that show dimensions, sizes, thicknesses, gauges, finishes, joining, attachments, and relationship of work to adjoining construction. Where concrete or other materials must be set to exact locations to receive work, furnish assistance and direction necessary to permit other trades to properly located their work. Where welded connectors, or concrete are required to receive work, shop drawings shall show exact locations required, and all such drawings shall be furnished to the trades responsible for installing the connectors or inserts. Catalog work sheets showing illustrated cuts of item to be furnished, scale details and dimensions may be submitted for standard manufactured items.
- C. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.
- D. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.
- B. Powdercoating Qualifications: Company performing the powdercoating shall have PCI 3000 certification.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Metalcraft Industries, Inc.
- B. Approved equal.

2.2 FINISH

- A. Powder Coating: posts, archway, and all accessories to receive powdercoating finish.
 - 1. Type: Epoxy or Epoxy/Polyester hybrid resin-based thermosetting powder.
 - 2. Color: Black

2.3 FASTENINGS

- A. Intent of Drawings: The drawings are intended to show the number, size and spacing of nails, bolts and screws, etc., required for structural strength. If any particular joint is not shown on the drawings, it shall be provided with bolts, screws, and/or nails, as required to be consistent with the fully detailed joints, and shall be subject to the approval of the Engineer.
- B. Furnish all hardware required for fastenings, as shown on the drawings, and as specified herein, and as required to complete the work. All fasteners shall be hot-dip galvanized. Fasteners shall include , but not be limited to, the following:

2.4 MATERIALS

- A. Steel Fabrications
 - 1. Steel tube: Cold-formed, conforming to ASTM A 500, Grade B.
 - 2. Steel plates, shapes, bars: Conforming to ASTM A 36.
 - 3. Concrete inserts: Malleable iron, ASTM A 47, or cast steel, ASTM A 27, inserts, with steel bolts, washers and shims; hot-dip galvanized.
 - 4. Anchors and inserts: Furnish inserts and anchoring devices to be built into other work for installation of miscellaneous metal items. Use non-ferrous metal or hot-dip galvanized

anchors and inserts for exterior resistance. Use toothed steel or lead expansion bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.

3.2 POWDERCOATING

- A. Preparation: all parts to be powdercoated are to be disassembled, sandblasted or abrasive blasted until completely smooth and even, thoroughly cleaned with all contaminants removed, and a conversion coating applied to ensure good adhesion of the powder coating.
- B. Finish: powdercoating finish to be Class A finish.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install neatly, with horizontal edges level.
- C. Install as indicated on the Drawings.
- D. Locate sign where indicated on drawings.
- E. Protect from damage until Substantial Completion; repair or replace damaged items.

END OF SECTION

Section 13 30 00
Pre-Fabricated Metal Structure

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Manufacturer-engineered, shop-fabricated shade structures - Shade Structure Entry Plaza and Shade Structure Spectator Area BID ALTERNATES 1 and 2.
 - 1. The structures shall be a pre-engineered package as indicated on the plans and shall be shipped as a pre-cut (excluding standing seam roof panels) and pre-fabricated package that shall include the structural framing members, roof panels, fasteners and roof trim as well as job specific installation instructions. The structures will be shipped in an un-assembled package for ease of shipment and minimum shipping charges.

1.2 RELATED REQUIREMENTS

- A. Section 15 of the City's Standard Specifications - Concrete Improvements

1.3 REFERENCE STANDARDS

- A. AISC 360-10 - Specification for Structural Steel Buildings; American Institute of Steel Construction, Inc.; 2010.
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2012.
- C. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2010.
- D. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.
- E. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts; 2007a.
- F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.
- G. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2010.
- H. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 50 and 105 ksi Yield Strength; 2007a.
- I. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2010
- J. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018.

- K. AWS D 1.8 - Structural Welding Code—Seismic Supplement; 2021.
- L. OSHA - Steel Erection Standard 29 CFR 1926.750 Part R.
- M. SSPC-SP 2 – Hand Tool Cleaning; 2004.
- N. SSPC-SP 10/NACE No. 2 – Near White Blast Cleaning; 2007.
- O. LEED – Leadership in Energy and Environmental Design.
- P. ISO – International Organization for Standardization.

1.4 DESIGN REQUIREMENTS

- A. The structure shall meet the following design requirements:
 - 1. Building Code: 2019 California Building Code
 - 2. Ground Snow Load: 20 p.s.f.
 - 3. Live Load: 20 p.s.f.
 - 4. Wind Speed: 85 m.p.h. Exp “C”
 - 5. Seismic Design Category: D

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week before starting work of this section.

1.6 SUBMITTALS

- A. See Section 1-14 for Shop Drawing and Product Data Submittals.
- B. Submit a minimum of four (4) sets of submittal drawings and (2) sets of structural calculations signed and sealed by a Professional Engineer licensed in the state of California.
- C. Samples: Submit two samples of precoated metal panels for each color selected, 2 x 2 inch minimum in size illustrating color and texture of finish.
- D. Calculations:
 - 1. Design according to the requirements of the national, state or local building codes as indicated in Section 1.04.B.
 - 2. Calculations shall include all member design for each different member type.
 - 3. Connection design for each different connection that will determine the design of the bolts, welds, plate thickness and anchorage to the foundation.

4. Foundation design shall be for the loads applied, not a generic foundation design, while taking into account all soils information.

E. Submittal Drawings:

1. Anchor bolt layout with all appropriate dimensions for installation.
2. Site specific foundation design.
3. Isometric as well as elevation and plan views of the framing members along with the member sizes and locations indicated on the drawings.
4. Connection details for every connection on the frame.
5. Roof panel connections and trim installation details.
6. All accessories on the structure shall have an installation detail as well as connection details.

F. Foundation Design

1. The foundation design shall be supplied by the manufacturer.
2. Anchor bolts shall be supplied by the manufacturer.
3. Foundation materials and labor shall be provided by the structure contractor.
4. Provide Geotechnical Engineering Report to the manufacturer for foundation design.

1.7 QUALITY ASSURANCE

A. MANUFACTURER QUALIFICATIONS

1. The product shall be designed, engineered and fabricated at a facility operated and directly supervised by the manufacturer.
2. The manufacturer shall have a minimum of 15 years in steel shelter fabrication.
3. Full Time on Staff Quality Assurance Manager.
4. All welders must be AWS certified for welding steel structures.
5. Membership in the American Welding Society (AWS).
6. Membership in the American Institute of Steel Construction (AISC).
7. Full Time on Staff Licensed Engineer.
8. Published Quality Control System manual.

9. Quality Control System must pass an annual audit by a Third Party Agency.

10. ISO 9001 certification for Powder Coating System.

1.8 FIELD OR SITE CONDITIONS

A. Foundations shall be installed per the ICON installation drawings.

1. All foundations shall be cast at the same elevation unless specifically noted on the ICON installation drawings.

B. Anchor bolts shall be placed in the foundation as per the ICON installation drawings utilizing the anchor bolt template supplied with the anchor bolts.

1. Anchor bolts shall be installed per the dimensions and orientation shown on the drawings.

1.9 WARRANTY

A. Shelter shall have a 10-year limited warranty on the steel framing members.

B. For all Finish Coatings there will be a pass-through warranty direct from the powder coater, a warranty shall be provided on request.

C. For all Metal Roofing there will be a pass-through warranty direct from the metal Roofing supplier, warranty shall be provided on request.

PART 2 PRODUCTS

2.1 PRE-FABRICATED METAL STRUCTURES - BID ALTERNATES

A. Manufacturer: ICON Shelter Systems, Inc

1. 1455 Lincoln Rd., Holland, MI, 49423,

2. Email: info@iconshelters.com, Website:www.iconshelters.com.

3. Pricing for this specific project and specified shelter can be requested from:

a. Gary Kimbrough 415 Elm St

b. Red Bluff CA, 96080 530-410-5436

c. Gary@parkplanet.com

B. The product shall be designed and fabricated at a facility operated and directly supervised by the manufacturer.

C. Shade Structure Entry Plaza: Bid Alternate #1

1. Cantilever Monoslope style shelter with Multi-Rib roof panels.
 2. Size: 28' x 52'
 3. Roof slope: 3:12
 4. Clear height under Tie Beam (UTB): 10'-0"
- D. Shade Structure Spectator Area: Bid Alternate #2
1. Cantilever Monoslope "T" style shelter with Multi-Rib roof panels.
 2. Size: 15.58' x 30'
 3. Roof slope: 3:12
 4. Clear height under Tie Beam (UTB): 14'-0"
- E. General:
1. The pre-engineered and pre-fabricated package of parts shall be pre-cut and packaged unless noted otherwise. These packages will include all parts and pieces necessary to field assemble the shelter at the jobsite. The shelter shall be shipped in knocked down format to minimize shipping expenses. Field labor will be kept to a minimum with no on-site welding required.
- F. Concrete for Foundations:
1. Concrete shall have a minimum 28-day compressive strength of 2,500 psi unless noted otherwise on the foundation detail.
 2. Reinforcing steel shall be ASTM A615, Grade 60.
- G. Columns:
1. Hollow Structural Section (HSS) columns shall meet ASTM A500, Grade B with a minimum wall thickness of 3/16" (0.1875").
 2. Unless the columns are direct buried in the foundation the columns shall attach to the foundation with a minimum of four (4) anchor rods and shall meet OSHA Steel Erection Standard 29 CFR 1926.755(a)(1).
- H. Structural Framing:
1. All Hollow Structural Sections (HSS) shall meet ASTM A500, Grade B. "I" Beams, tapered columns or open channel sections shall not be accepted for primary members.
- I. Compression rings:

1. Compression rings shall be made of ASTM A36 structural plate or of structural channel welded together to form the ring. All connections not requiring compression rings shall use ASTM A500, Grade B HSS sections for these connections.

J. Connection Requirements:

1. Anchor rods shall be ASTM F1554, Grade 36 unless otherwise noted.
2. Structural fasteners shall be ASTM A325 high strength bolts and A563 nuts.
3. All structural fasteners shall be hidden within the framing members whenever possible.
4. No field welding shall be required to finish the construction of the shelter.
5. Manufacturer shall supply extra fasteners.

K. Roofing Materials:

1. Multi-rib metal roofing
2. Roofing shall be a minimum of 24-gauge Galvalume steel sheet with ribs that are 1 3/16 inches tall and 12 inches on center. Ribs shall run with the slope of the roof for proper drainage.
3. Roof outside surface shall be a baked on Kynar 500 paint finish and shall be supplied in one of the manufacturer's standard colors: TBD. Ceiling color to be a "wash coat" primer.
4. Metal roofing trim shall match the color of the roof and shall be factory made from 26-gauge Kynar 500 painted Galvalume sheet steel.
5. Trim includes panel ridge caps, hip caps, eave "J" trim, splice channels, rake trim, roof peak cap and corner trim as applicable for the model selected. Trim may need to be field cut to length. Please refer to the installation drawings for additional information and detail.
6. Ridge, hip and valley caps shall be pre-formed with a single central bend to match the roof slope and shall be hemmed on both edges.
7. Roof peak caps shall be pre-fabricated with no field assembly required.
8. Manufacturer shall supply roof screws painted to match the roof.

L. Factory Frame Finish:

1. E-COAT/ POWDERCOAT:

- a. The steel shall be shot-blasted to the specification of SSPC-SP10 near white blast cleaning. SSPC-SP2 hand tool cleaning will not be an acceptable alternative.
2. The shot-blasted parts are then washed with zinc-phosphate in an eight (8) stage washer.
3. The steel is then immersed in a liquid epoxy and coated through an electro-deposition process (E-coat), this is coated both inside and out to a uniform cover of 0.7-0.9 mils. The E-coat totally encapsulates the part for superior corrosion protection.
4. The parts are then coated with a color coat of TGIC polyester powder and then one clear coat for a final finish thickness of 8 to 12 mils.

M. Substitutions:

1. Alternate suppliers shall meet the requirements, qualifications and provide proof of certifications listed under Section 1.07 QUALITY ASSURANCE.
2. Alternate suppliers shall provide documentation that the power-coat system being provided meets or exceeds the ICON supplied powder-coat system listed under Section 2.01(c)(8).

PART 3 EXECUTION

3.1 STORAGE AND HANDLING

- A. When the shelter arrives at the jobsite protect the products from weather, sunlight and damage.
- B. When unloading, pad the forks and use other precautions to protect the powder-coated finish. Do not use chains to move the materials, use straps. Handle all materials carefully in the field to avoid scratching the powder-coat finish.
- C. Contractor shall store the product elevated from the soil to allow full air circulation around the materials as do not introduce mold, decay, fungi or insects into or on the materials. One end of the materials shall be elevated higher than the other end if storage will be longer than a few days as to allow the water to run off the materials.

3.2 INSTALLATION OF MATERIALS

- A. Install in accordance with manufacturer's instructions.
- B. The shelter shall be placed on prepared foundations that were designed by the manufacturer (unless otherwise noted). Materials for these foundations are not supplied by ICON but by the foundation installation contractor. Foundation shall be constructed to all local building code requirements and per good construction practices for the specific site conditions.

1. In accordance with OSHA Steel Erection Standard 29 CFR 1926.750 Part B, anchor rods shall be installed for proper column stability and shall have a minimum of four (4) anchor bolts per column. Therefore, no single anchor rod column base connections shall be allowed.
- C. The contractor shall install all parts and pieces per the manufacturer's supplied installation instructions and these specifications.

3.3 REPAIR

- A. No field modifications or corrections are allowed without authorization from the ICON Engineering Department.

END OF SECTION

Section 26 05 19
Low Voltage Electrical Power Conductors and Cables

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

- 1. Building wires and cables rated 600 V and less.
- 2. Connectors, splices, and terminations rated 600 V and less.

B. Related Requirements:

- 1. Section 260533 "Raceways and Boxes for Electrical Systems"
- 2. Section 260553 "Identification for Electrical Systems."

1.3 DEFINITIONS

- A. ASTM: American Society of Testing Materials.
- B. ICEA: Insulated Cable Engineers Association.
- C. IEEE: Institute of Electrical & Electronics Engineers.
- D. NEMA: National Electrical Manufacturers Association.
- E. NETA ATS: InterNational Electrical Testing Association - Acceptance Testing Specification.
- F. VFC: Variable frequency controller.

1.4 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's technical data for each type of product, indicating conductor/cable construction, insulation material, thickness of insulation, jacket, cable stranding, and voltage rating of each type of conductor/cable specified, splices and terminations. Indicate date and place of manufacture for each conductor/cable, cable, splice and termination.
- B. Manufacturer's ISO certification.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Independent Testing Agency.
- B. Field quality-control reports. Perform field testing of cables per para 3.8. Submit six (6) copies of field test reports to City's representative within two (2) weeks of completion of test.

1.6 QUALITY ASSURANCE

- A. General Requirements: The low voltage power conductors and cable shall be copper, minimum 600V rated unless otherwise indicated. Aluminum conductors and cables shall not be accepted unless otherwise indicated.

Section 26 05 19
Low Voltage Electrical Power Conductors and Cables

- B. Materials and installation shall meet or exceed requirements in the following referenced standards and shall be listed and labelled by UL.
1. ICEA S-93-639/ NEMA WC 74.
 2. AEIC CS8.
 3. UL 1072.
 4. IEEE.
 5. ASTM.
 6. NEMA.
- C. Conductors and cables shall be of the same manufacturer, and shipped to the job site in original unbroken reels.
- D. Conductors and cables shall be manufactured with in twelve (12) months of installation. Date of manufacture shall be clearly marked on conductors or conductor reels.
- E. Manufacturer shall have minimum ten (10) years' experience in the manufacturer of conductors and cables similar to those specified on this project.
- F. Manufacturer shall have ISO 9001 and ISO 9002 certification.
- G. All conductors and cables shall be new and supplied by a local distributor.
- H. American made conductors and cables have been acceptable. If non-domestic product is submitted, notice is hereby given that extensive testing shall be required to insure quality and conformance to the Specifications. All of the testing procedures and results shall be satisfactory to the City's representative. The Contractor shall bear all costs for testing and shall be responsible for all costs associated with travel, lodging, etc. for the City's Representative to witness the test at the manufacturer's testing facility. The Contractor shall reimburse the City at \$1,200 per man day or part thereof for the time required to witness the testing.
- I. Testing: Provide the services of an independent qualified testing laboratory to perform the specified field tests. Notify the City's Representative fourteen (14) days in advance of performance of work requiring testing.
- J. Conductors, cables, splices and terminations shall be manufactured within twelve (12) months of installation. Each item shall have a permanent marking on the product or the original manufacturers' package indicating the date of manufacture unless otherwise noted.
- K. Testing Agency Qualifications:
1. Testing agency shall be an independent company; shall have been a member of NETA for a minimum of last ten (10) years and has permanent in-house testing engineers and technicians involved with testing of low voltage electrical power conductors and cables similar to those specified on this project.
 2. Testing company shall be located within 50 miles radius of the project.
 3. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.
 4. Field Testing technician and supervisor shall have minimum ten (10) years' experience in field testing of low voltage power conductors and cables of the type and rating similar to the conductors and cables to be tested on this project.

Section 26 05 19
Low Voltage Electrical Power Conductors and Cables

PART 2 - - PRODUCTS

2.1 CONDUCTORS AND CABLES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following manufacturers:
 - 1. General Cable Technologies Corporation.
 - 2. Southwire Incorporated
 - 3. Encore Wire Corporation
 - 4. Or Equal
- B. Conductor Material: Electrical grade, soft drawn annealed copper, 98 percent conductivity, and fabricated in accordance with ASTM and IPCEA standards. Minimum size is number 12 for branch circuits, number 14 stranded for control wiring. Aluminum conductors are not permitted. Copper Conductors: Comply with NEMA WC 70/ICEA S-95-658.
- C. Conductor Insulation: Comply with NEMA WC 70/ICEA S-95-658 for Type XHHW-2.
- D. Provide separate neutral with each branch circuit serving outlets. When dedicated neutrals are provided, use color spiral to match associated phase.

2.2 CONNECTORS AND SPLICES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following manufacturers:
 - 1. Ideal Industries, Inc.
 - 2. IIsco; a branch of Bardes Corporation.
 - 3. O-Z/Gedney; a brand of the EGS Electrical Group.
 - 4. 3M; Electrical Markets Division.
 - 5. Tyco Electronics.
 - 6. Or Equal
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.
- C. Copper conductors shall be terminated in copper or bronze mechanical connectors or lugs or tool applied compression connections made of copper for all connections except those on wiring devices.
- D. Splices in wires No. 10 and smaller shall be made with twist-on splicing connector in accordance with UL486-C. Connections in wires No. 8 and larger shall be made with compression type connectors in accordance with UL486-A and wrapped with insulated tape in accordance with UL501. Insulating tape shall be applied in a minimum of two layers of half wrap or built to match the overall insulation of the wire.
- E. Splices in underground pull boxes shall be made submersible type and made using "3M" Scotch-cast epoxy kits.
- F. Pressure type connectors are not permitted.

2.3 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: UL Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

Section 26 05 19
Low Voltage Electrical Power Conductors and Cables

- B. Comply with NFPA 70.

PART 3 - - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger, except VFC cable, which shall be extra flexible stranded.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Service Entrance: Type XHHW-2, single conductors in raceway
- B. Exposed Feeders: Type XHHW-2, single conductors in raceway.
- C. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway
- D. Exposed Branch Circuits, Including in Crawlspace: Type THHN-2-THWN-2, single conductors in raceway.
- E. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. All conductors and cables shall be installed in a raceway.
- B. Before installing conductors and cables in existing conduits, verify the continuity of each conduit; each surface conduit is properly supported per code and clear of any debris.
- C. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- D. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- E. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- F. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

Section 26 05 19
Low Voltage Electrical Power Conductors and Cables

- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors].
 - 1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.5 IDENTIFICATION

- A. Each conductor shall be factory color coded by conductor manufacturer. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.6 FIELD QUALITY CONTROL

- A. Testing Agency: Engage an independent qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- C. Test and Inspection Reports: Prepare a written report to record the following:
 - 1. Procedures used.
 - 2. Results that comply with requirements. Include color scan images.
 - 3. Results that do not comply with requirements and corrective action taken to achieve compliance with requirements.
- D. Cables will be considered defective if they do not pass tests and inspections.

END OF SECTION

Section 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes: Grounding systems and equipment.
- B. Section includes grounding systems and equipment, plus the following special applications:
 - 1. Underground distribution grounding.

1.3 DEFINITIONS:

- A. NETA ATS: International Electrical Testing Association - Acceptance Testing Specification.
- B. NETA MTS: International Electrical Testing Association - Maintenance Testing Specification.
- C. NFPA: National Fire Protection Association.

1.4 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's technical catalog cuts for each type of product indicated.
 - 1. Wiring Diagrams: Differentiate between manufacturer installed and field installed wiring.

1.5 INFORMATIONAL SUBMITTALS

- A. Informational Submittals: Plans drawn to scale (1/4"=1'-0") showing dimensioned locations of grounding features specified in "Field Quality Control" Article, including the following:
 - 1. Ground rods.
 - 2. Grounding conductors, connectors.
 - 3. Grounding arrangements and connections for separately derived systems.
- B. Qualification Data: For qualified independent testing agency and testing agency's field supervisor.
- C. Field quality-control reports. Submit written test reports including the following:
 - 1. Test procedures used.
 - 2. Test results that comply with requirements.
 - 3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For grounding to include in emergency, operation, and maintenance manuals, include the following:

Section 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

1. Instructions for periodic testing and inspection of grounding features at grounding connections for separately derived systems based on NETA MTS.
 - a. Tests shall determine if ground-resistance or impedance values remain within specified maximums, and instructions shall recommend corrective action if values do not.
 - b. Include recommended testing intervals.

1.7 QUALITY ASSURANCE

A. Testing Agency Qualifications:

1. Testing agency shall be an independent company; shall have been a member of NETA for a minimum of last ten (10) years and has permanent in-house testing engineers and technicians involved with testing of grounding systems similar to those specified on this project.
2. Testing company shall be located within 50 miles radius of the project.
3. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.
4. Field Testing technician and supervisor shall have minimum ten (10) years' experience in field testing of rounding systems of the type and rating similar to the systems to be tested on this project.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 GROUNDING ELECTRODES, CONDUCTORS, CONNECTOR, BUS:

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following, or equal:

1. Grounding Connectors, Bars and Rods:
 - a. Erico Inc.; Electrical Product Group
 - b. Framatome Connectors/Burndy Electrical.
 - c. Ideal Industries, Inc.
 - d. O-Z/Gedney Co.; a business of the EGS Electrical Group.
 - e. Thomas & Betts, Electrical.
 - f. Or Equal
2. Grounding Conductors and cables:
 - a. Southwire
 - b. American Insulated Wire
 - c. Okonite
 - d. Or Equal

2.2 CONDUCTORS

A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

Section 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

B. Bare Copper Conductors:

1. Solid Conductors: ASTM B 3.
2. Stranded Conductors: ASTM B 8.
3. Tinned Conductors: ASTM B 33.

4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch (6 mm) in diameter.
5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.
7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.

2.3 CONNECTORS

- A. Listed and labeled by UL for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, pressure type with at least two bolts.
 1. Pipe Connectors: Clamp type, sized for pipe.

- C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

- D. Bus-bar Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

2.4 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel; 3/4 inch by 10 feet-in diameter.

- B. Chemical-Enhanced Grounding Electrodes: Copper tube, straight or L-shaped, charged with nonhazardous electrolytic chemical salts
 1. Termination: Factory-attached No. 4/0 AWG bare conductor at least 48 inches (1200 mm) long.
 2. Backfill Material: Electrode manufacturer's recommended material.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

- B. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 2/0 AWG minimum.
 1. Bury at least 24 inches (600 mm) below grade.

Section 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

2. Duct-Bank Grounding Conductor: Bury 12 inches (300 mm) above duct bank when indicated as part of duct-bank installation.

C. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
3. Connections to Ground Rods at Test Wells: Bolted connectors.
4. Connections to Structural Steel: Welded connectors.

3.2 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

- A. Comply with IEEE C2 grounding requirements.

- B. Grounding Manholes and Handholes: Install a driven ground rod through manhole or handhole floor, close to wall, and set rod depth so 4 inches will extend above finished floor. If necessary, install ground rod before manhole is placed and provide No. 1/0 AWG bare, tinned-copper conductor from ground rod into manhole through a waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from 2 inches above to 6 inches below concrete. Seal floor opening with waterproof, nonshrink grout.

- C. Install #4/0 bare copper ground wire loop around the outside perimeter of the manhole, in soil, 12" above bottom of manhole. Cadweld ground wire loop to #4/0 bare copper ground wire connecting all exposed metal parts inside the manhole through a 1" opening at the top of manhole wall. Seal and waterproof opening after wire installation.

- D. Grounding Connections to Manhole Components: Bond exposed-metal parts such as inserts, cable racks, pulling irons, ladders, and cable shields within each manhole or handhole, to ground rod or grounding conductor. Make connections with No. 4 AWG minimum, stranded, hard-drawn copper bonding conductor. Train conductors level or plumb around corners and fasten to manhole walls. Connect to cable armor and cable shields according to written instructions by manufacturer of splicing and termination kits.

3.3 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits in the same conduit containing phase and neutral conductors. Comply with NFPA 70, Article 250, for types, sizes, and quantities of equipment grounding conductors, unless specific types, larger sizes, or more conductors than required by NFPA 70 are indicated.

- B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70. :

1. Feeders and branch circuits.
2. Lighting circuits.
3. Receptacle circuits.

- C. Isolated Equipment Enclosure Circuits: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from supply circuit raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure, and install a separate insulated equipment grounding conductor. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.

Section 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

3.4 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.
 - 1. Interconnect ground rods with grounding electrode conductor below grade using exothermic welds, except at test wells and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
 - 2. For grounding electrode system, install ground rods at least three rods, spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
- C. Test Wells: Ground rod driven through drilled hole in bottom of handhole. Handholes are specified in Section 260543 "Underground Ducts and Raceways for Electrical Systems," and shall be at least 12 inches deep, with cover.
 - 1. Test Wells: Install at least one test well for each service unless otherwise indicated. Install at the ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.
- D. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
 - 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 - 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
 - 3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

3.5 LABELING

- A. Comply with requirements in Section 260553 "Identification for Electrical Systems" for instruction signs. The label or its text shall be green.
- B. Install labels at the telecommunications bonding conductor and grounding equalizer.
 - 1. Label Text: "If this connector or cable is loose or if it must be removed for any reason, notify the facility manager."

3.6 FIELD QUALITY CONTROL

- A. Testing Agency: Engage an independent qualified testing agency to perform tests and inspections. Refer to section
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections.

Section 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- D. Tests and Inspections:
1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
 2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
 3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal. Make tests at ground rods before any conductors are connected.
 - a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - b. Perform tests by fall-of-potential method according to IEEE 81.
 4. Prepare dimensioned Drawings locating each test well, ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.
- E. Grounding system will be considered defective if it does not pass tests and inspections.
- F. Prepare test and inspection reports.
- G. Report measured ground resistances that exceed the following values:
1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
 2. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 5 ohms.
 3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
- H. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION

Section 26 05 33
RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Metal conduits, tubing, and fittings.
2. Nonmetal conduits, tubing, and fittings.
3. Surface raceways.
4. Boxes, enclosures, and cabinets.
5. Handholes and boxes for exterior underground cabling.

B. Related Requirements:

1. Section 260543 "Underground Ducts and Raceways for Electrical Systems" for exterior ductbanks, manholes, and underground utility construction.

1.3 DEFINITIONS

- A. ARC: Aluminum rigid conduit.
- B. EMT: Electrical metal tubing
- C. ENT: Electrical non-metallic tubing
- D. GRC: Galvanized rigid steel conduit.
- E. HDPE: High density polyethylene pipe
- F. IMC: Intermediate metal conduit.
- G. LFMC: Liquidtite flexible metal conduit
- H. LFNC: Liquidtite flexible non-metallic conduit.
- I. RNC: Rigid non-metallic conduit
- J. RTRC: Reinforced thermosetting resin conduit

1.4 QUALITY ASSURANCE:

- A. Each conduit shall bear manufacturer's trademark and UL label.
- B. Each type of conduit and fittings shall be of a single manufacturer. Multiple manufacturer's of the same material are not acceptable.
- C. Comply with California Electric Code (CEC)

Section 26 05 33
RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

1.5 ACTION SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

1.6 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:
 - 1. Structural members in paths of conduit groups with common supports.
- B. Qualification Data: For professional engineer.
- C. Seismic Qualification Certificates: For enclosures, cabinets, and conduit racks and their mounting provisions, including those for internal components, from manufacturer.
 - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 - 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
 - 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
 - 4. Detailed description of conduit support devices and interconnections on which the certification is based and their installation requirements.
- D. Source quality-control reports.

PART 2 - PRODUCTS

2.1 METAL CONDUITS, TUBING, AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Allied Tube & Conduit; a Tyco International Ltd. Co.
 - 2. Electri-Flex Company.
 - 3. O-Z/Gedney; a brand of EGS Electrical Group.
 - 4. Republic Conduit.
 - 5. Thomas & Betts Corporation.
 - 6. Western Tube and Conduit Corporation.
 - 7. Wheatland Tube Company; a division of John Maneely Company.
 - 8. Or Equal
- B. Listing and Labeling: Metal conduits, tubing, and fittings shall be UL listed and labeled as defined in NFPA 70, and marked for intended location and application.
- C. GRC: Comply with ANSI C80.1 and UL 6.
- D. ARC: Comply with ANSI C80.5 and UL 6A.
- E. IMC: Comply with ANSI C80.6 and UL 1242.

Section 26 05 33
RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

- F. EMT: Comply with ANSI C80.3 and UL 797.
- G. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.
- H. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
 - 1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886 and NFPA 70.
 - 2. Fittings for EMT:
 - a. Material: Steel.
 - b. Type: compression.
 - 3. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
- I. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS, TUBING, AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. CANTEX Inc.
 - 2. Condux International, Inc.
 - 3. Electri-Flex Company.
 - 4. Lamson & Sessions; Carlon Electrical Products.
 - 5. RACO; a Hubbell company.
 - 6. Thomas & Betts Corporation.
 - 7. Or Equal
- B. Listing and Labeling: Nonmetallic conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. ENT: Comply with NEMA TC 13 and UL 1653.
- D. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
- E. LFNC: Comply with UL 1660.
- F. Rigid HDPE: Comply with UL 651A.
- G. Continuous HDPE: Comply with UL 651B.
- H. Coilable HDPE: Preassembled with conductors or cables, and complying with ASTM D 3485.
- I. RTRC: Comply with UL 1684A and NEMA TC 14.
- J. Fittings for ENT and RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.
- K. Fittings for LFNC: Comply with UL 514B.

Section 26 05 33
RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

- L. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- M. Solvent cements and adhesive primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.3 BOXES, ENCLOSURES, AND CABINETS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Cooper Technologies Company; Cooper Crouse-Hinds.
 - 2. EGS/Appleton Electric.
 - 3. Hoffman; a Pentair company.
 - 4. O-Z/Gedney; a brand of EGS Electrical Group.
 - 5. RACO; a Hubbell Company.
 - 6. Thomas & Betts Corporation.
 - 7. Or Equal
- B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.
- E. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.
- F. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- G. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum with gasketed cover.
- H. Device Box Dimensions: 4 inches square by 2-1/8 inches deep.
- I. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 3R with continuous-hinge cover with flush latch unless otherwise indicated.
 - 1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
 - 2. Nonmetallic Enclosures: Fiberglass.
 - 3. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.
- J. Cabinets:
 - 1. NEMA 250, Type 4X galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
 - 2. Hinged door in front cover with flush latch and concealed hinge.
 - 3. Key latch to match panelboards.
 - 4. Metal barriers to separate wiring of different systems and voltage.
 - 5. Accessory feet where required for freestanding equipment.
 - 6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

Section 26 05 33
RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

2.4 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

- A. General Requirements for Handholes and Boxes:
1. Boxes and handholes for use in underground systems shall be designed and identified as defined in NFPA 70, for intended location and application.
 2. Boxes installed in wet areas shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Jensen Precast Inc.
 - b. CDR Systems Corporation; Hubbell Power Systems.
 - c. Oldcastle Precast, Inc.; Christy Concrete Products.
 - d. Synertech Moulded Products; a division of Oldcastle Precast, Inc.
 - e. As indicated on the drawings.
 - f. Or Equal
 2. Standard: Comply with SCTE 77.
 3. Configuration: Designed for flush burial with closed bottom unless otherwise indicated.
 4. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
 5. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
 6. Cover Legend: Molded lettering, "ELECTRIC.". Boxes containing conductors and cables over 600V, the cover shall include permanently engraved name of the utility company (e.g UCSD), type of utility (e.g. ELECTRIC), "DANGER-HIGH VOLTAGE-KEEP OUT" in minimum 1/2" inch size, block letters.
Boxes for sports lighting (Musco) shall be labeled "LIGHTING"
 7. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
 8. Handholes 12 Inches Wide by 24 Inches Long and Larger: Have inserts for cable racks and pulling-in irons installed before concrete is poured.

2.5 SOURCE QUALITY CONTROL FOR UNDERGROUND ENCLOSURES

- A. Handhole and Pull-Box Prototype Test: Test prototypes of handholes and boxes for compliance with SCTE 77. Strength tests shall be for specified tier ratings of products supplied.
1. Tests of materials shall be performed by an independent testing agency.
 2. Strength tests of complete boxes and covers shall be by either an independent testing agency or manufacturer. A qualified registered professional engineer shall certify tests by manufacturer.
 3. Testing machine pressure gages shall have current calibration certification complying with ISO 9000 and ISO 10012 and traceable to NIST standards.

Section 26 05 33
RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
 - 1. Exposed Conduit: GRC.
 - 2. Underground Conduit: Type EPC-40-PVC, direct buried.
 - 3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
 - 4. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
- B. Indoors: Apply raceway products as specified below unless otherwise indicated:
 - 1. Exposed, Not Subject to Physical Damage: EMT.
 - 2. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:
 - a. Loading dock.
 - b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
 - c. Mechanical rooms.
 - 3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
 - 4. Damp or Wet Locations: GRC.
 - 5. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.
- C. Minimum Raceway Size: 3/4-inch trade size.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
 - 1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
 - 2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
 - 3. EMT: Use compression, steel fittings. Comply with NEMA FB 2.10.
 - 4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.
- E. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.
- F. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.
- G. Install surface raceways only where indicated on Drawings.
- H. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F.

Section 26 05 33
RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

3.2 INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
- B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Complete raceway installation before starting conductor installation.
- D. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.
- E. Arrange stub-ups so curved portions of bends are not visible above finished slab.
- F. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.
- G. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
- H. Support conduit within 12 inches of enclosures to which attached.
- I. Stub-ups to Above Recessed Ceilings:
 - 1. Use RMC for raceways.
 - 2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
- J. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- K. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.
- L. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
- M. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
- N. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.
- O. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- P. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.

Section 26 05 33
RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

- Q. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 250lbs (113 kgs) tensile strength. Leave at least 12 inches of slack at each end of pull wire. Provide acrylic identification tags (2"X4") at each end indicating the source. Cap underground raceways designated as spare above grade alongside raceways in use.
- R. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.
- S. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 2. Where an underground service raceway enters a building or structure.
 3. Where otherwise required by NFPA 70.
- T. Comply with manufacturer's written instructions for solvent welding RNC and fittings.
- U. Expansion-Joint Fittings:
1. Install in each run of aboveground RNC that is located where environmental temperature change may exceed 30 deg F and that has straight-run length that exceeds 25 feet. Install in each run of aboveground RMC conduit that is located where environmental temperature change may exceed 100 deg F and that has straight-run length that exceeds 100 feet.
 2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:
 - a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F temperature change.
 - b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.
 3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F of temperature change for metal conduits.
 4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
 5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.
- V. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.
- W. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

- A. Direct-Buried Conduit:

Section 26 05 33
RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified by civil engineer for pipe less than 6 inches in nominal diameter.
2. Install backfill as specified by civil engineer.
3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction per civil engineering drawings and specifications.
4. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through floor unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
5. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.
6. Underground Warning Tape: Comply with requirements in Section 260553 "Identification for Electrical Systems."

3.4 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

- A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances. Top of conduits inside the handhole/box shall be minimum 3 inches above the bottom of the handhole/box.
- B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel (minimum 6 inch high), graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.
- C. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch above finished grade.
- D. Install handholes with bottom below frost line.
- E. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables but short enough to preserve adequate working clearances in enclosure.
- F. Field-cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.5 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION

Section 26 05 43
UNDERGROUND DUCTS & RACEWAYS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Conduit, ducts, and duct accessories for direct-buried and concrete-encased duct bank(s)
 - 2. Handholes and boxes.
 - 3. Manholes.
- B. Related Requirements:
 - 1. Section 260526 "Grounding and Bonding of Electrical Systems".

1.3 DEFINITION

- A. RNC: Rigid nonmetallic conduit.
- B. PVC coated GRS: PVC coated Galvanized rigid steel conduit
- C. PVC: Poly Vinyl Chloride
- D. NETA: InterNational Testing Association

1.4 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Duct-bank materials, including separators and miscellaneous components.
 - 2. Ducts and conduits and their accessories, including elbows, end bells, bends, fittings, and solvent cement.
 - 3. Accessories for manholes, handholes, boxes, and other utility structures.
 - 4. Warning tape.
 - 5. Warning planks.
 - 6. Pull ropes.
- B. Shop Drawings for Precast or Factory-Fabricated Underground Utility Structures: Include plans, elevations, sections, details, attachments to other work, and accessories, including the following:
 - 1. Duct entry provisions, including locations and duct sizes.
 - 2. Reinforcement details.
 - 3. Frame and cover design and manhole frame support rings.

Section 26 05 43
UNDERGROUND DUCTS & RACEWAYS

4. Grounding details.
 5. Cable racks, insert. Include dimensioned locations of cable rack inserts, pulling-in and lifting irons, and sumps.
 6. Joint details.
- C. Shop Drawings for Factory-Fabricated Manholes, Handholes and Boxes Other Than Precast Concrete: Include dimensioned plans, sections, and elevations, and fabrication and installation details, including the following:
1. Duct entry provisions, including locations and duct sizes.
 2. Cover design. Include details of factory engraved markings as specified.
 3. Grounding details.
 4. Cable racks, inserts. Include dimensioned locations of cable rack inserts, and pulling-in and lifting irons.

1.5 INFORMATIONAL SUBMITTALS

- A. Duct-Bank Coordination Drawings: Show duct profiles and coordination with other utilities and underground structures.
1. Include plans and sections, drawn to scale, and show bends and locations of expansion fittings.
 2. Drawings shall be signed and sealed by a qualified California registered professional electrical engineer.
- B. Product Certificates: For concrete and steel used in precast concrete manholes and handholes, as required by ASTM C 858. Certificates shall be signed by manufacturer's structural engineer. Include name and date.
- C. Qualification Data: For professional engineer and testing agency.
- D. Source quality-control test reports.
- E. Field quality-control test reports.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- B. Comply with ANSI C2.
- C. Comply with NFPA 70.
- D. Each conduit shall bear manufacturer's trademark and UL label. Conduits and fittings shall be of a single manufacturer. Multiple manufactures for the same material are not acceptable.
- E. Comply with California Electric Code (CEC).

Section 26 05 43
UNDERGROUND DUCTS & RACEWAYS

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver ducts to project site with ends capped. Store nonmetallic ducts with supports to prevent bending, warping, and deforming.
- B. Deliver precast concrete manholes, handholes and other underground utility structures when the site is ready for installation. Store precast concrete and other factory-fabricated underground utility structures at project site (if necessary) as recommended by manufacturer to prevent physical damage. Arrange so identification markings are visible.
- C. Lift and support precast concrete units only at designated lifting or supporting points.

1.8 PROJECT CONDITIONS

- A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by city or others unless permitted under the following conditions and then only after arranging to provide temporary electrical service according to requirements indicated:
 - 1. Notify University no fewer than fourteen (14) days in advance of proposed interruption of electrical service.
 - 2. Do not proceed with interruption of electrical service without city's written permission.
 - 3. Existing electrical service shall be shut down by city authorized personnel. Coordinate with university in advance.

1.9 COORDINATION

- A. Coordinate layout and installation of ducts, manholes, handholes, and boxes with final arrangement of other utilities, site grading, and surface features as determined in the field.
- B. Coordinate elevations of ducts and duct-bank entrances into manholes, handholes, and boxes with final locations and profiles of ducts and duct banks as determined by coordination with other utilities, underground obstructions, and surface features. Revise locations and elevations from those indicated as required to suit field conditions and to ensure that duct runs drain to manholes and handholes, and as approved by engineer.

1.10 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
- B. Furnish cable-support stanchions, arms, insulators, and associated fasteners in quantities equal to 5 percent of quantity of each item installed (minimum six of each type).

PART 2 - PRODUCTS

2.1 CONDUIT

- A. Plastic-Coated Rigid Steel Conduit: Galvanized. Comply with ANSI C80.1. Plastic-Coated Rigid Steel Conduit and Fittings: Rigid steel conduit and fittings with an extruded polyvinyl

Section 26 05 43
UNDERGROUND DUCTS & RACEWAYS

chloride jacket, minimum 40 mils. The jacket shall have high tensile strength, shall be highly resistant to corrosion and shall not oxidize or deteriorate or shrink when exposed to sunlight and weather. The jacket shall be flame retardant and shall not support combustion. The interior of the conduit shall have a urethane coating, minimum 2 mils.

- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Allied Tube and Conduit
 2. Republic Conduit
 3. Western Tube
- C. RNC: Heavy wall design; NEMA TC 2, Type EPC-40-PVC, UL 651, with matching fittings by same manufacturer as the conduit, complying with NEMA TC 3 and UL 514B. Make all fittings watertight with solvent-weld recommended by the conduit manufacturer and specifically manufactured for the purpose.
- D. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Cantex, Inc.
 2. Thomas & Betts-Carlton
 3. Lamson & Sessions -Carlton Division
 4. JM Eagle
 5. Allied Tube and Conduit

2.2 NONMETALLIC DUCTS AND DUCT ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. CANTEX Inc.
 2. Condux International, Inc.
 3. Electri-Flex Company.
 4. Lamson & Sessions; Carlon Electrical Products.
 5. RACO; a Hubbell company.
 6. Thomas & Betts Corporation.
 7. Or Equal
- B. Duct Accessories:
1. Duct Separators: Factory-fabricated rigid PVC interlocking spacers, sized for type and sizes of ducts with which used, and selected to provide minimum duct spacings indicated while supporting ducts during concreting or backfilling.
 2. Warning Tape: Underground-line warning tape specified in Section 260553 "Identification for Electrical Systems."
 3. Concrete Warning Planks: Nominal 12 by 24 by 3 inches (300 by 600 by 76 mm) in size, manufactured from 6000-psi (41-MPa) concrete.
 - a. Color: Red dye added to concrete during batching.
 - b. Mark each plank with "ELECTRIC" in 2-inch- (50-mm-) high, 3/8-inch- (10-mm-) deep letters.

Section 26 05 43
UNDERGROUND DUCTS & RACEWAYS

2.3 PRECAST CONCRETE HANDHOLES AND BOXES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Christy Concrete Products.
 2. Oldcastle Precast Group.
 3. Jensen Precast
- B. Comply with ASTM C 858 for design and manufacturing processes.
- C. Description: Factory-fabricated, reinforced-concrete, monolithically poured walls and bottom unless open-bottom enclosures are indicated. Frame and cover shall form top of enclosure and shall have traffic load rating consistent with that of handhole or box.
1. Frame and Cover: Weatherproof steel frame, with steel cover with recessed hinged cover hook eyes and tamper-resistant, captive, cover-securing bolts.
 2. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
 3. Cover Legend: Molded lettering "ELECTRIC", "LIGHTING", "GROUNDING" As indicated for each service.
 4. Configuration: Units shall be designed for flush burial and have closed bottom, unless otherwise indicated.
 5. Extensions and Slabs: Designed to mate with bottom of enclosure. Same material as enclosure.
 - a. Extension shall provide increased depth of 12 inches (300 mm).
 - b. Slab: Same dimensions as bottom of enclosure and arranged to provide closure.
 6. Windows: Precast openings in walls, arranged to match dimensions and elevations of approaching ducts and duct banks plus an additional 12 inches (300 mm) vertically and horizontally to accommodate alignment variations.
 - a. Windows shall be located no less than 6 inches (150 mm) from interior surfaces of walls, floors, or frames and covers of handholes, but close enough to corners to facilitate racking of cables on walls.
 - b. Window opening shall have cast-in-place, welded wire fabric reinforcement for field cutting and bending to tie in to concrete envelopes of duct banks.
 - c. Window openings shall be framed with at least two additional No. 4 steel reinforcing bars in concrete around each opening.
 7. Duct Entrances in Handhole Walls: Cast end-bell or duct-terminating fitting in wall for each entering duct.
 - a. Type and size shall match fittings to duct or conduit to be terminated.
 - b. Fittings shall align with elevations of approaching ducts and be located near interior corners of handholes to facilitate racking of cable.
 8. Handholes 12 inches wide by 24 inches long (300 mm wide by 600 mm long) and larger shall have inserts for cable racks and pulling-in irons installed before concrete is poured.

2.4 SOURCE QUALITY CONTROL

- A. Test and inspect precast concrete utility structures according to ASTM C 1037.

Section 26 05 43
UNDERGROUND DUCTS & RACEWAYS

- B. Nonconcrete Handhole and Pull-Box Prototype Test: Test prototypes of manholes and boxes for compliance with SCTE 77. Strength tests shall be for specified tier ratings of products supplied.
1. Tests of materials shall be performed by a independent testing agency.
 2. Strength tests of complete boxes and covers shall be by either an independent testing agency or the manufacturer. A qualified registered professional engineer shall certify tests by manufacturer.
 3. Testing machine pressure gages shall have current calibration certification complying with ISO 9000 and ISO 10012, and traceable to NIST standards.

PART 3 - EXECUTION

3.1 UNDERGROUND DUCT APPLICATION

- A. Ducts for Electrical Feeders 600 V and Less: RNC, NEMA Type EPC-40 PVC, in concrete-encased duct bank, unless otherwise indicated.
- B. Ducts for Electrical Branch Circuits: RNC, NEMA Type EPC-40-PVC, in direct-buried duct bank, unless otherwise indicated.
- C. Underground Ducts for Telephone, Communications, or Data Utility Service Cables: RNC, NEMA Type EPC-40 PVC, in concrete-encased duct bank, unless otherwise indicated.
- D. Underground Ducts Crossing Paved Paths Walks and Roadways: RNC, NEMA Type EPC-40-PVC, encased in reinforced concrete.

3.2 UNDERGROUND ENCLOSURE APPLICATION

- A. Handholes and Boxes for 600 V and Less, Including Telephone, Communications, and Data Wiring:
 1. Units in Roadways and Other Deliberate Traffic Paths: Precast concrete, AASHTO HB 17, H-20 structural load rating.
 2. Units in Driveway, Parking Lot, and Off-Roadway Locations, Subject to Occasional, Nondeliberate Loading by Heavy Vehicles: Precast concrete, AASHTO HB 17, H-20 structural load rating.
 3. Units in Sidewalk and Similar Applications with a Safety Factor for Nondeliberate Loading by Vehicles: Precast concrete, AASHTO HB 17, H-10 structural load rating.

3.3 EARTHWORK

- A. Refer to civil drawings and specifications for excavation and backfill requirements.
- B. Restore surface features at areas disturbed by excavation and reestablish original grades, unless otherwise indicated. Replace removed sod immediately after backfilling is completed.
- C. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary topsoiling, fertilizing, liming, seeding, sodding, sprigging, and mulching.

Section 26 05 43
UNDERGROUND DUCTS & RACEWAYS

- D. Cut and patch existing pavement in the path of underground ducts and utility structures according to civil engineers drawings and specifications.

3.4 DUCT INSTALLATION

- A. Slope: Pitch ducts a minimum slope of 1:300 down toward manholes and handholes and away from buildings and equipment. Slope ducts from a high point in runs between two manholes to drain in both directions.
- B. Curves and Bends: Use 5-degree angle couplings for small changes in direction. Use manufactured long sweep bends with a minimum radius of 12.5 feet (4 m), both horizontally and vertically, at other locations, unless otherwise indicated
- C. Joints: Use solvent-cemented joints in ducts and fittings and make watertight according to manufacturer's written instructions. Stagger couplings so those of adjacent ducts do not lie in same plane.
- D. Duct Entrances to Manholes and Concrete and Polymer Concrete Handholes: Use end bells, spaced approximately 10 inches (250 mm) o.c. for 5-inch (125-mm) ducts, and vary proportionately for other duct sizes.
 - 1. Begin change from regular spacing to end-bell spacing 10 feet (3 m) from the end bell without reducing duct line slope and without forming a trap in the line.
 - 2. Direct-Buried Duct Banks: Install an expansion and deflection fitting in each conduit in the area of disturbed earth adjacent to manhole or handhole.
 - 3. Grout end bells into structure walls from both sides to provide watertight entrances.
- E. Do not install conduits underneath a building except where the service/feeder/branch circuit conduits enter the building.
- F. Sealing: Provide temporary closure at terminations of ducts that have cables pulled. Seal spare ducts at terminations. Use sealing compound and plugs to withstand at least 15-psi (1.03-MPa) hydrostatic pressure.
- G. Pulling Cord: Install minimum 1/8 inch thick test nylon cord with minimum 250 pounds per foot tensile strength in ducts, including spares.
- H. Concrete-Encased Ducts: Support ducts on duct separators.
 - 1. Separator Installation: Space separators close enough to prevent sagging and deforming of ducts, with not less than 5 spacers per 20 feet (6 m) of duct. Secure separators to earth and to ducts to prevent floating during concreting. Stagger separators approximately 6 inches (150 mm) between tiers. Tie entire assembly together using fabric straps; do not use tie wires or reinforcing steel that may form conductive or magnetic loops around ducts or duct groups.
 - 2. Concreting Sequence: Pour each run of envelope between manholes or other terminations in one continuous operation.
 - a. Start at one end and finish at the other, allowing for expansion and contraction of ducts as their temperature changes during and after the pour. Use expansion fittings installed according to manufacturer's written recommendations, or use other specific measures to prevent expansion-contraction damage.

Section 26 05 43
UNDERGROUND DUCTS & RACEWAYS

- b. If more than one pour is necessary, terminate each pour in a vertical plane and install 3/4-inch (19-mm) reinforcing rod dowels extending 18 inches (450 mm) into concrete on both sides of joint near corners of envelope.
3. Pouring Concrete: Spade concrete carefully during pours to prevent voids under and between conduits and at exterior surface of envelope. Do not allow a heavy mass of concrete to fall directly onto ducts. Use a plank to direct concrete down sides of bank assembly to trench bottom. Allow concrete to flow to center of bank and rise up in middle, uniformly filling all open spaces. Do not use power-driven agitating equipment unless specifically designed for duct-bank application.
4. Encase all feeder ducts in a 3 inch concrete envelope. Extend envelope with 3 inches beyond all external surfaces of all outer most ducts. Do not over pour the concrete.
5. Concrete encasement shall be minimum 3000 psi. All underground ducts containing MV and HV cables (above 600V) shall be encased in red concrete. Concrete shall be premixed during batching with 1-1/2 lbs of red ochre dye per sack of cement.
6. Reinforcement: Reinforce concrete-encased duct banks where they cross disturbed earth and where indicated. Arrange reinforcing rods and ties without forming conductive or magnetic loops around ducts or duct groups.
7. Forms: Use walls of trench to form side walls of duct bank where soil is self-supporting and concrete envelope can be poured without soil inclusions; otherwise, use forms.
8. Minimum Space between Ducts: 3 inches (75 mm) between ducts and exterior envelope wall and 12 inches (300 mm) between power and signal ducts.
9. Depth: Install top of duct bank at least 24 inches (600 mm) below finished grade in areas not subject to deliberate traffic, and at least 30 inches (750 mm) below finished grade in deliberate traffic paths for vehicles, unless otherwise indicated. Minimum depth below grade in all areas shall be 36 inches (900 mm) for underground ducts.
10. Stub-Ups: Use manufactured PVC coated rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through the floor.
 - a. Couple PVC coated steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches (75 mm) of concrete.
 - b. Stub-Ups to Equipment: For equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches (1500 mm) from edge of base. Install insulated grounding bushings on terminations at equipment.
11. Warning Tape: Bury warning tape approximately 12 inches (300 mm) below grade above all concrete-encased ducts and duct banks. Align tape parallel to and within 3 inches (75 mm) of the centerline of duct bank. Provide an additional warning tape for each 12-inch (300-mm) increment of duct-bank width over a nominal 18 inches (450 mm). Space additional tapes 12 inches (300 mm) apart, horizontally.
12. Warning Planks: Bury warning planks approximately 12 inches (300 mm) above direct-buried ducts and duct banks, placing them 24 inches (600 mm) o.c. Align planks along the width and along the centerline of duct bank. Provide an additional plank for each 12-inch (300-mm) increment of duct-bank width over a nominal 18 inches (450 mm). Space additional planks 12 inches (300 mm) apart, horizontally.

3.5 INSTALLATION OF CONCRETE MANHOLES, HANDHOLES, AND BOXES

A. Precast Concrete Handhole and Manhole Installation:

1. Comply with ASTM C 891, unless otherwise indicated.

Section 26 05 43
UNDERGROUND DUCTS & RACEWAYS

2. Install units level and plumb and with orientation and depth coordinated with connecting ducts to minimize bends and deflections required for proper entrances.
3. Unless otherwise indicated, support units on a level bed of 12 inches thick crushed stone or gravel, graded from 1-inch (25-mm) sieve to No. 4 (4.75-mm) sieve and compacted to same density as adjacent undisturbed earth.

B. Elevations:

1. Manhole Roof: Install with rooftop at least 15 inches (380 mm) below finished grade.
2. Manhole Frame: In paved areas and trafficways, set frames flush with finished grade. In other areas, set manhole frames 1 inch (25 mm) above finished grade.
3. Install handholes with bottom below the frost line, below grade.
4. Handhole Covers: In paved areas and trafficways, set surface flush with finished grade. Set covers of other handholes 1 inch (25 mm) above finished grade.
5. Where indicated, cast handhole cover frame integrally with handhole structure.

C. Drainage: Install drains in bottom of manholes where indicated. Coordinate with drainage provisions indicated.

D. Hardware: Install removable hardware, including pulling eyes, cable stanchions, and cable arms, and insulators, as required for installation and support of cables and conductors and as indicated.

E. Fixed Manhole Ladders: Arrange to provide for safe entry with maximum clearance from cables and other items in manholes.

F. Field-Installed Bolting Anchors in Manholes and Concrete Handholes: Do not drill deeper than 3-7/8 inches (98 mm) for manholes and 2 inches (50 mm) for handholes, for anchor bolts installed in the field. Use a minimum of two anchors for each cable stanchion.

G. Warning Sign: Install "Confined Space Hazard" warning sign on the inside surface of each manhole cover.

3.6 INSTALLATION OF HANDHOLES AND BOXES OTHER THAN PRECAST CONCRETE

A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting ducts to minimize bends and deflections required for proper entrances. Use box extension if required to match depths of ducts, and seal joint between box and extension as recommended by the manufacturer.

B. Unless otherwise indicated, support units on a level bed of 12 inches thick crushed stone or gravel, graded from 1/2-inch (12.7-mm) sieve to No. 4 (4.75-mm) sieve and compacted to same density as adjacent undisturbed earth.

C. Elevation: In paved areas and trafficways, set so cover surface will be flush with finished grade. Set covers of other handholes 1 inch (25 mm) above finished grade.

D. Install handholes and boxes with bottom below the frost line.

E. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables, but short enough to preserve adequate working clearances in the enclosure.

Section 26 05 43
UNDERGROUND DUCTS & RACEWAYS

- F. Field-cut openings for ducts and conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.7 GROUNDING

- A. Ground underground ducts and utility structures according to Section 260526 "Grounding and Bonding for Electrical Systems."

3.8 FIELD QUALITY CONTROL

- A. During construction, partially completed duct lines shall be protected from the entrance of debris such as mud, sand and dirt by means of suitable conduit plugs. As each section of a duct line is completed from manhole to vault, a testing mandrel not less than 12 inches long with a diameter 1/4-inch less than the size of the duct, shall be drawn through each duct, after which a brush having the diameter of the duct, and have stiff bristles shall be drawn through until the conduit is clear of all particles of earth, sand, gravel and other foreign materials. Conduit plugs shall then be immediately installed. Underground conduits, which terminate inside the building below grade, or which slope so that water might flow into building, shall be sealed at termination after installation of wires.
- B. Perform the following tests and inspections and prepare test reports:
 - 1. Demonstrate capability and compliance with requirements on completion of installation of underground ducts and utility structures.
 - 2. Pull aluminum or wood test mandrel through duct to prove joint integrity and test for out-of-round duct. Provide mandrel equal to 80 percent fill of duct. If obstructions are indicated, remove obstructions and retest.
 - 3. Test manhole and handhole grounding to ensure electrical continuity of grounding and bonding connections. Measure and report ground resistance as specified in Section 260526 "Grounding and Bonding for Electrical Systems."
- C. Correct deficiencies and retest as specified above to demonstrate compliance.

3.9 CLEANING

- A. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of ducts. Follow with rubber duct swab for final cleaning and to assist in spreading lubricant throughout ducts.
- B. Clean internal surfaces of manholes, including sump. Remove foreign material.

END OF SECTION

Section 26 05 53
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Identification for raceways.
 - 2. Identification of power cables.
 - 3. Identification for conductors.
 - 4. Underground-line warning tape.
 - 5. Warning labels and signs.

1.3 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's catalog cut sheets for each electrical identification product indicated.

1.4 QUALITY ASSURANCE

- A. Comply with ANSI A13.1 and IEEE C2.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969. Adhesive type labels shall be used for only applications indicated in this section.

1.5 COORDINATION

- A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.
- B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- C. Coordinate installation of identifying devices with location of access panels and doors.
- D. Install identifying devices before installing acoustical ceilings and similar concealment.

Section 26 05 53
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 2 - PRODUCTS

2.1 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each cable size.
- B. Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing ends of legend label.
- C. Heat-Shrink Preprinted Tubes: Flame-retardant polyolefin tube with machine-printed identification label. Sized to suit diameter of and shrinks to fit firmly around cable it identifies. Full shrink recovery at a maximum of 200 deg F. Comply with UL 224.
- D. Snap-Around Labels: Slit, pre-tensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of cable it identifies and to stay in place by gripping action.

2.2 CONDUCTOR AND CABLES IDENTIFICATION MATERIALS

- A. Color coding of conductors: Provide color coded insulation by conductor manufacturer. Coordinate with Division 26, Section "Low Voltage Electrical Power Conductors and Cables". If permitted by owner's representative, install color coding conductor tape for temporary installations only.
- B. Provide tags on each pull rope of spare conduits showing starting point and end point of spare conduits.

2.3 UNDERGROUND-LINE WARNING TAPE

- A. Tape:
 - 1. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
 - 2. Printing on tape shall be permanent and shall not be damaged by burial operations.
 - 3. Tape material and ink shall be chemically inert, and not subject to degrading when exposed to acids, alkalis, and other destructive substances commonly found in soils.
- B. Color and Printing:
 - 1. Comply with ANSI Z535.1 through ANSI Z535.5.
 - 2. Inscriptions for Red-Colored Tapes: CAUTION-BURIED ELECTRIC LINE, HIGH VOLTAGE.

2.4 EQUIPMENT IDENTIFICATION LABELS

- A. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 3/8 inch except designation which will be in 1/2 inch letters unless otherwise indicated.
- B. Labels shall include the following information. Color of nameplate shall be black for equipment connected to normal power, red for equipment connected to emergency power, and blue for equipment connected to uninterruptible Power Supply. Color of letters shall be white.
 - 1. Panel or equipment designation.
 - 2. Rating: Volt, Amps, No. of phase and wires, horsepower, etc.
 - 3. AIC Rating (RMS Symmetrical Amps).

Section 26 05 53
IDENTIFICATION FOR ELECTRICAL SYSTEMS

4. Fed from information.
5. Manufacturer Shop Order number.
6. Date of Installation.
7. Other information as requested by Owner.

C. Adhesive labels and nameplates are not acceptable.

2.5 WIRING DEVICES LABELS

- A. Identify wiring devices with heavy duty clear vinyl polyester tape "Weber" unless otherwise indicated. Provide labels on the device cover plate made of non-metallic materials. Color of letters shall be black for device connected to normal power, color of letters shall be red for device connected to emergency power. Labels shall be printed, flexible, self-adhesive type. In addition, write the circuit no. (e.g. 1PA-2) on the inside of the device cover plate of non-metallic material using a permanent marker.
- B. For stainless steel cover plates, engrave information on the device cover plate.
- C. Device (receptacles, switches etc.) label shall include panel designation and circuit number.

2.6 CABLE TIES

- A. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, Type 6/6 nylon.
 1. Minimum Width: 3/16 inch.
 2. Tensile Strength at 73 deg F, according to ASTM D 638: 12,000 psi.
 3. Temperature Range: Minus 40 to plus 185 deg F.
 4. Color: Black.
- B. Plenum-Rated Cable Ties: Self-extinguishing, UV stabilized, one piece, self-locking.
 1. Minimum Width: 3/16 inch.
 2. Tensile Strength at 73 deg F, according to ASTM D 638: 7000 psi.
 3. UL 94 Flame Rating: 94V-0.
 4. Temperature Range: Minus 50 to plus 284 deg F.
 5. Color: Black.

2.7 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Verify identity of each item before installing identification products.
- B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

Section 26 05 53
IDENTIFICATION FOR ELECTRICAL SYSTEMS

- C. Apply identification devices to surfaces that require finish after completing finish work.
- D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
- E. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
- F. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.
- G. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:
 - 1. Outdoors: UV-stabilized nylon.
 - 2. In Spaces Handling Environmental Air: Plenum rated.
- H. Painted Identification: Comply with requirements in painting Sections for surface preparation and paint application.

3.2 IDENTIFICATION SCHEDULE

- A. Power-Circuit Conductor Identification, 600V or less: Provide factory color coded conductors as indicated in Division 26 "Low Voltage Power Conductors and Cables". Color coding tape may be field applied (if specified on the documents or permitted in writing by Owner's representative) to identify phase conductors in vaults, pull and junction boxes, manholes, handholes and other locations where conductors are spliced and terminated. Colors for factory-assembled cable, such as MC and AC, must match colors listed in first paragraph below.
 - 1. Color-Coding for Phase Identification, 600 V or Less: Use colors listed below for ungrounded service, feeders and branch-circuit conductors.
 - a. Color shall be factory applied.
 - b. Colors for 208/120-V Circuits:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Phase C: Blue.
 - 4) Neutral: White
 - 5) Ground Green
 - c. Colors for 480/277-V Circuits:
 - 1) Phase A: Brown.
 - 2) Phase B: Orange.
 - 3) Phase C: Yellow.
 - 4) Neutral: Grey
 - 5) Ground: Green
 - d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

Section 26 05 53
IDENTIFICATION FOR ELECTRICAL SYSTEMS

- B. Install instructional sign including the color-code for grounded and ungrounded conductors using adhesive-film-type labels.
- C. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable.
 - 1. Install underground-line warning tape for both direct-buried cables and cables in raceway.
 - 2. During backfilling of trenches install continuous underground-line warning tape directly above the line at 12 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches overall.
- D. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
- E. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems. Verify requirements with Owner's representative.
 - 1. Labeling Instructions:
 - a. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
 - b. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
 - c. Fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.
 - 2. Equipment to Be Labeled:
 - a. Panelboards: Typewritten directory of circuits in the location provided by panel board manufacturer. Panelboard identification shall be engraved laminated acrylic label.
 - b. Enclosures, electrical, telecom, alarm and communication system cabinets.
 - c. Access doors and panels for concealed electrical items.
 - d. Switchgear.

END OF SECTION

Section 26 08 00
COMMISSIONING OF ELECTRICAL SYSTEMS

PART 1 - GENERAL

- 1.1 SECTION INCLUDES:
- A. System specific commissioning
 - B. Systems to be commissioned are as follows:
 - 1. Fixture locations and aiming
 - 2. Delivered lighting levels (Footcandles)
 - 3. Lighting controls

PART 2 - EXECUTION

- 2.1 COMMISSIONING PROCESS AND PROCEDURES AS DEFINED BY THE COMMISSIONING AUTHORITY
- 2.2 PRE-FUNCTIONAL CHECKLIST
- A. Pre-Functional Test is defined by the Commissioning Authority. Only the sample checklists are provided in this section as an indication of the format and rigor of the required pre-functional checklists and documentation (refer to 26 08 00 - Exhibit B). Though not developed specifically for this project, they show the extent of checks involved associated with typical installations. Actual Pre-Functional Checklist shall be prepared by the CA upon review of all the contractor submittals, including manufacturer's installation instructions.
 - B. These checklists do not take the place of the manufacturer's recommended checkout and start-up procedures or report or those used by the Contractor Provided Testing Agency.
 - C. Regardless of whether the CA includes them or not, checks, inspections, safety measures, quality control measures and start-up procedures recommended by the manufacturer shall be implemented by the Contractor prior to initiation of the commissioning activity.
 - D. The Commissioning Coordinator (CC) employed by the Contractor shall be responsible for directing all Pre-Functional Check lists provided by the CA. The CC shall engage subcontractors and vendors service representatives with expertise in the specific equipment or system to determine whether the equipment or system passes the checks detailed in the Pre-Functional Checklist.
 - E. CC shall communicate the actual schedule for the execution of the Pre-Functional Checks to the CA.
 - F. The Commissioning Authority (CA) may choose to participate in the inspection of items along with the Contractor and his specialty subcontractors and vendors, including the Testing Agency. In addition, CA reserves the right to inspect any or all of the items on his own in order to satisfy that the installation conforms to the design objectives and the system is ready for Functional Testing.
 - G. CA shall provide information on how the Pre-Functional Checklists fit within the overall framework of Commissioning as well as the Contractor's obligations under the same.

Section 26 08 00
COMMISSIONING OF ELECTRICAL SYSTEMS

2.3 FUNCTIONAL PERFORMANCE TESTING

- A. Contractor shall assist the Testing Agency and the Commissioning Authority (CA) in developing the Working Functional Performance Test (FPT) Procedures. Electrical Acceptance testing shall be generally based on procedures determined by the Testing Agency. For any given equipment or system, subcontractors and equipment suppliers associated with and specializing in the specific equipment are required to participate in developing the working procedures for the indicated FPTs. It is conceivable that for certain equipment and systems, multiple subcontractors and specialties may be required to participate to contribute to the development of the Functional Test. Contractor shall extend his full cooperation to the CA in securing the subcontractor or supplier resources necessary to develop and implement the Functional Tests.
- B. The Contractor's Commissioning Coordinator is required to manage the subcontractors in developing the Working FPT Procedures and Data Forms, and in performing all FPT's.
- C. Only the sample functional tests are provided in this section as an indication of the format and rigor of the required for functional tests and documentation (refer to 26 08 00 - Exhibit B). Though not developed specifically for this project, they show the extent of checks involved associated with typical installations. Actual functional test reports for the project shall be prepared by the CA upon review of all the contractor submittals, including manufacturer's installation instructions.
- D. Contractor shall conduct functional tests for 100% of the systems to be commissioned shall be subject to the Functional Tests.
- E. CA shall develop the Functional Test following review of all contractor submittals. The Functional Test documents shall be made available to the immediately upon the successful completion of the Pre-Functional Check Lists and correction of all issues identified in the Pre-Functional Checklist.

END OF SECTION

**SAMPLE FUNCTIONAL TEST PLAN (FTP)
FOR EXTERIOR LIGHTING CONTROLS – EXHIBIT B**

Project: _____

FTP - _____ EXTERIOR LIGHTING CONTROLS

1. Participants

<u>Party</u>	<u>Participation</u>
_____	_____
_____	_____

Date of test _____

2. Prerequisite Checklist

- a. ___ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final set points, schedules, debugging and fine tuning of photo-cell parameters.

_____ Controls Contractor Signature or Verbal _____ Date

- b. ___ All A/E punch list items for this equipment corrected.
 c. ___ Safeties and operating ranges reviewed.
 d. ___ Test requirements and sequences of operation attached.
 e. ___ Schedules and set points attached.
 f. ___ Have all energy savings control strategies, set points and schedules been incorporated that this equipment and control system are capable of? If not, list recommendations below.
 g. ___ BAS Program Review. Review the BAS software control program(s) for this equipment. Parameters, set points and logic sequences appear to follow the specified written sequences.
 h. ___ Schedule of fixtures on each control type (Parking or Security) has been reviewed.
 i. ___ Record of All Values for Current Set points (SP), Control Parameters, Limits, Delays, Lockouts, Schedules, Etc. Changed to Accommodate Testing:

Parameter	Pre-Test Values	Returned to Pre-Test Values <input checked="" type="checkbox"/>
Exterior lights schedule	<u>ON</u> by photo cell <u>OFF</u> by sched: _____	
Photo-cell BAS parameters		

Parameter	Pre-Test Values	Returned to Pre-Test Values <input checked="" type="checkbox"/>
Exterior security lights schedule	<u>ON</u> by photo cell <u>OFF</u> by photo-cell	

- 3. Sensor Calibration Checks.** Check the sensors listed below for calibration and adequate location. This is a sampling check of calibrations done during pre-functional checklist. Test the packaged controls and BAS readings.

**SAMPLE FUNCTIONAL TEST PLAN (FTP)
FOR EXTERIOR LIGHTING CONTROLS – EXHIBIT B**

**SAMPLE FUNCTIONAL TEST PLAN (FTP)
FOR EXTERIOR LIGHTING CONTROLS – EXHIBIT B**

4. Device Calibration Checks

---NONE---

5. Verification of Misc. Pre-Functional Checks

Misc. site checks of the pre-functional checklist and startup reports completed successfully.
Pass? Y / N _____

- Photo-cell (PC) mounted securely.
- PC mounted where it won't be tampered with.
- PC mounted so it won't become dirty easily.
- PC accessible for servicing.

6. Functional Testing Record

Proced. No. & Spec. Seq. ID ¹	Req ID No. ²	Test Procedure ³ (including special conditions)	Expected and Actual Response ⁴ [Write ACTUAL response in brackets or circle]	Pass Y/N & Note #
1		Near dusk, observe exterior lights until they come ON. (Witnessed by Owner's Rep: _____)	All exterior lights come on at dusk, before dark, but not when still very light.	
2		a) Change the light schedule OFF to be in 5 minutes. b) Return schedule to normal.	a) Observe that the parking lot lights, designated by the approved schedule, shut OFF. Designated signage remains ON. b) Schedule returned to normal.	
3		Before daylight in the morning, observe the security lights ON. Wait until dawn. (Witnessed by Owner's Rep: _____)	When sufficiently light, Security Lights and signage lights shut OFF.	
4	--	Return all changed control parameters and conditions to their pre-test values ⁵	Check off in Section 2 above when completed	

Record Foot Notes

- ¹Sequences of operation specified in Contract Documents (attached).
- ²Mode or function ID being tested, per testing requirements section of the project Specifications.
- ³Step-by-step procedures for manual testing, trend logging or data-logger monitoring.
- ⁴Include tolerances for a passing condition.
- ⁵Record any permanently changed parameter values and submit to Owner.

END OF EXHIBIT

**SECTION 26 24 13
SWITCHBOARDS**

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section Includes:

1. Service and distribution switchboards rated 600 V and less and between 600A to 4000A.
2. Surge Protective Devices (SPD).
3. Disconnecting and overcurrent protective devices.
4. Instrumentation.
5. Control power.
6. Accessory components and features.
7. Identification.

B. Switchboard shall be front aligned.

C. Related Sections include the following:

1. Section 260526 "Grounding and Bonding for Electrical Systems".
2. Section 260553 "Identification for Electrical Systems".

1.03 DEFINITIONS

- A. NETA ATS: InterNational Electrical Testing Association - Acceptance Testing Specification.
- B. EMI: Electromagnetic interference.
- C. GFCI: Ground-fault circuit interrupter.
- D. RFI: Radio-frequency interference.
- E. RMS: Root mean square.
- F. SPDT: Single pole, double throw.
- G. AIC: Interrupting capacity (RMS symmetrical) in amperes.

1.04 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Switchboards shall withstand the effects of earthquake motions determined according to SEI/ASCE 7.
1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."
 2. Component Importance Factor: 1.0.
 3. Component Amplification Factor: 2.5.
 4. Component Response Modification Factor: 6.0.

1.05 ACTION SUBMITTALS

- A. Product Data: For each type of switchboard, overcurrent protective device, transient voltage suppression device, ground-fault protector, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.
- B. Shop Drawings: For each switchboard and related equipment.
 - 1. Include dimensioned plans, elevations, sections, and details, including required horizontal and vertical clearances and service space around equipment. Show tabulations of installed devices, equipment features, and ratings.
 - 2. Detail enclosure types for types other than NEMA 250, Type 1.
 - 3. Detail bus configuration, current, and voltage ratings.
 - 4. Detail short-circuit current rating of switchboards and overcurrent protective devices.
 - 5. Include evidence of UL NRTL listing for series rating of installed devices.
 - 6. Detail utility company's metering provisions with indication of approval by utility company.
 - 7. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
 - 8. Include time-current coordination curves for each type and rating of overcurrent protective device included in switchboards. Submit on log-log plotting; include selectable ranges for each type of overcurrent protective device.
 - 9. Include schematic and wiring diagrams for power, signal, and control wiring.

1.06 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings for construction and record documentation.
- B. Field Quality-Control Reports:
 - 1. Test procedures used.
 - 2. Test results that comply with requirements.
 - 3. Submit of completion of tests along side findings for PV systems and generator systems in joint coordination.

1.07 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For switchboards and components to include in emergency, operation, and maintenance manuals include the following:
 - 1. Routine maintenance requirements for switchboards and all installed components.
 - 2. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
 - 3. Time-current coordination curves for each type and rating of overcurrent protective device included in switchboards. Submit on translucent log-log plotting; include selectable ranges for each type of overcurrent protective device.

1.08 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Control-Power Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than two of each size and type.

1.09 QUALITY ASSURANCE

- A. If alternate manufacturer of products other than what are specified in this section are submitted, all necessary documents not limited to cut sheets, technical information, test reports from recognized testing labs and factory test reports shall be submitted to the satisfaction of the owner/engineer to ensure quality and conformance to the specifications. Additional testing shall be undertaken if it is concluded by the owner/engineer that the submitted test reports are either insufficient or do not include all tests necessary for product acceptance. The tests shall be conducted by a recognized lab acceptable to the engineer and all tests shall be witnessed by engineer's personnel. All testing procedures and test results shall be satisfactory to the engineer. Contractor shall be responsible for arranging the tests, for transportation, food and lodging for minimum of one engineer's representative to witness the test at the testing lab. Include all costs for the above in the bid.
- B. Contractor shall ensure that the manufacturer has a minimum of 15 years experience in the production of Switchboards similar to the type and size specified in this project.
- C. Manufacturer shall have ISO 9001 or 9002 Certification.
- D. Manufacturer shall have ability to readily provide replacement parts for a minimum period of ten (10) years, from the date of completion of the project. Furnish a letter from the manufacturer confirming the availability.
- E. Switchboards shall be assembled at the manufacturer's own manufacturing facility using its own major devices (e.g., circuit breakers) for the assembly. These devices shall be normally carried by the manufacturer as standard catalog items.
- F. Switchboard shall comply with seismic zone applicable to the project. Unless otherwise indicated, verify requirements with Structural Engineer of Record (SEOR). Provide certified test reports of shake table test done by manufacturer on similar units.
- G. Materials and equipment shall be new, modern in design and shall not have been in prior service except as required by factory tests. Major components (e.g., primary switch, transformer, and switchboard) shall be manufactured within six months of installation.
- H. Source Limitations: Obtain switchboards, overcurrent protective devices and accessories through one source from a single manufacturer through a local distributor unless otherwise indicated. All power distribution equipment shall be of the same manufacturer as the substation.
- I. Comply with NEMA PB 2.
- J. Comply with NFPA 70.
- K. Comply with UL 891.
- L. Installer Qualifications: An employer of workers qualified as defined in NEMA PB 2.1 and trained in electrical safety as required by NFPA 70E.
- M. Product Options: Drawings indicate size, profiles, and dimensional requirements of switchboards and are based on the specific system indicated. Refer to Part 2 "Product Requirements."
- N. Electrical Components, Devices, and Accessories: UL Listed and labeled as defined in NFPA 70, Article 100 and marked for intended location and application.
- O. Testing Agency Qualifications: Member of NETA;
 - 1. Testing agency shall be an independent company; shall have been a member of NETA for a minimum of ten (10) years and has permanent in-house testing engineers and technicians involved with testing of switchboards and OCPDs similar to those specified on this project.
 - 2. Testing company shall be located within 50 miles radius of the project.

3. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing to supervise on-site testing specified in Part 3.
 4. Field Testing technician and supervisor shall have minimum ten (10) years experience in field testing of switchboards similar to the type and rating specified on this project.
- P. Product Selection for Restricted Space: Drawings indicate maximum dimensions for switchboards including clearances between switchboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products in accordance with manufacturer's recommended practices and as listed in Installation and Maintenance Manual.
- B. Each switchboard section shall be shipped in individual shipping splits for ease of handling. They shall be mounted on shipping skids and individually wrapped.
- C. Deliver switchboards in sections or lengths that can be moved past obstructions in delivery path at site.
- D. Inspect and report damage to carrier within their required time period.
- E. Store indoors in clean dry space with uniform temperature to prevent condensation. Protect from exposure to dirt, fumes, water, corrosive substances, and physical damage.
- F. If stored in areas subjected to weather, cover switchboards to provide protection from weather, dirt, dust, corrosive substances, and physical damage.
- G. Remove loose packing and flammable materials from inside switchboards and install temporary electric heating (250 W per section) to prevent condensation.
- H. Handle and prepare switchboards for installation according to NECA 400.

1.11 PROJECT CONDITIONS

- A. Installation Pathway: Remove and replace access fencing, doors, lift-out panels, and structures to provide pathway for moving switchboards into place.
- B. Environmental Limitations:
 1. Do not deliver or install switchboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above switchboards is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
 2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:
 - i. Ambient Temperature: Not exceeding 104 deg F.
 - ii. Altitude: Not exceeding 6600 feet.
- C. Service Conditions: NEMA PB 2, usual service conditions, as follows:
 1. Ambient temperatures within limits specified.
 2. Altitude not exceeding 6600 feet.
- D. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
 1. Notify city no fewer than fourteen (14) days in advance of proposed interruption of electric service.

2. Do not proceed with interruption of electric service without City's written permission.
3. All utility shutdowns will be done by City's authorized personnel unless otherwise noted. Coordinate through City's Representative.
4. Comply with NFPA 70E.
5. Provide temporary standby power through a standby diesel quiet type back-up generator complete with fuel and 7/24 monitoring if the existing service interruption exceeds 2 hours. Coordinate additional requirements with owner minimum fourteen days in advance. Indicate method of providing temporary electric service.

1.12 COORDINATION

- A. Coordinate layout and installation of switchboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
- B. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified with concrete.

1.13 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace SURGE PROTECTION DEVICES that fail in materials or workmanship within specified warranty period.
 1. Warranty Period: Five (5) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURED UNITS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Square D; a brand of Schneider Electric
 2. Eaton
 3. GE Consumer & Industrial by ABB - Electrical Distribution.
- B. Front-Connected, Front-Accessible Switchboards:
 1. Main Devices: Fixed, individually mounted unless otherwise indicated.
 2. Sections front and rear aligned.
- C. Seismic Requirements: Fabricate and test switchboards according to IEEE 344 to withstand seismic forces defined in Section 260548 "Vibration and Seismic Controls for Electrical Systems."
- D. Indoor Enclosures: Steel, NEMA 250, Type 1.
- E. Outdoor Enclosures: Type 3R.
 1. Finish: Factory-applied finish in manufacturer's standard color; undersurfaces treated with corrosion-resistant undercoating.
 2. Enclosure: bolt-on rear covers for each section
 3. Provisions for padlocking – 3-point latch.

- F. Enclosure Finish for Indoor Units: Factory-applied finish in manufacturer's standard gray finish over a rust-inhibiting primer on treated metal surface.
- G. Enclosure Finish for Outdoor Units: Factory-applied finish in green finish over a rust-inhibiting primer on treated metal surface.
- H. Barriers: Between adjacent switchboard sections.
- I. Insulation and isolation for main bus of main section and main and vertical buses of feeder sections.
- J. Utility Metering Compartment: Fabricated, barrier compartment and section complying with utility company's requirements; hinged sealed door; buses provisioned for mounting utility company's current transformers and potential transformers or potential taps as required by utility company. If separate vertical section is required for utility metering, match and align with basic switchboard. Provide service entrance label and necessary applicable service entrance features.
- K. Customer Metering Compartment: Customer metering, for indicated metering, and current transformers for each meter. Current transformer secondary wiring shall be terminated on shorting-type terminal blocks. Include potential transformers having primary and secondary fuses with disconnecting means and secondary wiring terminated on terminal blocks. Coordinate with IID Electrical Utility for programming.
- L. Bus Transition and Incoming Pull Sections: Matched and aligned with basic switchboard.
- M. Hinged Front Panels: Allow access to circuit breaker, metering, accessory, and blank compartments.
- N. Pull Box on Top of Switchboard:
 - 1. Provide a proper size (per NEC) pull box on the top of the switchboard where necessary per means and methods.
 - 2. Adequate ventilation to maintain temperature in pull box within same limits as switchboard.
 - 3. Set back from front to clear circuit-breaker removal mechanism.
 - 4. Removable covers shall form top, front, and sides. Top covers at rear shall be easily removable for drilling and cutting.
 - 5. Bottom shall be insulating, fire-resistive material with separate holes for cable drops into switchboard.
 - 6. Cable supports shall be arranged to facilitate cabling and adequate to support cables indicated, including those for future installation.
- O. Buses and Connections: Three phase, four wire unless otherwise indicated.
 - 1. Phase- and Neutral-Bus Material: Hard-drawn copper of 98 percent conductivity, silver-plated, copper feeder circuit-breaker line connections.
 - 2. Load Terminals: Insulated, rigidly braced, runback bus extensions, of same material as through buses, equipped with compression connectors for outgoing circuit conductors. Provide load terminals for future circuit-breaker positions at full-ampere rating of circuit-breaker position.
 - 3. Ground Bus: 1/4-by-2-inch- hard-drawn copper of 98 percent conductivity, equipped with compression connectors for feeder and branch-circuit ground conductors. For busway feeders, extend insulated equipment grounding cable to busway ground connection and support cable at intervals in vertical run.

4. Main Phase Buses and Equipment Ground Buses: Uniform capacity for entire length of switchboard's main and distribution sections. Provide for future extensions from both ends.
 5. Neutral Buses: 100 percent of the ampacity of phase buses unless otherwise indicated, equipped with compression connectors for outgoing circuit neutral cables. Brace bus extensions for busway feeder neutral bus.
- P. Bus-Bar Insulation: Factory-applied, flame-retardant, tape wrapping of individual bus bars or flame-retardant, spray-applied insulation. Minimum insulation temperature rating of .

2.02 SURGE PROTECTIVE DEVICES (SPD)

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following
1. Square D; a brand of Schneider Electric.
 2. Eaton
 3. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
- B. Surge Protection Device Description: IEEE C62.41-compliant, externally mounted, solid-state, parallel-connected, modular (with field-replaceable modules) type, with sine-wave tracking suppression and filtering modules, UL 1449, second edition, short-circuit current rating matching or exceeding the switchboard short-circuit rating, and with the following features and accessories:
1. Fuses rated at 200-kA interrupting capacity.
 2. disconnect switch.
 3. Redundant suppression circuits.
 4. Redundant replaceable modules.
 5. Arrangement with wire connections to phase buses, neutral bus, and ground bus.
 6. LED indicator lights for power and protection status.
 7. Audible alarm, with silencing switch, to indicate when protection has failed.
 8. Form-C contacts rated at 5 A and 250-V ac, one normally open and one normally closed, for remote monitoring of system operation. Contacts shall reverse position on failure of any surge diversion module or on opening of any current-limiting device. Coordinate with building power monitoring and control system.
 9. Four-digit, transient-event counter set to totalize transient surges.
- C. Withstand Capabilities: 12,000 IEEE C62.41, Category C3 (10 kA), 8-by-20-mic.sec. surges with less than 5 percent change in clamping voltage.
- D. Protection modes and UL 1449 SVR for grounded wye circuits with 480Y/277 and 208Y/120-V, three-phase, four-wire circuits shall be as follows:
1. Line to Neutral: 800 V for 480Y/277 ;400 V for 208Y/120.
 2. Line to Ground: 800 V for 480Y/277; 400 V for 208Y/120.
 3. Neutral to Ground: 800 V for 480Y/277; 400 V for 208Y/120.

2.03 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

- A. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with interrupting capacity (AIC) to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
 2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
 3. Electronic trip circuit breakers with rms sensing; field-replaceable rating plug or field-replaceable electronic trip; field replaceable and the following field-adjustable settings:
 - i. Instantaneous trip.
 - ii. Long- and short-time pickup levels.
 - iii. Long- and short-time time adjustments.
 - iv. Ground-fault pickup level, time delay, and I²t response.
 4. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller; let-through ratings less than NEMA FU 1, RK-5.
 5. GFCI Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (6-mA trip).
 6. Ground-Fault Equipment Protection (GFEP) Circuit Breakers: Class B ground-fault protection (30-mA trip).
 7. Molded-Case Circuit-Breaker (MCCB) Features and Accessories:
 - i. Standard frame sizes, trip ratings, and number of poles.
 - ii. Lugs: Mechanical or compression style, suitable for number, size, trip ratings, and conductor material.
 - iii. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge (HID) lighting circuits.
 - iv. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
 - v. Zone-Selective Interlocking: Integral with electronic trip unit; for interlocking ground-fault protection function.
 - vi. Communication Capability: Integral communication module with functions and features compatible with power monitoring and control system specified in Section 260913 "Electrical Power Monitoring and Control."
 - vii. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage without intentional time delay.
 - viii. Auxiliary Contacts: Two SPDT switches with "a" and "b" contacts; "a" contacts mimic circuit-breaker contacts, "b" contacts operate in reverse of circuit-breaker contacts.
 - ix. Key Interlock Kit: Externally mounted to prohibit circuit-breaker operation; key shall be removable only when circuit breaker is in off position.
- B. Insulated-Case Circuit Breaker (ICCB): 80 and 100 percent rated per plans, sealed, insulated-case power circuit breaker with interrupting capacity rating to meet available fault current .
1. Fixed circuit-breaker mounting.
 2. Two-step, stored-energy closing.

3. Standard-function, microprocessor-based trip units with interchangeable rating plug, trip indicators, and the following field-adjustable settings:
 - i. Instantaneous trip.
 - ii. Long- and short-time time adjustments.
 - iii. Ground-fault pickup level, time delay, and I2t response.
 4. Zone-Selective Interlocking: Integral with electronic trip unit; for interlocking ground-fault protection function.
 5. Remote trip indication and control.
 6. Communication Capability: Integral communication module with functions and features compatible with power monitoring and control system specified in Section 260913 "Electrical Power Monitoring and Control."
 7. Key Interlock Kit: Externally mounted to prohibit circuit-breaker operation; key shall be removable only when circuit breaker is in off position.
 8. Control Voltage: 120-V ac.
- C. Bolted-Pressure Contact Switch (applicable to client solar PV generators where required by IID interconnection requirements): Operating mechanism uses rotary-mechanical-bolting action to produce and maintain high clamping pressure on the switch blade after it engages the stationary contacts.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following]
 - i. Square D; a brand of Schneider Electric
 - ii. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - iii. Pringle Electrical Manufacturing Company, Inc.
 - iv. Boltswitch, Inc.
 2. Main-Contact Interrupting Capability: Minimum of 12 times the switch current rating.
 3. Operating Mechanism: Manual handle operation to close switch; stores energy in mechanism for opening and closing.
 - i. Electrical Trip: Operation of lever or push-button trip switch, or trip signal from ground-fault relay or remote-control device, causes switch to open.
 - ii. Mechanical Trip: Operation of mechanical lever, push button, or other device causes switch to open.
 4. Auxiliary Switches: Factory installed, single pole, double throw, with leads connected to terminal block, and including one set more than quantity required for functional performance indicated.
 5. Service-Rated Switches: Labeled for use as service equipment.
 6. Ground-Fault Relay: Comply with UL 1053; self-powered type with mechanical ground-fault indicator, test function, tripping relay with internal memory, and three-phase current transformer/sensor.
 - a) Configuration: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
 - b) Internal Memory: Integrates the cumulative value of intermittent arcing ground-fault currents and uses the effect to initiate tripping.

- c) No-Trip Relay Test: Permits ground-fault simulation test without tripping switch.
 - d) Test Control: Simulates ground fault to test relay and switch (or relay only if "no-trip" mode is selected).
- 2) Open-Fuse Trip Device: Arranged to trip switch open if a phase fuse opens.

2.04 INSTRUMENTATION

- A. Instrument Transformers: IEEE C57.13, NEMA EI 21.1, and the following:
 - 1. Current Transformers: IEEE C57.13; 5 A, 60 Hz, secondary; wound type; single secondary winding and secondary shorting device. Burden and accuracy shall be consistent with connected metering and relay devices.
 - 2. Control-Power Transformers: by manufacturer where applicable.
- B. Multifunction Digital-Metering Monitor: Microprocessor-based unit suitable for three- or four-wire systems and with the following features:
 - 1. Switch-selectable digital display of the following values with maximum accuracy tolerances as indicated:
 - i. Phase Currents, Each Phase: Plus or minus 1 percent.
 - ii. Phase-to-Phase Voltages, Three Phase: Plus or minus 1 percent.
 - iii. Phase-to-Neutral Voltages, Three Phase: Plus or minus 1 percent.
 - iv. Megawatts: Plus or minus 2 percent.
 - v. Megavars: Plus or minus 2 percent.
 - vi. Power Factor: Plus or minus 2 percent.
 - vii. Frequency: Plus or minus 0.5 percent.
 - viii. Accumulated Energy, Megawatt Hours: Plus or minus 2 percent; accumulated values unaffected by power outages up to 72 hours.
 - ix. Megawatt Demand: Plus or minus 2 percent; demand interval programmable from five to 60 minutes.
 - x. Contact devices to operate remote impulse-totalizing demand meter.
 - 2. Mounting: Display and control unit flush or semiflush mounted in instrument compartment door.
 - 3. Digital Meter shall be manufactured by the one following manufacturers: Square D; Eaton-Cutler Hammer.

2.05 CONTROL POWER

- A. Control Circuits: 120-V ac, supplied through secondary disconnecting devices from control-power transformer.
- B. Control Circuits: 120-V ac, supplied from remote branch circuit.
- C. Respective voltages for Modbus and BACnet connections.
- D. Electrically Interlocked Main and Tie Circuit Breakers: Two control-power transformers in separate compartments, with interlocking relays, connected to the primary side of each control-power transformer at the line side of the associated main circuit breaker. 120-V

secondaries connected through automatic transfer relays to ensure a fail-safe automatic transfer scheme.

- E. Control-Power Fuses: Primary and secondary fuses for current-limiting and overload protection of transformer and fuses for protection of control circuits.
- F. Control Wiring: Factory installed, with bundling, lacing, and protection included. Provide flexible conductors for No. 8 AWG and smaller, for conductors across hinges, and for conductors for interconnections between shipping units

2.06 ACCESSORY COMPONENTS AND FEATURES

- A. Portable Test Set: For testing functions of solid-state trip devices without removing from switchboard. Include relay and meter test plugs suitable for testing switchboard meters and switchboard class relays.

2.07 IDENTIFICATION

- A. Presentation Media: Painted graphics in color contrasting with background color to represent bus and components, complete with lettered designations.
- B. Service Equipment Label: UL labeled for use as service equipment for switchboards with one or more service disconnecting and overcurrent protective devices.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Receive, inspect, handle, and store switchboards according to NECA 400.
- B. Examine switchboards before installation to verify compliance with approved shop drawings. Reject switchboards that are moisture damaged or physically damaged.
- C. Examine elements and surfaces to receive switchboards for compliance with installation tolerances and other conditions affecting performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected to the satisfaction of the owner.

3.02 INSTALLATION

- A. Install switchboards and accessories according to NECA 400.
- B. Equipment Mounting: Install switchboards on concrete base, 4-inch nominal thickness. Comply with structural requirements for concrete base "Cast-in-Place Concrete."
 - 1. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
 - 2. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
 - 3. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 4. Install anchor bolts to elevations required for proper attachment to switchboards.
- C. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from switchboard units and components.
- D. Equipment installation shall comply with seismic mounting and anchoring requirements.

- E. Operating Instructions: Frame and mount the printed basic operating instructions for switchboards, including control and key interlocking sequences and emergency procedures. Fabricate frame of finished wood or metal and cover instructions with clear acrylic plastic. Mount on front of switchboards.
- F. Install filler plates in unused spaces of panel-mounted sections.
- G. Install overcurrent protective devices, surge protection devices, and instrumentation.
 - 1. Set field-adjustable switches and circuit-breaker trip ranges in accordance with the recommendations of the Overcurrent Protective Device Short Circuit, Coordination and Arc Flash Study.
- H. Comply with NECA 1.

3.03 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- B. Switchboard Nameplates: Label each switchboard compartment with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- C. Device Nameplates: Label each disconnecting, and overcurrent protective device and each meter and control device mounted in compartment doors with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.04 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, start-up and to assist in testing.
- B. Acceptance Testing Preparation:
 - 1. Test insulation resistance for each switchboard bus, component, connecting supply, feeder, and control circuit.
 - 2. Test continuity of each circuit.
- C. Tests and Inspections:
 - 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - 2. All tests shall be witnessed by owner's representative. Provide minimum fourteen (14) days advance notice.
 - 3. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
 - 4. Perform the following infrared scan tests and inspections and prepare reports:
 - i. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each switchboard. Remove front and rear panels so joints and connections are accessible to portable scanner.
 - ii. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each switchboard 11 months after date of Substantial Completion.

iii. Instruments and Equipment:

- 1) Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

5. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

D. Switchboard will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports, including a certified report that identifies switchboards included and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.05 ADJUSTING

A. Adjust moving parts and operable components to function smoothly and lubricate as recommended by manufacturer.

B. Set field-adjustable circuit-breaker trip ranges as specified in Section 260573 "Short Circuit, Coordination and Arc Flash Studies."

3.06 PROTECTION

A. Temporary Heating: Apply temporary heat, to maintain temperature according to manufacturer's written instructions, until switchboard is ready to be energized and placed into service.

3.07 DEMONSTRATION

A. Engage a factory-authorized service representative to train City's maintenance personnel to adjust, operate, and maintain switchboards, overcurrent protective devices, instrumentation, and accessories, and to use and reprogram microprocessor-based trip, monitoring, and communication units.

END OF SECTION

Section 26 27 26
Wiring Devices

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Receptacles, receptacles with integral GFCI, and associated device plates.
 - 2. Weather-resistant receptacles.
 - 3. Communications outlets.

1.3 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. GFCI: Ground-fault circuit interrupter.
- C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.
- D. RFI: Radio-frequency interference.
- E. TVSS: Transient voltage surge suppressor.
- F. UTP: Unshielded twisted pair.

1.4 ADMINISTRATIVE REQUIREMENTS

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.
- C. Samples: One for each type of device and wall plate specified, in each color specified.

1.6 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.7 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

1.8 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of wiring device through one source from a single manufacturer. Switches, receptacles and cover plates shall be of the same manufacturer.

Section 26 27 26
Wiring Devices

- B. Comply with National Electrical Manufacturer's Association (NEMA) standards. Furnish products listed and classified by Underwriter's Laboratories Inc. as suitable for purpose specified and shown.
- C. Manufacturer shall have a minimum of ten (10) years of experience in the production of wiring devices specified and shall have ISO 9001 and 9002 certifications.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
 - 1. Hubbell Incorporated; Wiring Device-Kellems (Hubbell).
 - 2. Leviton Mfg. Company Inc. (Leviton).
 - 3. Pass & Seymour/Legrand (Pass & Seymour).
 - 4. Or Equal
- B. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 GENERAL WIRING-DEVICE REQUIREMENTS

- A. Wiring Devices, Components, and Accessories: UL Listed and labeled, and marked for intended location and application.
- B. Comply with NFPA 70.
- C. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:
 - 1. Connectors shall comply with UL 2459 and shall be made with stranding building wire.
 - 2. Devices shall comply with the requirements in this Section.

2.3 STRAIGHT-BLADE RECEPTACLES

- A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.
 - 1. Products: Subject to compliance with requirements, provide one of the following manufacturers:
 - a. Hubbell; HBL5361 (single), HBL5362 (duplex).
 - b. Leviton; 5361 (single), 5362 (duplex).
 - c. Pass & Seymour; 5361 (single), 5362 (duplex).
 - d. Or Equal
 - 2. Description: Grounded, industrial extra heavy duty specifications grade, back- and side-wired, single-piece grounding brass strap with integral ground, impact-resistant thermoplastic nylon cover and body, smooth face, 20A, 125V, duplex, with separate grounding screw and NEMA 5-20R plug configurations.

Section 26 27 26
Wiring Devices

2.4 GFCI RECEPTACLES

A. General Description:

1. Straight blade, feed-through type.
2. Comply with NEMA WD 1, NEMA WD 6, UL 498, UL 943 Class A, and FS W-C-596.
3. Include indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection.
4. Include self-test feature so that the outlet is automatically tested every fifteen minutes.
5. Outlets used in coastal environments shall be suitable for such applications and shall be properly protected against the ambient conditions.

B. Duplex GFCI Convenience Receptacles, 125 V, 20 A:

1. Products: Subject to compliance with requirements, provide one of the following manufacturers:
 - a. Hubbell; GFR5352L.
 - b. Pass & Seymour; 2095.
 - c. Leviton; 7590.
 - d. Or Equal
2. Description:
 - a. Straight blade, 125 V, 20 A; NEMA WD 6 Configuration 5-20R.
 - b. Equipment grounding contacts shall be connected only to the green grounding screw terminal of the device and with inherent electrical isolation from mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts.

2.5 FINISHES

A. Device Color:

1. Wiring Devices Connected to Normal Power System: White unless otherwise indicated or required by NFPA 70 or device listing.

B. Wall Plate Color: For plastic covers, match device color.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

B. Coordination with Other Trades:

1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.

Section 26 27 26
Wiring Devices

4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:

1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
4. Existing Conductors:
 - a. Cut back and pigtail, or replace all damaged conductors.
 - b. Straighten conductors that remain and remove corrosion and foreign matter.
 - c. Pigtailing existing conductors is permitted, provided the outlet box is large enough.

D. Device Installation:

1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the right.

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

H. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.2 GFCI RECEPTACLES

- A. Install non-feed-through-type GFCI receptacles where protection of downstream receptacles is not required.

Section 26 27 26
Wiring Devices

3.3 IDENTIFICATION

- A. Comply with Section 260553 "Identification for Electrical Systems."
- B. Identify each receptacle with panelboard identification and circuit number. Use hot, stamped, or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.4 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. In healthcare facilities, prepare reports that comply with recommendations in NFPA 99.
 - 2. Test Instruments: Use instruments that comply with UL 1436.
 - 3. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.
- B. Tests for Convenience Receptacles:
 - 1. Line Voltage: Acceptable range is 105 to 132 V.
 - 2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
 - 3. Ground Impedance: Values of up to 2 ohms are acceptable.
 - 4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
 - 5. Using the test plug, verify that the device and its outlet box are securely mounted.
 - 6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.
- C. Test straight-blade outlets for the retention force of the grounding blade according to NFPA 99. Retention force shall be not less than 4 oz..
- D. Wiring device will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports. Submit reports within two (2) weeks of completion of tests.

END OF SECTION

**Section 26 56 68
Exterior Athletic Lighting
Lighting System with LED Light Source**

PART 1 – GENERAL

1.1 SUMMARY

- A. Work covered by this section of the specifications shall conform to the contract documents, engineering plans as well as state and local codes.
- B. The purpose of these specifications is to define the lighting system performance and design standards for Ken Mercer Skate Park using an LED Lighting source. The manufacturer / contractor shall supply lighting equipment to meet or exceed the standards set forth in these specifications.
- C. The sports lighting will be for the following venues:
 - 1. Skate Park
- D. The primary goals of this sports lighting project are:
 - 1. **Guaranteed Light Levels:** Selection of appropriate light levels impacts the safety of players and the enjoyment of spectators. Therefore, light levels are guaranteed to not drop below specified target values for a period of 25 years.
 - 2. **Environmental Light Control:** It is the primary goal of this project to minimize spill light to adjoining properties and glare to players, spectators, and neighbors.
 - 3. **Cost of Ownership:** To reduce the operating budget, the preferred lighting system shall be energy efficient and cost effective to operate. All maintenance costs shall be eliminated for the duration of the warranty.
 - 4. **Control and Monitoring** – To allow for optimized use of labor resources and avoid unneeded operation of the facility, customer requires a remote on/off control system for the lighting system. Fields should be proactively monitored to detect luminaire outages over a 25-year life cycle. All communication and monitoring costs for 25-year period shall be included in the bid.

1.2 ONFIELD LIGHTING PERFORMANCE

- A. **Illumination Levels and Design Factors:** Playing surfaces shall be lit to an average target illumination level and uniformity as specified in the chart below. Lighting manufacturers will provide a guarantee that light levels will be sustained over the life of the warranty period. Lighting calculations shall be developed, and field measurements taken on the grid spacing with the minimum number of grid points specified below.

Manufacturers will provide lumen maintenance data of the LED luminaires used per TM-21-11 and will incorporate the lumen maintenance projections into the lighting designs to ensure target light levels are achieved throughout the guaranteed period of the system. Per IES guidelines, lumen maintenance hours should be reported based on the 6x multiplier of testing hours.

Area of Lighting	Average Target Illumination Levels	Maximum to Minimum Uniformity Ratio	Grid Points	Grid Spacing
Skate Park	30 Footcandles	3.16:1	422	10'x10'

- B. **Color Temperature:** The lighting system shall have a minimum color temperature of 5700K and a CRI of 75.
- C. **Playability:** Lighting design and luminaire selection should be optimized for playability by reducing glare onfield and providing sufficient uplight.

**Section 26 56 68
Exterior Athletic Lighting
Lighting System with LED Light Source**

1. Aiming Angles: To reduce glare, luminaire aiming should ensure the top of the luminaire field angle (based on sample photometric reports) is a minimum of 10 degrees below horizontal.
2. Glare Control Technology – Luminaires selected should have glare control technology including, but not limited to: external visors, internal shields and louvres. No symmetrical beam patterns are acceptable.
3. Mounting Heights: To ensure proper aiming angles, minimum mountings heights shall be as described below. Higher mounting heights may be necessary for luminaire with lesser glare control to meet field angle requirements of section 1.2.C.1.

# of Poles	Pole Designation	Pole Height
10	P1-P10	30'

1.3 ENVIRONMENTAL LIGHT CONTROL

- A. Light Control Luminaires: All luminaires shall utilize spill light and glare control devices including, but not limited to, internal shields, louvers, and external shields. No symmetrical beam patterns are accepted.
- B. Spill Light and Glare Control: To minimize impact on adjacent properties, spill light and candela values must not exceed the following levels taken at 3 feet above grade.

	Average	Maximum
Property Spill Specified Spill Line Horizontal Footcandles	0 fc	0 fc
Property Spill Specified Spill Line Max Vertical Footcandles	0 fc	0 fc
Property Spill Specified Spill Line Max Candela (taken at 5 ft above grade)	5 cd	75 cd

- C. Spill Scans: Spill scans must be submitted indicating the amount of horizontal and vertical footcandles along the specified lines. Light levels shall be provided in 30-foot intervals along the boundary line at 3 ft above grade.
- D. Sample Photometry: The first page of a photometric report for all luminaire types proposed showing horizontal and vertical axial candle power shall be provided to demonstrate the capability of achieving the specified performance. Reports shall be certified by a qualified testing laboratory with a minimum of five years experience or by a manufacturer’s laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products. A summary of the horizontal and vertical aiming angles for each luminaire shall be included with the photometric report.
- E. Field Verification: Lighting manufacturer shall supply field verification of environmental light control using a meter calibrated within the last 12 months:
 1. Spill verification: Illumination levels shall be taken in accordance with IESNA RP-6-22. The light sensing surface of the light meter should be held 36 inches above the playing surface with the sensing surface horizontal (for horizontal readings) or vertically pointed at the brightest light bank (for max vertical readings)

1.4 COST OF OWNERSHIP

Section 26 56 68
Exterior Athletic Lighting
Lighting System with LED Light Source

- A. Manufacturer shall submit a 25 year Cost of Ownership summary that includes energy consumption, anticipated maintenance costs, and control costs. All costs associated with faulty luminaire replacement - equipment rentals, removal and installation labor, and shipping - are to be included in the maintenance costs.

PART 2 – PRODUCT

2.1 SPORTS LIGHTING SYSTEM CONSTRUCTION

- A. Manufacturing Requirements: All components shall be designed and manufactured as a system. All luminaires, wire harnesses, drivers and other enclosures shall be factory assembled, aimed, wired and tested.
- B. Durability: All exposed components shall be constructed of corrosion resistant material and/or coated to help prevent corrosion. All exposed carbon steel shall be hot dip galvanized per ASTM A123. All exposed aluminum shall be powder coated with high performance polyester or anodized. All exterior reflective inserts shall be anodized, coated, and protected from direct environmental exposure to prevent reflective degradation or corrosion. All exposed hardware and fasteners shall be stainless steel, passivated and coated with aluminum-based thermosetting epoxy resin for protection against corrosion and stress corrosion cracking. Structural fasteners may be carbon steel and galvanized meeting ASTM A153 and ISO/EN 1461 (for hot dipped galvanizing), or ASTM B695 (for mechanical galvanizing). All wiring shall be enclosed within the cross-arms, pole, or electrical components enclosure.
- C. System Description: Lighting system shall consist of the following:
1. Galvanized steel poles and cross-arm assembly. Alternate: Concrete pole with a minimum of 8,000 psi and installed with concrete backfill will be an acceptable alternative provided building code, wind speed and foundation designs per specifications are adhered to.
 2. Non-approved pole technology:
 - a. Square static cast concrete poles will not be accepted.
 - b. Direct bury steel poles which utilize the extended portion of the steel shaft for their foundation will not be accepted due to potential for internal and external corrosive reaction to the soils and long term performance concerns.
 3. Lighting systems shall use concrete foundations. See Section 2.4 for details.
 - a. For a foundation using a pre-stressed concrete base embedded in concrete backfill the concrete shall be air-entrained and have a minimum compressive design strength at 28 days of 3,000 PSI. 3,000 PSI concrete specified for early pole erection, actual required minimum allowable concrete strength is 1,000 PSI. All piers and concrete backfill must bear on and against firm undisturbed soil.
 - b. For anchor bolt foundations or foundations using a pre-stressed concrete base in a suspended pier or re-enforced pier design pole erection may occur after 7 days. Or after a concrete sample from the same batch achieves a certain strength.
 4. Manufacturer will supply all drivers and supporting electrical equipment.
 - a. Remote drivers and supporting electrical equipment shall be mounted approximately 10 feet above grade in aluminum enclosures. The enclosures shall be touch-safe and include drivers and fusing with indicator lights on fuses to notify when a fuse is to be replaced for each luminaire. Disconnect per circuit for each pole structure will be located in the enclosure. Integral drivers are not allowed.
 - b. Alternate: Integral drivers mounted at the top of the pole will require a pole mounted enclosure approximately 10 feet above grade. The enclosure shall include a disconnect per

Section 26 56 68
Exterior Athletic Lighting
Lighting System with LED Light Source

circuit, individual luminaire fusing, and surge protection.

- c. Manufacturer shall provide surge protection at the pole equal to or greater than 40 kA for each line to ground (Common Mode) as recommended by IEEE C62.41.2_2002.
 5. Wire harness complete with an abrasion protection sleeve, strain relief and plug-in connections for fast, trouble-free installation.
 6. All luminaires, visors, and cross-arm assemblies shall withstand 150 mi/h winds and maintain luminaire aiming alignment.
 7. Control cabinet to provide remote on-off control, monitoring, and entertainment features of the lighting system. See Section 2.3 for further details.
 8. Manufacturer shall provide lightning grounding as defined by NFPA 780 and be UL Listed per UL 96 and UL 96A.
 - a. Integrated grounding via concrete encased electrode grounding system.
 - b. If grounding is not integrated into the structure, the manufacturer shall supply grounding electrodes, copper down conductors, and exothermic weld kits. Electrodes and conductors shall be sized as required by NFPA 780. The grounding electrode shall be minimum size of 5/8 inch diameter and 8 feet long, with a minimum of 10 feet embedment. Grounding electrode shall be connected to the structure by a grounding electrode conductor with a minimum size of 2 AWG for poles with 75 feet mounting height or less, and 2/0 AWG for poles with more than 75 feet mounting height.
- D. Safety: All system components shall be UL listed for the appropriate application.

2.2 ELECTRICAL

- A. Electric Power Requirements for the Sports Lighting Equipment:
 1. Electric power: 480 Volt, Three Phase
 2. Maximum total voltage drop: Voltage drop to the disconnect switch located on the poles shall not exceed three (3) percent of the rated voltage.
- B. Energy Consumption: The kW consumption for the field lighting system shall be 15.12 kW.

2.3 CONTROL

- A. Instant On/Off Capabilities: System shall provide for instant on/off of luminaires.
- B. Lighting contactor cabinet(s) constructed of NEMA Type 4 aluminum, designed for easy installation with contactors, labeled to match field diagrams and electrical design. Manual off-on-auto selector switches shall be provided.
- C. Contactor control of lights: To minimize wear on drivers and other electrical components and prevent lights from turning on due to communication loss, circuits must be controlled via contactor switching, not dimming driver output to zero.
- D. Dimming: System shall provide for 3-stage dimming (high-medium-low). Dimming will be set via scheduling options (Website, app, phone, email).
- E. Remote Lighting Control System: System shall allow city and users with a security code to schedule on/off system operation via a web site, phone, or email up to ten years in advance. Manufacturer shall provide and maintain a two-way TCP/IP communication link. Trained staff shall be available 24/7 to provide scheduling support and assist with reporting needs.

The City may assign various security levels to schedulers by function and/or fields. This function must be flexible to allow a range of privileges such as full scheduling capabilities for all fields to only

Section 26 56 68
Exterior Athletic Lighting
Lighting System with LED Light Source

having permission to execute "early off" commands by phone. Scheduling tool shall be capable of setting curfew limits.

Controller shall accept and store 7-day schedules, be protected against memory loss during power outages, and shall reboot once power is regained and execute any commands that would have occurred during outage.

- F. Remote Monitoring System: System shall monitor lighting performance and notify manufacturer if individual luminaire outage is detected so that appropriate maintenance can be scheduled. The controller shall determine switch position (manual or auto) and contactor status (open or closed).
- G. Management Tools: Manufacturer shall provide a web-based database and dashboard tool of actual field usage and provide reports by facility and user group. Dashboard shall also show current status of luminaire outages, control operation and service. Mobile application will be provided suitable for IOS and Android devices.

Hours of Usage: Manufacturer shall provide a means of tracking actual hours of usage for the field lighting system that is readily accessible to the City.
 - 1. Cumulative hours: shall be tracked to show the total hours used by the facility.
 - 2. Report hours saved by using early off and push buttons by users.
- H. Communication Costs: Manufacturer shall include communication costs for operating the control and monitoring system for a period of 25 years.
- I. Communication with luminaire drivers: Control system shall interface with drivers in electrical components enclosures by means of powerline communication.

2.4 STRUCTURAL PARAMETERS

- A. Wind Loads: Wind loads shall be based on the 2022 California Building Code. Wind loads to be calculated using ASCE 7-16, a design wind speed of 95, exposure category C and wind importance factor of 1.0.
- B. Pole Structural Design: The stress analysis and safety factor of the poles shall conform to AISC 360-16 Specification for Structural Steel Buildings.
- C. Foundation Design: The foundation design shall be based on soil parameters as outlined in the geotechnical report. BSK Associates, BSK Project NO.: G21-147-11L, June 22, 2021.
- D. Foundation Drawings: Project specific foundation drawings stamped by a registered engineer in the state where the project is located are required. The foundation drawings must list the moment, shear (horizontal) force, and axial (vertical) force at ground level for each pole. These drawings must be submitted at time of bid to allow for accurate pricing.

PART 3 – EXECUTION

3.1 SOIL QUALITY CONTROL

- A. It shall be the Contractor's responsibility to notify the City if soil conditions exist other than those on which the foundation design is based, or if the soil cannot be readily excavated. Contractor may issue a change order request / estimate for the City's approval / payment for additional costs associated with:
 - 1. Providing engineered foundation embedment design by a registered engineer in the State of California for soils other than specified soil conditions;
 - 2. Additional materials required to achieve alternate foundation;
 - 3. Excavation and removal of materials other than normal soils, such as rock, caliche, etc.

Section 26 56 68
Exterior Athletic Lighting
Lighting System with LED Light Source

3.2 DELIVERY TIMING

- B. Delivery Timing Equipment On-Site: The equipment must be on-site 8 – 10 weeks from receipt of approved submittals and receipt of complete order information.

3.3 FIELD QUALITY CONTROL

- A. Illumination Measurements: Upon substantial completion of the project and in the presence of the Contractor, Project Engineer, City's Representative, and Manufacturer's Representative, illumination measurements shall be taken and verified. The illumination measurements shall be conducted in accordance with IESNA RP-6-22.
- B. Field Light Level Accountability
 1. Light levels are guaranteed not to fall below the target maintained light levels for the entire warranty period of 25 years. These levels will be specifically stated as "guaranteed" on the illumination summary provided by the manufacturer.
 2. The contractor/manufacturer shall be responsible for conducting initial light level testing and an additional inspection of the system, in the presence of the City representative, one year from the date of commissioning of the lighting.
 3. The contractor/manufacturer will be held responsible for any and all changes needed to bring these fields back to compliance for light levels and uniformities. Contractor/Manufacturer will be held responsible for any damage to the fields during these repairs.
- C. Correcting Non-Conformance: If, in the opinion of the City or his appointed Representative, the actual performance levels including footcandles, uniformity ratios, are not in conformance with the requirements of the performance specifications and submitted information, the Manufacturer shall be required to make adjustments to meet specifications and satisfy the City.

3.4 WARRANTY AND GUARANTEE

- A. 25-Year Warranty: Each manufacturer shall supply a signed warranty covering the entire system for 25 years from the date of shipment. Warranty shall guarantee specified light levels. Manufacturer shall maintain specifically funded financial reserves to assure fulfillment of the warranty for the full term. Warranty does not cover weather conditions events such as lightning or hail damage, improper installation, vandalism or abuse, unauthorized repairs or alterations, or product made by other manufacturers.
- B. Maintenance: Manufacturer shall monitor the performance of the lighting system, including on/off status, hours of usage and luminaire outage for 25 years from the date of equipment shipment. Parts and labor shall be covered such that individual luminaire outages will be repaired when the usage of any field is materially impacted. Manufacturer is responsible for removal and replacement of failed luminaires, including all parts, labor, shipping, and equipment rental associated with maintenance. The City agrees to check fuses in the event of a luminaire outage.

PART 4 – DESIGN APPROVAL

4.1 PRE-BID SUBMITTAL REQUIREMENTS (Non-Musco)

- A. Design Approval: The City / engineer will review pre-bid submittals per section 4.1.B from all the manufacturers to ensure compliance to the specification 10 days prior to bid. If the design meets the design requirements of the specifications, a letter and/or addendum will be issued to the manufacturer indicating approval for the specific design submitted.
- B. Approved Product: Musco's Light-Structure System™ with TLC for LED® is the approved product. All substitutions must provide a complete submittal package for approval as outlined in Submittal Information at the end of this section at least 10 days prior to bid. Special manufacturing to meet the standards of this specification may be required. An addendum will be issued prior to bid listing any

Section 26 56 68
Exterior Athletic Lighting
Lighting System with LED Light Source

other approved lighting manufacturers and designs.

- C. All listed manufacturers not pre-approved shall submit the information at the end of this section at least 10 days prior to bid. An addendum will be issued prior to bid; listing approved lighting manufacturers and the design method to be used.
- D. Bidders are required to bid only products that have been approved by this specification or addendum by the City or City's representative. Bids received that do not utilize an approved system/design, will be rejected.

**Section 26 56 68
Exterior Athletic Lighting
Lighting System with LED Light Source**

**REQUIRED SUBMITTAL INFORMATION FOR ALL MANUFACTURERS (NOT PRE-APPROVED) 10 DAYS
PRIOR TO BID**

*All items listed below are mandatory, shall comply with the specification and be submitted according to pre-bid submittal requirements. Complete the Yes/No column to indicate compliance (Y) or noncompliance (N) for each item. **Submit checklist below with submittal.***

Yes / No	Tab	Item	Description
	A	Letter/ Checklist	Listing of all information being submitted must be included on the table of contents. List the name of the manufacturer's local representative and his/her phone number. Signed submittal checklist to be included.
	B	Equipment Layout	Drawing(s) showing skatepark layout with pole locations
	C	On Field Lighting Design	Lighting design drawing(s) showing: <ul style="list-style-type: none"> a. Field Name, date, file number, prepared by b. Outline of field(s) being lighted, as well as pole locations referenced to the center of the field (x & y), Illuminance levels at grid spacing specified c. Pole height, number of fixtures per pole, horizontal and vertical aiming angles, as well as luminaire information including wattage, lumens and optics d. Height of light test meter above field surface. e. Summary table showing the number and spacing of grid points; average, minimum and maximum illuminance levels in foot candles (fc); uniformity including maximum to minimum ratio, coefficient of variance (CV), coefficient of utilization (CU) uniformity gradient; number of luminaires, total kilowatts, average tilt factor; light loss factor.
	D	Off Field Lighting Design	Lighting design drawing showing initial spill light levels along the boundary line (defined on bid drawings) in footcandles. Lighting design showing glare along the boundary line in candela. Light levels shall be taken at 30-foot intervals along the boundary line. Readings shall be taken with the meter orientation at both horizontal and aimed towards the most intense bank of lights.
	E	Photometric Report	Provide first page of photometric report for all luminaire types being proposed showing candela tabulations as defined by IESNA Publication LM-35-02. Photometric data shall be certified by laboratory with current National Voluntary Laboratory Accreditation Program or an independent testing facility with over 5 years experience.
	F	Performance Guarantee	Provide performance guarantee including a written commitment to undertake all corrections required to meet the performance requirements noted in these specifications at no expense to the City. Light levels must be guaranteed to not fall below target levels for warranty period.
	G	Structural Calculations	Pole structural calculations and foundation design showing foundation shape, depth backfill requirements, rebar and anchor bolts (if required). Pole base reaction forces shall be shown on the foundation drawing along with soil bearing pressures. Design must be stamped by a structural engineer in the state of California, if required by the City. (May be supplied upon award).
	H	Control & Monitoring System	Manufacturer of the control and monitoring system shall provide written definition and schematics for automated control system. They will also provide ten (10) references of customers currently using proposed system in the state of California.
	I	Electrical Distribution Plans	Manufacturer bidding an alternate product must include a revised electrical distribution plan including changes to service entrance, panels and wire sizing, signed by a licensed Electrical Engineer in the state of California.
	J	Warranty	Provide written warranty information including all terms and conditions. Provide ten (10) references of customers currently under specified warranty in the state of California.
	K	Project References	Manufacturer to provide a list of ten (10) projects where the technology and specific fixture proposed for this project has been installed in the state of California. Reference list will

**Section 26 56 68
Exterior Athletic Lighting
Lighting System with LED Light Source**

			include project name, project city, installation date, and if requested, contact name and contact phone number.
	L	Product Information	Complete bill of material and current brochures/cut sheets for all products being provided.
	M	Delivery	Manufacturer shall supply an expected delivery timeframe from receipt of approved submittals and complete order information.
	N	Non-Compliance	Manufacturer shall list all items that do not comply with the specifications. If in full compliance, tab may be omitted.
	O	Cost of Ownership	Document cost of ownership as defined in the specification. Identify energy costs for operating the luminaires. Maintenance cost for the system must be included. All costs should be based on 25 Years

The information supplied herein shall be used for the purpose of complying with the specifications for Ken Mercer Skate Park. By signing below, I agree that all requirements of the specifications have been met and that the manufacturer will be responsible for any future costs incurred to bring their equipment into compliance for all items not meeting specifications and not listed in the Non-Compliance section.

Manufacturer: _____

Signature: _____

Contact Name: _____

Date: ____/____/____

Contractor: _____

Signature: _____

Section 31 10 00

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. Section 31 22 00 - Grading: Topsoil removal.
- B. Section 31 23 23 - Fill: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

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. Vegetation Removed: Do not burn, bury, landfill, or leave on site, except as indicated.
 - 1. Clear and grub areas dictated by Demolition plan.
- B. 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 and properly dispose of 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 31 22 00

Grading

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Removal of topsoil.
- B. Rough grading the site for site structures, and landscaped areas.
- C. Finish grading.

1.2 RELATED REQUIREMENTS

- A. Geotechnical Report: Proposed Skatepark Improvements Project at Ken Mercer Sports Park prepared by BSK Associates June 22, 2021 (Revised June 23, 2021) and Supplemental Memorandum February 13, 2024.
- B. Section 31 10 00 - Site Clearing.
- C. Section 31 23 16 - Excavation.
- D. Section 31 23 23 - Fill: Filling and compaction.
- E. Section 4 of the City's Standard Specifications - Roadwork Excavation and Grading
- F. Section 20 of the City's Standard Specifications - Plants and Plantings

PART 2 PRODUCTS

2.1 MATERIALS

- A. Topsoil: Section 20 of the City's Standard Specifications - Plants and Plantings
 - 1. Graded
 - 2. Free of roots, rocks larger than 1/2 inch, subsoil, debris, large weeds and foreign matter.
- B. Other Fill Materials: See Section 31 23 23.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that survey bench mark and intended elevations for the Work are as indicated.
- B. Verify the absence of standing or ponding water.

3.2 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Construction Staking: The Contractor shall be responsible for providing the construction staking for the project and shall notify the Public Works Department (925-931-5650) 48 hours in advance of the date that staking is planned. Any changes to the staking during the course of construction shall also be the Contractor's responsibility
- C. Contractor shall stake and flag locations of known utilities.
- D. Locate, identify, and protect from damage above- and below-grade utilities to remain.
- E. Notify utility company to remove and relocate utilities.
- F. Provide temporary means and methods to remove all standing or ponding water from areas prior to grading.
- G. Protect site features to remain, including but not limited to bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs, from damage by grading equipment and vehicular traffic.
- H. Protect trees to remain. Refer to plans and see Section 32 31 15 - Tree Protection and Temporary Fencing.

3.3 ROUGH GRADING

- A. Remove topsoil from areas to be further excavated, re-landscaped, or re-graded, without mixing with foreign materials.
- B. Do not remove topsoil when wet.
- C. Remove subsoil from areas to be further excavated, re-landscaped, or re-graded.
- D. Do not remove wet soil, unless it is subsequently processed to obtain the required moisture content.
- E. Excavating through roots, refer to Tree Protection Plan and Section 32 31 15 - Tree Protection and Temporary Fencing.
- F. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.
- G. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack surface water control.

3.4 SOIL REMOVAL

- A. Stockpile excavated topsoil on site.

- B. Stockpile subsoil to be re-used on site; remove remainder from site.
- C. Stockpiles: Use areas designated on site; pile depth not to exceed 6 feet; protect from erosion.

3.5 FINISH GRADING

- A. Before Finish Grading:
 - 1. Verify trench backfilling have been inspected.
 - 2. Verify subgrade has been contoured and compacted.
- B. Remove debris, roots, branches, stones, in excess of 3 inch in size.
- C. Where topsoil is to be placed, scarify surface to depth of 12 inches.
- D. In areas where vehicles or equipment have compacted soil, scarify surface to depth of 12 inches.
- E. Place topsoil in areas indicated on plans as turf to min 4" deep.
- F. Place topsoil where required to level finish grade.
- G. Place topsoil during dry weather.
- H. Remove roots, weeds, rocks, and foreign material while spreading.
- I. Near plants and tree roots spread topsoil manually to prevent damage.
- J. Fine grade topsoil to eliminate uneven areas and low spots. Maintain profiles and contour of subgrade.
- K. Lightly compact placed topsoil.
- L. Maintain stability of topsoil during inclement weather. Replace topsoil in areas where surface water has eroded thickness below specifications.

3.6 REPAIR AND RESTORATION

- A. Existing Facilities, Utilities, and Site Features to Remain: If damaged due to this work, repair or replace to original condition.
- B. Trees to Remain: If damaged due to this work, trim broken branches and repair bark wounds; if root damage has occurred, obtain instructions from Landscape Architect as to remedy.
- C. Other Existing Vegetation to Remain: If damaged due to this work, replace with vegetation of equivalent species and size.

3.7 CLEANING

- A. Remove unused stockpiled topsoil and subsoil. Grade stockpile area to prevent standing water.
- B. Leave site clean and raked, ready to receive landscaping.

END OF SECTION

Section 31 23 16.13

Trenching

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Backfilling and compacting for utilities as discovered.

1.2 RELATED REQUIREMENTS

- A. Geotechnical Report: Proposed Skatepark Improvements Project at Ken Mercer Sports Park prepared by BSK Associates June 22, 2021 (Revised June 23, 2021) and Supplemental Memorandum February 13, 2024.
- B. Section 31 22 00 - Grading: Site grading.

1.3 DEFINITIONS

- A. Finish Grade Elevations: Indicated on drawings.

1.4 REFERENCE STANDARDS

- A. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2014.
- B. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)); 2012.
- C. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN m/m³)); 2012.
- D. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth); 2010.

1.5 SUBMITTALS

- A. See Section 1-14 for Shop Drawing and Product Data Submittals.
- B. Materials Sources: Submit name of imported materials source.
- C. Compaction Density Test Reports.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. When necessary, store materials on site in advance of need.

PART 2 PRODUCTS

2.1 FILL MATERIALS

- A. Refer to Section 31 23 23.
- B. General Fill: Subsoil excavated on-site.
 - 1. Free of lumps larger than 4 inches, rocks larger than 3 inches, and debris.
- C. Refer to Section 11 of the City of Pleasanton Standard Specifications.

2.2 SOURCE QUALITY CONTROL

- A. Soil tests to be provided for all imported soils and fills.
- B. If tests indicate materials do not meet specified requirements, change material and retest.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that survey bench marks and intended elevations for the work are as indicated.

3.2 PREPARATION

- A. Identify required lines, levels, contours, and datum locations.
- B. See Section 31 22 00 for additional requirements.
- C. Grade top perimeter of trenching area to prevent surface water from draining into trench.
Provide temporary means and methods, as required, to maintain surface water diversion until no longer needed, or as directed by the City.

3.3 TRENCHING

- A. Notify Landscape Architect of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.
- B. Slope banks of excavations deeper than 4 feet to angle of repose or less until shored.
- C. Cut trenches wide enough to allow inspection of installed utilities.
- D. Hand trim excavations. Remove loose matter.
- E. Remove excavated material that is unsuitable for re-use from site.
- F. Remove excess excavated material from site.

- G. Provide temporary means and methods, as required, to remove all water from trenching until directed by the City. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack of dewatering or surface water control.
- H. Determine the prevailing groundwater level prior to trenching. If the proposed trench extends less than 1 foot into the prevailing groundwater, control groundwater intrusion with perimeter drains routed to sump pumps, or as directed by the City.
- I. Provide Sheet piling and Shoring necessary for protection of the Work and safety of personnel.
 - 1. Prior to backfilling, remove all sheet piling
 - 2. Do not permit sheet piling to remain in the trenches except when, in the opinion of the Engineer, field conditions or the type of sheet piling or methods of construction such as use of concrete bedding are such as to make removal of sheet piling impracticable. In such cases, the Engineer may permit portions of sheet piling to be cut off and remain in the trench.

3.4 PREPARATION FOR UTILITY PLACEMENT

- A. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.
- B. Compact subgrade to density equal to or greater than requirements for subsequent fill material.
- C. Until ready to backfill, maintain excavations and prevent loose soil from falling into excavation.

3.5 BACKFILLING

- A. Backfill to contours and elevations indicated using unfrozen materials.
- B. Employ a placement method that does not disturb or damage other work.
- C. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.
- D. Maintain required moisture content of fill materials to attain required compaction density.
- E. Correct areas that are over-excavated.
 - 1. Other areas: Use general fill, flush to required elevation, compacted to the required percentage of maximum dry density.
- F. Reshape and re-compact fills subjected to vehicular traffic.

3.6 TOLERANCES

- A. Top Surface of General Backfilling: Plus or minus 1 inch from required elevations.

3.7 FIELD QUALITY CONTROL

- A. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D1557 ("modified Proctor") or ASTM D698 ("standard Proctor").
- B. If tests indicate work does not meet specified requirements, remove work, replace and retest.
- C. Frequency of Tests: One per per 250 lineal feet under paved surfaces, minimum one per trench.

3.8 CLEANING

- A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SECTION

Section 31 23 16

Excavation

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Excavating for footings, paving, site structures, and walls.
- B. Trenching for utilities.

1.2 RELATED REQUIREMENTS

- A. Geotechnical Report: Proposed Skatepark Improvements Project at Ken Mercer Sports Park prepared by BSK Associates June 22, 2021 .
- B. Section 31 23 16.13 - Trenching
- C. Section 31 23 23 - Fill: Fill materials, backfilling, and compacting.

1.3 REFERENCE STANDARDS

- A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.

PART 2 PRODUCTS -NOT USED

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that survey bench mark and intended elevations for the work are as indicated.

3.2 PREPARATION

- A. Identify required lines, levels, contours, and datum locations.
- B. See Section 31 22 00 for topsoil removal.
- C. Locate, identify, and protect utilities that remain and protect from damage.
- D. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- E. Grade top perimeter of excavation to prevent surface water from draining into excavation. Provide temporary means and methods, as required, to maintain surface water diversion until no longer needed, or as directed by the City.

3.3 EXCAVATING

- A. Excavate to accommodate new structures and construction operations.
- B. Notify City of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.
- C. Provide temporary means and methods, as required, to remove all water from excavations until directed by Landscape Architect. Remove and replace soils deemed suitable by classification and which are excessively moist due to lack of dewatering or surface water control.

3.4 SHORING AND BRACING

- A. Provide materials for shoring and bracing as may be necessary for safety of personnel, protection of work, and compliance with requirements of governmental agencies having jurisdiction.
- B. Maintain shoring and bracing in excavations regardless of the time period excavations will be open.
- C. Carry shoring and bracing down as excavation progresses.

3.5 CLEANING

- A. Stockpile excavated material to be re-used in area designated on site in accordance with Section 31 22 00.
- B. Remove excavated material that is unsuitable for re-use from site.
- C. Remove excess excavated material from site.

3.6 PROTECTION

- A. Divert surface flow from rains or water discharges from the excavation.
- B. Prevent displacement of banks and keep loose soil from falling into excavation; maintain soil stability.
- C. Protect open excavations from rainfall, runoff, freezing groundwater, or excessive drying so as to maintain foundation subgrade in satisfactory, undisturbed condition.
- D. Keep excavations free of standing water and completely free of water during concrete placement.

END OF SECTION

Section 31 23 23

Fill

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Filling, backfilling, and compacting for footings, paving, and site structures
- B. Backfilling and compacting for utilities outside the building to utility main connections.
- C. Filling holes, pits, and excavations generated as a result of removal (demolition) operations.

1.2 RELATED REQUIREMENTS

- A. Geotechnical Report: Proposed Skatepark Improvements Project at Ken Mercer Sports Park prepared by BSK Associates June 22, 2021 (Revised June 23, 2021) and Supplemental Memorandum February 13, 2024.
- B. Section 31 22 00 - Grading
- C. Section 31 23 16.13 - Trenching

1.3 REFERENCE STANDARDS

- A. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2014.
- B. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)); 2012.
- C. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN m/m³)); 2012.
- D. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth); 2010.

PART 2 PRODUCTS

2.1 FILL MATERIALS

- A. General Fill: Subsoil excavated on-site.
 - 1. Graded.
 - 2. Free of lumps larger than 3 inches, rocks larger than 3 inches, and debris.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Identify required lines, levels, contours, and datum locations.
- B. See Section 31 22 00 for additional requirements.
- C. Verify subdrainage, dampproofing, or waterproofing installation has been inspected.
- D. Verify areas to be filled are not compromised with surface or ground water.

3.2 PREPARATION

- A. Scarify and recompact subgrade surface to a depth of 12 inches prior to placing fill.
- B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.
- C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.
- D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

3.3 FILLING

- A. Fill to contours and elevations indicated using unfrozen materials.
- B. Employ a placement method that does not disturb or damage other work.
- C. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.
- D. Maintain required moisture content of fill materials to attain required compaction density.
- E. Correct areas that are over-excavated.
 - 1. Other areas: Use general fill, flush to required elevation, compacted to required percentage of maximum dry density.
- F. Reshape and re-compact fills subjected to vehicular traffic.
- G. Maintain temporary means and methods, as required, to remove all water while fill is being placed as required, or until directed by the City. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack of dewatering or surface water control.

3.4 CLEANING

- A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SECTION

Section 32 01 90
Maintenance of Landscape

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Maintain plants in manner that promotes health, growth, color and appearance, to quality levels specified; replace dead, dying, and damaged plants at no extra cost to City.
- B. Maintain newly planted landscape plants, including turf (lawn), trees, shrubs, and groundcover.
- C. Maintain established landscape plants, including turf (lawns), trees, shrubs, and ground cover.
- D. Renovate the following established landscape plants within the project boundaries: turf (lawns).
- E. Operate permanent irrigation system.
- F. Clean up landscaped areas.
- G. Maintenance Period: The time frame covered by these requirements is 90 days:
 - 1. Start Date: Maintenance of landscape period will not start until all of elements of the Project that impact the landscape are completed in accordance with the Contract Documents.

1.2 RELATED REQUIREMENTS

- A. Section 19 of the City's Standard Specifications - Irrigation
- B. Section 20 of the City's Standard Specifications - Plants and Plantings

1.3 REFERENCE STANDARDS

- A. ANSI A300 Part 1 - American National Standard for Tree Care Operations -- Tree, Shrub and Other Woody Plant Maintenance -- Standard Practices; 2008.
- B. ANSI Z133.1 - American National Standard For Arboricultural Operations - Pruning, Repairing, Maintaining, And Removing Trees, And Cutting Brush - Safety Requirements; 2012.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Maintenance Contractor: The contractual entity that performed the planting installation.
 - 2. Pesticide Applicators: Certified by authorities having jurisdiction.

3. Herbicide Applicators: Certified by authorities having jurisdiction.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver U.S. EPA-controlled materials to site in original containers with legible labels indicating registration number and registered uses.
- B. Deliver fertilizer and manufactured soil amendments to site in original containers bearing manufacturer's chemical analysis, name, trade name or trademark, and indication of compliance with applicable state and federal laws and regulations ; alternatively, bulk delivery with equivalent certificate is acceptable.
- C. Store fertilizer, soil amendments, and mulch in dry locations away from contaminants.
- D. Do not store pesticides, herbicides, or other chemical treatment materials in locations where they could damage seeds or plants.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Fertilizers: Used during the course of the maintenance period shall be determined by soils test required in Section 20 of the City's Standard Specifications. For bidding purposes only, assume the use of ammonium sulfate (21-0-0) at 5 lbs. per 1000 SF, minimum of two applications.
- B. Water: During the course of construction and maintenance period water shall be paid for by the Contractor.
- C. Herbicide/Fungicide/Insecticide: Shall be a commercially available chemical recommended for this project and these plantings by a State of California appropriately licensed individual. The licensed individual shall review all planting, including but not limited to sod, groundcovers, shrubs, and trees, the types and extent of soil preparation, the irrigation systems, drainage patterns, and other project characteristics to verify type, compatibility, and recommend the appropriate chemical(s) for use. Contractor shall be responsible for all overspray, spreading, runoff, plant health, and other impacts from the use of chemical(s).

PART 3 EXECUTION

- 3.1 **TIME LIMITS:** The maintenance period shall commence from the date of substantial completion of planting as defined in paragraph 3.6 below, and extend for a ninety (90) day period thereafter, or until the acceptance of Final Completion.
- 3.2 **FERTILIZER APPLICATION:** Fertilizer(s) shall be applied per Lucchesi Plant and Soil Consulting, LLC recommendations. For bidding purposes, assume initial application to be four weeks after planting and subsequent applications to be at 45-day intervals.
- 3.3 **HERBICIDE APPLICATION:** Herbicide shall not be used until all plant material has been planted a minimum of 20-days. All planting areas shall be kept weed-free by non-herbicide methods during this time period. Contractor must apply the material in conformance with the written recommendations of the State appropriately licensed individual.
- 3.4 **BASIC REQUIREMENTS:** All planting areas shall be kept weed-free at all times during the maintenance period. All pest and disease control shall be the Contractor's responsibility. All planting areas shall be kept at optimum moisture for plant growth. Settlement of soil and plants and soil erosion shall be repaired and areas replanted as required. Dying or deficient plants shall be replaced as soon as they become apparent.
- 3.5 **CITY'S RESPONSIBILITY:** Work installed under this contract that is damaged or stolen prior to Substantial Completion shall be repaired or replaced by the Contractor without cost to the City. After Substantial Completion and through the maintenance period, these damages and similar factors such as extensive litter, abuse and defacement shall be the City's responsibility to repair or replace and shall not be a part of this contract. No planting shall be guaranteed beyond the maintenance period, except as to conform to specified species and variety.
- 3.6 **SUBSTANTIAL COMPLETION:** Shall be deemed as the time all major plantings, including groundcover, are installed, and when all other work is satisfactorily completed (with the exception of minor items to be completed as noted upon a checklist compiled by the City).
- 3.7 **FINAL REVIEW:** Contractor shall request a final review of the project at least five days in advance of the proposed date. Failure to request this notice shall automatically extend the date of completion. The maintenance period will continue until project is deemed complete.
- 3.8 **LANDSCAPE MAINTENANCE - GENERAL**
- A. Protect existing vegetation, pavements, and facilities from damage due to maintenance activities; restore damaged items to original condition or replace, at no extra cost to City.
 - B. General Cleanup: Remove debris from all landscape areas at least once a week and from turf areas before each mowing.

1. Debris consists of trash, rubbish, dropped leaves, downed branches and limbs of all sizes, dead vegetation, rocks, and other material not belonging in landscaped areas.
 2. Remove debris from site and dispose of properly.
- C. Watering, Soil Erosion, and Sedimentation Control: Comply with federal, state, local, and other regulations in force; prevent over-watering, run-off, erosion, puddling, and ponding.
1. Site grading and planting have been designed to resist erosion once fully grown, with temporary measures in place during establishment period.
 2. Repair temporary erosion control mechanisms provided by others.
 3. Repair eroded areas and replant, when caused by inadequate maintenance.
 4. Prevent sediment from entering storm drains.
- D. Trees: Exercise care to avoid girdling trees; provide protective collars if necessary; remove protective collars at end of maintenance period.
- E. Fertilizing: Apply fertilizer only when necessary.
- F. Drainage Channels: Remove obstructions in gutters, catch basins, storm drain inlets, yard drains, swales, ditches, and overflows.
1. Remove grates from catch basins to clean.
 2. Prevent encroachment of other vegetation on turfed surface drainage channels.
- G. Health Maintenance: Inspect all plants regularly for health:
1. Eradicate diseases and damaging pests, regardless of severity or speed of effect.
 2. Treat accidental injuries and abrasions.
 3. If a plant is unhealthy but not yet dead, according to specified definitions, determine reason(s) and take remedial action immediately.
 4. Remove dead plants immediately upon determining that they are dead.
- H. Pesticide and Herbicide Application: Comply with manufacturer's instructions and recommendations and applicable regulations.
1. Obtain City's approval prior to each application.
 2. Apply in manner to prevent injury to personnel and damage to property due to either direct spray or drifting, both on and off City's property.
 3. Use backflow preventers on hose bibbs used for mixing water; prevent spills.

4. Inspect equipment daily before application; repair leaks, clogs, wear, and damage.
 5. Do not dispose of excess mixed material, unmixed material, containers, residue, rinse water, or contaminated articles on site; dispose of off site in legal manner.
 6. Rinse water may be used as mix water for next batch of same formulation.
 7. Contractor is responsible for all recordkeeping, submissions, and reports required by laws and regulations.
- I. Replanting: Perform replacement and replanting immediately upon removal of dead plant.

3.9 IRRIGATION

- A. Irrigation: Do not allow plants to wilt; apply water as required to supplement rainfall; do not waste water; do not water plants or areas not needing water; do not water during rainfall; shut off water flow when finished; repair leaks.
1. New & renovated automatic irrigation system may be used.
 2. City's water source may be used.
 3. Do not drive water trucks over turf, seeded areas, or planting beds.
 4. Provide backflow preventers on hose bibbs used for irrigation hoses.
- B. Automatic Irrigation System: Obtain and follow manufacturer's operating and maintenance instructions.
1. Adjust to water landscape areas only.
 2. Adjust sprinkler heads, drippers, valves, pumps, and controllers as required for optimum operation.
 3. During system warranty period notify Landscape Architect and system installer promptly of defects and leaks that adversely affect irrigation performance.
 4. After end of system warranty period, service and repair all defects and leaks.

3.10 RENOVATION OF ESTABLISHED TURF

- A. Remove turf from around trees to radius of 18 inches from base of tree trunk. Cut turf out and remove; do not simply mow. Trim turf edge as specified.
- B. Trim perimeter of turf area and around intervening objects as specified under Turf Maintenance.
- C. Eliminate undesirable grasses and weeds. Remove as much thatch as possible.

- D. Apply fertilizer over entire aerated area.
- E. Water as soon as possible after planting. Do not allow newly planted material to become dry.
- F. Begin normal mowing once grass reaches 1-1/2 times specified mowing height.

3.11 TURF MAINTENANCE

- A. Maintain turf in manner required to produce turf that is healthy, uniform in color and leaf texture, and free from weeds and other undesirable growth.
 - 1. Bare Spots - Lawns: 2 percent of total area, maximum; 6 inches square, maximum.
 - 2. Keep turf relatively free of thatch, woody plant roots, diseases, nematodes, soil-borne insects, stones larger than 1 inch in diameter, and other materials detrimental to grass growth.
 - 3. Limit broadleaf weeds and patches of foreign grass to a maximum of 2 percent of the total area.
 - 4. When new grass is planted in existing turf areas, quality will be evaluated when grass is 1 inch high.
 - 5. Mower type used by contractor shall not create depressions, ruts, or settlement of sod surface.
- B. Mowing: During growing season(s) mow turf to uniform height, in manner that prevents scalping, rutting, bruising, and uneven or rough cutting.
 - 1. Prior to mowing clean all debris and leaves from turf surface.
 - 2. Schedule frequency of mowing so that no more than one-quarter to one-third of grass leaf length is removed during a cutting.
 - a. Maximum grass height before mowing: 4 inches.
 - b. Height of turf is measured from the soil surface.
 - 3. Make each successive mowing at approximately 45 degrees to the previous mowing, if practical.
 - 4. Cool Season Grasses:
 - a. Reduce mowing height in fall and spring.
 - b. Use rotary type mowers; mulcher type mowers may be used.

- C. Trimming: Immediately after each mowing, neatly trim perimeter of each turf area and around obstructions within turf area; match height and appearance of adjacent turf.
 - 1. Adjacent to Pavements: Cut edges of turf to form a distinct, uniform turf edge.
 - 2. Adjacent to Planting Beds and Permanently Mulched Areas: Cut edges of turf to form a distinct, uniform turf edge.
 - 3. Around Other Trees and Poles: Where no planting bed or mulched area exists, trimming with string trimmer is acceptable.
 - 4. At Fences: Trim on both sides of fence.
 - 5. Irrigation Heads and Valve Boxes: Trim neatly so grass doesn't interfere with operation.

3.12 PLANTING BED MAINTENANCE

- A. Planting beds include all planted areas except turf.
- B. Begin maintenance immediately after plants have been installed; inspect at least once a week and perform needed maintenance promptly.
- C. Keep planting beds free of pests; remove weeds and grass by hand before reaching 1 inch height.
- D. Do not allow climbing, twining, or creeping plants to encroach into other species.
- E. Ground Cover and Vines:
 - 1. Trim to encourage dense, well-developed growth covering intended areas.
 - 2. Do not allow plants to grow up trees, shrubs, or vines or encroach into turf or drainage channels, unless the drainage channel is intended to be planted with ground cover.
 - 3. Remove existing plants grown up trees, shrubs, and vines.
- F. Replace mulch as required and remove debris.

3.13 TREE AND SHRUB MAINTENANCE

- A. Trees will be considered dead when main leader has died back or when 25 percent or more of crown has died ; except as otherwise indicated for palm trees.
- B. Shrubs will be considered dead when 25 percent or more of plant has died.
- C. Inspect woody plants for health by scraping up to 1/16 inch square area of bark; no green cambium layer below bark shall be evidence of death.

- D. Adjust stakes, guys and turnbuckles, ties, and trunk wrap as required to promote growth and avoid girdling.
- E. Fertilizing: Fertilize all trees at least once during maintenance period, preferably in the Fall; use accepted standards for determining type and method of fertilization.
- F. Pruning: Unless otherwise indicated, prune only to maintain balanced natural shape; follow recommendations of ANSI A300 and ANSI Z133.1 and best local practices for species involved.
- G. Shrubs: Prune at least once during maintenance period at best time to influence ultimate shape and size for the particular species.
 - 1. Prune to balance the plant's form and according to its natural growth characteristics.
 - 2. Remove water shoots, suckers, and branches not complying with desired shape and size.
- H. Young Trees: Prune at least once during maintenance period at best time to influence ultimate shape and size for the particular species; do not remove or cut off leader.

3.14 CLEANING

- A. Remove fallen deciduous leaves in Fall; removal may wait until all leaves have fallen.
- B. Clean adjacent pavements of plant debris and other debris generated by maintenance activities.
- C. Remove and dispose of general cleanup debris and biodegradable debris in a proper manner; City's trash collection facilities may be used.
- D. Remove and dispose of general cleanup debris and biodegradable debris in a proper manner.
 - 1. Biodegradable Debris: City will designate a compost pile on site where biodegradable debris may be deposited; branches and bark are not considered biodegradable.
 - 2. Branches and Bark: City will designate a wood chip storage area; machine-chip all branch and bark debris.
 - 3. Non-Biodegradable Debris: City's trash collection facilities may be used.

3.15 CLOSEOUT ACTIVITIES

- A. 10 days prior to end of maintenance period, submit request for final inspection.
- B. Final inspection will be conducted by City.

END OF SECTION

Section 32 11 23
Aggregate Base Courses

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aggregate base course.

1.2 RELATED REQUIREMENTS

- A. City of Pleasanton Standard Specifications.
- B. Geotechnical Report: Proposed Skatepark Improvements Project at Ken Mercer Sports Park prepared by BSK Associates June 22, 2021 (Revised June 23, 2021) and Supplemental Memorandum February 13, 2024.
- C. Section 31 22 00 - Grading: Preparation of site for base course.
- D. Section 32 13 13 - Concrete Paving: Finish concrete surface course.

1.3 REFERENCE STANDARDS

- A. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2014.
- B. ASTM D1556/D1556M - Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method; 2015, with Editorial Revision (2016).
- C. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method; 2008.
- D. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2011.
- E. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth); 2010.
- F. Caltrans Standard Specifications, 2015

1.4 SUBMITTALS

- A. See Section 1-14 for Submittal procedures.
- B. Materials Sources: Submit name of imported materials source for recycled aggregate.
- C. Aggregate Composition Test Reports: Results of laboratory tests on proposed and actual materials used.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. When necessary, store materials on site in advance of need.
- B. When aggregate materials need to be stored on site, locate where directed by City.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Follow City Standard Specifications. Where City does not have specify, Contractor shall use Caltrans Standard Specifications 2015.
- B. Use of recycled aggregate is prohibited in stormwater treatment measures (bioretention, pervious pavements, pervious pavers). Stormwater treatment measures shall use clean, virgin Caltrans Class 2 Permeable Material

2.2 SOURCE QUALITY CONTROL

- A. Where aggregate materials are specified using ASTM D2487 classification, test and analyze samples for compliance before delivery to site.

PART 3 EXECUTION

3.1 Follow City Standard Specifications

END OF SECTION

Section 32 14 13
Precast Concrete Unit Paving

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Non-interlocking concrete paver units.
- B. Joint filler.
- C. Bedding.
- D. Base.
- E. Subbase.
- F. Impervious geotextile liner.

1.2 RELATED REQUIREMENTS

- A. Section 15 of the City's Standard Specifications - Concrete Improvements
- B. Section 31 22 00 - Grading: Preparation of subsoil for pavers.
- C. Section 31 23 23 - Fill: Compacted fill for pavers.

1.3 REFERENCE STANDARDS

- A. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2016.

1.4 SUBMITTALS

- A. See Section 1-14 for Shop Drawing and Product Data Submittals.
- B. Product Data: Provide characteristics of paver unit, dimensions, finish and color.

PART 2 PRODUCTS

2.1 VEHICULAR RATED PERMEABLE PAVERS

- A. Manufacturer: Calstone
 - 1. Contact: Donald Givens at Oldcastle. Email: Donald.Givens@oldcastle.com
 - 2. Product: Narrow Joint Permeable Mission
 - 3. Size: 4" x 8" x 80mm
 - 4. Color: Grey Charcoal

5. Pattern: Herringbone, with headers per plan.

2.2 MATERIALS

- A. Joint filler: ASTM No.9 maximum 3/16 inches wide.
- B. Bedding: ASTM No.8 bedding depth 2 inches thick minimum.
- C. Base: ASTM No.57 base depth 4 inches thick minimum.
- D. Subbase: ASTM No.4 depth 6 inches thick minimum.
- E. Impervious geotextile liner: 30 millimeter PVC liner. Aqua 30 or City Approved Equal.
- F. Portland cement mortar that meets or exceeds ANSI A118.4 requirements when mixed with water or a latex admixture, and is designed for installation of large format tile - pedestrian installation.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate is level or to correct gradient, smooth, capable of supporting pavers and imposed loads, and ready to receive work of this Section.
- B. Verify gradients and elevations of substrate are correct.

3.2 CLEANING

- A. Clean soiled surfaces using cleaning solution. Do not harm pavers, joint materials, or adjacent surfaces.
- B. Use non-metallic tools in cleaning operations.
- C. Rinse surfaces with clean water.
- D. Broom clean paving surfaces. Dispose of excess sand.

3.3 PROTECTION

- A. Do not permit traffic over unprotected paver surface.

END OF SECTION

Section 32 31 13
Chain Link Fences and Gates

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Chainlink fences, posts, rails, frames and fabric.
- B. Manual gates with related hardware.
- C. Accessories.

1.2 RELATED REQUIREMENTS

- A. Section 15 of the City's Standard Specifications - Concrete Improvements

1.3 REFERENCE STANDARDS

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- C. ASTM A392 - Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric; 2011a.
- D. ASTM F567 - Standard Practice for Installation of Chain-Link Fence; 2011.
- E. ASTM F1083 - Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures; 2013.
- F. CLFMI CLF-SFR0111 - Security Fencing Recommendations; 2014.
- G. FS RR-F-191/1D - Fencing, Wire and Post Metal (Chain-Link Fence Fabric); 1990.

1.4 SUBMITTALS

- A. See Section 1-14 for Shop Drawing and Product Data Submittals.
- B. Product Data: Provide data on fabric, posts, accessories, fittings, connections, cables, hardware and backstop components. Shop drawings to include layout plans, elevations, and details.
- C. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, and schedule of components. See CLFMI CLF-SFR0111 for planning and design recommendations.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Fence Installer: Company with demonstrated successful experience installing similar projects and products, with not less than five years of documented experience.

1.6 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a 2 year period after Date of Substantial Completion.
- C. Provide 2 year manufacturer warranty for .

PART 2 PRODUCTS

2.1 **FENCES, GATES, & POSTS**

- A. Fence: 6' high chain link fence
 - 1. Chainlink Fence: New galvanized 1" wire mesh around electrical and irrigation utilities enclosure.
 - a. Finish: galvanized.
- B. Gate - ADA gate to electrical and irrigation utilities enclosure.
 - 1. Chainlink: New galvanized 1" wire mesh.
 - a. Color: galvanized.

2.2 COMPONENTS

- A. Line Posts: 2 inch outside diameter.
- B. Corner and Terminal Posts: 2 1/2 inch outside diameter.
- C. Gate Posts: 2 1/2 inch outside diameter.
- D. Top, Bottom, and Brace Rail: 1 1/4 inch outside diameter, plain end, sleeve coupled.
- E. Gate Frame: 1 1/2 inch outside diameter for welded fabrication.
- F. Chain Link Fence Fabric: 1 inch diamond mesh interwoven wire, 11 guage thick, top selvage knuckle end closed, bottom selvage twisted tight.
- G. Tension Wire: 7 guage thick steel, single strand.

H. Tie Wire: Aluminum alloy steel wire.

2.3 MATERIALS

A. Posts, Rails, and Frames: ASTM F1083 Schedule 40 hot-dipped galvanized steel pipe, welded construction, minimum yield strength of 30 ksi.

B. Line Posts: Type I round in accordance with FS RR-F-191/1D.

C. Terminal, Corner, Rail, Brace, and Gate Posts: Type I round in accordance with FS RR-F-191/1D.

D. Wire Fabric:

1. ASTM A392 zinc coated steel chain link fabric.

2. Top selvage: knuckle and closed.

3. Bottom selvage: twist.

4. Thickness: 11 gauge core.

2.4 COMPONENTS

A. Fabric: 1 inch diamond mesh interwoven wire, 11 gauge thick core, top selvage knuckle end closed, bottom selvage twisted tight.

2.5 Manual Gates and Related Hardware

A. Hardware for Single Swinging Gates: 180 degree hinges, 2 for gates up to 60 inches high, 3 for taller gates; fork latch with gravity drop and padlock hasp; keeper to hold gate in fully open position.

B. Hinges: Finished to match fence components.

1. Brackets: Round.

2. Mounting: Center.

3. Closing: Manual.

C. Latches: Finished to match fence components.

1. Brackets: Round.

2.6 ACCESSORIES

A. Caps: Cast steel galvanized; sized to post diameter, set screw retainer.

- B. Fittings: Sleeves, bands, clips, rail ends, tension bars, fasteners and fittings; steel.

2.7 FINISHES

- A. Components (Other than Fabric): Galvanized in accordance with ASTM A123/A123M, at 1.7 ounces per square foot.
- B. Hardware: Hot-dip galvanized to weight required by ASTM A153/A153M.
- C. Accessories: Same finish as framing.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions: Verify that areas are clear of obstructions or debris.

3.2 INSTALLATION

- A. Install framework, fabric, accessories and gates in accordance with ASTM F567.
- B. Place fabric on outside of posts and rails.
- C. Set intermediate posts plumb. Slope top of concrete for water runoff.
- D. Brace each gate and corner post to adjacent line post with diagonal truss rods. Install brace rail one bay from end and gate posts.
- E. Provide top rail through line post tops and splice with 6 inch long rail sleeves.
- F. Do not stretch fabric until concrete foundation has cured 28 days.
- G. Position bottom of fabric 2 inches above finished grade.
- H. Attach fabric to end, corner, and gate posts with tension bars and tension bar clips.

3.3 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch.
- B. Maximum Offset From True Position: 1 inch.

END OF SECTION

Section 32 31 15
Tree Protection and Temporary Fencing

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Tree Protection.
- B. Temporary Construction Fencing.

1.2 RELATED REQUIREMENTS

- A. Arborist Report 5800 Parkside Drive, Pleasanton, CA Ken Mercer Skate Park prepared by Hort Science June 2021, updated July 18, 2023.
- B. Demolition Section 02 41 00

1.3 SUBMITTALS

- A. See Section 1-14 for Shop Drawing and Product Data Submittals.
- B. Provide Data: Provide data on fabric, posts, accessories, fittings and hardware.

PART 2 PRODUCTS

2.1 Tree Protection Fencing

- A. Manufacturer / Supplier: By Contractor.
- B. Refer to drawings for product information.
- C. Furnish and supply all equipment necessary for tree protection and pruning including, but not limited to, removal, protection and pruning of existing trees.

2.2 Temporary Construction Fencing

- A. Manufacturer / Supplier: By Contractor.
- B. Refer to drawings for product information.

PART 3 EXECUTION

3.1 GENERAL

- A. Contractor shall erect tree protective fencing and temporary construction fencing. Refer to drawings for layout.

- B. All work shall be done per the International Society of Arboriculture (ISA) tree protection and pruning requirements.

3.2 ACCESS AND STORAGE

- A. Prior to commencement of work, the Contractor shall confer with the City and the Landscape Architect of the purposed of determining the exact scope of work. At no time shall materials, soil or equipment be stored or placed withing the "dripline" of existing trees to be preserved. At no time shall vehicles be parked within the "dripline" of an existing tree to be preserved.

3.3 COORDINATION AND SCHEDULING OF WORK

- A. All work shall be scheduled and conducted in a cooperative manner in order to give the least possible interference with or annoyance to others. Contractors shall work out any cooperative schedules. Construction of drainage and irrigation lines etc., around existing trees, shall receive priority in scheduling in order that trenching, irrigation installation and backfilling can be done in an expedient manner.

3.4 PRUNING

- A. Contractor shall review with the City the trees that shall be pruned.
- B. Selective pruning: Pruning consists of reducing the overall foliage and their branches by no more than 20% to 25% of the total tree canopy in order to trim canopy up for visibility and safety. Pruning is to be performed by a method called "drop crotch" pruning that permits the preservation of a natural appearing foliage margin and retains the character of the tree. At no time shall the leader of any tree be pruned or removed. Thinning of trees shall include "safey trim". This involves the removal of all dead branches over 1-1/2 inches in diameter , the removal of broken branches and the removal of over burdened or conflicting branches as deemed necessary by the Landcape Architect.
- C. Debris removal: All trimmings, stumps, roots, logs, sod, or any other form of debris resulting from this work or any work resulting from said operation shall be cleaned up and removed from the site by the Contractor. All laws, ordinances, etc., applicable to the involved locality governing such disposal shall be fully complied with. Stumps shall be ground to 12 inches below grade.
- D. Tools: Cutting tools and saws shall be kept sharpened to a condition that will permit leaving an unabraided cambium edge on final cuts and bark tracings.
- E. Final pruning cuts: Final pruning cuts shall be made without leaving a stub. They shall be made in a manner to favor the earliest possible covering of the wound by callus growth. This requires that the wound be as small as practical, the cut be within the shoulder ring area, and that the cambial tissue at the edge of the cut be alive and healthy. Extremely flush cuts that produce large wounds and weaken the tree at the cut cannot be made.

3.5 ROOT CUTTING

- A. All exposed severed root ends are to be cut cleanly using a sharp pruning saw. Cuts shall leave roots that remain free of splits, cracks, or other damage.

3.6 EXCAVATION

- A. Trenching and backfill: All trenching under the drip lines of trees shall be hand dug with no roots over 1 inch in diameter being cut or damaged.

3.7 WATERING

- A. Contractor shall provide supplemental irrigation as necessary during construction to prevent drought stress. If trees show stress it may become necessary for Contractor to perform deep root watering as required at no extra cost to the City.

3.8 **DAMAGE TO EXISTING VEGETATION**

- A. Any trees damaged during construction shall be immediately repaired by a tree surgeon / arborist acceptable to the City at the Contractors expense.
- B. Any tree judged by the accepted arborist to be damaged beyond repair shall be removed at contractors expense.
- C. Contractor shall replace each damaged tree with nursery-grown material of similar size and of the same or approved species.
 - 1. Replacement trees shall be the greater of a two (2)-inch caliper or size equivalent to the size of the damaged tree, balled and burlapped, and planted in accordance with City standards.

END OF SECTION

Section 32 33 00
Site Furnishings

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Benches
- B. Tables.
- C. Trash receptacles.
- D. Bike racks.
- E. Entry Monument Sign - Bid Alternate #5 (Deduct)
- F. Drinking Fountain.
- G. Bollards.

1.2 RELATED REQUIREMENTS

- A. Section 15 of the City's Standard Specifications - Concrete Improvements

1.3 SUBMITTALS

- A. See Section 1-14 for Shop Drawing and Product Data Submittal requirements.
- B. Product Data: Provide manufacturer's specifications and descriptive literature, installation instructions, and maintenance information.
- C. Product Samples: Submit actual color chips for review and approval by City.

1.4 WARRANTY

- A. Provide manufacturer's warranty against defects in materials or workmanship.

PART 2 PRODUCTS

2.1 **Tables**

- A. Table
 - 1. Manufacturer: Outdoor Creations.
 - 2. Model: 100-S
 - 3. Description: ADA compliant concrete picnic table with two benches.

4. Size: 7'-8" x 5'-5" x 2'-8".
5. Weight: 2450 lbs.
6. Options:
 - a. Concrete Sealant: Per manufacturer recommendation.
 - b. Mounting: No mounting.

2.2 Bench

- A. Bench Type 1: To be provided and installed by City.
- B. Bench Type 2: To be provided and installed by City.

2.3 Bike Racks

- A. Manufacturer: Dero.
- B. Model: Arc Rack.
- C. Options:
 1. Mounting: Surface.
 2. Finish: Galvanized.

2.4 Trash Receptacles

- A. To be provided and installed by City.

2.5 Entry Monument Sign

- A. Manufacturer: Outdoor Creations
- B. Model: 707S - 48" x 84" with 703 base and bubble to.
- C. Finishes:
 1. Smooth texture
 2. Sequoia sand color
 3. Standard acrylic finish
 4. Skatepark name and logo painted Pleasanton Green, Address Painted Black
- D. Footing - Per manufacturers instructions

2.6 Drinking Fountain

- A. City of Pleasanton Standard Detail 825.
- B. Manufacturer: Haws.
- C. Model: 5010.
- D. Description: Double-sided ADA compliant trough drinking fountain.
- E. Finish: 304 Stainless Steel.
- F. Mounting: Footing per manufacturer's recommendation and geotechnical report.
- G. Valve Box:
 - 1. Manufacturer: Old Castle
 - 2. Product: Cast In Place Concrete B03 Christy Utiltiy Box.

2.7 Bollards

- A. Bollard Type 1
 - 1. Manufacturer: Traffic Guard
 - 2. Model: HRP, Round Post, Collapsible
 - 3. Material: galvanized metal pipe per detail.
 - 4. Color: TBD / Provide color samples for final color selection by client
 - 5. Installation: Per detail and manufacturers instructions.
- B. Bollard Type 2
 - 1. Manufacturer: Grainger
 - 2. Model: CBOL-42-4
 - 3. Item: 4NEN3
 - 4. Material: Steel
 - 5. Finish/color: Chrome/Silver
 - 6. Size: 4" outside diameter; 42" height; wall thickness 0.12"
 - 7. Installation: surface mount per manufacturers instructions.

8. Anchors: Wedge achors
 - a. Manufacturer: Vestil
 - b. Model: AS-383-4PK
 - c. Item: 49Y450
 - d. Material: zinc plated steel
 - e. Finish/color: Silver

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify proper installation of mounting surfaces, preinstalled anchor bolts, and other mounting devices; and ready to receive site furnishing items.
- B. Do not begin installation until unacceptable conditions are corrected.

3.2 INSTALLATION

- A. Install site furnishings in accordance with approved shop drawings, and manufacturer's installation instructions.
- B. Provide level mounting surfaces for site furnishing items.

END OF SECTION

**Section 32 40 00
Landscape Boulders**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Landscape Boulders.

1.2 SUBMITTALS

- A. See Section 1-14 for Product Data Submittal requirements.
- B. Samples - submit the following:
 - 1. Boulders
 - a. Photographs taken at supplier or quarry that are representative of the size range, color, shape, and rock type. Boulders shown should be individually depicted so as to be clearly seen, and not on a palette or in a pile with other rock or rubble.
 - b. Owner and Landscape Architect reserve the right to visit supplier's yard or quarry to make final selections.

1.3 QUALITY ASSURANCE

- A. Provide all boulders in this section from a source less than 200 miles away from project site.

PART 2 PRODUCTS

2.1 LANDSCAPE BOULDERS

- A. Description: Landscape Boulders, quantity and sizes per plans. Boulders should be free of evidence of significant cracks, fissures, and fragmentation, and generally cubical or spherical in shape. Any one dimension of a boulder (height, width, depth) should not be more than 2-times any other dimension.
- B. Color: Moss fieldstone

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions: Verify that boulders are of good quality without cracks or fissures.
- B. Verify subgrades are ready to receive work.

3.2 INSTALLATION AND PLACEMENT

- A. Install in accordance with drawings.

END OF SECTION

Section 33 42 11
Stormwater Gravity Piping

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Stormwater drainage piping.
- B. Stormwater pipe accessories.
- C. Catch basins.
- D. Connection to municipal storm drain.
- E. Storm Drain Lift Station.

1.2 RELATED REQUIREMENTS

- A. City of Pleasanton Standard Specifications.

1.3 REFERENCE STANDARDS

- A. AASHTO M 252 - Standard Specification for Corrugated Polyethylene Drainage Pipe; 2009.

1.4 SUBMITTALS

- A. See Section 1-14 for Submittal procedures.
- B. Product Data: Provide data indicating pipe, pipe accessories, and catch basins.
- C. Product Data: Provide data indicating pump, pump accessories, pump specifications, and pump structure
- D. Project Record Documents:
 - 1. Record location of pipe runs, connections, and invert elevations.

PART 2 PRODUCTS

2.1 Follow City of Pleasanton Standard Specifications Section 12 unless otherwise noted on plan

2.2 PIPE MATERIALS

- A. Reinforced Concrete Pipe (12" diameter and larger) per City of Pleasanton Standard Specifications
- B. Poly Vinyl Chloride (PVC) (less than 12" diameter) solid pipe per City of Pleasanton Standard Specifications.

- C. Poly Vinyl Chloride (PVC) (less than 12" diameter) perforated pipe per City of Pleasanton Standard Specifications.
- D. Deck Drain: "Zurn", Type 'B', 6-inch diameter polished bronze strainer with vandal proof screws attached to No. Z-415 floor drain with 6 inch outlet . Or City-approved equal.

2.3 PIPE ACCESSORIES

- A. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.
- B. Trace Wire: Magnetic detectable conductor, clear plastic covering, imprinted with "Stormwater Service" in large letters.

2.4 CATCH BASIN, CLEANOUT, AND AREA DRAIN COMPONENTS

- A. Drainage Inlet
 1. Inlet: Nyloplast Drain Basin, Christybox, Oldcastle or CITY-approved equal
 2. Grate: NDS Standard grate, Christy, or CITY-approved equal unless specified on plan; ductile iron;
 3. Adaptor: see manufacturer's specifications
 4. Connector: see manufacturer's specifications
 5. Frames and grates shall be vehicular rated and vandal proof
- B. Geotextile Fabric: Nonwoven Polypropylene, Mirafi 140 N or approved equal.

2.5 PUMP

- A. As shown on the plans
- B. Zoeller G-6123-XXXX or CITY approved equal
- C. Zoeller 124D4-0001 or CITY approved equal
- D. Zoeller 10-1883 CITY or approved equal
- E. Zoeller 10-0253 CITY or approved equal
- F. Zoeller 10-0438 CITY or approved equal
- G. Zoeller 33-XXJP CITY or approved equal
- H. Zoeller 39-0175 CITY or approved equal

- I. Zoeller 6039-0032 or CITY approved equal

2.6 BEDDING AND COVER MATERIALS

- A. Follow City of Pleasanton Standard Specifications Section 12 unless otherwise noted on plan

PART 3 EXECUTION

3.1 TRENCHING

- A. Follow City of Pleasanton Standard Specifications Section 12 unless otherwise noted on plan

3.2 INSTALLATION

- A. Follow City of Pleasanton Standard Specifications Section 12 unless otherwise noted on plan
- B. Lay pipe to slope gradients noted on layout drawings; with maximum variation from true slope of 1/8 inch in 10 feet for pipe slopes greater than or equal to 1%. Variation from the plans are not allowed for pipe slopes less than 1%.
- C. Connect to park storm drainage system and utility/municipal system.
- D. Install continuous trace wire 6 inches above top of pipe.

3.3 **INSTALLATION - CATCH BASINS**

- A. Install per manufacturer's specifications
- B. Form bottom of excavation clean and smooth to correct elevation.
- C. Form and place cast-in-place concrete base pad, with provision for storm drain pipe end sections
- D. Establish elevations and pipe inverts for inlets and outlets as indicated.
- E. Mount lid and frame level in grout, secured to top cone section to elevation indicated.
- F. Where lids (i.e. rims) are below FG, install geotextile fabric over top of lid to prevent sediment, debris, rock, and/or wood fibers from entering storm drain system. Flows should still enter storm drain structure. Do not use impermeable fabrics or liners to cover grated lids.

3.4 INSTALLATION - PUMP

- A. Install per manufacturer's specifications

3.5 PROTECTION

- A. Protect pipe and bedding cover from damage or displacement until backfilling operation is in progress.

END OF SECTION

Skate Park Contractor Qualification

The skate park structure improvements including finish grading, rebar work, fabricated metal work, steel edging, concrete work, and shotcrete work require qualification as described herein.

Contractors bidding the skate park structure shall have satisfactory completed the installation of five (5 minimum number) similar skate park projects of at least 20,000 square feet in size, in accordance with the project plans and written specifications. The qualification can be met by either the prime bidding contractor or a subcontractor bidding to the prime. Qualifying projects must include concrete skate park structures of comparable size, finishes, transition depths, coping types and features built within the last five (5) years. Qualifying projects by either the prime contractor or the skate park subcontractor must be listed in the bid proposal documents under the section **CERTIFICATION OF BIDDER'S EXPERIENCE AND QUALIFICATIONS.**

If Contractor intends to use an ACI Certified Nozzleman for Shotcrete installation other than the Nozzleman who performed work for the required qualifying projects, the Contractor must submit five (5) qualifying projects that the ACI Certified Nozzleman has performed. Qualifying project shall be of the same requirement as described herein.

Only the Nozzleman referenced with the bid shall be permitted to perform shotcrete work for the said project. Should the Contractor want to substitute the qualifying Nozzleman of record with another Nozzleman, the Contractor shall make an application to the Owner providing all qualifying records of the proposed substitute Nozzleman at least four (4) days in advance of said work. The Owner shall reserve the right to reject any substitute Nozzleman not meeting the qualifying requirements.

The Skate Park Contractor (either prime or subcontractor) shall provide reference for five (5) qualifying reference projects and proposed Nozzleman including location of qualifying projects, size, owner, and owner's contact information.



**GEOTECHNICAL INVESTIGATION REPORT
PROPOSED SKATEPARK IMPROVEMENTS PROJECT
KEN MERCER SPORTS PARK
5800 PARKSIDE DRIVE
PLEASANTON, CALIFORNIA**

BSK PROJECT NO.: G21-147-11L

PREPARED FOR:

RRM DESIGN GROUP
325 DAVIS STREET
SAN LEANDRO, CALIFORNIA 94577

June 22, 2021

Table of Contents

1.	SITE AND PROJECT DESCRIPTION.....	1
2.	SUBSURFACE INVESTIGATION.....	2
3.	LABORATORY TESTING.....	3
4.	SITE GEOLOGY AND SEISMICITY.....	3
5.	SUBSURFACE CONDITIONS	4
6.	DISCUSSIONS AND CONCLUSIONS.....	4
	6.1.1 Fault Rupture and Strong Ground Shaking	5
	6.1.2 Expansive Soils.....	5
	6.1.3 Liquefaction.....	5
7.	RECOMMENDATIONS	6
	7.1 Site Preparation and Grading.....	6
	7.2 New Utility Trench Excavation and Backfill.....	7
	7.3 Foundation Recommendations.....	8
	7.3.1 Mat Foundations	8
	7.3.2 Drilled Piers	10
	7.4 Skateboarding Bowl Recommendations	12
	7.4.1 Wall Lateral Earth Pressures	12
	7.4.2 Uplift Loading Due to Buoyancy.....	13
	7.4.3 Subdrains and Dewatering Systems.....	13
	7.4.4 Construction Considerations.....	14
	7.5 2019 CBC Mapped Seismic Design Parameters	14
	7.6 Exterior Concrete Flatwork	15
	7.7 Pavements.....	16
	7.7.1 Asphalt Concrete Pavements	16
	7.7.2 Portland Cement Concrete Pavements.....	16
	7.7.3 Additional Pavement Considerations.....	17
	7.8 Effect of Plants on Foundation and Flatwork Performance.....	17
	7.9 Site Drainage	17
	7.10 Storm Water Runoff Mitigation	18
	7.11 Corrosivity Test Results	18
	7.12 Plan Review and Construction Observation.....	19



8.	ADDITIONAL SERVICES AND LIMITATIONS	19
8.1	Additional Services	19
8.2	Limitations.....	20
9.	CLOSURE.....	21

Figures

FIGURES

Figure 1 – Vicinity Map

Figure 2 – Site Plan

Figure 3 – Creek & Watershed Map

Figure 4 – Lateral Earth Pressure Diagram

APPENDIX A – Boring Logs

Figure A-1 – Unified Soil Classification System (ASTM D2487/D2488)

Figure A-2 – Soil Description Key

Figure A-3 – Log Key

Logs of Borings No. B-4 through B-6

APPENDIX B – Laboratory Test Results

Figure B-1 – Atterberg Limits

Figure B-2 – Unconsolidated-Undrained Triaxial Test

Figure B-3 – Resistance Value

Corrosivity Analysis Results (2 pages)





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June 22, 2021

BSK Project No. G21-147-11L

Gina Chavez
RRM Design Group
325 Davis Street
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**SUBJECT: Geotechnical Investigation Report
Proposed Skatepark Improvements Project
Ken Mercer Sports Park
Pleasanton, California**

Dear Ms. Chavez:

We are pleased to submit our geotechnical investigation report for the proposed skatepark improvements at the Ken Mercer Sports Park in Pleasanton, California. A Vicinity Map showing the location of the project is presented on Figure 1. This report contains a description of our site investigation methods and findings, including field and laboratory data and provides geotechnical recommendations for the project. The purpose of this investigation was to explore and evaluate the subsurface conditions at the project site (Site) in order to provide geotechnical input for the design and construction of the planned improvements. The scope of services, as outlined in our proposal (Proposal No. GL21-21667) dated February 26, 2021, included the following:

- Field investigation,
- Laboratory testing,
- Engineering analysis, and
- Preparation of this report.

This investigation specifically excludes the assessment of site environmental characteristics, particularly those involving hazardous substances.

1. SITE AND PROJECT DESCRIPTION

Ken Mercer Sports Park is located at 5800 Parkside Drive in Pleasanton California and is surrounded by commercial and residential properties. The park generally consists of sports fields with paved walkways located throughout the park. There is an existing 8,000 square foot skatepark located at the southwestern-most corner of the park. The City of Pleasanton plans to enlarge the existing skatepark by approximately 0.7 acres in the area shown on the Site Plan, Figure 2. According to Google Earth Pro, the Site's surface appears to be relatively flat with an average elevation of about 323 feet.

The planned improvements will consist of the construction of new skatepark amenities including a bowl that will extend up to approximately 12 feet deep below existing ground surface (BGS), construction of new shade structures, construction of a bioretention area, and improvements to existing concrete flatwork. In addition, the parking lot at the northwest end of the project area may be extended to the southwest by about 40 to 50 feet. Although grading plans are not currently available for the project, we assume that the grading for the project will be limited to cuts on the order of 15 feet BGS for the skateboarding bowl and cuts and fills of 2 to 3 feet to attain desired finished grades and provide proper drainage elsewhere. Excavations for new underground utility lines and bioretention areas are expected to be up to about 5 feet BGS.

If the actual project differs significantly from that described above, specifically if the grading differs from that we assumed above, we should be contacted to review and/or revise our conclusions and recommendations presented in this report.

2. SUBSURFACE INVESTIGATION

We performed our field investigation on May 12, 2021, which consisted of drilling three (3) exploratory borings (labeled B-4 through B-6) at the approximate locations shown on Figure 2. The borings were drilled using a truck-mounted drill rig equipped with hollow-stem augers to depths ranging from approximately 15 to 20 feet BGS. The borings were logged by a BSK geologist on a full-time basis and soil samples were obtained from the borings at selected intervals. Exploration GeoServices of San Jose, California was subcontracted to provide drilling services.

Prior to our subsurface investigation, Underground Service Alert (USA) was contacted to provide utility clearance. We also retained the services of a private utility locator, GeoTech Utility Locating of Moraga, California, to mark detectable underground utilities near our proposed boring locations. We met with representatives from the City of Pleasanton parks department to locate the borings to avoid surface improvements such as sprinkler heads. A drilling permit was obtained from Zone 7 Water Agency. Upon completion of the subsurface investigation, the borings were backfilled with cement grout per the Agency requirements. Excess soil cuttings generated during drilling were left in unimproved areas of the Site.

The locations of the borings were estimated by our field representative based on rough measurements from existing features at the Site. Elevations shown on the boring logs were estimated using the elevation information available on Google Earth Pro. As such, the elevations and locations of the borings should be considered accurate to the degree implied by the methods used.

Relatively undisturbed samples of the subsurface materials were obtained using a split barrel sampler with a 2.5-inch inside diameter (I.D.) and a 3-inch outside diameter (O.D.) fitted with stainless steel liners. The sampler was driven 18 inches using a 140-pound, semi-automatic trip hammer falling 30 inches. Blow counts for successive 6-inch penetration intervals were recorded on the boring logs. After the sampler was withdrawn from the borehole, the samples were removed, sealed to reduce moisture loss, labeled, and returned to our laboratory. Prior to sealing the samples, strength characteristics of the cohesive soil



samples recovered were evaluated using a hand-held pocket penetrometer. The results of these tests are shown adjacent to the sample locations on the boring logs. We also collected a disturbed bulk sample of the surficial soil from the upper 1 to 5 feet BGS at boring B-4.

Soil classifications made in the field from auger cuttings and samples were re-evaluated in the laboratory after further examination and testing. The soils were classified in the field in general accordance with the Unified Soil Classification System (Visual/Manual Procedure - ASTM D2488). Where laboratory tests were performed, the designations reflect the laboratory test results in general accordance with ASTM D2487 as presented on Figure A-1 in Appendix A. The Soil Description Key and Log Key are presented on Figures A-2 and A-3. Sample classifications, blow counts recorded during sampling, and other related information were recorded on the soil boring logs, which are also presented in Appendix A. A discussion of the subsurface conditions encountered at the Site is presented in the “Subsurface Conditions” section of this report.

3. LABORATORY TESTING

Our laboratory testing program consisted of performing dry density and moisture content, organic content, Atterberg limits, unconsolidated-undrained triaxial (TXUU) tests, and a Resistance (R) Value test. The test results are presented on the boring logs and graphical presentations of the Atterberg limits, TXUU tests, and R-Value test are presented in Appendix B.

Analytical testing was performed on a sample of the near-surface soils collected from a depth of about 2½ feet BGS from Boring B-5 to assist in evaluating the corrosion potential of the on-site soils. The corrosion results are presented at the end of Appendix B and a discussion of test results is presented in the “Corrosivity Test Results” section of this report.

4. SITE GEOLOGY AND SEISMICITY

According to Witter et al. (2006¹), the Site is mapped as Holocene age basin deposits which consist primarily of fine-grained alluvium (clay and silt) interbedded with lobes of coarser alluvium (sand and gravel) from streams that flow into the basin. According to Sowers (2003²), the Site is underlain by former willow marsh of the Tulare Lake as shown on Figure 3, Creek and Watershed Map. According to the California Geological Survey (CGS) (2008³), the Site is not located within a Seismic Hazard Zone associated with liquefaction or earthquake-induced landslides. Although the Site, like most of California, is situated in a region of high seismic activity, it is not located within an Alquist-Priolo (AP) Earthquake Fault Zone

¹ Witter, Knudsen, Sowers, 2006, Maps of Quaternary Deposits and Liquefaction Susceptibility in the Central San Francisco Bay Region, California, U.S. Geological Survey Open-File Report 2006-1037.

² Sowers, J.M. Creek & Watershed Map of the Pleasanton & Dublin Area, Oakland Museum of California, published 2003.

³ California Geological Survey (2008), Earthquake Zones of Required Investigation, Dublin Quadrangle: California Geological Survey, Seismic Hazard Zones, Official Map, August 27, 2008.



and no known active fault traces cross the Site. The nearest AP zone is the Calaveras Fault about 1¼ miles to the west.

5. SUBSURFACE CONDITIONS

According to results of our field exploration, the Site is underlain by soft to hard, medium to high plasticity clay soils. Based on our Atterberg limits test results (see Figure B-1), the near-surface clays exhibit a moderate to high expansion potential. Trace organics were encountered in several of the samples that we collected, which is most likely organic material from the previous marsh at the Site.

Free groundwater was not observed in our borings. However, according to the CGS⁴, historically high groundwater at the Site lies between 10 and 20 feet BGS. These historically high groundwater depths are consistent with groundwater monitoring wells located within approximately ¼-mile to the southeast of the Site available in the State Water Resources Control Board GeoTracker website (<http://geotracker.waterobards.ca.gov/>). It should be noted that groundwater levels can fluctuate several feet depending on factors such as seasonal rainfall, groundwater withdrawal, and construction activities on this or adjacent properties.

The above is a general description of soil and groundwater conditions encountered within the project area. For a more detailed description of the soils encountered, refer to the boring logs in Appendix A. Soil and groundwater conditions can deviate from those conditions encountered at the boring locations. If significant variation in the subsurface conditions is encountered during construction, it may be necessary for BSK to review the recommendations presented herein and recommend adjustments as necessary.

6. DISCUSSIONS AND CONCLUSIONS

The proposed skatepark improvements at Ken Mercer Sports Park are geotechnically feasible provided the conclusions and recommendations contained in this report are properly incorporated into the design and construction of the project.

6.1 Geologic and Seismic Hazards

The primary geologic and seismic hazards for the proposed project are 1) the potential for moderate to intense ground shaking during a seismic event and 2) the presence of moderately to highly expansive soils as discussed below.

⁴ CGS (2008), Seismic Hazard Zone Report for the Dublin 7.5-Minute Quadrangle, Alameda County, California, California Geological Survey, Seismic Hazard Zone Report 112.



6.1.1 Fault Rupture and Strong Ground Shaking

The Site is not located within an Alquist-Priolo Earthquake Fault Zone and no mapped active fault traces are known to traverse the Site. Therefore, we conclude that the potential for fault-related surface rupture to affect the Site to be very low. Nevertheless, because the Site is located in a highly active seismic area of California, we expect the Site to be subjected to substantial ground shaking due to a significant seismic event on one or more of the active faults in the Bay Area and surrounding regions during the design life of the project. In 2015, scientists and engineers released a new earthquake forecast for the State of California⁵. It updates the earthquake forecast made for the greater San Francisco Bay Area by the 2007 Working Group for California Earthquake Probabilities. According to this recent study, there is a 72 percent probability that one or more magnitude M6.7 or greater earthquakes will occur in the San Francisco Bay Area between 2014 and 2044.

6.1.2 Expansive Soils

We performed Atterberg limits testing on near-surface samples obtained from borings B-4 and B-5 from the upper 3 to 6 feet BGS, which resulted in Liquid Limits (LL) of 37 and 50 and Plasticity Indices (PI) of 18 and 22, respectively. These results are indicative of soils with moderate to high expansion potential when subjected to changes in moisture content. Mitigation of expansive soil behavior is recommended through the use of “non-expansive” fill beneath exterior slabs and moisture conditioning of the subgrade soils as discussed in the “Exterior Flatwork” section of this report.

6.1.3 Liquefaction

Soil liquefaction is a condition where saturated, granular soils undergo a substantial loss of strength and deformation due to pore pressure increase resulting from cyclic stress application induced by earthquakes. In the process, the soil acquires mobility sufficient to permit both horizontal and vertical movements if the soil mass is not confined. Soils most susceptible to liquefaction are saturated, loose, clean, uniformly graded, and fine-grained sand deposits. If liquefaction occurs, foundations resting on or within the liquefiable layer may undergo settlement and/or a loss of bearing capacity.

Based on the composition, apparent relative density, and consistency of the soils encountered within the maximum depth of our borings (approximately 20 feet BGS) and the lack of free groundwater in our borings, we conclude that the potential for the Site to experience liquefaction-induced settlement within the upper 20 feet BGS during a design-level seismic event is low. We did not advance a deep boring to assess liquefaction to a depth of 50 feet BGS for this project; however, as noted earlier, the Site is not within a state mapped liquefaction hazard zone.

⁵ Field, E.H., and 2014 Working Group on California Earthquake Probabilities (2015), UCERF3: A new earthquake forecast for California’s complex fault system: U.S. Geological Survey 2015–3009, 6 p., <https://dx.doi.org/10.3133/fs20153009>.



7. RECOMMENDATIONS

Presented below are our recommendations for earthwork, foundations, seismic considerations, retaining walls, exterior concrete flatwork, site drainage, storm water runoff mitigation, and construction considerations associated with proposed improvements.

7.1 Site Preparation and Grading

Our general site preparation and grading recommendations are as follows:

1. The areas to be graded should be cleared of debris, significant surface vegetation and obstructions including abandoned underground pipes, foundations and concrete slabs. Stripped surface organics should be stockpiled and may be reused only in landscaping areas or disposed off-site.
2. The root system of trees to be demolished (if any) should be removed. The removal of the tree roots could disturb several feet of the near-surface soils. If these disturbed soils are not being removed by design cuts, the disturbed soils should be overexcavated and replaced with engineered fill.
3. Existing pipelines crossing the Site to be abandoned should be removed whenever feasible. Abandoned pipes to remain should be capped at both ends if smaller than 2 inches in diameter or be filled with 1-sack sand-cement slurry if greater than 2 inches in diameter.
4. If zones of soft or saturated soils are encountered during excavation and compaction, deeper excavations may be required to expose firm soils. This should be evaluated in the field by a BSK representative.
5. From a geotechnical standpoint only, the on-site soils are generally suitable for re-use as general engineered fill provided they are free of debris, vegetation, and other deleterious matter and properly processed so that particle sizes are not greater than 3 inches in largest dimension. At least 90 percent by weight of the fill/backfill materials should be passing the 1-inch sieve. All fill materials should be subject to evaluation and approval by a BSK representative prior to their use.
6. Proper granular bedding and shading should be used beneath and around new utilities. Imported fill material to be used as general fill should not be classified as being more corrosive than "moderately corrosive." **Imported fill, including "non-expansive" fill**, should be granular in nature, adhere to the above gradation recommendations, and conform to the minimum criteria presented in the table below (unless otherwise permitted by BSK). Highly pervious materials such as pea gravel or clean sands are not recommended because they permit transmission of water to the adjacent and/or underlying soils.

IMPORT FILL AND "NON-EXPANSIVE" FILL CRITERIA	
Plasticity Index	12 or less
Liquid Limit	Less than 27%
% Passing #200 Sieve	8% – 40%



7. Following stripping and removal of deleterious materials, the Site should be scarified to a minimum depth of 12 inches, moisture conditioned to at least 2 percent above optimum moisture content, and re-compacted to a minimum of 90 percent relative compaction. **It is important to meet this minimum moisture conditioning due to the expansion potential of the near-surface soils.** Relative compaction refers to the in-place dry density of soil expressed as a percentage of the maximum dry density determined by ASTM D1557 compaction test procedures. Optimum moisture is the water content (percentage by dry weight) corresponding to the maximum dry density.
8. Where fills/backfills are greater than 7 feet in depth below finish grade, the zone below a depth of 7 feet should be compacted to a minimum of 95 percent compaction.
9. **In proposed flatwork and pavement areas to be exposed to vehicular traffic**, the upper 12 inches of the soil subgrade immediately below the aggregate base layer should be compacted to a minimum of 92 percent relative compaction at least 2 percent above optimum moisture content. Subgrade preparation should extend a minimum of 3 feet laterally beyond the edge of flatwork and pavements, where feasible. The aggregate base layer underneath such flatwork and pavement should be compacted to a minimum of 95 percent relative compaction near optimum moisture content.
10. Unless otherwise indicated above, all fill and backfill should be placed in thin lifts up to 8-inch maximum uncompacted thickness, properly moisture conditioned to at least 2 percent above optimum moisture content for clayey soils and to near optimum moisture content for granular soils, and compacted to at least 90 percent compaction per ASTM D1557. Aggregate base should be moisture conditioned to near-optimum moisture content.
11. Observations and compaction testing should be carried out by a BSK representative during grading and backfill operations to assist the contractor in obtaining the required degree of compaction and proper moisture content. Where the moisture content or compaction is outside the range required, additional compactive effort and adjustment of moisture content should be made until the specified compaction and moisture conditioning is achieved.
12. BSK should be notified at least 48 hours prior to any grading and backfill operations. The procedure and methods of grading may then be discussed between the contractor and BSK.

7.2 New Utility Trench Excavation and Backfill

All excavations should conform to current OSHA requirements for work safety. Where trenches or other excavations extend deeper than 5 feet, the excavations may become unstable and should be evaluated by the contractor to monitor stability prior to personnel entering the trenches. Shoring or sloping of any trench wall may be necessary to protect personnel and to provide stability. It is the contractor's responsibility to follow OSHA temporary excavation guidelines and grade the slopes with adequate layback or provide adequate shoring and underpinning of existing structures and improvements, as needed. Slope layback and/or shoring measures should be adjusted as necessary in the field to suit the actual conditions encountered, in order to protect personnel and equipment within excavations.



Free groundwater was not observed in our borings, but mapping by the CGS and nearby groundwater monitoring wells indicate that historically high groundwater depths in the area could be as shallow as about 10 feet BGS. The actual depth at which groundwater may be encountered in trenches and excavations may vary. As a minimum, provisions should be made to ensure that conventional sump pumps used in typical trenching and excavation projects are available during construction in case substantial runoff water accumulates within the excavations as a result of wet weather conditions.

Material quality, placement, and compaction requirements for utility bedding and shading materials⁶ should meet applicable agency requirements. Utility trench backfill above the shading materials may consist of on-site soils provided they are free of organics, debris, rock over 3 inches in largest dimension, and other deleterious material. Backfill materials should be placed in lifts not exceeding 8 inches in loose thickness, moisture conditioned, and compacted to the requirements provided in the “Site Preparation and Grading” section of this report.

Utility trenches located in landscaped areas should be capped with a minimum of 12 inches of compacted on-site clayey soils.

7.3 Foundation Recommendations

We anticipate that there may be some improvements associated with the skatepark that will require a shallow foundation. We recommend the use of a mat foundation due to the presence of expansive soils and because the improvements will be relatively lightweight. The mat foundation will help mitigate the shrink and swell potential of the subsurface soils.

7.3.1 Mat Foundations

We recommend the criteria presented in the table below be incorporated into the design of mat foundations for this project.

⁶ Bedding material typically consists of sand used to backfill a few inches (typically 3 to 6 inches) below the invert elevation of a pipe. Shading material typically consists of sand used to backfill around and a few inches (typically 6 to 12 inches) above the top of a pipe.



MAT FOUNDATION CRITERIA ¹	
Static Allowable Bearing Capacity ²	1,000 psf
Seismic/Wind Allowable Bearing Capacity ²	1,500 psf
Passive Resistance (Equivalent Fluid Pressure) ^{3, 4}	250 pcf (above design groundwater depth ⁵) 170 pcf (below design groundwater depth)
Allowable Lateral Sliding Resistance Adhesion ⁴	500 psf
Modulus of Vertical Subgrade Reaction ⁶	60 psi/in
Minimum Slab Thickness ⁷ at the Edges	24 inches
<p>Notes:</p> <ol style="list-style-type: none"> 1. Mat foundations should be a minimum of 8 inches thick and should be supported on a minimum of 12 inches of compacted Caltrans Class 2 aggregate base to provide enhance slab support. 2. Includes a factor of safety of at least 3 for static loading and at least 2 for transient loading (i.e., seismic or wind conditions). 3. Neglect upper 1 foot if surface is not confined by concrete slab or pavement. For foundations located on or proximate to sloping ground, the passive resistance should be neglected in the upper portion of the foundation until there is a horizontal distance of at least 7 feet between the slope face and the nearest edge of the foundation. 4. The sliding resistance and passive resistance may be used concurrently, and the passive resistance can be increased by one-third for wind and/or seismic loading. Values include a factor of safety of at least 1½. The sliding resistance adhesion should be multiplied by the foundation area to obtain horizontal sliding resistance. 5. We recommend using a design groundwater depth of 10 feet BGS for this project. 6. Based on a one square foot bearing plate. This unadjusted value needs to be adjusted for the actual size of the mat as follows: <ol style="list-style-type: none"> a. Multiply by $[(m+0.5)/(1.5 \times m)]$ where m is the ratio of the mat length divided by its width (unitless). b. If a computer program is used to design the mat for this project and it requires the input of a modulus of subgrade reaction for the Site, the designer should check whether the program requires input of the unadjusted or adjusted modulus of vertical subgrade reaction. 7. Below lowest adjacent finished grade. The slab designer should determine the slab concrete thickness and reinforcing. 	

Provided that the foundations are designed according to the recommendations presented above and constructed properly, total and differential settlements are estimated to be less than about 1-inch and ½-inch, respectively. Differential settlement is defined in this report as the vertical difference in settlement between adjacent foundation supports or across a horizontal distance of 30 feet, whichever is less.



Where foundations are located adjacent to below-grade structures (including existing footings) or near major underground utilities, the foundation should extend below a 1H:1V (horizontal to vertical) plane projected upward from the structure foundation or bottom of the underground utility to avoid surcharging the below grade structure and underground utility with foundation loads.

Concrete for foundations should be placed neat against firm native soil or engineered fill. **It is critical that foundation excavations not be allowed to dry before placing concrete.** If shrinkage cracks appear in the foundation excavations, the excavations should be thoroughly moistened to close all cracks prior to concrete placement. The foundation excavations should be monitored by a representative of BSK for compliance with appropriate moisture control and to confirm the adequacy of the bearing materials.

7.3.2 Drilled Piers

We assume that the planned shade structures will be supported by drilled pier foundations. We recommend the following criteria be incorporated into the design of drilled piers for this project.



DRILLED PIER FOUNDATION CRITERIA	
Static Allowable Downward Skin Friction ¹	400 psf
Seismic/Wind Allowable Downward Skin Friction ¹	500 psf
Passive Resistance (Equivalent Fluid Pressure) ²	250 pcf
Minimum Pier Diameter	18 inches
Minimum Pier Depth Below Ground Surface	5 feet
Minimum Pier Center to Center Spacing	3D ³ (axial loading) 6D ^{3,4} (lateral loading)
Notes:	
<ol style="list-style-type: none"> 1. Includes a factor of safety of at least 2 for static loading and at least 1½ for transient loading (i.e., seismic or wind conditions). Uplift resistance may be taken as 2/3 of downward capacity. Weight of piers may be used to resist upward loading. 2. Neglect upper 1 foot if surface is not confined by concrete slab or pavement. For piers located on or proximate to sloping ground, the passive resistance should be neglected in the upper portion of the piers until there is a horizontal distance of at least 7 feet between the slope face and the nearest edge of the piers. Passive resistance should be limited to 1,500 psf and may be applied to twice the diameter of the piers. Passive resistance may be increased by 1/3 for seismic or wind loads. Value includes a factor of safety of at least 1½. 3. D = pier diameter. Minimum spacing for lateral loading only applies to piers aligned in the direction of loading (i.e., one or more piers shadow another pier). 4. For piers spaced less than 6D apart and where the loading direction is such that there is one or more trailing pier(s) shadowing the leading pier, reductions to lateral capacity of the trailing pier(s) should be applied as follows: <ol style="list-style-type: none"> a. For trailing⁷ piers spaced 3D (D = pier diameter) apart, reduce trailing pier capacity by 50 percent (multiply contribution of trailing piers to group capacity by 0.5), b. For trailing piers spaced between 4D and 5D apart, reduce trailing pier capacity by 40 percent (multiply contribution of trailing piers to group capacity by 0.6), c. For trailing piers spaced 6D or greater apart, no reduction is needed, and d. For trailing piers spaced between 3D and 4D apart and 5D and 6D apart, interpolate the reduction factors provided above. 	

Provided that the drilled piers are designed according to the recommendations presented above and constructed properly, the total and differential elastic settlements are estimated to be less than about ½-inch and ¼-inch, respectively. Differential elastic settlement is defined in this report as the vertical difference in settlement between adjacent foundation supports or across a horizontal distance of 30 feet, whichever is less. A majority of the estimated elastic settlement is expected to occur during construction as the foundation is loaded.

We recommend that drilled pier steel reinforcement and concrete be placed within about 4 to 6 hours upon completion of each drilled hole. As a minimum, the holes should be poured the same day they are drilled. If the holes cannot be backfilled the same day they are drilled, the hole needs to be checked for

⁷ The leading pier is defined as the pier that has no pier in front of it in the direction of lateral loading, while the trailing pier is defined as the pier that is behind (i.e., shadows) the leading pier in the direction of lateral loading.



caving, sloughing or squeezing prior to setting the rebar cage and checked again before pouring concrete. The steel reinforcement should be centered in the drilled hole. Concrete used for pier construction should be discharged vertically into the holes to reduce aggregate segregation. Under no circumstances should concrete be allowed to free-fall against either the steel reinforcement or the sides of the excavation during construction.

As discussed in the “Subsurface Conditions” section above, free groundwater could be as shallow as about 10 feet BGS at the Site. Therefore, the foundation contractor should be prepared for groundwater if piers extend deeper than about 10 feet BGS. If water more than 6 inches deep is present during concrete placement, either the water needs to be pumped out or the concrete needs to be placed into the hole using tremie methods. If tremie methods are used, the end of the tremie pipe must remain below the surface of the in-place concrete at all times. Unit prices for dewatering and/or tremie placement methods should be obtained during the bidding process.

Concrete for drilled piers should be designed and placed in general conformance with the recommendations provided in ACI 336.3R-14, Design and Construction of Drilled Piers⁸. The recommendations provided within ACI 336.3R-14 should be followed at all times and in particular when concrete placement is necessary below groundwater level, in caving or sloughing soils, or in sand, which may necessitate casing or the slurry displacement method for concrete placement. These methods require concrete placement at higher slumps than “dry” conditions and concrete mix specifications, including the addition of concrete admixtures and consideration of consolidation methods, should be provided by the design team. If temporary casing is used, it should consist of smooth walled steel. **Corrugated metal pipe (CMP) should not be used as temporary casing because it has a tendency to create voids or disturbed zones during removal.**

7.4 Skateboarding Bowl Recommendations

7.4.1 Wall Lateral Earth Pressures

It is our understanding that the skateboarding bowl (bowl) will be as deep as 12 feet BGS. The bowl walls should be designed to resist static earth pressures due to the adjacent soil, and any surcharge effects caused by loads adjacent to the walls. It is recommended that the walls be designed for lateral earth pressures as presented below, which are expressed as equivalent fluid pressures, and that a design groundwater depth of 10 feet BGS be used. The unit weight of the soil is assumed to be 110 pcf.

A diagram showing lateral earth pressures and the nomenclature discussed in the following sections of this report is presented on Figure 4, Lateral Earth Pressure Diagram. We consider the bowl walls to be a relatively flexible cantilever wall. However, to account for additional lateral pressure due to the moderately to highly expansive soils present at the Site, we recommend designing the walls for at-rest earth pressures. An at-rest lateral earth pressure, “ σ_h ”, of 60 pounds per cubic feet (pcf), expressed as an equivalent fluid

⁸ ACI Committee 336, 2014



pressure (unit weight), may be used for design. Below the design groundwater depth of 10 feet BGS, the earth pressure, " $\sigma_{h(gw)}$ ", should be increased to 90 pcf to account for hydrostatic pressure.

Surcharge loads, " q ", adjacent to the bowl should also be included in the design of the bowl walls. A rectangular distribution acting over the upper 10 feet of depth of the walls with a pressure, " s ", equal to one-half of the surcharge load may be used. If drilled piers are closer than about 6D to the bowl (where D is the diameter of the drilled pier), we should be contacted to provide a reduction in lateral capacity of the pier and for additional surcharge load on the bowl wall imposed by the pier.

Section 1803.5.12 of the 2019 CBC requires that the design for foundation walls and retaining walls supporting backfill heights greater than 6 feet include seismic earth pressures for Seismic Design Categories D, E, and F. We recommend using a seismic pressure, " $\Delta\sigma_e$ ", of 33 pcf per Agusti and Sitar⁹ above the design groundwater level and a pressure below the design groundwater level, " $\Delta\sigma_{e(gw)}$ ", of 14 pcf. This pressure is expressed as an equivalent fluid pressures and would be added to the wall design in addition to the static values presented above. The seismic earth pressure should be applied as a triangular distribution with the resultant force acting 1/3 times the wall height above the base of the wall.

7.4.2 Uplift Loading Due to Buoyancy

The bowl should be designed to resist a buoyancy force based on the recommended design groundwater depth of 10 feet BGS. The weight of the bowl may be used to resist this uplift pressure. Other methods to counteract buoyancy forces could include the use of drilled piers connected to the bottom of the bowl to act as anchors or by creating a "lip" around the bottom of the bowl. If the latter is desired, the weight of the backfill above the lip plus a soil wedge extending upward at a 65-degree angle from the horizontal from the edge of the lip may be used to resist uplift pressure in lieu of the wall friction discussed in the paragraph above. Effective soil unit weights of 110 and 48 pcf may be used above and below the design groundwater depth, respectively.

If additional resistance to buoyancy is required, this could be provided via use of thicker walls providing a greater weight for the bowl and deadman anchors.

7.4.3 Subdrains and Dewatering Systems

Because the bowl will extend below the groundwater design level, we recommend that an under-drain system be installed below the bottom of the bowl mat foundation. It should consist of a minimum 12-inch thick layer of Caltrans Class 2 Permeable Material (graded filter rock) meeting the requirement of Section 68 of the 2018 Caltrans Standard Specifications. A pressure relief valve should be installed in the low point of the bowl to allow discharge from the under-drain. As an alternative to a pressure relief valve, a perforated PVC drainpipe (Schedule 40 or greater and at least 4 inches in diameter) can be installed (with

⁹ August, G.C. and Sitar, N., Seismic Earth Pressures on Retaining Structures in Cohesive Soils, Report No. UCB GT 13-02, August 2013



the perforations facing down) along the bottom of the low point of the under-drain. The perforated pipe should discharge to a sump or vertical relief well located within the bowl deck area outside of the bowl footprint. The water discharged to the relief well or sump should be pumped to the storm drain system to prevent buildup of hydrostatic pressures.

7.4.4 Construction Considerations

Prior to placement of the concrete or gunite for the bowl walls, the exposed subgrade should be moisture conditioned to at least 2 percent over optimum moisture content. The sides and bottom of the bowl excavation should be wetted **several times a day** to reduce drying and shrinkage before gunite is applied. **If shrinkage cracks develop on the sides of the excavation, they will be difficult to mitigate without removing and replacing the soil.**

If water is encountered at the bottom of the bowl excavation, the water should be pumped out prior to placement of the 12-inch layer of Class 2 Permeable Material. If portions of the bottom of the bowl excavation are soft and unstable (i.e., “pumping” under foot and equipment traffic), we recommend overexcavating these areas by 6 to 12 inches at least a couple feet laterally beyond their limits and placing a geotextile fabric, such as Mirafi® RS280i or equivalent over the bottom of the overexcavated areas and backfilling them with Class 2 Permeable Material.

7.5 2019 CBC Mapped Seismic Design Parameters

The seismicity of the region surrounding the Site is discussed in the “Site Geology and Seismicity” and “Fault Rupture and Strong Ground Shaking” sections of this report. From that discussion, it is important to note that the Site is in a region of high seismic activity and will likely be subjected to major shaking during the life of the project. As a result, structures for this project should be designed in accordance with applicable seismic provisions of the California Building Code (CBC) presented in the table below.

Use of the 2019 CBC mapped seismic design criteria presented in the table below is considered appropriate for the design of structural improvements for this Site if the exceptions provided in Section 11.4.8 of ASCE 7-16 apply to the planned improvements. Otherwise, the project’s structural engineer should be consulted to evaluate whether a site-specific ground motion hazards analysis is required for this project. Therefore, BSK has not performed a site-specific ground motion hazards analysis for this project.



2019 CBC SEISMIC DESIGN PARAMETERS ³ (Lat: 37.677761°N, Lon: 121.898714°W)			
Seismic Design Parameter	Value		Reference ¹
Site Class	D		Table 20.3-1, ASCE 7-16
MCE _R Mapped Spectral Acceleration (g)	S _s = 1.887	S ₁ = 0.694	USGS Mapped Values based on Figures 1613.3.1(1) and 1613.3.1(2), 2019 CBC
Site Coefficients	F _a = 1.0	F _v = 1.7 ²	Tables 1613.3.3(1) and 1613.3.3(2), 2019 CBC
MCE _R Mapped Spectral Acceleration Adjusted for Site Class Effects (g)	S _{MS} = 1.887	S _{M1} = 1.180	Section 1613.2.3, 2019 CBC
Design Spectral Acceleration (g)	S _{DS} = 1.258	S _{D1} = 0.787	Section 1613.2.4, 2019 CBC
MCE _G peak ground acceleration adjusted for Site Class effects (g)	PGA _M = 0.863		Section 11.8.3, ASCE 7-16
Definitions: MCE _R = Risk-Targeted Maximum Considered Earthquake MCE _G = Maximum Considered Earthquake Geometric Mean Notes: <ol style="list-style-type: none"> 1. When referencing ASCE 7-16, Supplement 1 must also be checked for changes to ASCE 7-16. 2. See requirements for site-specific ground motions in Section 11.4.8 of ASCE 7-16. This value of F_v shall be used only for calculation of T_s. 3. These seismic design parameters are based on the assumption that a site-specific ground motion hazard analysis is <u>not</u> required based on the exceptions provided in Section 11.4.8 of ASCE 7-16. Otherwise, a site-specific ground motion hazard analysis should be performed to develop the seismic design parameters for this project. 			

7.6 Exterior Concrete Flatwork

New exterior concrete flatwork at grade, including the deck surrounding the bowl, will be constructed on soils subject to swell/shrink cycles. Some of the adverse effects of swelling and shrinking can be reduced with proper moisture treatment. The intent is to reduce the fluctuations in moisture content by moisture conditioning the soils, sealing the moisture in, and controlling it. Near-surface soils to receive exterior concrete flatwork should be moisture conditioned according to the recommendations in the "Site Preparation and Grading" section of this report. In addition, all exterior flatwork should be supported on a minimum of 18 inches of "non-expansive" fill. Where concrete flatwork is to be exposed to vehicle traffic, the upper 6 inches of the "non-expansive" fill should consist of Caltrans Class 2 aggregate base.

New pedestrian concrete flatwork should have a minimum thickness of 4 inches and minimum reinforcing of #4 bars at 18 inches on center along expansion joints. Vehicular concrete should be designed as discussed in the "Portland Cement Concrete Pavements" section of this report. Final design of exterior concrete flatwork is the responsibility of the civil or structural engineer for the project.

Exterior flatwork will be subjected to edge effects due to the drying out of subgrade soils. To protect against edge effects adjacent to unprotected areas, such as vacant or landscaped areas, lateral cutoffs, such as



inverted curbs (i.e., turndown edges) that extend at least 2 inches below the aggregate base or “non-expansive” fill layer into the subgrade soils, are recommended. Alternatively, a moisture barrier at least 80 mils thick extending at least 6 inches below the aggregate base or “non-expansive” fill layer into the subgrade soils could be installed at the edge of the flatwork.

Due to the presence of moderately to highly expansive soils near the site surface, flatwork should have control joints (i.e., weakened plane joints) spaced no more than 8 feet on centers. Prior to construction of the flatwork, the aggregate base should be moisture conditioned to near optimum moisture content. If the aggregate base is not covered within about 30 days after placement, the soils below this material will need to be checked to confirm that their moisture content is at least 2 percent over optimum. If the moisture is found to be below this level, the aggregate base layer over flatwork areas will need to be soaked until the proper moisture content is reached. Where flatwork is adjacent to curbs, reinforcing bars should be placed between the flatwork and the curbs. Expansion joint material should be used between flatwork and structures, including concrete driveways.

7.7 Pavements

7.7.1 Asphalt Concrete Pavements

The near surface soils at the Site consist of clayey soils having a moderate to high expansion potential and a resistance (R) value of 7. We assumed an R-Value of 5 for design purposes and have increased the aggregate base thickness to account for the high expansion potential. Based on an R-Value of 5, the asphalt pavement sections provided in the table below may be used at this Site.

PAVEMENT DESIGN RECOMMENDATIONS (R-VALUE = 5)		
Traffic Index	AC ¹ (inches)	Class 2 AB ² (inches)
4.0	2.5	9.5
4.5	2.5	10.0
5.0	2.5	12.0
5.5	3.0	13.0
6.0	3.0	15.0
6.5	3.5	15.0
7.0	4.0	18.0

1. Asphalt Concrete
2. Caltrans Class 2 Aggregate Base (Minimum R-Value = 78)

7.7.2 Portland Cement Concrete Pavements

If used, Portland Cement Concrete (PCC) pavement should have a minimum thickness of 6 inches supported over 6 inches of Caltrans Class 2 aggregate base. The aggregate base and subgrade for PCC



pavements should be properly moisture conditioned and compacted. Construction joints should be located no more than 12 feet apart in both directions. Concrete compressive strength should be tested in lieu of third point loading for rupture strength. A minimum 28-day compressive strength of 3,000 pounds per cubic foot (psi) should be specified for the concrete mix design. The PCC pavement should be continuously reinforced using No. 4 bars (or larger) spaced no more than 18 inches on center in both directions. Final design of the PCC pavement is the responsibility of the civil or structural engineer for the project.

7.7.3 Additional Pavement Considerations

Paved areas should be sloped and drainage gradients maintained to carry all surface water to appropriate collection points. Surface water ponding should not be allowed anywhere on the Site during or after construction. We recommend that the pavement section be isolated from non-developed areas and areas of intrusion of irrigation water from landscaped areas. Concrete curbs should extend a minimum of 2 inches below the aggregate base and into the subgrade to provide a barrier against drying of the subgrade soils or reduction of migration of landscape water into the pavement section. Weep holes spaced at 4 feet on centers should also be provided. In lieu of the weep holes, a more effective system is to install a subdrain behind the curbs.

7.8 Effect of Plants on Foundation and Flatwork Performance

Because of the moderately to highly expansive nature of the on-site soils, trees and other large plants can significantly contribute to differential settlement of a foundation, flatwork, and paved areas. This type of damage is common in this area. The roots of trees and large plants can absorb the moisture from the soil, causing the soil to shrink much faster than other soil areas exposed to the weather. The soil where the moisture is lost more rapidly will sink lower than the surrounding soil, causing differential settlement in overlying or adjacent improvements. Certain trees and plants are known to be more water-consuming than others. Research studies indicate that a tree should be at least as far away from a building, flatwork, and pavement as the mature height of the tree to minimize the effect of drying caused by the tree. A plant and tree specialist should be consulted to avoid the issues described herein.

At a minimum, a root barrier should be installed between trees and adjacent improvements and should be designed and installed following the recommendations of a landscape architect.

7.9 Site Drainage

Proper site drainage is important for the long-term performance of future improvements. The Site should generally be graded to provide positive drainage towards drain inlets, catch basins, or bioretention areas. The Site should be graded so as to carry surface water away from the Site structures at a minimum of 2 percent in flatwork areas and 5 percent in landscaped areas to a minimum of 10 feet laterally from a structure as required by the 2019 CBC. Water should not be allowed to pond anywhere on-site.



7.10 Storm Water Runoff Mitigation

Storm runoff regulations require pretreatment of runoff and infiltration of storm water to the extent feasible. Typically, this results in the use of bioretention areas, vegetated swales, infiltration trenches, or permeable pavement near or within parking lots. These features are not well-suited to fine-grained soils (silts and clays) because these soils have relatively low permeability and require significant time for infiltration to occur. In addition, allowing water to pond on expansive soils will cause the soils to swell, which can cause distress to adjacent pavements, slabs, and lightly loaded structures.

Implementation of storm water infiltration criteria will likely result in increased distress and reduced service life of pavement and flatwork if not carefully designed in fine-grained soils such as those covering the surface of the Site. Bioretention areas, vegetated swales, and infiltration areas should be located in landscaped areas and well away (typically 5 to 10+ feet laterally) from foundations, flatwork, and pavements. If it is not possible to locate these infiltration systems away from such improvements, alternatives that isolate the infiltrated water, such as flow-through planters, could be considered. When using an infiltration system in clay soils, underdrains should be used. Improvements should be located such that there is at least 1 foot of horizontal distance between the edge of improvements and the top edge of the bioswale excavation for every 1 foot of vertical bioswale depth. If this is not possible, then concrete curbs for pavements or lateral restraint for exterior flatwork located directly adjacent to a vertical bioswale cut should be adequately keyed into the native soil or should be engineered (i.e., to generate sufficient passive pressure) to reduce the potential for rotation or lateral movement of the curbs. Due to the potential adverse effects on project performance, BSK should review the geotechnical aspects of the storm water infiltration system and its location before the project plans are finalized.

Based on our experience, we expect the near surface clayey soil encountered at the Site to have very low permeability. Therefore, we classify the Site's surficial soils as predominantly hydrologic soil group D per Chapter 7 of Part 630 Hydrology National Engineering Handbook (United States Department of Agriculture, 2007). Hydrologic soil group D soils have a saturated hydraulic conductivity of between .06 and 0.14 inches/hour.

It should be noted that during periods of prolonged precipitation, the underlying soils tend to become saturated to greater and greater depths/extents. Therefore, infiltration rates tend to decrease with prolonged rainfall.

7.11 Corrosivity Test Results

Results of corrosion testing by CERCO Analytical are presented in Appendix B. Also included is an evaluation of the results of the corrosion tests. Based upon the resistivity measurements, the sample collected from a depth of about 2.5 feet BGS in boring B-5 is classified as "severely corrosive". The sulfate ion concentration in that sample was 160 mg/kg (ppm). This result is indicative of an exposure category S1 per Table 19.3.1.1 of ACI 318-19. For an S1 exposure class, Table 19.3.2.1 indicates that the minimum f'_c of the concrete is 4,000 psi. All buried iron, steel, cast iron, ductile iron, galvanized steel, and dielectric



coated steel or iron should be properly protected against corrosion depending upon the critical nature of the structure. All buried metallic pressure piping such as ductile iron firewater pipelines should be protected against corrosion. Since we are not corrosion specialists, a corrosion testing firm should be contacted for specific design details.

The above are general discussions. A more detailed investigation may include more or fewer concerns and should be directed by a corrosion expert. Consideration should also be given to soils in contact with concrete that may be imported to the Site during construction, such as topsoil and landscaping materials. For instance, any imported soil materials should not be any more corrosive than the on-site soils and should not be classified as being more corrosive than any imported soil materials should not be any more corrosive than the on-site soils and should not be classified as being more corrosive than “moderately corrosive”. Also, on-site cutting and filling may result in soils contacting concrete that were not anticipated at the time of the investigation.

As an alternative or in addition to meeting CBC mix requirements, your structural engineer, architect or corrosion expert may choose to isolate the concrete from the corrosive soils or from ground or surface water that may leach corrosive materials from the soils and contact the concrete.

7.12 Plan Review and Construction Observation

We recommend that BSK be retained by the Client to review the final grading plans and specifications before they go out to bid. It has been our experience that this review provides an opportunity to detect misinterpretation or misunderstandings of our recommendations prior to the start of construction.

Variations in soil types and conditions are possible and may be encountered during construction. To permit correlation between the soil data obtained during this investigation and the actual soil conditions encountered during construction, we recommend that BSK be retained to provide observation and testing services during site earthwork. This will allow us the opportunity to compare actual conditions exposed during construction with those encountered in our investigation and to provide supplemental recommendations if warranted by the exposed conditions. Earthwork should be performed in accordance with the recommendations presented in this report, or as recommended by BSK during construction. BSK should be notified at least two weeks prior to the start of construction and prior to when observation and testing services are needed.

8. ADDITIONAL SERVICES AND LIMITATIONS

8.1 Additional Services

The review of plans and field observation and testing during construction by BSK are an integral part of the conclusions and recommendations made in this report. If BSK is not retained for these services, the Client will be assuming BSK’s responsibility for any potential claims that may arise during or after



construction due to the misinterpretation of the recommendations presented herein. The recommended tests, observations, and consultation by BSK during construction include, but are not limited to:

- review of plans and specifications;
- observations of site grading, including stripping and engineered fill construction;
- observation of foundation construction, including drilled piers; and
- in-place density testing of fills, backfills, finished subgrades, and aggregate base.

8.2 Limitations

The findings, conclusions, and recommendations contained in this report are based on our field observations and subsurface exploration, limited laboratory tests, and our present knowledge of the proposed construction. It is possible that soil and subsurface conditions could vary between or beyond the points explored. If soil conditions are encountered during construction that differ from those described herein, we should be notified immediately in order that a review may be made and any supplemental recommendations provided. If the scope of the proposed construction changes from that described in this report, our recommendations should also be reviewed.

We prepared this report in substantial accordance with the generally accepted geotechnical engineering practice as it exists in the Site area at the time of our study. No warranty, either express or implied, is made. The recommendations provided in this report are based on the assumption that an adequate program of tests and observations will be conducted by BSK during the construction phase in order to evaluate compliance with our recommendations.

This report may be used only by the Client and only for the purposes stated within a reasonable time from its issuance, but in no event later than two (2) years from the date of the report, or if conditions at the Site have changed. If this report is used beyond this period, BSK should be contacted to evaluate whether site conditions have changed since the report was issued.

Also, land or facility use, on and off-site conditions, regulations, or other factors may change over time, and additional work may be required with the passage of time. Based on the intended use of the report, BSK may recommend that additional work be performed and that an updated report be issued.

The scope of services for this report did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous substances in the soil, surface water, or groundwater at this Site.

BSK conducted subsurface exploration and provided recommendations for this project. We understand that BSK will be given an opportunity to perform a formal geotechnical review of the final project plans and specifications. In the event BSK is not retained to review the final project plans and specifications to evaluate if our recommendations have been properly interpreted, we will assume no responsibility for misinterpretation of our recommendations.



We recommend that all foundation excavations and earthwork during construction be monitored by a representative from BSK, including site preparation, foundation excavations, and placement of engineered fill, trench backfill, and aggregate base. The purpose of these services would be to provide BSK the opportunity to observe the actual soil conditions encountered during construction, evaluate the applicability of the recommendations presented in this report to the soil conditions encountered, and recommend appropriate changes in design or construction procedures if conditions differ from those described herein.

9. CLOSURE

BSK appreciates the opportunity to provide our services to you and trust this report meets your needs at this time. If you have any questions concerning the information presented, please contact us at 925-315-3151.

Respectfully submitted,
BSK Associates

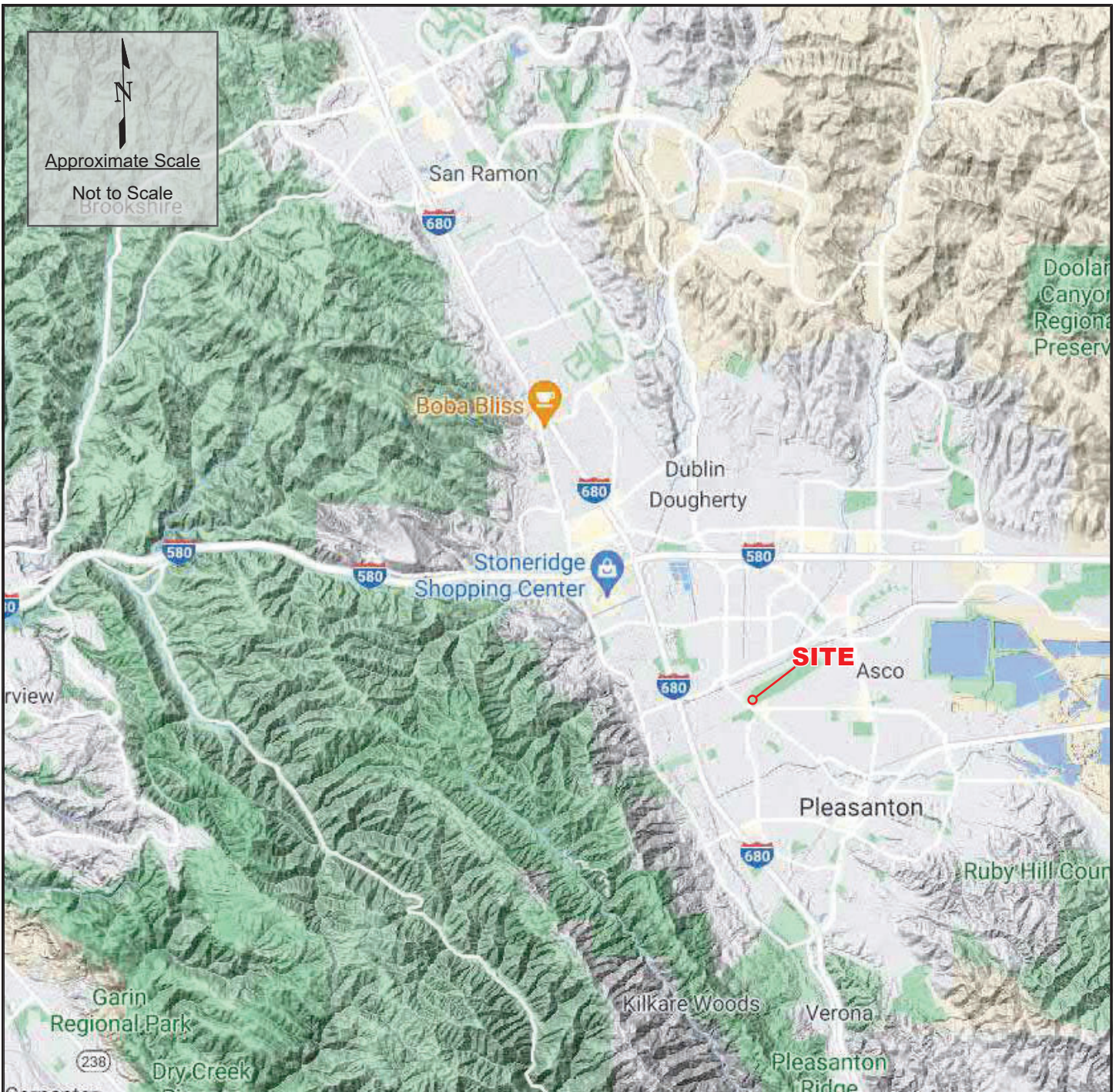

Danaige Tower, EIT
Senior Staff Engineer


Carrie L. Foulk, PE, GE #3016
Senior Geotechnical Engineer



FIGURES





References: 1. <https://maps.google.com>, 2021
 Note: Location is approximate

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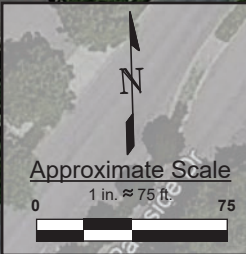
PROJECT NO. G21-147-11L
 DRAWN: 06/07/21
 DRAWN BY: D. Tower
 CHECKED BY: C. Foulk
 FILE NAME:
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VICINITY MAP

Proposed Skatepark Improvements
 Ken Mercer Sports Park
 5800 Parkside Drive
 Pleasanton, California


FIGURE

1



References: 1. <http://earth.google.com>, 2021

Legend

B-1  Approximate Boring Location

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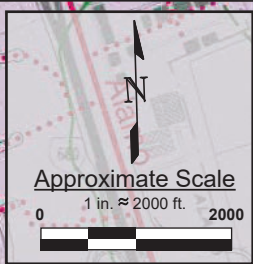
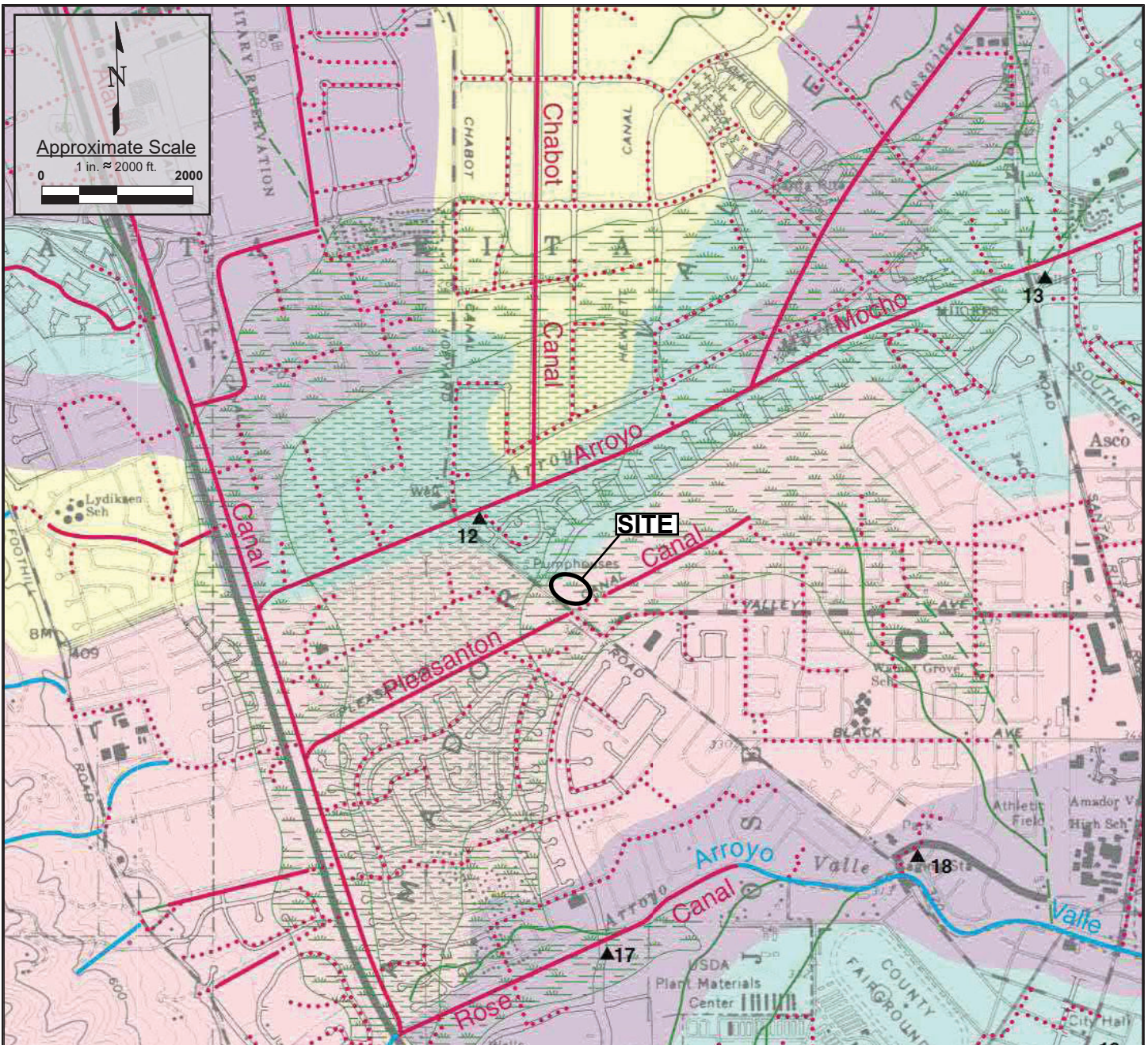
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SITE PLAN

Proposed Skatepark Improvements
Ken Mercer Sports Park
5800 Parkside Drive
Pleasanton, California

FIGURE

2



References: 1. Sowers, J.M. Creek & Watershed Map of the Pleasanton & Dublin Area, Oakland Museum of California, published 2003.

Legend

- Creeks
- forked where channel disappears on alluvial slope
- Former creeks, buried or drained
- dashed where exact location is uncertain
- Underground culverts & storm drains
- Engineered channels
- Tulare Lake:**
 - Willow marsh, 1874 boundary
 - Lagoon, 1867 boundary
- Artificial bodies of water
- Present watersheds draining to the bay
- Present watersheds draining into the ground

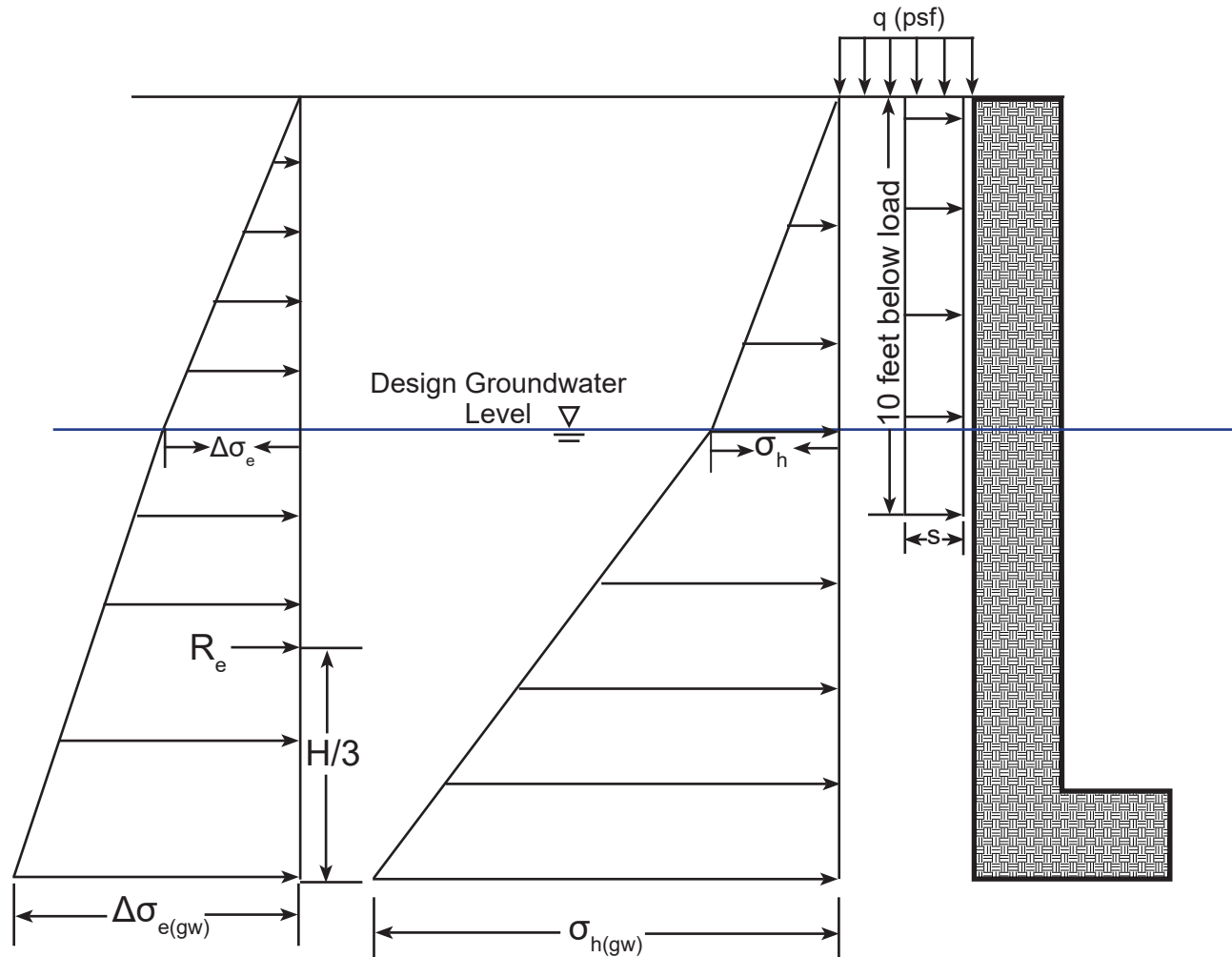
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CREEK & WATERSHED MAP
 PProposed Skatepark Improvements
 Ken Mercer Sports Park
 5800 Parkside Drive
 Pleasanton, California

FIGURE
3



Notes:

H= height of wall

q = surcharge pressure

s= surcharge load on wall, equal to 1/2q for restrained walls and 1/3q for cantilever walls

σ_h = at-rest or active lateral earth pressure above design groundwater level in psf/ft

$\sigma_{h(gw)}$ = at-rest or active lateral earth pressure below design groundwater level in psf/ft (includes hydrostatic pressure)

$\Delta\sigma_e$ = seismic increment pressure above design groundwater level in psf/ft

$\Delta\sigma_{e(gw)}$ = seismic increment pressure below design groundwater level in psf/ft

R_e = Resultant of seismic increment pressure

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**LATERAL EARTH
PRESSURE DIAGRAM**

Proposed Skatepark Improvements
Ken Mercer Sports Park
5800 Parkside Drive
Pleasanton, California

FIGURE

4

APPENDIX A

Boring Logs



UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2487/2488)

MAJOR DIVISIONS

GRAPHIC LOG

TYPICAL DESCRIPTIONS

MAJOR DIVISIONS	GRAPHIC LOG	TYPICAL DESCRIPTIONS				
COARSE GRAINED SOILS (More than half of material is larger than the #200 sieve)	GRAVELS (More than half of coarse fraction is larger than the #4 sieve)	CLEAN GRAVELS WITH <5% FINES $Cu \geq 4$ and $1 \leq Cc \leq 3$		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES	
		CLEAN GRAVELS WITH <5% FINES $Cu < 4$ and/or $1 < Cc > 3$		GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES	
		GRAVELS WITH 5 to 12% FINES $Cu \geq 4$ and $1 \leq Cc \leq 3$		GW-GM	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE FINES	
				GW-GC	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE CLAY FINES	
			$Cu < 4$ and/or $1 < Cc > 3$		GP-GM	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE FINES
					GP-GC	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE CLAY FINES
		GRAVELS WITH >12% FINES		GM	SILTY GRAVELS, GRAVEL-SILT-SAND MIXTURES	
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES	
				GC-GM	CLAYEY GRAVELS, GRAVEL-SAND-CLAY-SILT MIXTURES	
	SANDS (More than half of coarse fraction is smaller than the #4 sieve)	CLEAN SANDS WITH <5% FINES $Cu \geq 6$ and $1 \leq Cc \leq 3$		SW	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES	
		CLEAN SANDS WITH <5% FINES $Cu < 6$ and/or $1 < Cc > 3$		SP	POORLY-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES	
		SANDS WITH 5 to 12% FINES $Cu \geq 6$ and $1 \leq Cc \leq 3$		SW-SM	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE FINES	
				SW-SC	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE CLAY FINES	
		$Cu < 6$ and/or $1 < Cc > 3$		SP-SM	POORLY-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE FINES	
				SP-SC	POORLY-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE CLAY FINES	
		SANDS WITH >12% FINES		SM	SILTY SANDS, SAND-GRAVEL-SILT MIXTURES	
				SC	CLAYEY SANDS, SAND-GRAVEL-CLAY MIXTURES	
				SC-SM	CLAYEY SANDS, SAND-SILT-CLAY MIXTURES	
FINE GRAINED SOILS (More than half of material is smaller than the #200 sieve)	SILTS AND CLAYS (Liquid limit less than 50)		ML	INORGANIC SILTS AND VERY FINE SANDS, SILTY OR CLAYEY FINE SANDS, SILTS WITH SLIGHT PLASTICITY,		
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS		
			CL-ML	INORGANIC CLAYS-SILTS OF LOW PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS		
	SILTS AND CLAYS (Liquid limit greater than 50)		OL	ORGANIC SILTS & ORGANIC SILTY CLAYS OF LOW PLASTICITY		
			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILT		
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS		
	OH	ORGANIC CLAYS & ORGANIC SILTS OF MEDIUM-TO-HIGH PLASTICITY				



PROJECT NO. G21-147-11L
 DRAWN: 06/17/21
 DRAWN BY: D. Tower
 CHECKED BY: C. Foulk
 FILE NAME: Legend.indd

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2487/2488)

Proposed Skatepark Improvements
 Ken Mercer Sports Park
 5800 Parkside Drive
 Pleasanton, California

FIGURE

A-1

SOIL DESCRIPTION KEY

MOISTURE CONTENT

DESCRIPTION	ABBR	FIELD TEST
Dry	D	Absence of moisture, dusty, dry to the touch
Moist	M	Damp but no visible water
Wet	W	Visible free water, usually soil is below water table

CEMENTATION

DESCRIPTION	FIELD TEST
Weakly	Crumbles or breaks with handling or slight finger pressure
Moderately	Crumbles or breaks with considerable finger pressure
Strongly	Will not crumble or break with finger pressure

PLASTICITY

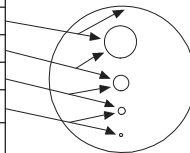
DESCRIPTION	ABBR	FIELD TEST
Non-plastic	NP	A 1/8-in. (3 mm) thread cannot be rolled at any water content.
Low (L)	LP	The thread can barely be rolled and the lump or thread cannot be formed when drier than the plastic limit.
Medium (M)	MP	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump or thread crumbles when drier than the plastic limit.
High (H)	HP	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump or thread can be formed without crumbling when drier than the plastic limit.

GRAIN SIZE

DESCRIPTION	SIEVE SIZE	GRAIN SIZE	APPROXIMATE SIZE	
Boulders	>12"	>12"	Larger than basketball-sized	
Cobbles	3 - 12"	3 - 12"	Fist-sized to basketball-sized	
Gravel	coarse	3/4 - 3"	3/4 - 3"	Thumb-sized to fist-sized
	fine	#4 - 3/4"	0.19 - 0.75"	Pea-sized to thumb-sized
Sand	coarse	#10 - #4	0.075 - 0.425"	Rock salt-sized to pea-sized
	medium	#40 - #10	0.075 - 0.250"	Sugar-sized to rock salt-sized
	fine	#200 - #10	0.075 - 0.0075"	Flour-sized to sugar-sized
Fines	Passing #200	<0.0075"	Flour-sized and smaller	

REACTION WITH HCl

DESCRIPTION	FIELD TEST
None	No visible reaction
Weak	Some reaction, with bubbles forming slowly
Strong	Violent reaction, with bubbles forming immediately



ANGULARITY

DESCRIPTION	ABBR	CRITERIA	Illustration
Angular	A	Particles have sharp edges and relatively plane sides with unpolished surfaces	
Subangular	SA	Particles are similar to angular description but have rounded edges	
Subrounded	SR	Particles have nearly plane sides but have well-rounded corners and edges	
Rounded	R	Particles have smoothly curved sides and no edges	

APPARENT / RELATIVE DENSITY - COARSE-GRAINED SOIL

APPARENT DENSITY	ABBR	SPT (# blows/ft)	MODIFIED CA SAMPLER (# blows/ft)	CALIFORNIA SAMPLER (# blows/ft)	RELATIVE DENSITY (%)	FIELD TEST
Very Loose	VL	<4	<4	<5	0 - 15	Easily penetrated with 1/2-inch reinforcing rod by hand
Loose	L	4 - 10	5 - 12	5 - 15	15 - 35	Difficult to penetrate with 1/2-inch reinforcing rod pushed by hand
Medium Dense	MD	10 - 30	12 - 35	15 - 40	35 - 65	Easily penetrated a foot with 1/2-inch reinforcing rod driven with 5-lb. hammer
Dense	D	30 - 50	35 - 60	40 - 70	65 - 85	Difficult to penetrate a foot with 1/2-inch reinforcing rod driven with 5-lb. hammer
Very Dense	VD	>50	>60	>70	85 - 100	Penetrated only a few inches with 1/2-inch reinforcing rod driven with 5-lb. hammer



PROJECT NO. G21-067-10L

DRAWN: 06/17/21

DRAWN BY: D. Tower

CHECKED BY: C. Foulk

FILE NAME: Legend.indd











SOIL DESCRIPTION KEY

Proposed Skatepark Improvements
Ken Mercer Sports Park
5800 Parkside Drive
Pleasanton, California

FIGURE

A-2

LOG SYMBOLS

	BULK / BAG SAMPLE	-4	PERCENT FINER THAN THE NO. 4 SIEVE (ASTM Test Method C 136)
	SPLIT BARREL SAMPLER (2-1/2 inch outside diameter)	-200	PERCENT FINER THAN THE NO. 200 SIEVE (ASTM Test Method C 117)
	SPLIT BARREL SAMPLER (3 inch outside diameter)	LL	LIQUID LIMIT (ASTM Test Method D 4318)
	STANDARD PENETRATION SPLIT SPOON SAMPLER (2 inch outside diameter)	PI	PLASTICITY INDEX (ASTM Test Method D 4318)
	CONTINUOUS CORE	TXUU	UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (EM 1110-1-1906)/ASTM Test Method D 2850
	SHELBY TUBE	EI	EXPANSION INDEX (UBC STANDARD 18-2)
	ROCK CORE	COL	COLLAPSE POTENTIAL
	GROUNDWATER LEVEL (encountered at time of drilling)	UC	UNCONFINED COMPRESSION (ASTM Test Method D 2166)
	GROUNDWATER LEVEL (measured after drilling)		
	SEEPAGE	MC	MOISTURE CONTENT (ASTM Test Method D 2216)

GENERAL NOTES

Boring log data represents a data snapshot.

This data represents subsurface characteristics only to the extent encountered at the location of the boring.

The data inherently cannot accurately predict the entire subsurface conditions to be encountered at the project site relative to construction or other subsurface activities.


Lines between soil layers and/or rock units are approximate and may be gradual transitions.

The information provided should be used only for the purposes intended as described in the accompanying documents.

In general, Unified Soil Classification System designations presented on the logs were evaluated by visual methods.

Where laboratory tests were performed, the designations reflect the laboratory test results.

The Responsible Geotechnical Engineer, Professional Engineer, or Professional Geologist uses professional judgement and visual-manual procedures in general conformance with ASTM D2488 to classify soil when the full classification suite of tests per ASTM D2487 is not conducted.

	PROJECT NO. G21-147-11L	LOG KEY	FIGURE A-3
	DRAWN: 06/17/21		
	DRAWN BY: D. Tower	Proposed Skatepark Improvements Ken Mercer Sports Park 5800 Parkside Drive Pleasanton, California	
	CHECKED BY: C. Foulk		
FILE NAME: Legend.indd			



BSK Associates
 399 Lindbergh Avenue
 Livermore, CA 94551
 Telephone: (925) 315-3151

LOG OF BORING NO. B-4

Project Name: **Ken Mercer Skate Park**
 Project Number: **G21-147-11L**
 Project Location: **5800 Parkside Dr, Pleasanton, CA 94588**
 Logged by: **M. Romero**
 Checked by: **O. Khan**

Depth, feet	Graphic Log	Surface El.: 322 ft Location: 37.677904, -121.899101	Samples	Sample Number	Penetration Blows / 6 inches	Pocket Penetrometer, TSF	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index
MATERIAL DESCRIPTION												
		Sandy Lean CLAY (CL): dark yellowish brown, moist, firm, medium plasticity, medium to coarse sand, iron oxide staining R-Value= 7		1A 1B 1C	9 13 14	2.5				37	19	18
5		Fat CLAY (CH): very dark gray, moist, soft, medium to high plasticity, organics present bluish gray, soft to firm, high plasticity, decreased organics, iron oxide staining increased organic content		2A 2B 2C 3A 3B 3C 4A 4B 4C	7 8 14 8 9 13 7 11 16	1.0 1.5 1.8 2.0 1.5		72	45			
15		Boring terminated at approximately 15 feet. No free groundwater was observed. Boring was backfilled with cement grout.										

GEO_TARGET KEN MERCER SKATE PARK BORING LOGS.GPJ GEOTECHNICAL 08.GDT 6/15/21

Completion Depth: 15.0
Date Started: 5/12/21
Date Completed: 5/12/21
California Sampler: 2.5-in inner diameter
SPT Sampler:

Drilling Equipment: Exploration Geoservices Mobile B-53R
Drilling Method: Hollow Stem Auger
Drive Weight: 140 lbs
Hole Diameter: 8-in
Drop: 30-in
Remarks:



BSK Associates
 399 Lindbergh Avenue
 Livermore, CA 94551
 Telephone: (925) 315-3151

LOG OF BORING NO. B-5

Project Name: **Ken Mercer Skate Park**
 Project Number: **G21-147-11L**
 Project Location: **5800 Parkside Dr, Pleasanton, CA 94588**
 Logged by: **M. Romero**
 Checked by: **O. Khan**

Depth, feet	Graphic Log	Surface El.: 321 ft Location: 37.677669, -121.898534	Samples	Sample Number	Penetration Blows / 6 inches	Pocket Penetrometer, TSF	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index
MATERIAL DESCRIPTION												
		Fat CLAY (CH): dark yellowish brown, moist, firm to hard, medium to high plasticity, iron oxide staining										
		TXUU (see Figure B-2) c = 1,375 psf		1A 1B 1C	5 8 6	3.0		79	39			
5		grayish brown, firm, trace organics		2A 2B 2C	6 8 10	2.0			35	50	28	22
		Organic Content = 3.5%										
		brown, firm to hard, mottled iron oxide staining		3A 3B 3C	9 13 15	3.0 4.0						
10												
		grayish brown, soft to firm		4A 4B 4C	6 5 4	1.8		81	38			
15												
		Lean CLAY with Sand (CL): bluish gray, moist, firm, medium plasticity, fine sand, iron oxide staining		5A 5B 5C	7 8 13	1.5 2.5						
20												
		Boring terminated at approximately 20 feet. No free groundwater was observed. Boring was backfilled with cement grout.										

GEO_TARGET KEN MERCER SKATE PARK BORING LOGS.GPJ GEOTECHNICAL 08.GDT 6/15/21

Completion Depth: 20.0
Date Started: 5/12/21
Date Completed: 5/12/21
California Sampler: 2.5-in inner diameter
SPT Sampler:

Drilling Equipment: Exploration Geoservices Mobile B-53R
Drilling Method: Hollow Stem Auger
Drive Weight: 140 lbs
Hole Diameter: 8-in
Drop: 30-in
Remarks:



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 399 Lindbergh Avenue
 Livermore, CA 94551
 Telephone: (925) 315-3151

LOG OF BORING NO. B-6

Project Name: **Ken Mercer Skate Park**
 Project Number: **G21-147-11L**
 Project Location: **5800 Parkside Dr, Pleasanton, CA 94588**
 Logged by: **M. Romero**
 Checked by: **O. Khan**

Depth, feet	Graphic Log	Surface El.: 323 ft Location: 37.677546, -121.897955	Samples	Sample Number	Penetration Blows / 6 inches	Pocket Penetro-meter, TSF	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index
MATERIAL DESCRIPTION												
		Lean CLAY (CL): brown to grayish brown, moist, firm, medium plasticity, trace fine grained sand, roots present		1A 1B 1C	7 11 14	4.0 3.0		91	30			
5		Sandy Lean CLAY (CL): grayish brown, very moist, soft to firm, low to medium plasticity, fine sand, iron oxide staining, decreased sand content with depth TXUU (see Figure B-2) c = 1,640 psf		2A 2B 2C	6 8 12	1.0 2.8		58	52			
10		Fat CLAY (CH): gray, moist, firm to hard, high plasticity, organics present, iron oxide staining		3A 3B 3C	7 14 13	3.8		97	27			
15		firm, increased iron oxide staining		4A 4B 4C	7 10 13	2.5 2.0						
		Boring terminated at approximately 15 feet. No free groundwater was observed. Boring was backfilled with cement grout.										

GEO_TARGET KEN MERCER SKATE PARK BORING LOGS.GPJ GEOTECHNICAL 08.GDT 6/15/21

Completion Depth: 15.0
Date Started: 5/12/21
Date Completed: 5/12/21
California Sampler: 2.5-in inner diameter
SPT Sampler:

Drilling Equipment: Exploration Geoservices Mobile B-53R
Drilling Method: Hollow Stem Auger
Drive Weight: 140 lbs
Hole Diameter: 8-in
Drop: 30-in
Remarks:

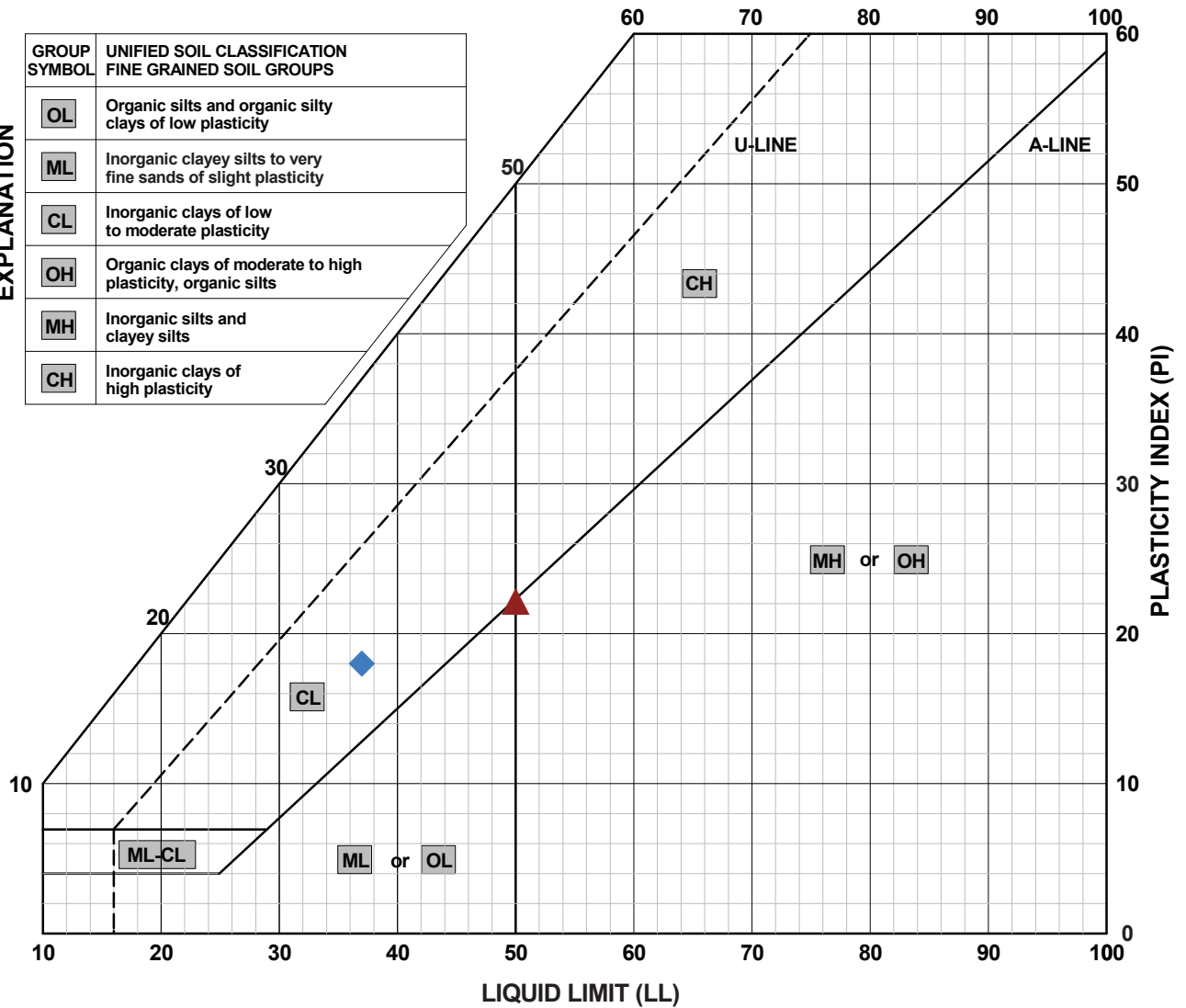
APPENDIX B

Laboratory Test Results



EXPLANATION

GROUP SYMBOL	UNIFIED SOIL CLASSIFICATION FINE GRAINED SOIL GROUPS
OL	Organic silts and organic silty clays of low plasticity
ML	Inorganic clayey silts to very fine sands of slight plasticity
CL	Inorganic clays of low to moderate plasticity
OH	Organic clays of moderate to high plasticity, organic silts
MH	Inorganic silts and clayey silts
CH	Inorganic clays of high plasticity



LEGEND:	SOURCE	DEPTH (ft)	LL	PL	PI	DESCRIPTION
◆	B-4	3.0	37	19	18	Sandy Lean Clay (CL)
▲	B-5	6.0	50	28	22	Fat Clay (CH)

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 FILE NAME: SitePlan.indd

ATTERBERG LIMITS

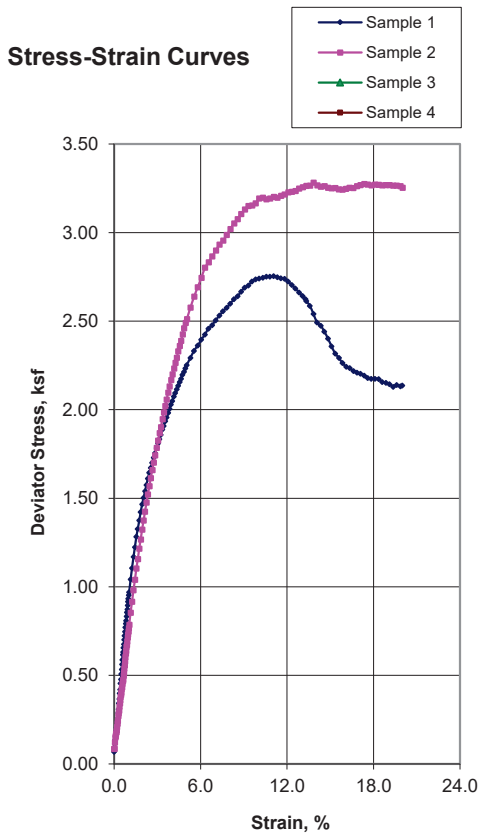
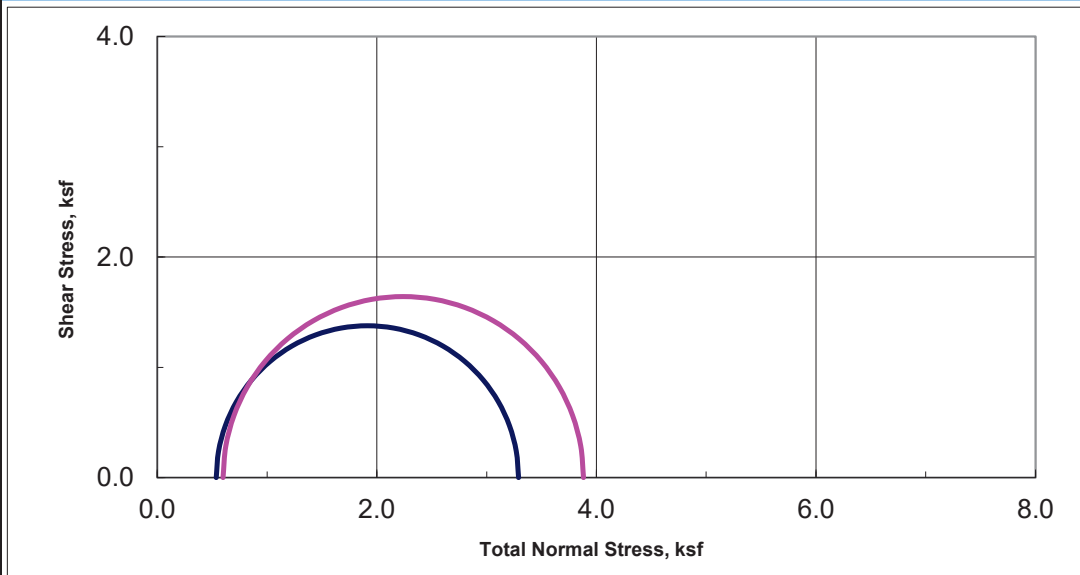
Proposed Skatepark Improvements
 Ken Mercer Sports Park
 5800 Parkside Drive
 Pleasanton, California

FIGURE

B-1



Unconsolidated-Undrained Triaxial Test ASTM D2850



Sample Data				
	1	2	3	4
Moisture %	39.0	51.7		
Dry Den,pcf	79.4	57.8		
Void Ratio	1.124	1.915		
Saturation %	93.8	72.9		
Height in	5.05	5.05		
Diameter in	2.41	2.42		
Cell psi	3.7	4.2		
Strain %	11.06	13.83		
Deviator, ksf	2.754	3.283		
Rate %/min	1.00	1.00		
in/min	0.050	0.051		
Job No.:	664-395			
Client:	BSK Associates			
Project:	G21-147-11L			
Boring:	B-5	B-6		
Sample:	1C	2C		
Depth ft:	3.0	6.0		

Visual Soil Description				
Sample #				
1	Fat Clay (CH)			
2	Sandy Lean Clay (CL)			
3				
4				
Remarks:				

Note: Strengths are picked at the peak deviator stress or 15% strain whichever ever occurs first per ASTM D2850.

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UNCONSOLIDATED-UNDRAINED TRIAxIAL COMPRESSION TEST

Proposed Skatepark Improvements
 Ken Mercer Sports Park
 5800 Parkside Drive
 Pleasanton, California

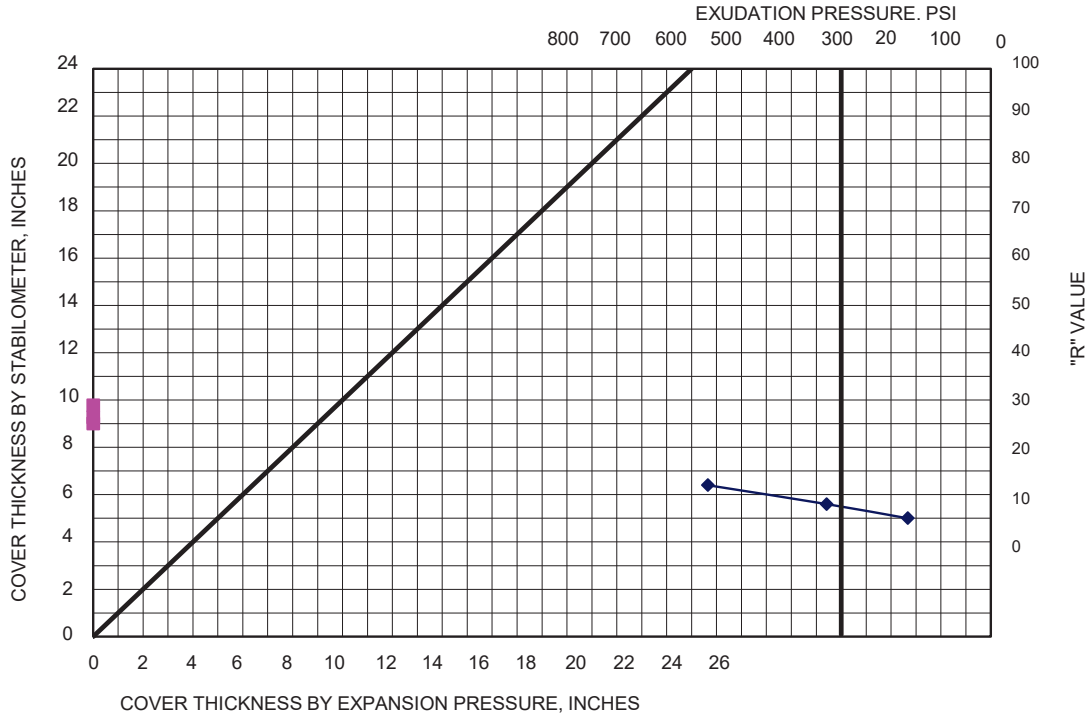
FIGURE

B-2

R-Value Test

Project Name: Ken Mercer Skate Park
Project Number: G2114711L
Sample Source:
Lab Tracking ID: 15154
Sample Location: B-4@1-5

Sample Date: 5/26/1901
Sample By: MR
Test Date: 5/23/2021
Report Date: 5/24/2021
Tested By: RC



Sample Description: Brown Lean Clay

SPECIMEN	A	B	C
EXUDATION PRESSURE, LOAD (lb)	7129	4132	2090
EXUDATION PRESSURE, PSI	568	329	166
EXPANSION, * 0.0001 IN	0	0	0
EXPANSION PRESSURE, PSF	0	0	0
STABILOMETER PH AT 2000 LBS	136	142	151
DISPLACEMENT	3.2	3.04	3.11
RESISTANCE VALUE "R"	12	9	5
"R" VALUE CORRECTED FOR HEIGHT	12	8	5
% MOISTURE AT TEST	26.2	27.9	29.6
DRY DENSITY AT TEST, PCF	96.7	95.2	91.6
"R" VALUE AT 300 PSI EXUDATION PRESSURE	7		
"R" VALUE BY EXPANSION PRESSURE TI = 4.0, GF=1.50	N/A		

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PROJECT NO. G21-147-11L
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DRAWN BY: D. Tower
CHECKED BY: C. Foulk
FILE NAME: SitePlan.indd

RESISTANCE VALUE

Proposed Skatepark Improvements
Ken Mercer Sports Park
5800 Parkside Drive
Pleasanton, California

FIGURE

B-3



1100 Willow Pass Court, Suite A
Concord, CA 94520-1006
925 462 2771 Fax. 925 462 2775
www.cercoanalytical.com

1 June, 2021

Job No. 2105124
Cust. No. 12667

Ms. Danaige Tower
BSK Associates Engineers & Laboratories
399 Lindbergh Avenue
Livermore, CA 94551

Subject: Project No.: G21-147-11L
Project Name: Ken Mercer Skate Park, Pleasanton
Corrosivity Analysis – ASTM Test Methods

Dear Ms. Tower:

Pursuant to your request, CERCO Analytical has analyzed the soil sample submitted on May 20, 2021. Based on the analytical results, this brief corrosivity evaluation is enclosed for your consideration.

Based upon the resistivity measurement, this sample is classified as “severely corrosive”. All buried iron, steel, cast iron, ductile iron, galvanized steel and dielectric coated steel or iron should be properly protected against corrosion depending upon the critical nature of the structure. All buried metallic pressure piping such as ductile iron firewater pipelines should be protected against corrosion.

The chloride ion concentration was 170 mg/kg. Because the chloride ion concentration is less than 300 mg/kg, it is determined to be insufficient to attack steel embedded in a concrete mortar coating.

The sulfate ion concentration is 160 mg/kg and is determined to be insufficient to damage reinforced concrete structures and cement mortar-coated steel at this location.

The pH of the soil was 7.97 which does not present corrosion problems for buried iron, steel, mortar-coated steel and reinforced concrete structures.

The redox potential was measured at 310-mV which is indicative of potentially “slightly corrosive” soils resulting from anaerobic soil conditions.

This corrosivity evaluation is based on general corrosion engineering standards and is non-specific in nature. For specific long-term corrosion control design recommendations or consultation, please call *JDH Corrosion Consultants, Inc. at (925) 927-6630.*

We appreciate the opportunity of working with you on this project. If you have any questions, or if you require further information, please do not hesitate to contact us.

Very truly yours,

CERCO ANALYTICAL, INC.

A handwritten signature in cursive script, appearing to read 'J. Darby Howard, Jr.', written over the printed name.

J. Darby Howard, Jr., P.E.

President

JDH/jdl

Enclosure



Client: BSK Associates Engineers & Laboratories
 Client's Project No.: G21-147-11L
 Client's Project Name: Ken Mercer Skate Park, Pleasanton
 Date Sampled: 15-Apr-21
 Date Received: 20-May-21
 Matrix: Soil
 Authorization: Signed Chain of Custody

Date of Report: 1-Jun-2021

Job/Sample No.	Sample I.D.	Redox (mV)	pH	Conductivity (umhos/cm)*	Resistivity			
					(100% Saturation) (ohms-cm)	Sulfide (mg/kg)*	Chloride (mg/kg)*	Sulfate (mg/kg)*
2105124-001	B-5 @ 2.5'	310	7.97	-	490	-	170	160

Method:	ASTM D1498	ASTM D4972	ASTM D1125M	ASTM G57	ASTM D4658M	ASTM D4327
Reporting Limit:	-	-	10	-	50	15
Date Analyzed:	27-May-2021	27-May-2021	-	27-May-2021	-	27-May-2021

C Cheryl McMillen
 Cheryl McMillen
 Laboratory Director

* Results Reported on "As Received" Basis
 N.D. - None Detected



399 Lindbergh Way
Livermore CA 94551
P 925.315.3151
www.bskassociates.com



Carrie L. Foulk

MEMORANDUM

TO: Mr. Matthew Gruber – City of Pleasanton (mgruber@cityofpleasantonca.gov)
Mr. Adam Nelkie, PE – City of Pleasanton (anelkie@cityofpleasantonca.gov)

FROM: Carrie Foulk, PE, GE #3016 - BSK Associates (cfoulk@bskassociates.com)
Cristiano Melo, PE, GE – BSK Associates (cmelo@bskassociates.com)

DATE: February 13, 2024

SUBJECT: **Supplemental Recommendations**
Ken Mercer Skatepark
Pleasanton, California

PROJECT NO.: B24000000

BSK Associates (BSK) is pleased to present this memorandum to provide supplemental recommendations for the Ken Mercer Skatepark in Pleasanton, California. BSK conducted a geotechnical investigation for this project, the results of which are presented in our report¹ dated June 22, 2021 (Revised June 23, 2021). In our report, we recommended placing a minimum of 18 inches of “non-expansive” material below exterior flatwork to mitigate the expansion potential of the underlying soils. Based on feedback from the skatepark designer (Wormhoudt, Inc.) and civil engineer (RRM Design Group) for the project, we have been requested to provide recommendations for soil stabilization to mitigate the expansion potential of the near surface soils in lieu of placing “non-expansive” material below the exterior slabs-on-grade, including the skatepark bowls. Since the exterior flatwork and skatepark bowls will be underlain by either 6 inches of crushed drain rock or 6 inches of aggregate base, 12 inches of soil stabilization will be necessary. In addition, we have been requested to provide recommendations for permeable pavers and supplemental underdrain recommendations for the skatepark bowls.

Soil Stabilization of Near Surface Soils

Prior to soil stabilization, sampling and testing should be conducted to assess the type and amount of soil stabilizer that should be used that would result in soil with a plasticity index of 12 or less. Samples should be obtained at the depth of the subgrade to be stabilized and Atterberg limits tests should be run on those samples. If the plasticity index of the untreated soil is greater than 30, we anticipate that high calcium or dolomitic quicklime will be more effective as the soil stabilizer. If the plasticity index of the untreated soil is less than 30, we anticipate that a lime/cement blend will be more effective as a soil stabilizer. The effectiveness of the soil stabilization should be confirmed by conducting Atterberg limits tests on soil

¹ Report entitled *Geotechnical Investigation Report, Proposed Skatepark Improvements Project, Ken Mercer Sports Park, 5800 Parkside Drive, Pleasanton, California*, dated June 22, 2021 (Revised June 23, 2021), BSK Project No. G21-147-11L.

samples treated with 5, 6, and 7 percent of high calcium or dolomitic quicklime by dry unit weight and a 5, 6, and 7 percent of a lime/cement blend for a total of 6 tests. The high calcium or dolomitic quicklime and lime/cement blend should be supplied by the soil stabilization subcontractor.

Once the type and amount of soil stabilizer is confirmed, the soil stabilization operation should be conducted in general accordance with Section 24 of the Caltrans Standard Specifications, 2018 edition. **For ease of discussion, we will refer to soil stabilization with high calcium or dolomitic quicklime or a lime/cement blend as “lime treatment” throughout the remainder of this memorandum.** Lime treatment typically consists of spreading the required amount of lime over the area to be treated, followed by initial mixing of the lime and water within the soil section to be treated. This initial mixing is then allowed to sit for a period of about 24 hours or longer to permit the resulting chemical reaction to break down the material and change it chemically. Following this “mellowing” period, the soil-lime section is re-mixed and additional water, if needed, is added. It is important that adequate water be added before final mixing to ensure complete hydration of the lime and to bring the soil moisture content to at least 3 percent above the optimum moisture content before compaction takes place.

After the lime-treated subgrade is compacted, it should be allowed to harden (cure) until loaded dump trucks and other construction equipment can operate on it without rutting the surface. Throughout this curing period, the surface of the lime-treated soil should be kept moist to aid in strength gain until the surface is covered with drain rock or aggregate base.

It is very important that the general steps outlined above be performed in a manner that introduces sufficient water to the soil-lime mix to allow the lime to thoroughly hydrate and react chemically with the soil subgrade. The negative impact of lime treatment on future vegetation should be considered.

Once the site is lime treated, the treated subgrade should be considered to be “non-expansive” from a design standpoint.

Vehicular Permeable Pavers

It is our understanding that permeable pavers that may be exposed to vehicular traffic are planned throughout the site. This design methodology attempts to accommodate portions of surface stormwater runoff through infiltration into the near-surface soils. This design is especially appropriate for coarser-grained soils, such as sands and gravels. Typically, both asphalt and Portland Cement Concrete pavements are based on minimizing the introduction of water into fine-grained pavement subgrades. This is because saturated fine-grained subgrades can yield (pump) under the dynamic loadings of design traffic and ultimately result in distress of the overlying roadways. By definition, permeable pavers allow saturation of subgrade soils during periods of rainfall or other introduction of surface water. Therefore, there is an increased risk of reduced pavement life if permeable pavers are used at this site. Also, the proper subgrade preparation of the surface fine-grained soils by densification becomes contrary to the inherent desire for high permeability. The greater the recommended degree of compaction, the lower the anticipated infiltration rate will be. However, it is our understanding that the permeable pavers will be underlain by an impermeable liner, and therefore water infiltration into the subgrade will be reduced.



Class 2 aggregate base (AB) is typically used for support of conventional paving. However, the well-graded grain-size distribution of Class 2 AB is not well-suited for the higher permeability and storativity desired for a permeable pavement section. Based on our communication with the design team, we understand that the pervious pavers and underlayment will consist of the following:

- The pavers will be a minimum of 3½ inches thick where exposed to vehicular traffic.
- The pavers will be underlain by a 2-inch-thick layer of ASTM No 8 bedding (i.e., the bedding layer).
- The bedding layer will be underlain by a 4-inch-thick layer of ASTM No. 57 base (i.e., permeable layer).
- The permeable layer will be underlain by a minimum 6-inch-thick reservoir layer consisting of ASTM No 2 stone. However, the final reservoir layer thickness and particle size should be specified by the civil engineer based on storm water runoff needs.

We recommend that filter fabric, such as Mirafi 140N or equivalent, be placed immediately below the bedding layer and the permeable layer to reduce the potential for the material in these layers to migrate into the layers below. The filter fabric should be overlapped a minimum of 18 inches at the seams.

The subgrade beneath the reservoir layer should be sloped towards perforated subdrain pipes located along the perimeter of the paved areas.

Skatepark Blanket Drain

We provided recommendations for subdrains and dewatering systems in Section 7.4.3 of our 2021 report based on the assumption that the skatepark bowls might extend as deep as 12 feet below existing ground surface (BGS). It is our understanding that the bowls will only extend to about 7 feet BGS, therefore, they will not extend under the historically high groundwater depth of 10 feet BGS. Therefore, the blanket drain thickness can be reduced to 6 inches.

Limitations

This memorandum has been prepared in substantial accordance with the generally accepted geotechnical engineering practice as it exists in the Site area at the time of our study. No warranty, either express or implied, is made. The limitations presented in the project geotechnical report apply to this memorandum.





Arborist Report

**5800 Parkside Drive, Pleasanton, CA
Ken Mercer Skate Park**

Prepared for:
City of Pleasanton
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Pleasanton, CA 94566

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June 2021
Updated July 18, 2023



Arborist Report
Ken Mercer Skate Park
Pleasanton, CA

Table of Contents

	Page
Introduction and Overview	1
Assessment Methods	1
Description of Trees	2
City of Pleasanton Tree Ordinance	5
Suitability for Preservation	6
Evaluation of Impacts	7
Tree Preservation Guidelines	8
Summary	10

List of Tables

Table 1. Tree condition & frequency of occurrence.	2
Table 2. Suitability for preservation.	7

Attachments

Tree Assessment Form

Tree Assessment Plan

Tree Disposition Table

Arborist Report

Ken Mercer Skate Park Pleasanton, CA

Introduction and Overview

The City of Pleasanton is planning to re-develop a section of the Ken Mercer Sports Park and construct a new skateboard facility. Existing site use consists of greenspace, picnic tables, sidewalks, a small skate park and a parking lot. HortScience | Bartlett Consulting, Divisions of The F.A. Bartlett Tree Expert Co., was asked to prepare a Preliminary Arborist Report for the project.

This report provides the following information:

1. An assessment of each tree's health, structure, suitability for preservation, and protected status.
2. An assessment of the trees that would be preserved and removed based on development plans.
3. Guidelines for tree preservation for future development throughout the planned demolition and construction phases of the project.

Assessment Methods

Trees #1 – 123 were originally assessed in June 2021. Trees were reassessed on July 10, 2023. Five trees (#53, 91, 92, 111 and 114) were removed after the original inventory and #92 was replaced with a new tree. Tree tags are now discontinuous. The scope encompassed all trees over 6 inches in diameter located within the proposed project limits, provided by the City of Pleasanton. The assessment procedure consisted of the following steps:

1. Identifying the tree species with a trunk diameter of 6 inches and greater within the property and adjacent trees overhanging the property.
2. Evaluate tagged trees with identification numbers and record their locations on a map (update).
3. Measuring the trunk diameter at a point 54 inches above natural grade. Ensuring trees larger than 18 inches in diameter or 35 feet tall are counted as *Heritage* trees.
4. Evaluating the health and structural condition using a scale of 1 – 5 based on visual inspection from the ground:
 - 5 - A healthy, vigorous tree, reasonably free of signs and symptoms of disease, with good structure and form typical of the species.
 - 4 - Tree with slight decline in vigor, small amount of twig dieback, minor structural defects that could be corrected.
 - 3 - Tree with moderate vigor, moderate twig and small branch dieback, thinning of crown, poor leaf color, moderate structural defects that might be mitigated with regular care.
 - 2 - Tree in decline, epicormic growth, extensive dieback of medium to large branches, significant structural defects that cannot be abated.
 - 1 - Tree in severe decline, dieback of scaffold branches and/or trunk; most of the foliage is from epicormic sprouting; extensive structural defects that cannot be abated.
 - 0 – Tree is dead.

5. Rating the suitability for preservation as “high,” “moderate” or “low.” Suitability for preservation considers the health, age and structural condition of the tree, and its potential to remain an asset to the site for years to come.

High: Trees with good health and structural stability that have the potential for longevity at the site.

Moderate: Trees with somewhat declining health and/or structural defects that can be abated with treatment. The tree will require more intense management and monitoring, and may have a shorter life span than those in the ‘high’ category.

Low: Trees in poor health or with significant structural defects that cannot be mitigated. A tree is expected to continue to decline, regardless of treatment. The species or individual may have characteristics that are undesirable for landscapes and generally are unsuited for use areas.

Results for individual trees are located in the **Tree Assessment Form** (see **Attachments**). Tree locations are noted by tree tag number in the **Tree Assessment Plan**.

Description of Trees

One hundred and nineteen (119) trees were evaluated, representing six species (Table 1). All trees assessed were planted when the Sports Park was developed in the 1980s. Although coast live oak is native to the Pleasanton area, trees of this species were not likely indigenous to the site. Species present were typical of those found in landscapes in the region.

The Ken Mercer Sports Park is irrigated with recycled water supplied by Dublin San Ramon Services District.

**Table 1. Tree condition & frequency of occurrence.
 Ken Mercer Skate Park. Pleasanton CA.**

Common Name	Scientific Name	Condition			Total
		Poor (1-2)	Fair (3)	Good (4-5)	
Sweetgum	<i>Liquidambar styraciflua</i>	14	17	1	32
Italian stone pine	<i>Pinus pinea</i>	-	2	-	2
Chinese pistache	<i>Pistacia chinensis</i>	-	-	5	5
London plane	<i>Platanus x hispanica</i>	-	6	17	23
Coast live oak	<i>Quercus agrifolia</i>	6	25	3	34
Coast redwood	<i>Sequoia sempervirens</i>	-	11	12	23
Total		20	61	38	119

Sweetgum was the most frequently encountered species with 32 trees. Sweetgums were concentrated along Hopyard Road and in the southeast corner of the project area (Photo 1). Trees were semi-mature in development with trunk diameters between 6 and 15 inches. Seventeen (17) trees were in fair condition, 14 were poor and #92 was a 6-inch diameter healthy young tree in good condition. Several trees lacked vigor and foliage was often pale yellow and small in size (Photo 1). Dieback of twigs and branches was common.



Photo 1. Group of sweetgum trees just north of existing skate park; note the yellowing leaves and twig dieback.

Most of the 34 coast live oaks were concentrated in a large grove on the east side of the project area (Photo 2). As is typical with groves, trees on the edge had one-sided crowns while those in the interior were either suppressed in development or had high crowns. Other oaks were found among London planes on the north side of the site. Trees were mature in development with trunk diameters ranging from 15 to 36 inches. Nearly 50% of the coast live oaks were 26 inches in diameter or larger.



Photo 2. Coast live oaks growing in a grove at the east side of the project area.

Tree condition was generally fair (25 trees) due largely to asymmetric form and/or defects in the structure. Many oaks had one or more codominant stems or multiple attachments. Six oaks were in poor condition and coast live oaks #19, 38, and 54 were in good condition.

Twenty-three (23) coast redwoods were concentrated along Hopyard Road and the south side of the site (Photo 3). Trees were semi-mature in development with trunk diameters ranging between 13 and 32 inches with half of the redwoods 21 inches or larger. Redwoods had been installed in long rows or small groves. All trees had the pyramidal form and strong central leader that is characteristic of the species.



Photo 3. Looking west at a grove of coast redwoods. Note variation in canopy density and color.

Variations in tree condition were due to tree health. Twelve (12) trees were in good condition and 11 trees were fair slightly thinner canopies and less live foliage.

Twenty-three (23) London plane trees were concentrated on the north side of the site, present along Parkside Drive and surrounding the parking lot. Trees were semi-mature and mature in development. Trunk diameters ranged from 9 to 18 inches with an average of 13 inches. Tree condition was generally either fair (6 trees) or good (17). Planes #7, 10, and 25 were in excellent condition (Photo 4). Trees in fair condition had smaller crowns due to crowding or smaller canopies due to water stress. Planes appeared to have been topped at 6 to 10 ft. many years ago. As a result, the central leader was often absent.



Photo 4. London plane trees #24 – 26 were growing well in a parking lot island and middle tree #25 was in excellent condition.

Chinese pistache #75, 76, 77, 120 and 121 were semi-mature trees in good condition (Photo 5). Tree canopies were full and dense. Trunk diameters ranged from 7 to 13 inches.

Photo 5. Chinese pistache #76 and 77 were semi-mature in development and in good condition.



Italian stone pines #82 and 84 were located in the southwest corner of the site (Photo 6). Tree #82 was 24 inches in diameter and in fair condition. The tree leaned to the south but was otherwise typical of the species. Tree #84 was 49 inches in diameter and also in fair condition. It leaned to the southwest over Hopyard Road. The main trunk was codominant at 12 ft. One of the resulting stems was vertical in orientation and dominated the crown. The second stem leaned over Hopyard Road. The tree had recently been heavily pruned.

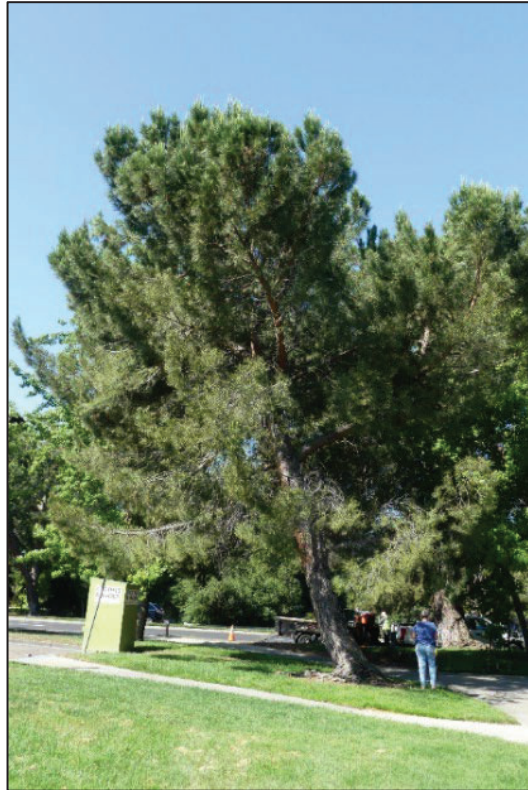


Photo 6. Italian stone pine #82 had a 25-inch diameter and was leaning south.

City of Pleasanton Tree Ordinance

The City of Pleasanton defines a Heritage tree as having a trunk diameter of 18 inches and larger or a height of 35 feet or more. For trees with more than one stem, trunk diameter is determined by adding together the 2 largest stems. We measured trunk diameter using a diameter tape and estimated tree height by eye. Using these criteria, I determined there to be 84 Heritage trees including 34 coast live oaks, 23 coast redwoods, 16 London planes, nine sweetgums and two Italian stone pines.

Suitability for Preservation

Before evaluating the impacts that will occur during development, it is important to consider the quality of the tree resource itself, and the potential for individual trees to function well over an extended length of time. Trees that are preserved on development sites must be carefully selected to make sure that they may survive development impacts, adapt to a new environment, and perform well in the landscape. Our goal is to identify trees that have the potential for long-term health, structural stability, and longevity within the proposed development.

Evaluation of suitability for preservation considers several factors as listed below:

- **Tree health**
Healthy, vigorous trees are better able to tolerate impacts such as root injury, demolition of existing structures, changes in soil grade and moisture, and soil compaction than are non-vigorous trees. For example, coast redwoods with dense full crowns are more likely to tolerate impacts better than redwood trees with thin, browning foliage.
- **Structural integrity**
Trees with significant amounts of wood decay and other structural defects that cannot be corrected are likely to fail. Such trees should not be preserved in areas where damage to people or property is likely. No trees in this development area had any obvious structural issues.
- **Species response**
There is a wide variation in the response of individual species to construction impacts and changes in the environment. London plane, coast live oak and coast redwood are more tolerant of site disturbance than sweetgum and Italian stone pine. These trees are moderate in response to root zone disturbance.
- **Tree age and longevity**
Old trees, while having a significant emotional and aesthetic appeal, have limited physiological capacity to adjust to an altered environment. Young trees are better able to generate new tissue and respond to change. Most trees were semi-mature to mature in development.
- **Invasiveness**
Species that spread across a site and displace desired vegetation are not always appropriate for retention. This is particularly true when indigenous species are displaced. The California Invasive Plant Inventory Database (<http://www.cal-ipc.org/paf/>) lists species identified as being invasive. Pleasanton is part of the Central West Floristic Province. No trees on-site were on the invasive species list.

Each tree was rated for suitability for preservation based on its age, health, structural condition, and ability to safely coexist within a development environment (Table 2). We consider trees with high suitability for preservation to be the best candidates for preservation. We do not recommend the retention of trees with low suitability for preservation in areas where people or property will be present. Retention of trees with moderate suitability for preservation depends upon the intensity of proposed site changes.

**Table 2. Tree Suitability for Preservation
Ken Mercer Skate Park, Pleasanton CA.**

High	Trees in good condition that have the potential for longevity at the site. Nine (9) trees were rated as having high suitability for preservation: London plane #7, 10, 25, 70; coast live oak #54; Chinese pistache #75 and 76; coast redwood #106, and sweetgum #92.
Moderate	Trees in fair health and/or possessing structural defects that may be abated with treatment. Trees in this category require more intense management and monitoring, and may have shorter life-spans than those in the "high in. category. Fifty-six (56) trees were rated as having moderate suitability for preservation including: 19 coast redwoods; 18 London planes; 13 coast live oaks; Chinese pistache #77, 120 121; sweetgum #83, 85 and Italian stone pine #82.
Low	Trees in poor health or possessing significant defects in structure that cannot be abated with treatment. These trees can be expected to decline regardless of management. The species or individual tree may possess either characteristics that are undesirable in landscape settings or be unsuited for use areas. Fifty-four (54) trees were rated as having low suitability for preservation including: 29 sweetgums, 20 coast live oaks, coast redwoods #96, 103 and 109, Italian stone pine #84 and London plane #15.

Evaluation of Impacts and Recommendations

Appropriate tree retention requires a practical match between the location and intensity of construction activities with the quality and health of trees. The **Tree Assessment Form** was the reference point for tree condition and quality. I reviewed the 50% Construction Plan (City of Pleasanton, Dept. of Engineering LC.101, 3/15/23).

The project proposes constructing a new skate park. Much of the southwest side of the park will be filled with the new skate park and amenities. Based on my assessment of the proposed plan and evaluation of the trees, I recommend the removal of 17 trees, three of which are considered *Heritage* due to being over 35' tall (all of which had low suitability for preservation) and three that were under 6 inches in diameter and not included in this inventory (see **Tree Disposition Table** in the **Attachments**). One hundred and five (105) trees are to be preserved. *Heritage* trees in Pleasanton are required to have a permit for removal.

The project calls for the addition of 14 new trees. This will more than offset the three *Heritage* tree removals.

Trees recommended for preservation must have adequate Tree Protection Zones (TPZ) in place. **Tree Preservation Guidelines** can be found on the following pages. Once final details of construction grading and utilities are provided, more project-specific **Tree Preservation Guidelines** can be prepared.

Tree Preservation Guidelines

The goal of tree preservation is not merely tree survival during development but maintenance of tree health and beauty for many years. Trees retained on sites that are either subject to extensive injury during construction or are inadequately maintained become a liability rather than an asset. The response of individual trees depends on the amount of excavation and grading, care with which demolition is undertaken, and construction methods. Coordinating any construction activity inside the **TREE PROTECTION ZONE** (TPZ) can minimize these impacts. Trees retained on this site are located along the northeast and southwest borders. Tree protection fencing should be established at the drip line of any trees adjacent to where work is being performed.

The following recommendations will help reduce impacts on trees from development and maintain and improve their health and vitality through the clearing, grading, and construction phases.

The keys to successful tree preservation at the Skate Park location are:

1. Focus preservation efforts on trees with high and moderate suitability for preservation.
2. If the site is going to be irrigated with recycled water in the future, focus preservation efforts on species with moderate and high tolerance (not coast redwoods).

Design recommendations

1. Locate the trunk of all trees recommended for preservation that are located within 25 ft. of the edge of grading and/or utility installation. Include trunk locations and tree tag numbers on all plans.

2. Establish a **TREE PROTECTION ZONE** around each tree to be preserved. For design purposes, the **TREE PROTECTION ZONE** shall be 3 ft. behind the edge of grading or the dripline, whichever is greater. No grading, excavation, construction or storage of materials shall occur within that zone.
3. Install protection around all trees to be preserved. Tree protection consists of 5-6 ft. tall chain link fencing with 2 in. metal posts pounded directly into the soil, spaced no more than 10 ft. apart. No entry is permitted into a tree protection zone without permission of the project superintendent.
4. Use only herbicides safe for use around trees and labeled for that use, even below pavement.

Pre-construction and demolition treatments and recommendations

1. The demolition contractor shall meet with the Consulting Arborist before beginning work to discuss work procedures and tree protection.
2. Trees to be preserved may require pruning to provide adequate clearance from construction activities. All pruning shall be performed by a licensed State of California contractor possessing the C61 classification license and the D49 specification. All pruning shall adhere to the latest editions of the American National Standards Institute Z133 and A300 standards.
3. Install tree protective fencing at the edge of the **TREE PROTECTION ZONE**. No grading, construction, installation or other activity is permitted within this area.

Tree protection during construction

1. Prior to beginning work, the contractors working in the vicinity of trees to be preserved are required to meet with the Consulting Arborist at the site to review all work procedures, access routes, storage areas and tree protection measures.
2. Any grading, construction, demolition or other work that is expected to encounter tree roots should be monitored by the Consulting Arborist.
3. If injury should occur to any tree during construction, it should be evaluated as soon as possible by the Consulting Arborist so that appropriate treatments can be applied.
4. Fences have been erected to protect trees to be preserved. Fences are to remain until all site work has been completed. Fences may not be relocated or removed without permission of the project superintendent.
5. Construction trailers, traffic and storage areas must remain outside fenced areas at all times.
6. No materials, equipment, spoil, waste or wash-out water may be deposited, stored, or parked within the **TREE PROTECTION ZONE** (fenced area).
7. Any additional tree pruning needed for clearance during construction must be performed by a qualified arborist and not by construction personnel.
8. Any roots damaged during grading or construction shall be exposed to sound tissue and cut cleanly with a saw.

Maintenance of impacted trees

Preserved trees will experience a physical environment different from that of pre-development. As a result, tree health and structural stability should be monitored. Occasional pruning, fertilization, mulching, pest management, replanting and irrigation may be required. In addition, provisions for monitoring both tree health and structural stability following construction must be made a priority. Inspect trees annually and following major storms to identify conditions requiring treatment to manage risk associated with tree failure.

Our procedures included assessing trees for observable defects in structure. This is not to say that trees without significant defects will not fail. The failure of defect-free trees does occur, especially during storm events. Wind forces, for example, can exceed the strength of defect-free wood causing branches and trunks to break. Wind forces coupled with rain can saturate soils, reducing their ability to hold roots and blow over defect-free trees. Although we cannot predict all failures, identifying those trees with observable defects is a critical component of enhancing public safety.

Furthermore, trees change over time. Our inspections represent the condition of the tree at the time of inspection. As trees age, the likelihood of failure of branches or entire trees increases. Annual tree inspections are recommended to identify changes to tree health and structure. In addition, trees should be inspected after storms of unusual severity to evaluate damage and structural changes. Initiating these inspections is the responsibility of the client and/or tree owner.

Summary

One hundred and nineteen (119) trees representing six species were assessed. All trees had been planted when the facility was developed in the early 1980s. Species present were common to landscapes in the East Bay area. Four species (coast redwood, sweetgum, coast live oak, and London plane) comprised over 90% of the trees assessed. Tree condition was variable: 61 trees were in fair condition, 38 were good and 20 were poor. Tree condition varied by species and was related to 1) tolerance to the high salt content of recycled water and 2) the presence of defects such as poor form and structure. Eighty-four (84) trees met the City's criteria for *Heritage* status.

HortScience | Bartlett Consulting



Scott Stringer
Consulting Arborist & Urban Forester
ISA Certified Arborist # WE-5544A
ISA Tree Risk Assessment Qualified



Attachments

Tree Assessment Form

Tree Disposition Table

Tree Assessment Plan



HORT SCIENCE

BARTLETT CONSULTING

Divisions of The F.A. Bartlett Tree Expert Company

Tree Assessment

Ken Mercer Skate Park
City of Pleasanton, CA
July 18, 2023



Tree No.	Species	Trunk Diameter (in.)	Protected Tree?	Condition 1=poor 5=excellent	Suitability for Preservation	Comments
1	Coast live oak	18	Yes	3	Low	Parking lot; suppressed by adj; London plane; bowed E; wide crown.
2	London plane	16	Yes	4	Moderate	Multiple attachments @ 10'; lost central leader; wide crown.
3	London plane	16	Yes	4	Moderate	Narrow form; crowded.
4	London plane	18	Yes	4	Moderate	One-sided to S.; multiple attachments @ 10'.
5	London plane	16	Yes	4	Moderate	Multiple attachments @ 10'; lost central leader; >35' tall.
6	London plane	13	Yes	4	Moderate	Narrow form; multiple attachments at 10'; >35 tall.
7	London plane	15	Yes	5	High	Good structure and form, narrow crown.
8	London plane	15	Yes	4	Moderate	Low laterals sweep towards vertical.
9	Coast live oak	20	Yes	3	Moderate	Leans S; over parking; codominant trunks @ 10'; partly suppressed.
10	London plane	15	Yes	5	High	Good tree.
11	London plane	10	No	3	Moderate	One-sided to N.; lost central leader.
12	Coast live oak	17	Yes	3	Moderate	Leans SW.; over parking; base outside of dripline; multiple attachments @ 12'.
13	London plane	16	Yes	4	Moderate	Multiple attachments @ 8'; branch dieback.
14	Coast live oak	17	Yes	3	Low	Poor form & structure; suppressed; crowded; irregular form; codominant trunks @ 6' & 7'.
15	London plane	10	No	3	Low	Narrow form; crowded; partly suppressed; smaller crown.
16	London plane	10	Yes	3	Moderate	Crowded; narrow & upright.
17	London plane	14	Yes	4	Moderate	Multiple attachments at 10'; wide crown.
18	London plane	16	Yes	4	Moderate	One-sided to W.; multiple attachments @ 10'.
19	Coast live oak	26	Yes	4	Moderate	One-sided to S.; several codominant attachments; small branch dieback.
20	Coast live oak	20	Yes	3	Low	Wide crown; lost central leader; small dead branches.
21	London plane	9	No	4	Moderate	4' parking lot planter; good form.

Tree Assessment

Ken Mercer Skate Park
City of Pleasanton, CA
July 18, 2023



Tree No.	Species	Trunk Diameter (in.)	Protected Tree?	Condition 1=poor 5=excellent	Suitability for Preservation	Comments
22	London plane	9	No	3	Moderate	4' parking lot planter; multiple attachments @ 7'; lacks vigor.
23	London plane	12	No	4	Moderate	10' parking lot planter; multiple attachments @ 7'; one-sided to N.
24	London plane	12	Yes	4	Moderate	4' from curb; good tree; low vigor.
25	London plane	16	Yes	5	High	5' from curb; good tree.
26	London plane	14	Yes	4	Moderate	10' wide planter; codominant trunks @ 10'; twig dieback.
27	London plane	9	No	3	Moderate	4' parking lot planter; lost central leader.
28	London plane	10	No	3	Moderate	4' parking lot planter; multiple attachments at 10'.
29	Coast live oak	27	Yes	3	Moderate	Slight lean S.; high crown; wide crown; adjacent to the sidewalk.
30	Coast live oak	28	Yes	3	Low	One-sided to E.; codominant trunks @ 6' & 8'.
31	Coast live oak	32	Yes	3	Low	Codominant trunks @ 6'; developing heavy lateral branches; slightly thin canopy; dead branches.
32	Coast live oak	22	Yes	3	Moderate	Codominant trunks @ 6' & 7'; slight gap in canopy; dead branches.
33	Coast live oak	27	Yes	3	Low	Codominant trunks @ 6' & 7'; crowded; heavy to NW.; wide crown.
34	Coast live oak	18	Yes	2	Low	Codominant trunks @ 6'; interior; poor form & structure; dead branches.
35	Coast live oak	19	Yes	2	Low	Poor form & structure; codominant trunks @ 6'; wedge of a crown to W; dead branches.
36	Coast live oak	28	Yes	3	Low	One-sided to NW.; codominant trunks @ 10'; checked & bleeding bark.
37	Coast live oak	33	Yes	3	Low	Large base; multiple attachments @ 10'; one-sided to W.; hanger; dead branches.
38	Coast live oak	26	Yes	4	Moderate	High crown; codominant trunks @ 7'; recommend a cable.

Tree Assessment

Ken Mercer Skate Park
City of Pleasanton, CA
July 18, 2023



Tree No.	Species	Trunk Diameter (in.)	Protected Tree?	Condition 1=poor 5=excellent	Suitability for Preservation	Comments
39	Coast live oak	36	Yes	3	Low	High crown; multiple attachments @ 6'; codominant trunks @ 18'; mostly upright; dead branches.
40	Coast live oak	26	Yes	3	Moderate	Codominant trunks @ 6' & 11', both with included bark; high crown; dead branches'; potential cable.
41	Coast live oak	28	Yes	3	Moderate	Multiple attachments @ 8'; high crown.
42	Coast live oak	15	Yes	2	Low	Leans E.; poor form & structure; >35' tall.
43	Coast live oak	24	Yes	3	Low	Swollen base with checked bark; basal wound on W; with decay; irregular form; dead branches; low vigor.
44	Coast live oak	23	Yes	2	Low	Crown a wedge to SW; dead branches.
45	Coast live oak	26	Yes	3	Low	Suppressed; one-sided to S.; multiple attachments @ 8'; dead branches.
46	Coast live oak	35	Yes	3	Moderate	Codominant trunks @ 5'; multiple attachments @ 9'; one-sided to W; dead, broken and hanging branches.
47	Sweetgum	10	No	2	Low	Poor form & structure; several codominant attachments; twig dieback; yellowing foliage; previous branch failures.
48	Sweetgum	14	No	2	Low	Poor form & structure; codominant trunks @ 5'; branch failures; yellowing foliage.
49	Sweetgum	10	Yes	3	Low	Codominant trunks @ 10'; pale foliage; narrow crown; >35' tall.
50	Sweetgum	12	Yes	3	Low	Irregular form; yellowing foliage; low vigor; twig dieback; >35' tall.
51	Sweetgum	10	Yes	2	Low	Very poor condition; twig & branch dieback to 1"; >35'.
52	Sweetgum	8	No	3	Low	One-sided to N; lost central leader.
54	Coast live oak	36	Yes	4	High	Codominant trunks @ 12'; 1 stem vertical & dominant; decay in 12" wound on S; side.
55	Sweetgum	8,6	No	2	Low	Poor form & structure; codominant trunks @ 2'; branch dieback.
56	Sweetgum	8	No	2	Low	Codominant trunks @ 8'; separated; branch dieback.
57	Sweetgum	8	No	2	Low	Leans S.; twig dieback; codominant stem removed.

Tree Assessment

Ken Mercer Skate Park
City of Pleasanton, CA
July 18, 2023



Tree No.	Species	Trunk Diameter (in.)	Protected Tree?	Condition 1=poor 5=excellent	Suitability for Preservation	Comments
58	Sweetgum	7	No	3	Low	One-sided to N.; poor form.
59	Coast redwood	24	Yes	4	Moderate	Typical form & structure; one-sided to W.
60	Coast redwood	26	Yes	4	Moderate	Typical form & structure; thin crown.
61	Coast redwood	23	Yes	4	Moderate	Typical form & structure; thin crown.
62	Coast redwood	22	Yes	4	Moderate	Typical form & structure; thin crown.
63	Sweetgum	11	No	2	Low	Poor form & structure; multiple attachments @ 7'; twig dieback.
64	Sweetgum	8	No	2	Low	Poor form & structure; small crown.
65	Coast live oak	22	Yes	3	Low	One-sided to W.; multiple attachments @ 5'; lost central leader; low & squat form
66	Coast live oak	20	Yes	2	Low	Poor form & structure; codominant trunks @ 5'; separated; wide crown.
67	Coast live oak	30	Yes	3	Low	Irregular form; one-sided to SW.; codominant trunks @ 6'; large, wide crown.
68	Coast live oak	27	Yes	3	Moderate	Multiple attachments @ 5'; 4 stems; 2 upright; 2 bowed flat.
69	Coast live oak	19	Yes	2	Low	Poor form & structure; multiple attachments @ 6'; one-sided to SE.
70	London plane	18	Yes	4	High	One-sided to S.; surface roots.
71	Coast live oak	27	Yes	3	Moderate	Upright form; codominant trunks @ 6'.
72	Coast live oak	35	Yes	3	Moderate	Multiple attachments @ 6'; one-sided to N; and headed back on north stem.
73	Coast live oak	23	Yes	3	Low	Poor form & structure; crown reduced; codominant trunks @ 12'; both bowed flat to S.
74	Coast live oak	19	Yes	3	Moderate	Codominant trunks @ 7'; crown raised.
75	Chinese pistache	13	No	4	High	Typical form & structure; multiple attachments @ 10'.
76	Chinese pistache	13	No	4	High	Typical form & structure; multiple attachments @ 6'; twig dieback.

Tree Assessment

Ken Mercer Skate Park
City of Pleasanton, CA
July 18, 2023



Tree No.	Species	Trunk Diameter (in.)	Protected Tree?	Condition	Suitability for Preservation	Comments
				1=poor 5=excellent		
77	Chinese pistache	11	No	4	Moderate	Typical form & structure; codominant trunks @ 6' & 7'; lifted; twig dieback.
78	Coast redwood	21	Yes	3	Moderate	Typical form & structure; thin canopy; browning leaves.
79	Coast redwood	20	Yes	4	Moderate	Typical form & structure; thin canopy.
80	Coast redwood	18	Yes	3	Moderate	Typical form & structure; thin canopy; interior.
81	Coast redwood	23	Yes	4	Moderate	Typical form & structure; thin canopy.
82	Italian stone pine	25	Yes	3	Moderate	Typical form & structure; leans S; previous branch failures.
83	Sweetgum	13	No	3	Moderate	Fair form & structure; laterals sweep upright.
84	Italian stone pine	49	Yes	3	Low	Slight lean SW.; codominant trunks @ 12'; huge tree; 1 stem vertical; 2nd leans over Hopyard; pruned heavily.
85	Sweetgum	9	No	3	Moderate	Poor form; partly corrected lean S.
86	Sweetgum	8	No	2	Low	Poor form & structure; upper crown bowed flat to S.; dead branches.
87	Sweetgum	11	Yes	3	Low	Okay tree; partly corrected lean S.; one-sided to E.; dead branches; >35' tall.
88	Sweetgum	12	Yes	2	Low	Poor form & structure; several sets of codominant trunks; very irregular form; twig dieback; >35' tall.
89	Sweetgum	8	No	2	Low	Poor form & structure; broad curve to trunk; one-sided to N.
90	Sweetgum	10	No	3	Low	Codominant trunks @ 12'; upright; branch dieback.
92	Sweetgum	6	No	5	High	Typical form & structure; healthy young tree.
93	Sweetgum	11	No	3	Low	Lost central leader; irregular form; laterals starting to bow outwards; twig dieback.
94	Sweetgum	11	No	3	Low	Lost central leader; irregular form; branch dieback.
95	Sweetgum	11	No	3	Low	Multiple attachments @ 7'; leaning out.
96	Coast redwood	13	Yes	3	Low	Typical form & structure; very thin canopy.
97	Coast redwood	21	Yes	4	Moderate	Typical form & structure; thin canopy; broken branches.
98	Coast redwood	17	Yes	3	Moderate	Typical form & structure; thin crown.

Tree Assessment

Ken Mercer Skate Park
City of Pleasanton, CA
July 18, 2023



Tree No.	Species	Trunk Diameter (in.)	Protected Tree?	Condition	Suitability for Preservation	Comments
				1=poor 5=excellent		
99	Coast redwood	21	Yes	3	Moderate	Typical form & structure; thin crown.
100	Coast redwood	22	Yes	3	Moderate	Typical form & structure; thin crown.
101	Coast redwood	20	Yes	3	Moderate	Typical form & structure; thin crown.
102	Coast redwood	23	Yes	4	Moderate	Typical form & structure; thin crown.
103	Coast redwood	20	Yes	3	Low	Typical form & structure; top of tree thin.
104	Coast redwood	20	Yes	4	Moderate	Typical form & structure; thin crown; dead branches.
105	Coast redwood	32	Yes	3	Moderate	Typical form & structure; thin crown.
106	Coast redwood	25	Yes	4	High	Typical form & structure; moderate vigor.
107	Coast redwood	26	Yes	4	Moderate	Typical form & structure; thin crown; browning leaves.
108	Coast redwood	24	Yes	3	Moderate	Typical form & structure; thin crown; low vigor; browning leaves.
109	Coast redwood	22	Yes	3	Low	Typical form & structure; thin crown; low vigor; browning leaves.
110	Coast redwood	26	Yes	4	Moderate	Typical form & structure; thin canopy.
112	Sweetgum	8	No	2	Low	Laterals sweep upright; branch dieback.
113	Sweetgum	11	No	2	Low	Poor form & structure; ext.; twig dieback; yellowing foliage.
115	Sweetgum	11	Yes	3	Low	Slight lean S.; lost central leader; epicormic sprouts.
116	Sweetgum	13	Yes	3	Low	Slight lean SE.; several sets of codominant attachments; branch dieback.
117	Sweetgum	12	Yes	3	Low	Slight lean SE.; several sets of codominant attachments; branch dieback.
118	Sweetgum	14	No	3	Low	Several sets of codominant attachments; lost central leader; branch dieback.
119	Sweetgum	11	No	3	Low	Multiple attachments @ 14'; lost central leader; branch dieback.
120	Chinese pistache	7	No	4	Moderate	Typical growth habit; twig dieback.
121	Chinese pistache	8	No	4	Moderate	Typical form & structure; multiple attachments @ 10'.
122	Sweetgum	10	No	2	Low	Codominant trunks @ 12'; branch dieback; epicormic sprouts.

Tree Assessment

Ken Mercer Skate Park
City of Pleasanton, CA
July 18, 2023



Tree No.	Species	Trunk Diameter (in.)	Protected Tree?	Condition	Suitability for Preservation	Comments
123	Sweetgum	15	Yes	3 1=poor 5=excellent	Low	Several sets of codominant attachments; lost central leader; branch dieback.

Tree Disposition

Ken Mercer Skate Park
City of Pleasanton, CA
July 18, 2023



Tree No.	Species	Trunk Diameter (in.)	Protected Tree?	Disposition	Comments
1	Coast live oak	18	Yes	Preserve	Outside development footprint.
2	London plane	16	Yes	Preserve	Outside development footprint.
3	London plane	16	Yes	Preserve	Outside development footprint.
4	London plane	18	Yes	Preserve	Outside development footprint.
5	London plane	16	Yes	Preserve	Outside development footprint.
6	London plane	13	Yes	Preserve	Outside development footprint.
7	London plane	15	Yes	Preserve	Outside development footprint.
8	London plane	15	Yes	Preserve	Outside development footprint.
9	Coast live oak	20	Yes	Preserve	Outside development footprint.
10	London plane	15	Yes	Preserve	Outside development footprint.
11	London plane	10	No	Preserve	Outside development footprint.
12	Coast live oak	17	Yes	Preserve	Outside development footprint.
13	London plane	16	Yes	Preserve	Outside development footprint.
14	Coast live oak	17	Yes	Preserve	Outside development footprint.
15	London plane	10	No	Preserve	Outside development footprint.
16	London plane	10	Yes	Preserve	Outside development footprint.
17	London plane	14	Yes	Preserve	Outside development footprint.
18	London plane	16	Yes	Preserve	Outside development footprint.
19	Coast live oak	26	Yes	Preserve	Outside development footprint.
20	Coast live oak	20	Yes	Preserve	Outside development footprint.
21	London plane	9	No	Preserve	Outside development footprint.
22	London plane	9	No	Preserve	Outside development footprint.
23	London plane	12	No	Preserve	Outside development footprint.
24	London plane	12	Yes	Preserve	Outside development footprint.
25	London plane	16	Yes	Preserve	Outside development footprint.
26	London plane	14	Yes	Preserve	Outside development footprint.
27	London plane	9	No	Preserve	Outside development footprint.
28	London plane	10	No	Preserve	Outside development footprint.
29	Coast live oak	27	Yes	Preserve	Outside development footprint.
30	Coast live oak	28	Yes	Preserve	Outside development footprint.
31	Coast live oak	32	Yes	Preserve	Outside development footprint.
32	Coast live oak	22	Yes	Preserve	Outside development footprint.
33	Coast live oak	27	Yes	Preserve	Outside development footprint.
34	Coast live oak	18	Yes	Preserve	Outside development footprint.
35	Coast live oak	19	Yes	Preserve	Outside development footprint.
36	Coast live oak	28	Yes	Preserve	Outside development footprint.
37	Coast live oak	33	Yes	Preserve	Outside development footprint.
38	Coast live oak	26	Yes	Preserve	Outside development footprint.
39	Coast live oak	36	Yes	Preserve	Outside development footprint.

Tree Disposition

Ken Mercer Skate Park
City of Pleasanton, CA
July 18, 2023



Tree No.	Species	Trunk Diameter (in.)	Protected Tree?	Disposition	Comments
40	Coast live oak	26	Yes	Preserve	Outside development footprint.
41	Coast live oak	28	Yes	Preserve	Outside development footprint.
42	Coast live oak	15	Yes	Preserve	Outside development footprint.
43	Coast live oak	24	Yes	Preserve	Outside development footprint.
44	Coast live oak	23	Yes	Preserve	Outside development footprint.
45	Coast live oak	26	Yes	Preserve	Outside development footprint.
46	Coast live oak	35	Yes	Preserve	Outside development footprint.
47	Sweetgum	10	No	Remove	Within skate park development.
48	Sweetgum	14	No	Remove	Within skate park development.
49	Sweetgum	10	Yes	Remove	Within skate park development.
50	Sweetgum	12	Yes	Remove	Within skate park development.
51	Sweetgum	10	Yes	Remove	Within skate park development.
52	Sweetgum	8	No	Remove	Within skate park development.
54	Coast live oak	36	Yes	Preserve	Preserve in new mulch bed.
55	Sweetgum	8,6	No	Remove	Within skate park development.
56	Sweetgum	8	No	Remove	Within skate park development.
57	Sweetgum	8	No	Remove	Poor condition.
58	Sweetgum	7	No	Remove	Poor condition.
59	Coast redwood	24	Yes	Preserve	Preserve within lawn area.
60	Coast redwood	26	Yes	Preserve	Preserve within lawn area.
61	Coast redwood	23	Yes	Preserve	Preserve within lawn area.
62	Coast redwood	22	Yes	Preserve	Preserve within lawn area.
63	Sweetgum	11	No	Remove	Poor condition.
64	Sweetgum	8	No	Remove	Poor condition.
65	Coast live oak	22	Yes	Preserve	Outside development footprint.
66	Coast live oak	20	Yes	Preserve	Outside development footprint.
67	Coast live oak	30	Yes	Preserve	Outside development footprint.
68	Coast live oak	27	Yes	Preserve	Outside development footprint.
69	Coast live oak	19	Yes	Preserve	Outside development footprint.
70	London plane	18	Yes	Preserve	Outside development footprint.
71	Coast live oak	27	Yes	Preserve	Outside development footprint.
72	Coast live oak	35	Yes	Preserve	Outside development footprint.
73	Coast live oak	23	Yes	Preserve	Outside development footprint.
74	Coast live oak	19	Yes	Preserve	Outside development footprint.
75	Chinese pistache	13	No	Preserve	Preserve in new mulch bed.
76	Chinese pistache	13	No	Remove	Within skate park development.
77	Chinese pistache	11	No	Preserve	Within feet of skate park development.
78	Coast redwood	21	Yes	Preserve	Preserve within lawn area.
79	Coast redwood	20	Yes	Preserve	Preserve within lawn area.

Tree Disposition

Ken Mercer Skate Park
City of Pleasanton, CA
July 18, 2023



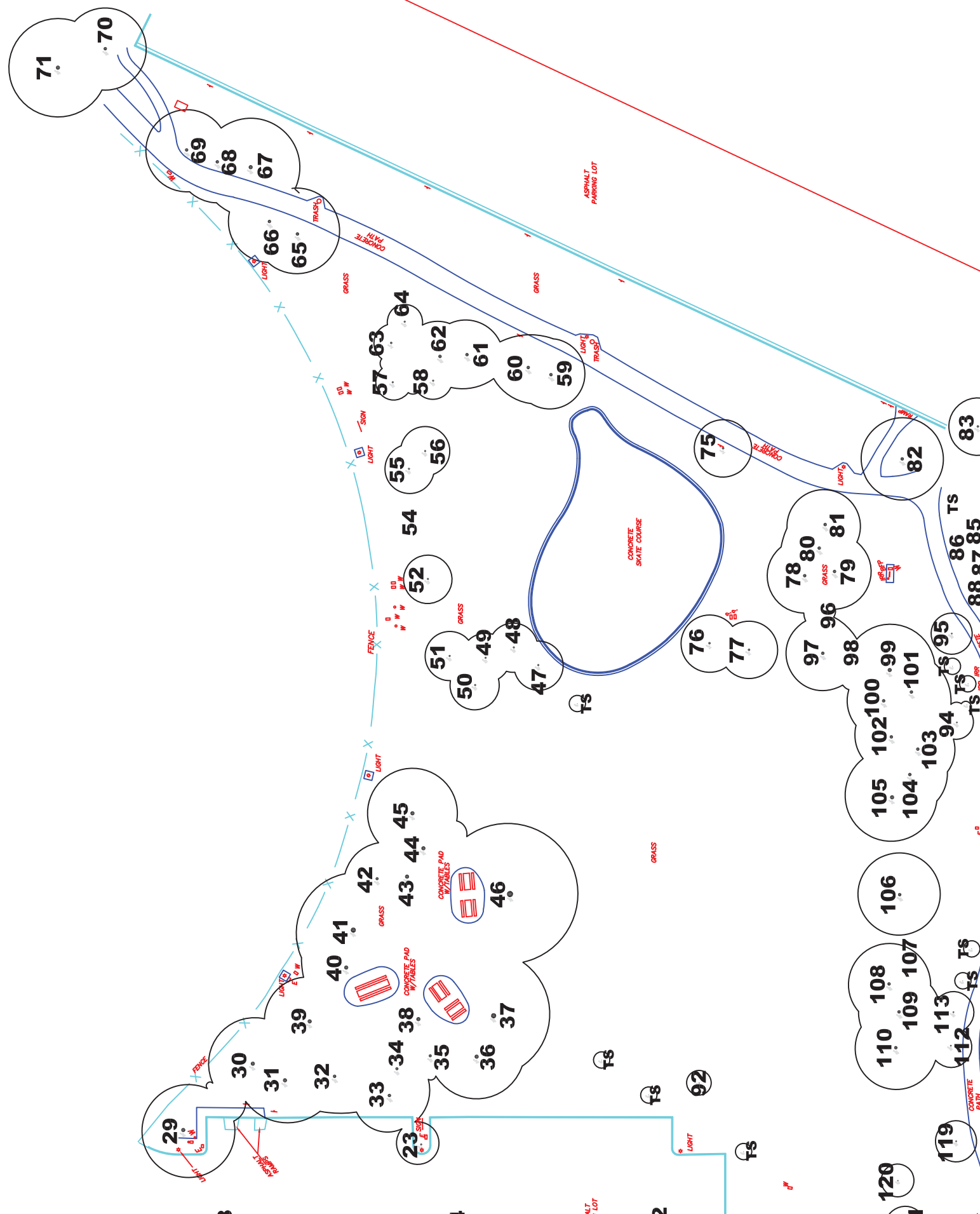
Tree No.	Species	Trunk Diameter (in.)	Protected Tree?	Disposition	Comments
80	Coast redwood	18	Yes	Preserve	Preserve within lawn area.
81	Coast redwood	23	Yes	Preserve	Preserve within lawn area.
82	Italian stone pine	25	Yes	Preserve	Outside development footprint.
83	Sweetgum	13	No	Preserve	Outside development footprint.
84	Italian stone pine	49	Yes	Preserve	Outside development footprint.
85	Sweetgum	9	No	Preserve	Outside development footprint.
86	Sweetgum	8	No	Preserve	Outside development footprint.
87	Sweetgum	11	Yes	Preserve	Outside development footprint.
88	Sweetgum	12	Yes	Preserve	Outside development footprint.
89	Sweetgum	8	No	Preserve	Outside development footprint.
90	Sweetgum	10	No	Preserve	Outside development footprint.
92	Sweetgum	6	No	Remove	Outside development footprint.
93	Sweetgum	11	No	Preserve	Outside development footprint.
94	Sweetgum	11	No	Preserve	Outside development footprint.
95	Sweetgum	11	No	Preserve	Outside development footprint.
96	Coast redwood	13	Yes	Preserve	Outside development footprint.
97	Coast redwood	21	Yes	Preserve	Within feet of skate park development.
98	Coast redwood	17	Yes	Preserve	Within feet of skate park development.
99	Coast redwood	21	Yes	Preserve	Within feet of skate park development.
100	Coast redwood	22	Yes	Preserve	Within feet of skate park development.
101	Coast redwood	20	Yes	Preserve	Within feet of skate park development.
102	Coast redwood	23	Yes	Preserve	Within feet of skate park development.
103	Coast redwood	20	Yes	Preserve	Within feet of skate park development.
104	Coast redwood	20	Yes	Preserve	Within feet of skate park development.
105	Coast redwood	32	Yes	Preserve	Within feet of skate park development.
106	Coast redwood	25	Yes	Preserve	Within feet of skate park development.
107	Coast redwood	26	Yes	Preserve	Within feet of skate park development.
108	Coast redwood	24	Yes	Preserve	Within feet of skate park development.
109	Coast redwood	22	Yes	Preserve	Within feet of skate park development.
110	Coast redwood	26	Yes	Preserve	Within feet of skate park development.
112	Sweetgum	8	No	Preserve	Outside development footprint.
113	Sweetgum	11	No	Preserve	Outside development footprint.
115	Sweetgum	11	Yes	Preserve	Outside development footprint.
116	Sweetgum	13	Yes	Preserve	Outside development footprint.
117	Sweetgum	12	Yes	Preserve	Outside development footprint.
118	Sweetgum	14	No	Preserve	Outside development footprint.
119	Sweetgum	11	No	Preserve	Outside development footprint.
120	Chinese pistache	7	No	Preserve	Outside development footprint.
121	Chinese pistache	8	No	Preserve	Outside development footprint.

Tree Disposition

Ken Mercer Skate Park
City of Pleasanton, CA
July 18, 2023



Tree No.	Species	Trunk Diameter (in.)	Protected Tree?	Disposition	Comments
122	Sweetgum	10	No	Preserve	Outside development footprint.
123	Sweetgum	15	Yes	Preserve	Outside development footprint.



8

4

2

1

3



MERSCH BUDCO & ASSOCIATES LLC
 167 Constitution Drive
 Menlo Park CA 94025
 Phone: 650-566-9260
 Fax: 650-566-9266
 Web: www.mersch-budco.com
 Email: bob@mersch-budco.com

Quotation

Ken Mercer Skate Park - Pleasanton
 Please check this list with plans and specifications to avoid any possibility of error. Quote is subject to terms of sale as specified on the manufacturers current price sheet.

Quote No: 17652-1
Quote Date: 1/12/2024
Print Date: 1/12/2024
Page: 1 of 1
Bid Due: 1/12/2024
Exp Date: 2/11/2024

Quote Information	Customer Information	Comments
Quote No: 17652-1 Job: Ken Mercer Skate Park - Pleasanton Footnotes: * Bid Due: 1/12/2024 Exp Date: 2/11/2024	RRM Design Group 325 Davis Street San Leandro 94577	

Line	Item Description	Quantity	List Price	Ext List	Footnotes
1	ZOELLER 6123-XXXX Click for Spec Sheet G-6123 3.0 bhp 460v/3ph 4" Horizontal Discharge, 2-1/2" Solids Handling Pump w/ SC/SC Lower Shaft Seal, Semi-Open impeller (6-3/8" dia.) & 50' Cord	2	5,719.00	11,438.00	
2	ZOELLER 124D4-0001 Click for Specification Control,Pivot Pro/Dup/3Ph/200/230/460V/4.0-6.3FLA/Standard	1	3,099.00	3,099.00	
3	ZOELLER 10-1883 Click for Spec Sheet Variable Level Mechanical Float Switch w/ 50' Cord & Adjustable Weight 125/250V/5A	3	136.00	408.00	
4	ZOELLER 10-0253 Click for Spec Sheet Stainless Steel Float Switch Bracket for 3 or 4 Float System	1	180.00	180.00	
5	ZOELLER 10-0438 Click for Spec Sheet Stainless Steel Cable/Float Cord Bracket	1	212.00	212.00	
6	ZOELLER 33-XXJP 60" x 192" Duplex Fiberglass Prepackaged Basin w/Rail System, 60" x 48" Attached Valve Box, 4" Sch.80 PVC Internal Piping, Check Valves, Plug Valves, Aluminum Gas Tight Hatch Cover, (1) 8" C/I Inlet Hub supplied loose, (2) 2" S.S. Electrical Couplings supplied loose, & Steel Anti-Floatation Device	1	74,700.00	74,700.00	
7	ZOELLER 39-0175 Click for Specification Rigid Lifting Bail for 61HD and 71 Series Pumps	2	410.00	820.00	
8	ZOELLER 6039-0032 Click for Spec Sheet Cable,Lifting&Choker/Perm/SS/15'Lg/.25"Dia	2	540.00	1,080.00	
	Footnote * <i>Quote prices based on shipment to wholesaler only</i> <i>Items on this quote are based on current information provided to our company. Pricing and quote is valid for 30 days.</i>				
	Quote Total:			91,937.00	

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SECTION: 22.10.100

ZM1750

0823

Supersedes

0323

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 Tel: (502) 778-2731 • 1 (800) 928-PUMP

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Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.



61 HD SERIES TECHNICAL DATA 1-7.5 BHP / 1750 RPM



MODEL NUMBER:	<input type="checkbox"/> 6120	<input type="checkbox"/> 6121	<input type="checkbox"/> 6122	<input type="checkbox"/> 6123	<input type="checkbox"/> 6124	<input type="checkbox"/> 6125
PUMP NAME PLATE HORSEPOWER: BHP	1.0	1.5	2.0	3.0	5.0	7.5
SERVICE FACTOR:	1.2	1.2	1.2	1.2	1.2	1.0
NEC LOCKED ROTOR CODE:	M	J	K	F	E	C
MAXIMUM KW INPUT:	1.4	1.9	2.4	3.5	5.5	6.9
3 PHASE IMPELLER DIA.: in (mm) STANDARD	4-7/8" (124 mm)	5-3/8" (137 mm)	5-3/4" (146 mm)	6-3/8" (162 mm)	7" (178 mm)	7-1/2" (191 mm)
DISCHARGE SIZE:	<input type="checkbox"/> 3" NPT Vertical <input type="checkbox"/> 3" Horizontal Flange <input type="checkbox"/> 4" Horizontal Flange					

SOLID SIZE: in (mm)	2 -1/2"(64 mm) OPTIONAL <input type="checkbox"/> 3"(76 mm)	TANDEM SEALS:	Standard
IMPELLER TYPE:	DUCTILE IRON SEMI-OPEN OPTIONAL <input type="checkbox"/> DUCTILE IRON VORTEX	MOTOR DESIGN LETTER:	NEMA B
FLANGE:	ANSI B16.1	POWER CORD LENGTH: FT (M)	25' (7.6 m) <input type="checkbox"/>
PUMP NET WEIGHT: lbs. (kg)	245 lbs. (111kg)	POWER CORD:	#12-4 SOOW*
MOTOR SHAFT	416 SS	STATOR & LEAD WIRES INSULATION:	Class F
RPM:	1750	MAXIMUM STATOR TEMPERATURE:	311 °F (155 °C)
MOTOR TYPE:	STANDARD SUBMERSIBLE	**DRY PIT (1-3 BHP, INTERMITTENT DUTY)	<input type="checkbox"/>
	<input type="checkbox"/> **** INVERTER DUTY SUBMERSIBLE (1-5 BHP, 230/460 VOLT, 3 PHASE ONLY)	**HIGH TEMP (1-3 BHP ONLY)	<input type="checkbox"/> (175 °F Max.)

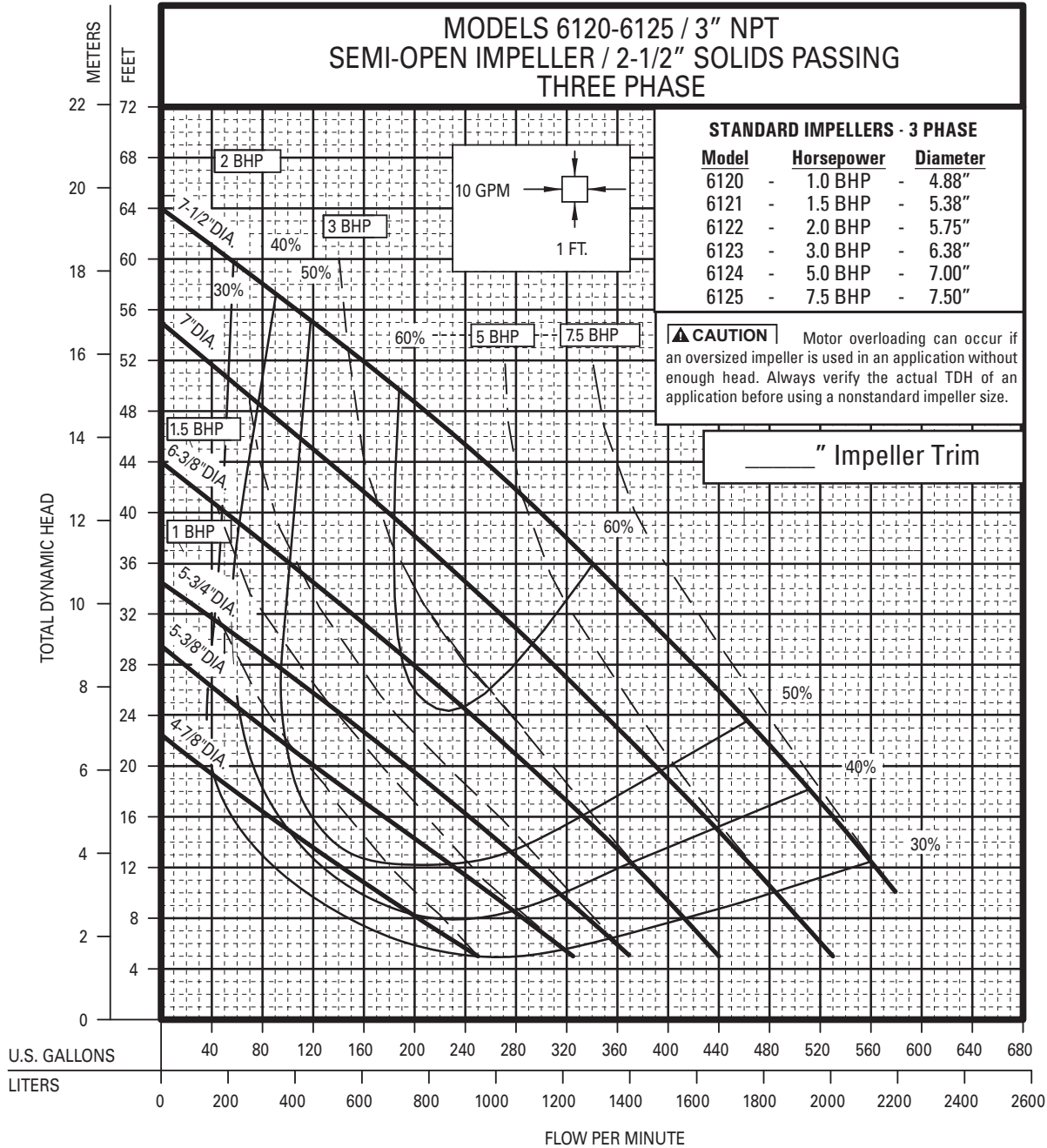
SHAFT SEAL CONSTRUCTION:	STANDARD	UPPER - CARBON CERAMIC LOWER - SILICON CARBIDE/SILICON CARBIDE
	OPTIONAL UPPER	<input type="checkbox"/> SILICON CARBIDE/SILICON CARBIDE <input type="checkbox"/> SILICON CARBIDE/SILICON CARBIDE VITON
	OPTIONAL LOWER	<input type="checkbox"/> SILICON CARBIDE/SILICON CARBIDE VITON
O-RING ELASTOMERS	STANDARD	BUNA-N
	OPTIONAL	<input type="checkbox"/> VITON
STANDARD SENSING DEVICES*** w/ #18-5 SOOW Cord	MOTOR THERMAL SHUTOFF	THERMAL SENSORS WITH AUTOMATIC RESET
	MOISTURE DETECTION	MOISTURE SENSING PROBES
IMPELLER TRIM:	OPTIONAL	<input type="checkbox"/> DESIGN POINT: ___ GPM @ ___' TDH, IMPELLER DIA. ___"
RECOMMENDED FLUID LEVEL FOR CONTINUOUS OPERATIONS: in (m)	24" (0.6m) (For Continuous Duty, Refer to Warranty)	
MAXIMUM WATER TEMPERATURE FOR CONTINUOUS OPERATION:	104 °F (40 °C)	

* Models with a FLA greater than 20 amps use #8-4 gauge power cord. ** 1-3 BHP Only. Contact factory. These configurations are not CSA listed.
 *** Requires a circuit in control panel to function. **** 30-60Hz Max, NEMA MG-1, Part 30, cCSAus certified with type VPWM inverter, 230/460 Volt, 3 Ph models only

MODEL	BHP	SERVICE FACTOR	<input type="checkbox"/> 230V / 1 PHASE		<input type="checkbox"/> 200V / 3 PHASE		<input type="checkbox"/> 230V / 3 PHASE		<input type="checkbox"/> 460V / 3 PHASE		<input type="checkbox"/> 575V / 3 PHASE	
			FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA
6120	1	1.2	6.9	48.0	4.8	32.0	4.2	28.0	2.1	14.0	--	--
6121	1.5	1.2	8.9	48.0	5.9	32.0	5.1	28.0	2.6	14.0	--	--
6122	2	1.2	14.5	86.0	7.8	46.0	6.8	41.0	3.4	20.5	2.7	16.2
6123	3	1.2	17.0	86.0	11.0	46.0	9.6	41.0	4.8	20.5	3.9	16.2
6124	5	1.2	28.0	139.0	17.5	64.0	15.2	58.0	7.6	29.0	6.1	23.0
6125	7.5	1.0	--	--	25.3	83.0	22.0	72.0	11.0	36.0	9.0	29.0



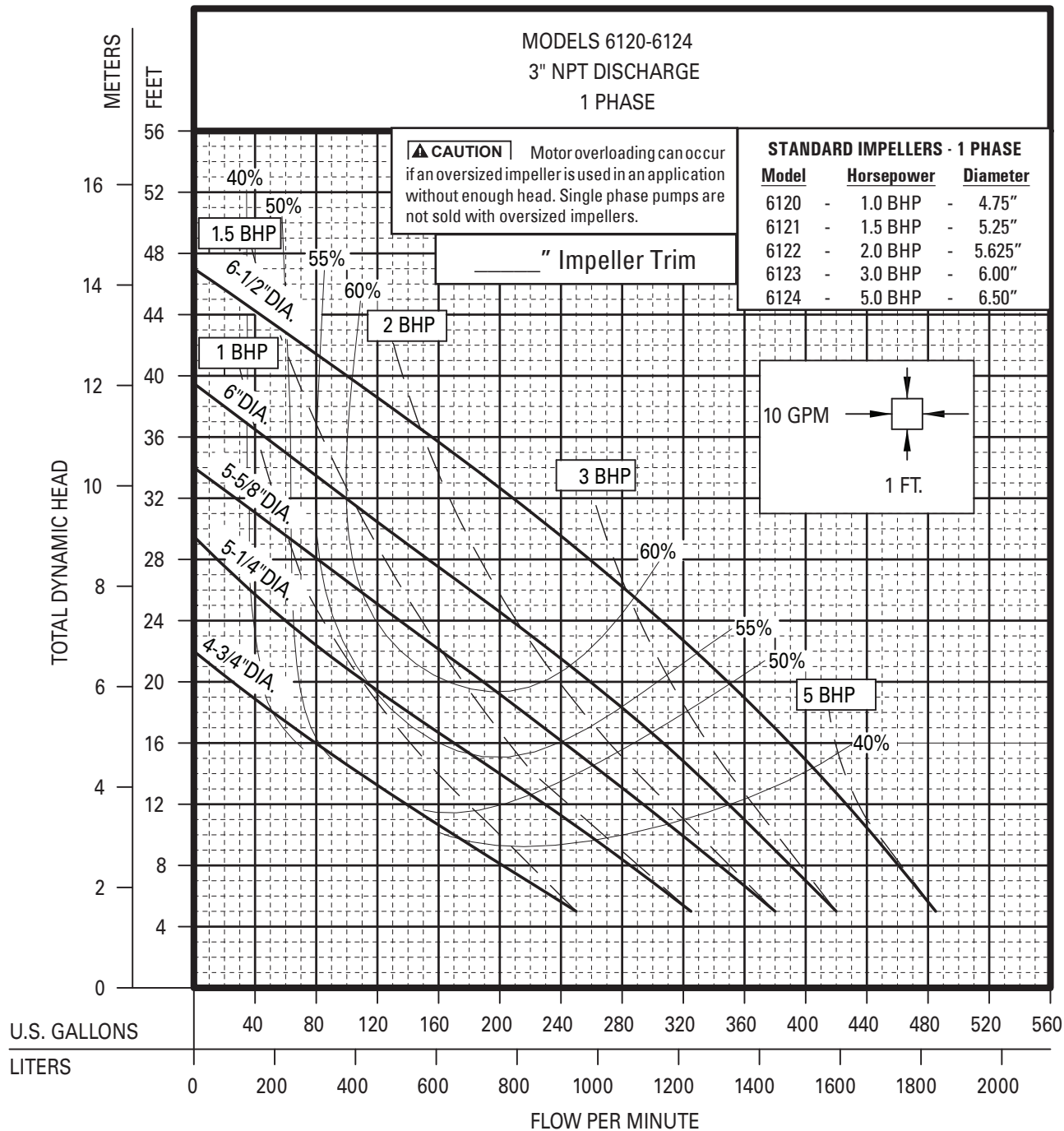
Semi-Open Impeller PERFORMANCE DATA 3 PHASE 3" Vertical Discharge 2-1/2" Solids Passing Capacity



A00499



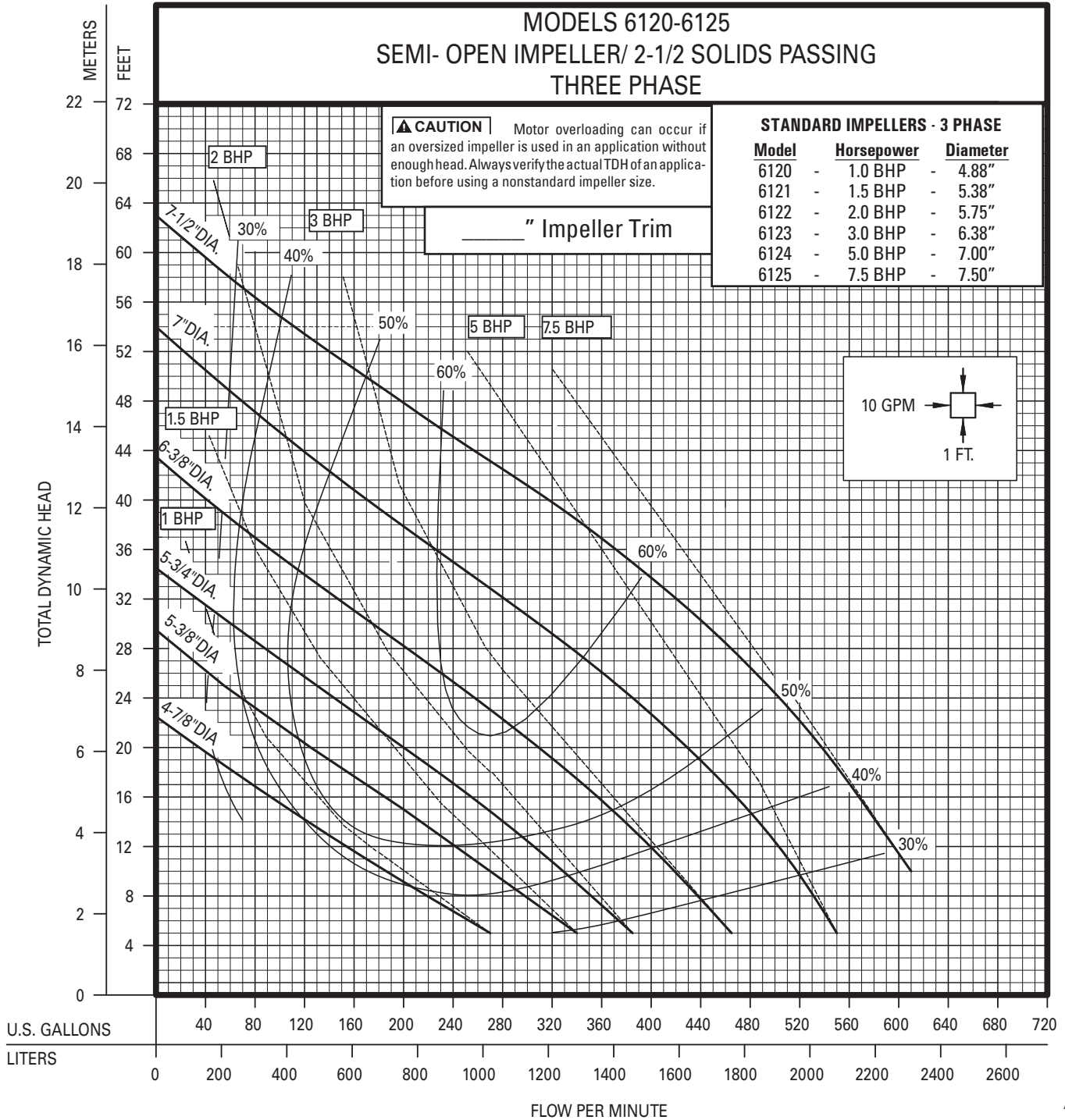
Semi-Open Impeller PERFORMANCE DATA 1 PHASE 3" Vertical Discharge 2-1/2" Solids Passing Capacity



A00672

Semi-Open Impeller PERFORMANCE DATA 3 PHASE

3" & 4" HORIZONTAL FLANGED DISCHARGE 2-1/2" Solids Passing Capacity



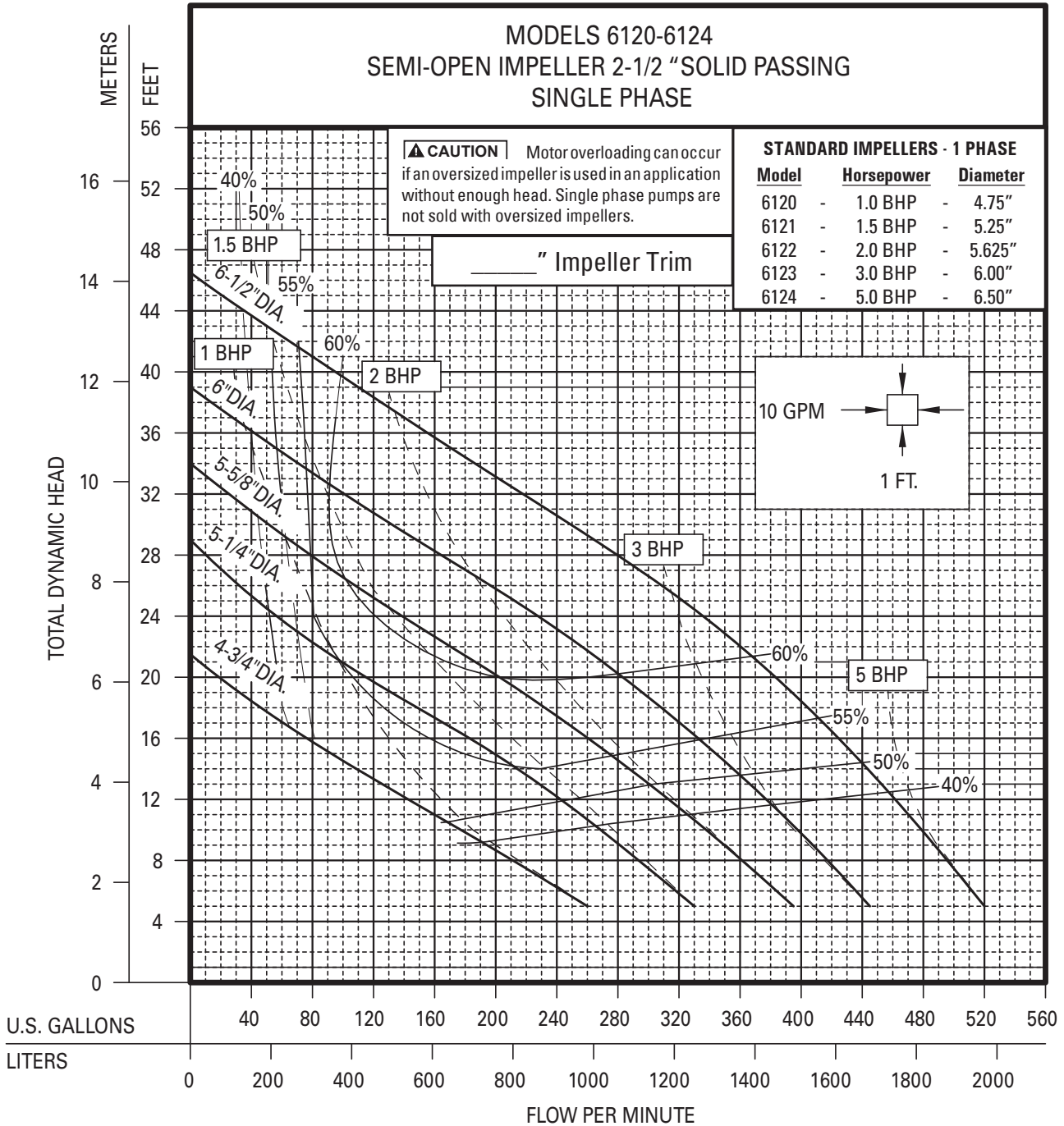
Semi-Open Impeller

PERFORMANCE DATA

1 PHASE

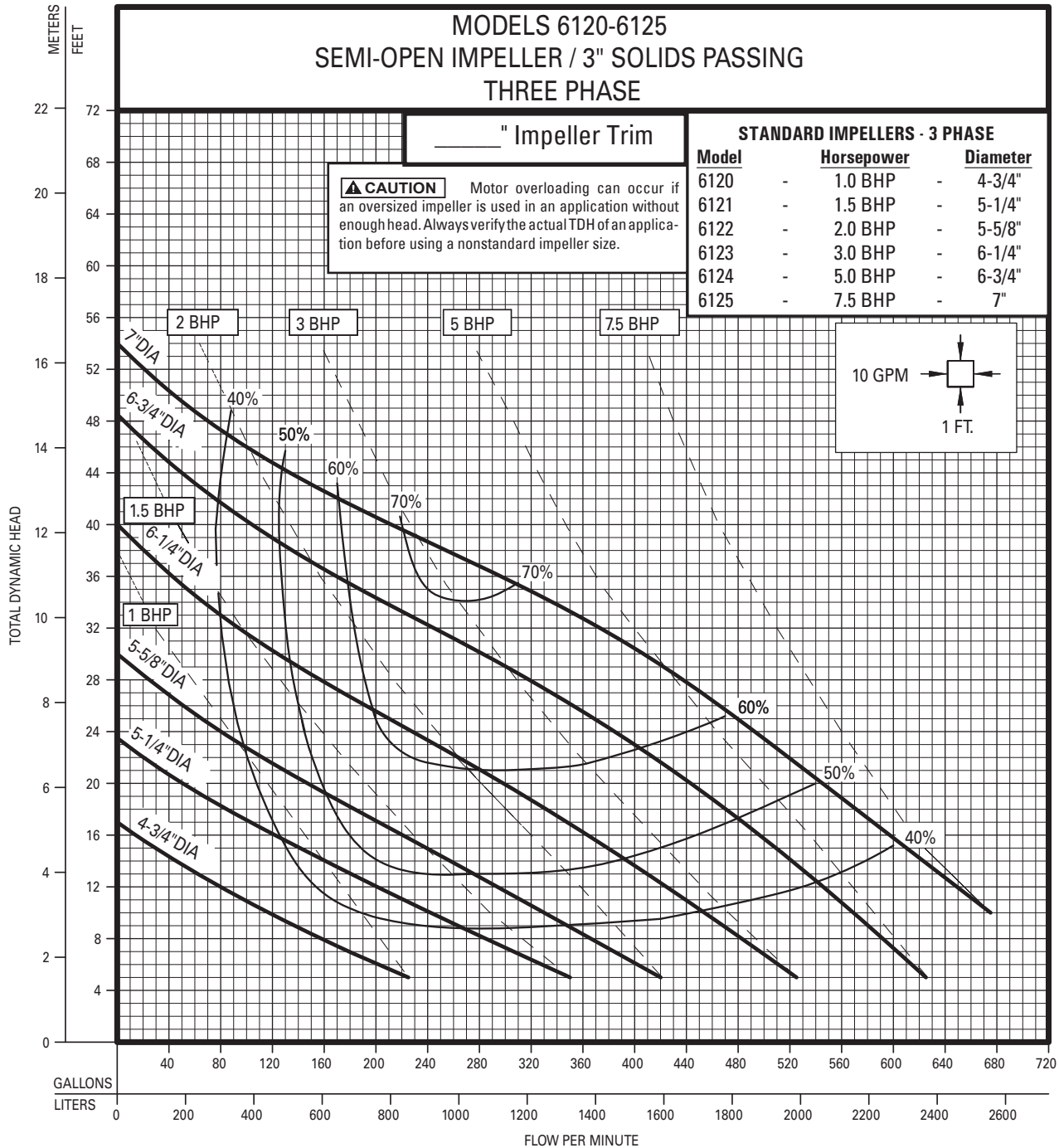
3" & 4" HORIZONTAL FLANGED DISCHARGE

2-1/2" Solids Passing Capacity



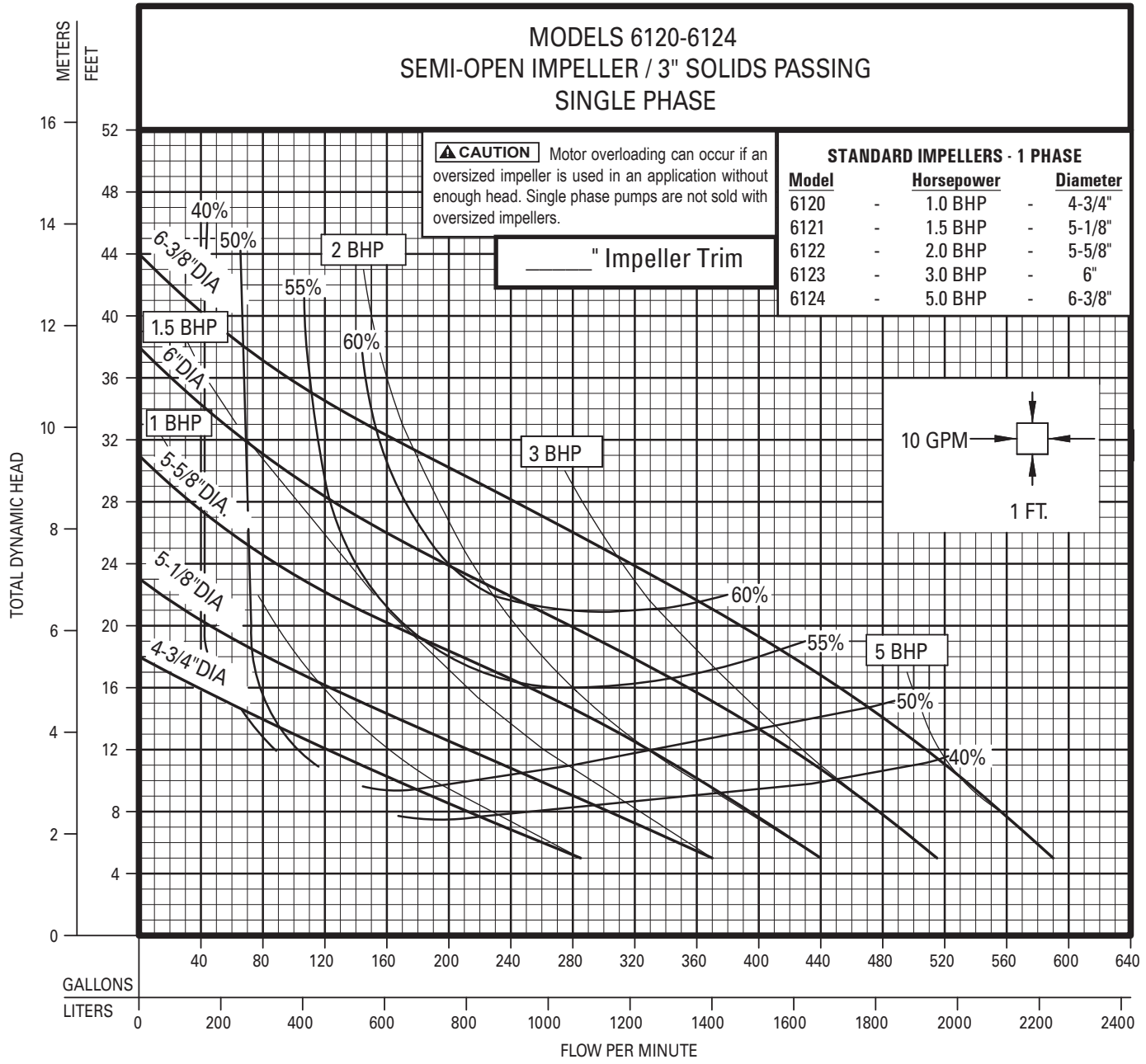
Semi-Open Impeller PERFORMANCE DATA 3 PHASE

4" HORIZONTAL FLANGED DISCHARGE 3" Solids Passing Capacity



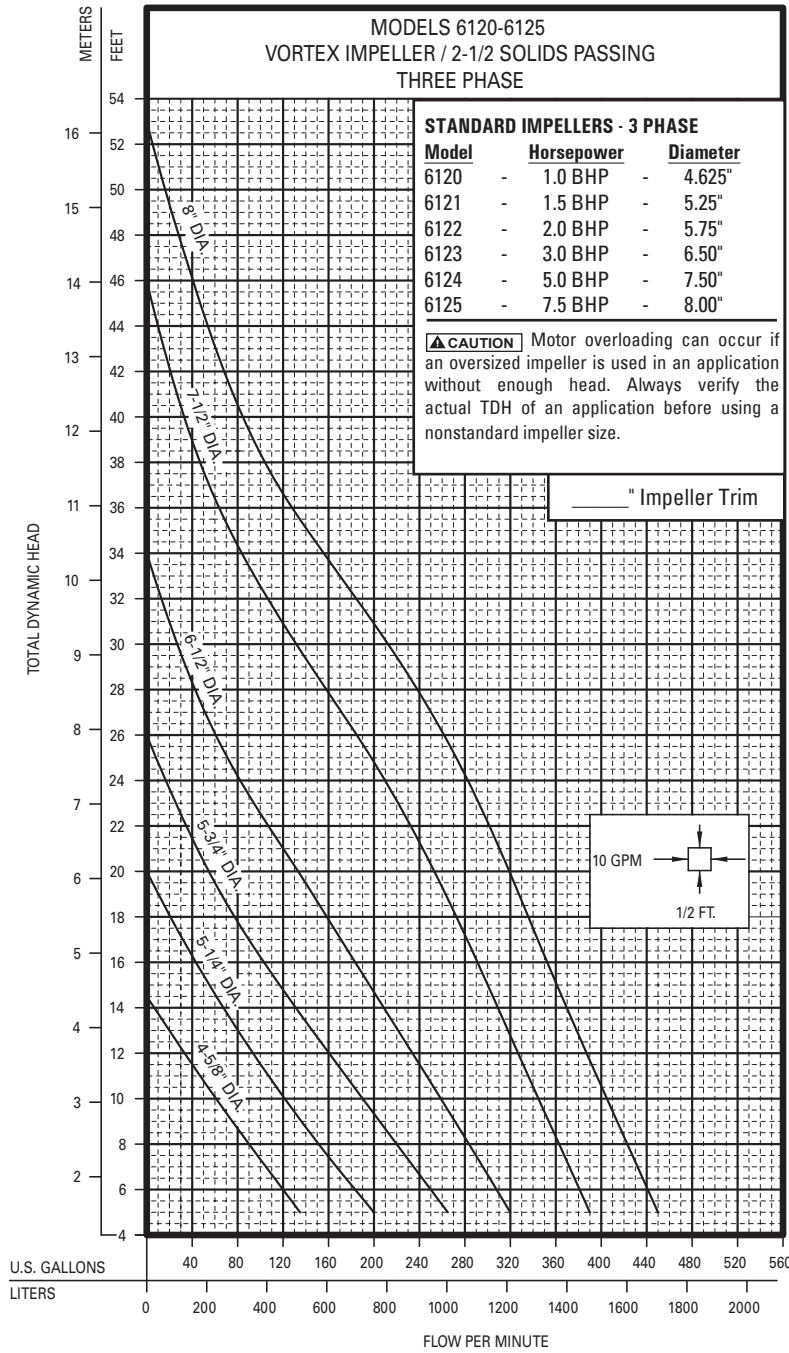
A00520

Semi-Open Impeller PERFORMANCE DATA 1 PHASE 4" HORIZONTAL FLANGED DISCHARGE 3" Solids Passing Capacity



Vortex Impeller PERFORMANCE DATA 3 PHASE

3" VERTICAL, 3" & 4" HORIZONTAL FLANGED DISCHARGE 2-1/2" Solids Passing Capacity



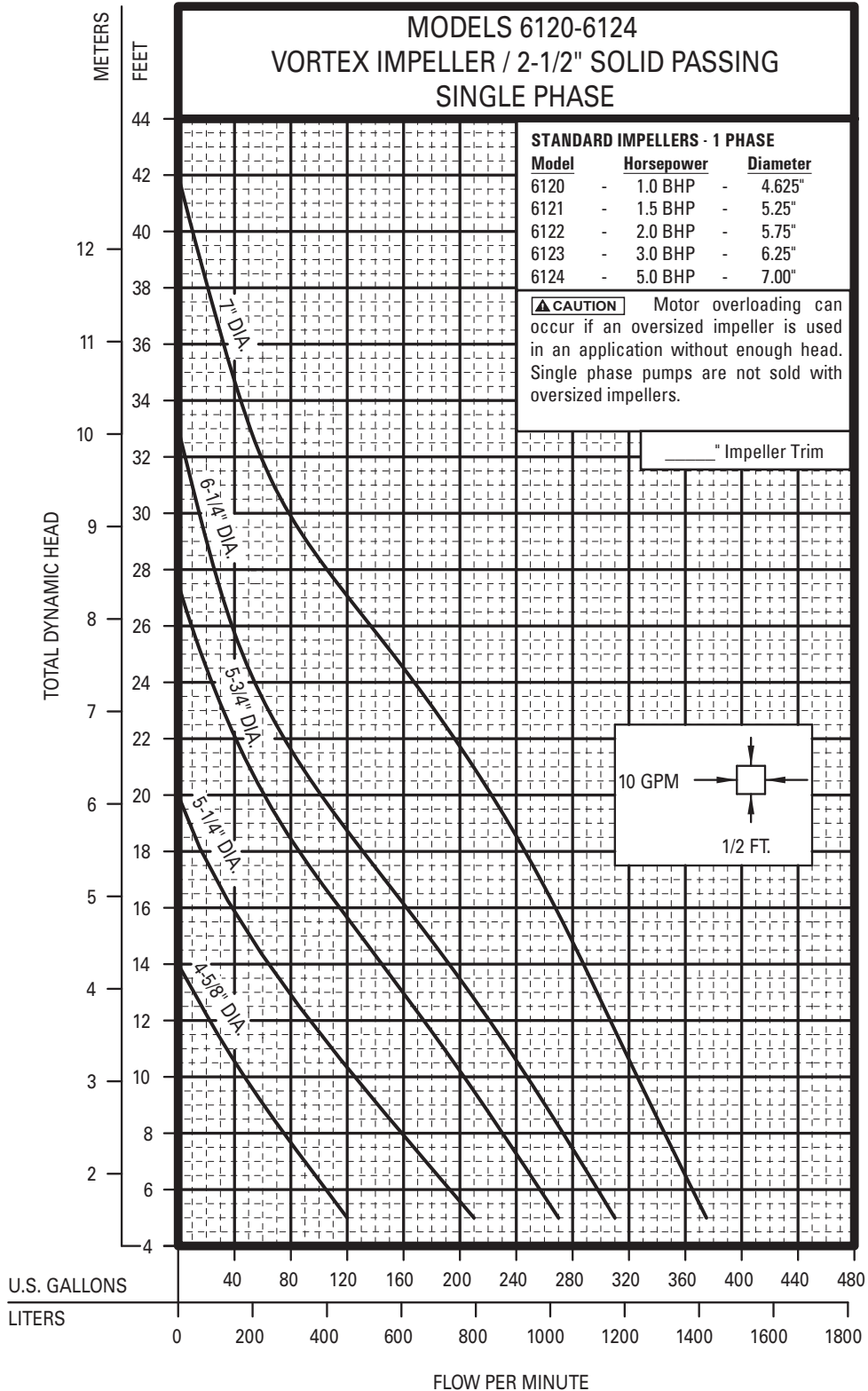
A00667



Vortex Impeller PERFORMANCE DATA 1 PHASE



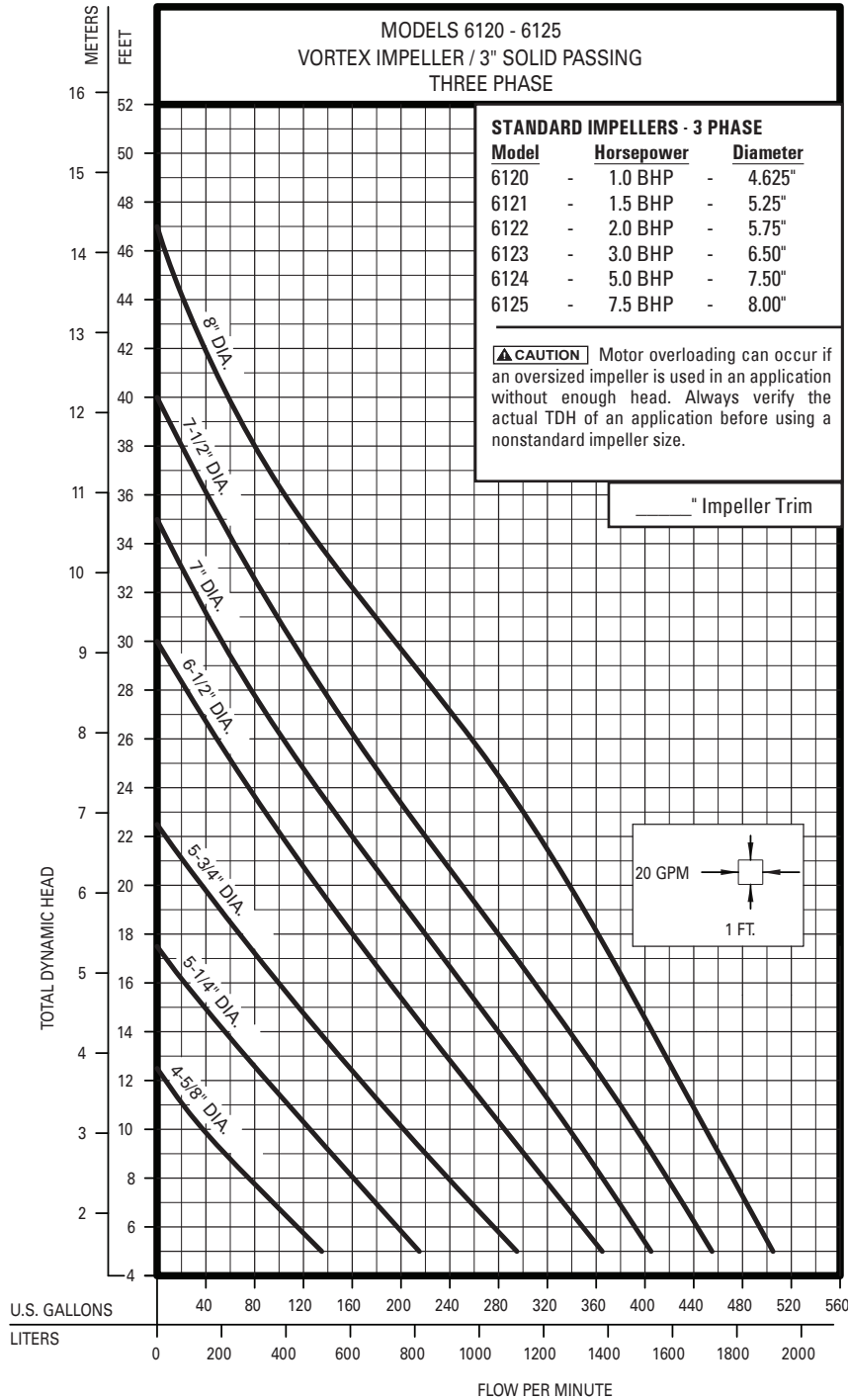
**3" VERTICAL, 3" & 4" HORIZONTAL FLANGED DISCHARGE
2-1/2" Solids Passing Capacity**



A00665

Vortex Impeller PERFORMANCE DATA 3 PHASE

4" HORIZONTAL FLANGED DISCHARGE 3" Solids Passing Capacity



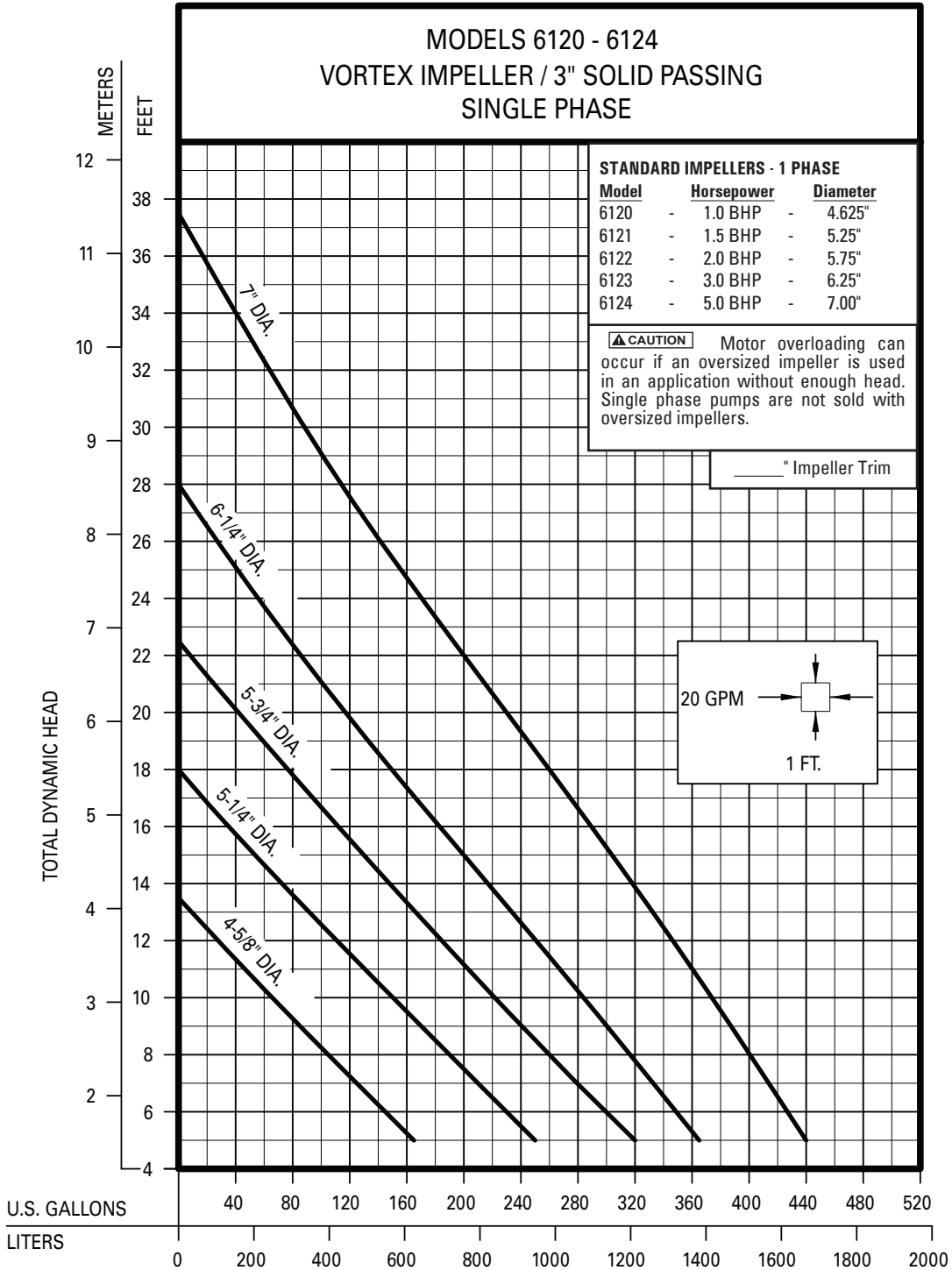
A00668



Vortex Impeller PERFORMANCE DATA

1 PHASE

4" HORIZONTAL FLANGED DISCHARGE
3" Solids Passing Capacity



A00666

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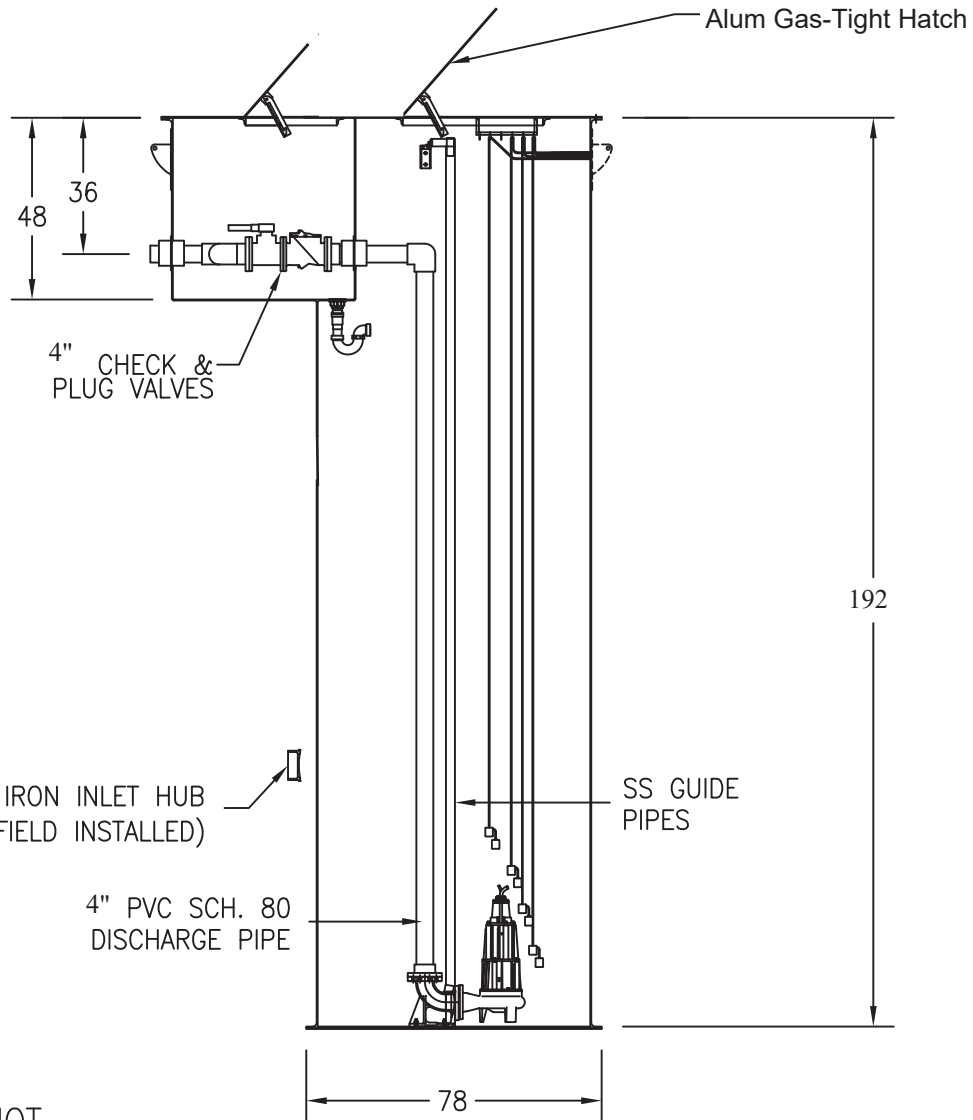
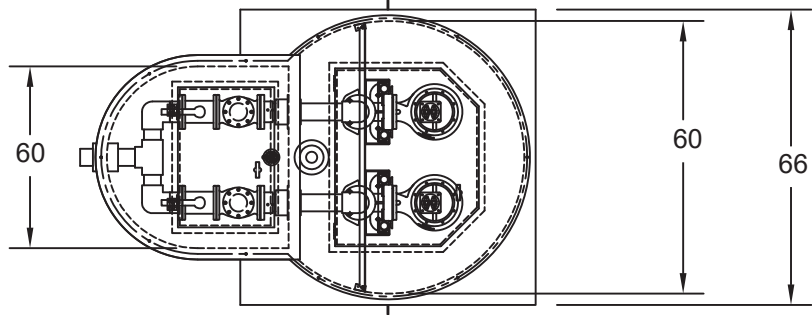
SWPA Data Categories Presented -- Data on this sheet supply design information as the minimum recommended by the Submersible Wastewater Pump Association and is defined in accordance with SWPA's Standardized Definitions for Pump and Motor Characteristics. The accuracy of the data is the responsibility of Zoeller Engineered Products.

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APPROVED BY: _____

DATE: _____

DRAWING REVISIONS				
LTR	BY	DATE	ECO #	DESCRIPTION



NOTE: PUMP CORDS NOT SHOWN FOR CLARITY.

DT

DO NOT SCALE PRINT		DRAFTER:	2/22/16	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.		CHECKED:		
TOLERANCES:		APPROVED:		
ANGLES ± 1°	DECIMALS			SHEET: 1 OF 1 DWG. No. 33-XXXX
FRACTIONS ± 1/16	.X ±~ .XX ±~ .XXX ±~ .XXXX±~		P/N: REV.: ~	

- IMPORTANT -

NUMBERS ENCLOSED IN A CIRCLE; EXAMPLE ①, INDICATES A CRUCIAL SPECIFICATION THAT MUST BE ROUTINELY VERIFIED.

Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.

MAIL TO: P.O. BOX 16347 • Louisville, KY 40256-0347
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COMPARE THESE FEATURES

- Float is constructed of durable PVC/polypropylene encasing variable level switch
- Standard mechanical variable level control switches are rated for 115/230 V, 5 Amps
- Low current mechanical variable level control switches are rated for 125 VAC/30 VDC, 0.1 Amps
- 18/2 Type SJOW CPE cord standard
- Cords are available in 15-25-35-50 foot lengths
- Temperature rating of 140°F (60°C)
- Approximately 1.5" liquid level differential in switching action

Variable Level Control Switch is normally open when hanging vertically above liquid level. Switch closes when it reaches a few degrees above the horizontal position.

APPLICATIONS

- Switch for simplex or duplex pump control and high level alarm on electrical alternating control panel systems for dewatering, effluent and sewage applications.
- Switch for APak® (use low current models)
- High level alarm switch

ADJUSTABLE WEIGHT: (P/N 10-0689) provides an accurate pivot point for suspended float switches.

- Gripper teeth on clip and weight channel securely lock float cable into place.
- Cable weight can be adjusted without the use of tools.

HOUSING: 1lb 12oz. (0.8 kg) 2.8" x 3.3" (7.1 cm x 8.4 cm)
 Impact-resistant & non-corrodible, PVC housing for liquids up to 140°F (60°C)

CLIP: injection-molded acetal plastic

WIRE/CABLE ACCOMMODATED: SJOW, SJTW, 18/2, 18/3, 16/3, 14/2, 14/3

SHIP WEIGHT: 2 lbs. (32 oz)



FLOAT SWITCHES			
Mechanical		Cord Length	Mounting Method
Standard P/N*	Low Current P/N**		
10-0743	10-2060	15	Clamp
10-0744	10-2061	20	Clamp
10-1877	10-2062	25	Clamp
10-1878	10-2063	35	Clamp
10-1879	10-2064	50	Clamp
10-1880	10-2065	15	Adjustable Weight
10-2033	10-3284	20	Adjustable Weight
10-1881	10-2066	25	Adjustable Weight
10-1882	10-2067	35	Adjustable Weight
10-1883	10-2068	50	Adjustable Weight

FLOAT SWITCH TREES			
Mechanical		Cord Length	Mounting Method
Standard P/N*	Intrinsically Safe P/N**		
10-1456	10-1456	---	Tree Only
10-1886	10-2069	15	(3) 15' Floats & Tree
10-1887	10-2070	15	(4) 15' Floats & Tree

* Do not use with intrinsically safe control systems.

** For use with intrinsically safe control systems only.

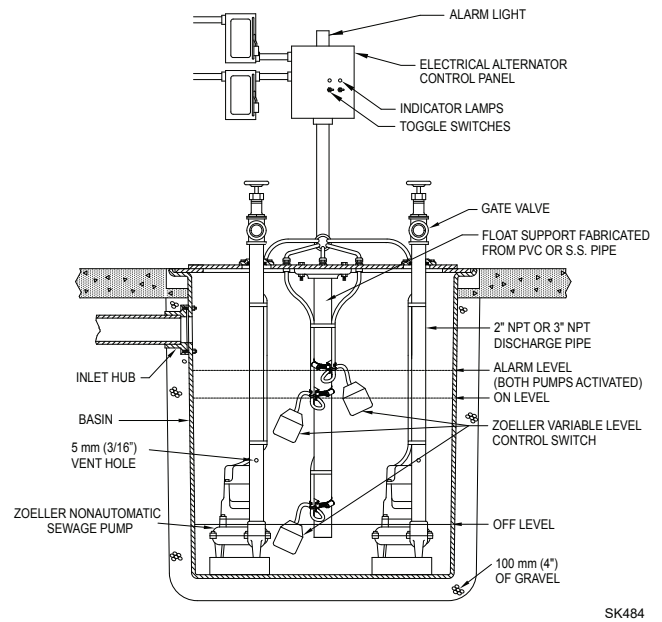
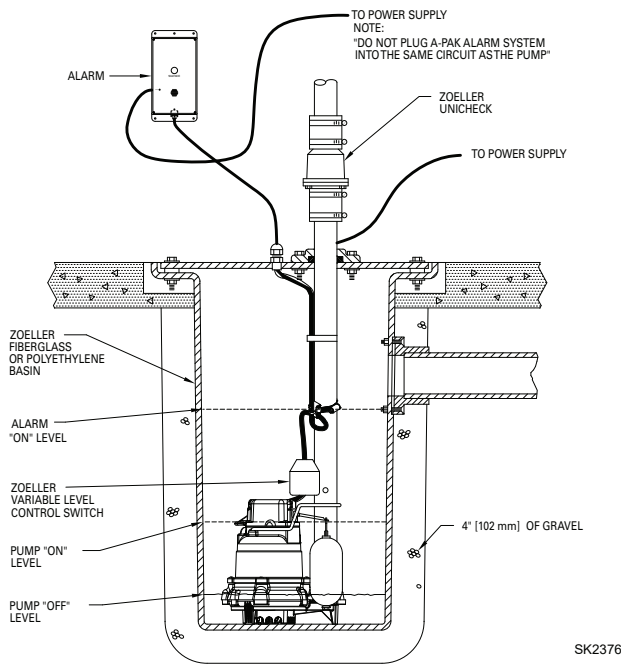
TYPICAL APPLICATIONS

Switch for APak®, High Level Alarm Switch.

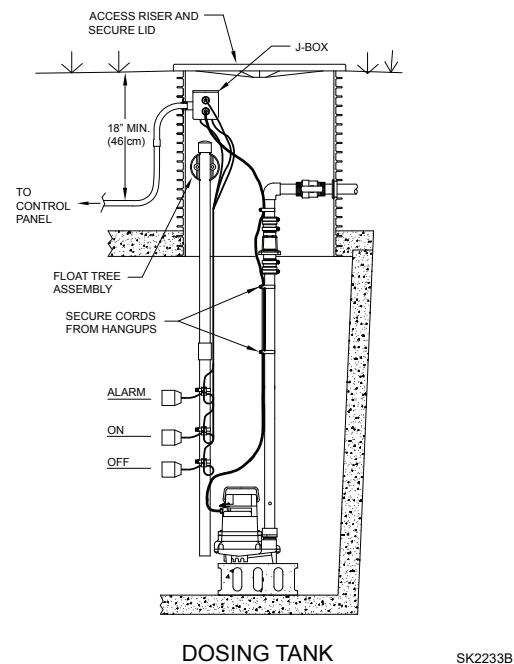
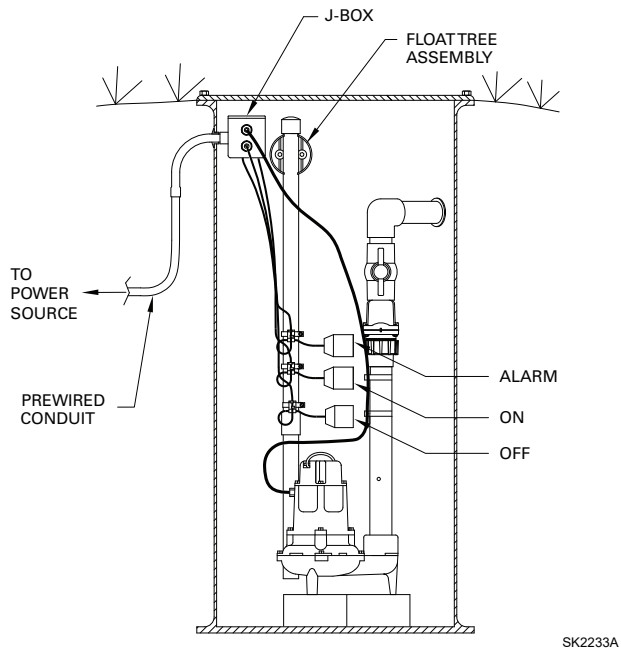
SIMPLEX SYSTEM

Voltage	APak®	Variable Level Control Switch
115 V	10-4012	10-0743

DUPLEX ELECTRICAL ALTERNATING SYSTEM



FLOAT TREE ASSEMBLIES



For information on additional Zoeller products refer to catalog on Electrical Alternator, FM0486; Single Phase Simplex Control/ Alarm Systems, FM0732; and Simplex Controller, FM0731.



WARNING All electrical systems must be installed by a qualified licensed electrician according to the National Electrical Code.



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SECTION: 2.50.110

FM1936

1120

Supersedes

0514

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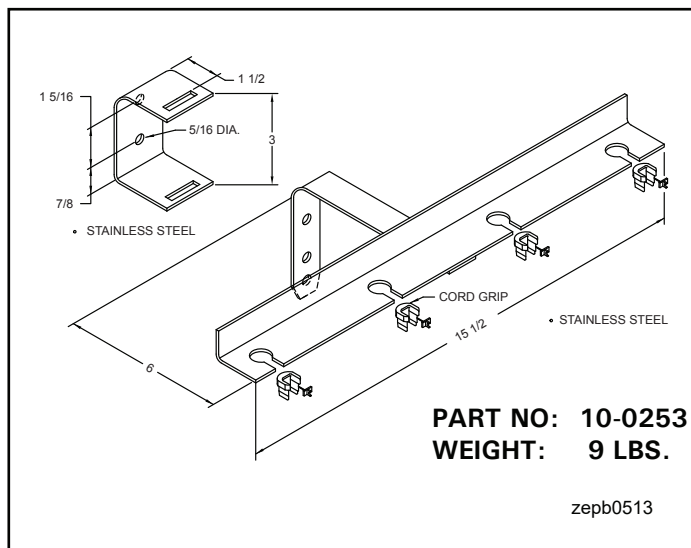
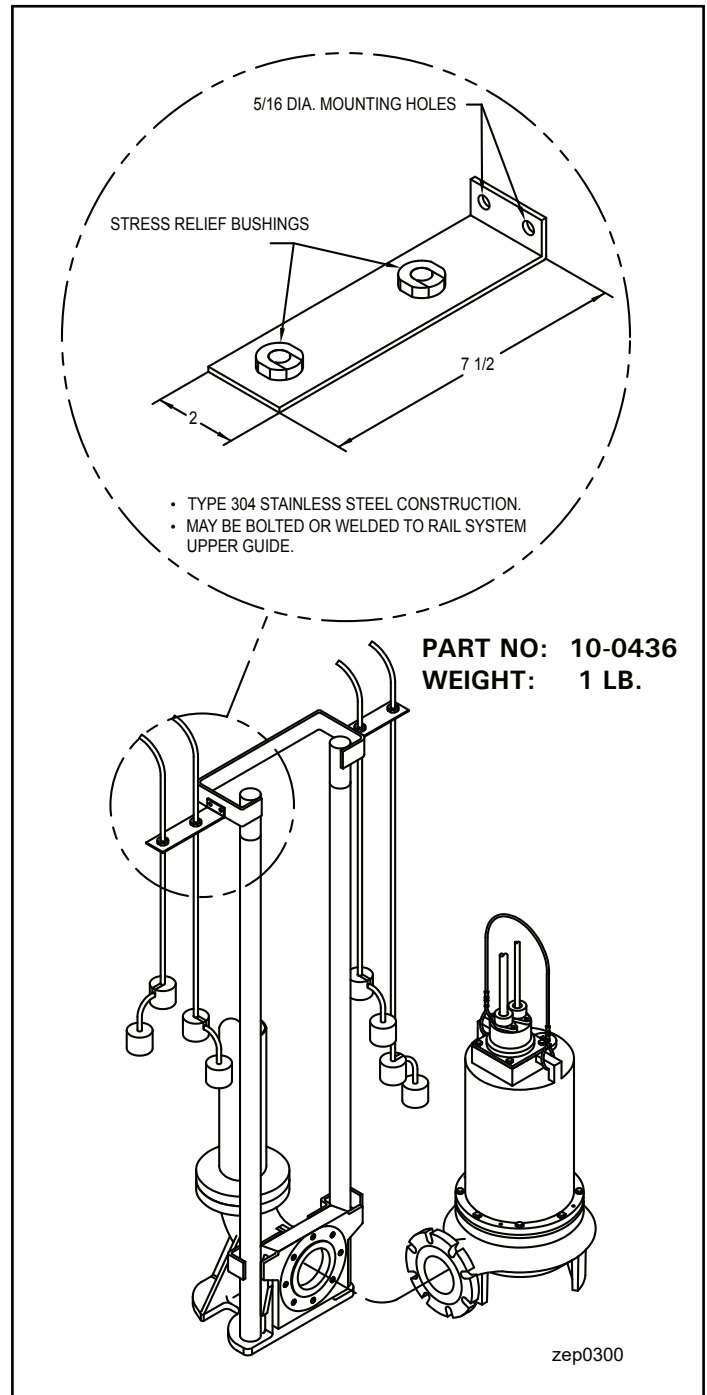
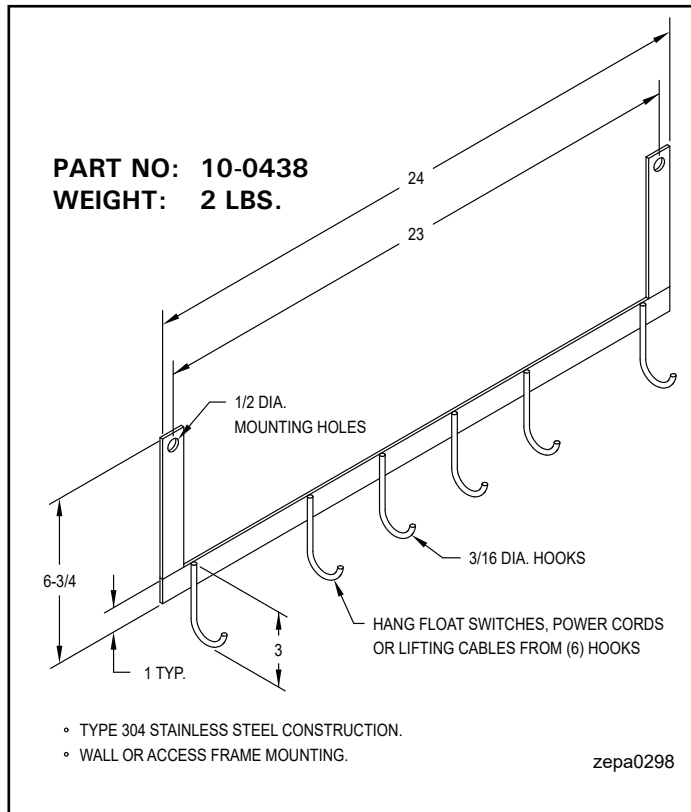
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FLOAT SWITCH BRACKETS (For Use with Weighted Floats)



Also see FM0526 for Float Tree Assemblies for floats that use clamp type hangers.

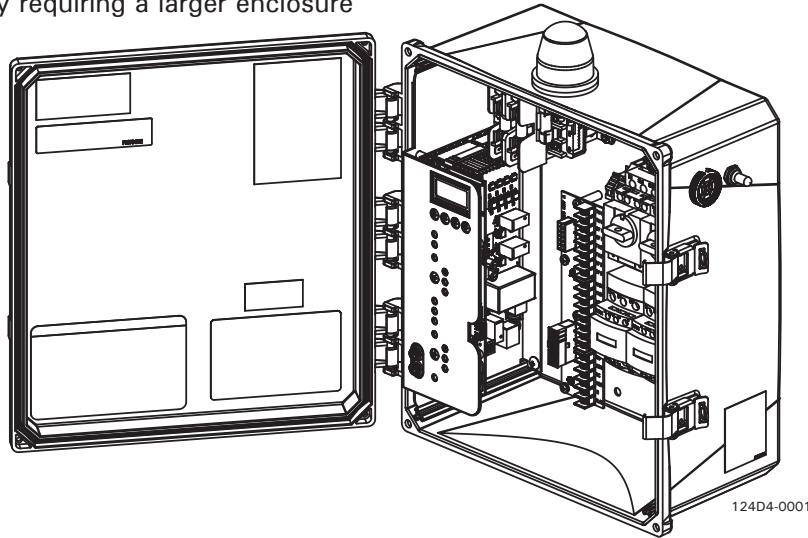


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TECHNICAL DATA SHEET

Pivot® Pro Series Control Panels

- Pivot 1Ph control panel, highly featured
- Pivot Pro 1Ph or 3Ph control panel with advanced features such as a user-friendly LCD interface and support for pump sensors and Z Control®
- Pivot Pro + The Pivot Pro + control panel is a Pivot Pro control panel built with one or more options and usually requiring a larger enclosure



SPECIFICATIONS

Certifications

- cCSAus certified to standard UL508
- FCC Class-B certification to ISED Canada ICES-003, Issue 6
- For outdoor or indoor use

Components

- Red alarm beacon with 360° visibility
- Audible alarm buzzer rated 95 db at 2' (0.6 m)
- SILENCE/RESET/TEST toggle switch with weatherproof rubber boot
- HAND/OFF/AUTO control are included for each pump
- RS-485 (12VDC, 2W) powered serial port for optional Z Control® Gateway connectivity
- Auxiliary output dry contacts (NO-COM-NC) terminals, Form C, 5A resistive load
- PUMP RUN dry contact, (NO-COM)
- NEMA 4X 14"x12"x6" enclosure with lockable latch

Power

- Control circuit powered by 120VAC, 60 Hz
- Alarm circuit can be powered by separate power feed, if needed
- Alarm and control circuits individually fused, 3A, fast-acting, 120VAC
- Circuit breaker protection on 1Ph models
- Multi-tap 200/230/460V or 575V transformer on 3Ph models

- Max alarm and control circuit power consumption: Simplex models 32W, Duplex models 40W
- Max standby power consumption: 5W
- Terminals for 120VAC control power, 120VAC alarm power, up to 4 float switches (duplex), pump input power
- 1Ph IEC motor contactors, models 120/208/240 VAC, 50/60Hz, up to 50A maximum
- 3PH IEC motor contactors, models 208/230/380/460/575 VAC, 60Hz

Field Wiring & Maintenance

- 4 enclosure mounting brackets are included
- 2 sets of wiring schematics and installation instructions are included along with an inside door mounted QR code for easy access to additional support material online
- All wires and terminal locations thoroughly labeled for easy identification
- All components are serviceable (See FM3364 for available replacement parts)

STANDARD FEATURES (For a more thorough description of features, see ZM3376 Panel Selection Guide, or FM3295 Cross Reference and Features Comparison List, or FM3272 Installation Instructions, or FM3394 Quick Reference Guide.)

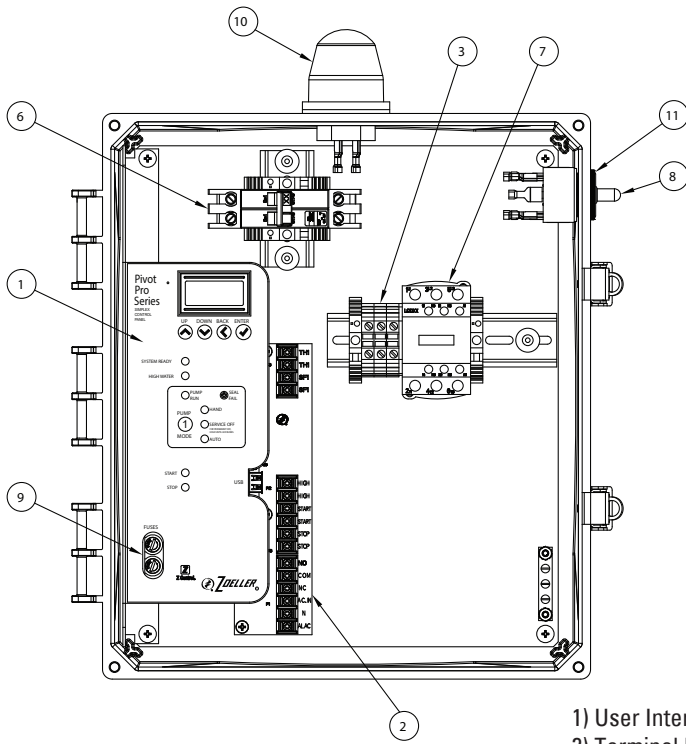
- 5 year limited warranty
- RED/AMBER/GREEN LEDs for float switch indicators, Pump Run, High Water, System Ready, and HOA functions
- Ample room for field wiring
- TEST toggle will check all LEDs, globe, and horn
- Elapsed time and cycle counts via USB port & LCD
- Z Control® enabled (requires Wi-Fi Gateway 90002-0001)
 - o Connecting to the Z Control® Cloud allows remote access to view equipment status and adjust settings
 - o Configure alert settings for nearly instant email, text, and push notifications of changing conditions
 - o Free access to the Z Control® Cloud
 - o Easy setup and use
 - o Leverage this technology to reduce/eliminate unnecessary site trips and provide real-time peace of mind
- Lockable LCD menu allows for easy access to status, counters, and settings
- Adjustable settings (see Installation Instructions)
 - o ‘Smart’ or ‘Standard’ float logic (Smart logic will compensate for bad floats. Standard logic will operate like traditional panels.)
 - o CONTINUOUS RUN alarm: 20 minute default (enable or disable via USB port)
 - o HOA Pump Run & Service Off Timeouts (enable or disable via USB port)
 - Service OFF and Permanent OFF pump modes
 - Smart HOA timer prevents pump damage caused by accidental “ON”
 - Smart HOA includes a Service OFF reminder alarm
 - o Globe mode (solid, blink, or alarm-specific blink pattern)
 - o Duplex float configuration (Stop/Lead/Lag/High or Stop/Lead/High/Lag)
- Seal fail indicator/alarm for each pump (feature requires moisture sensor in pump)
- Thermal trip indicator/alarm for each pump (feature requires thermal sensor in pump)
- Lead/lag selector with pump run ratio settings
- Float switch logic choices: Smart or Relay, 3 or 4 float, SLLH or SLHL
- Current overload alarms (as applicable)

Alarm Conditions

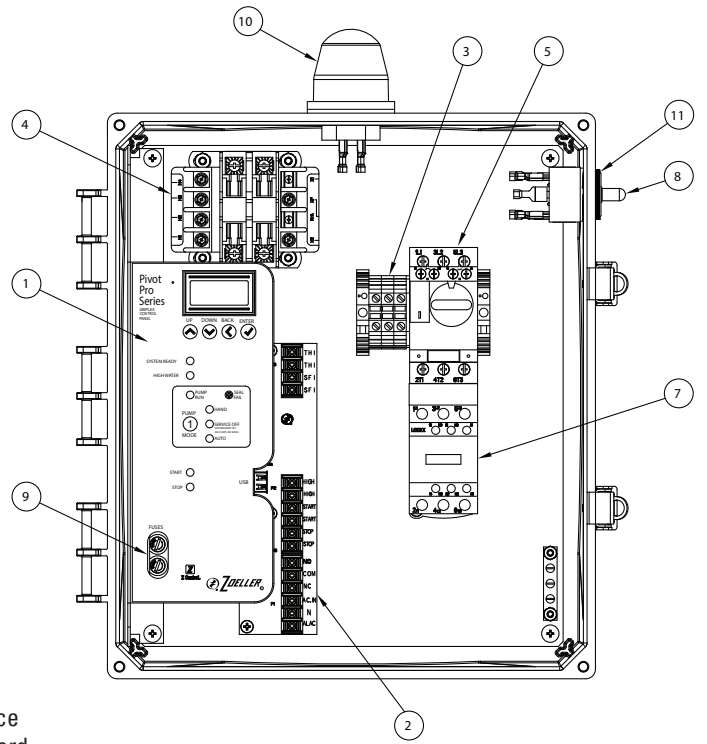
Alarm Condition	User Interface LEDs						
	Latching	Globe	System Ready	High Water	Pump Run (1 or 2)	Pump Off (1 or 2)	Stop, Start/Lead, or Lag
Overload (3PH only)	No	Fast Blink	Off	Off	Solid Red	Off	Off
Failed Contactor	Yes	Fast Blink	Off	Off	Solid Red	Off	Off
Service Off Timeout	No	Double Blink	Off	Off	Off	Blinking Red	Off
Disabled Alarm Circuit	No	Double Blink	Off	Solid Red	Off	Off	Solid Red
Continuous Run	Yes	Solid	Off	Off	Blinking Amber	Off	Off
High Water Float Logic Error	Yes	Slow Blink	Off	Blinking Red	Off	Off	Off
Float Logic Error	Yes	Slow Blink	Off	Off	Off	Off	Blinking Red
Float Questionable	Yes	Slow Blink	Off	Off	Off	Off	Blinking Amber
High Water	Yes	Solid	Off	Solid Red	Off	Off	Off
Seal Fail Alarm	Yes	Fast Blink	Off	Off	Blinking Red	Off	Off
Thermal Alarm	Yes	Fast Blink	Off	Off	Blinking Red	Off	Off
High Control Voltage	Yes	Off	Blinking Green	Blinking Red	Blinking Red	Blinking Red	Blinking Red

COMMON PIVOT PRO CONTROL PANEL DETAILS

PART NO.	REV	SIMPLEX OR DUPLEX	ENCLOSURE	VOLTAGE	PHASE	FULL LOAD AMP	BREAKER OR OVERLOAD RATING	DIMENSIONS "A" X "B" X "C"
11314-0001	A	SIMPLEX	NEMA-4X	120/208/240	1	0 TO 7	15	14" X 12" X 6"
11324-0001	A	SIMPLEX	NEMA-4X	120/208/240	1	7 TO 15	20	14" X 12" X 6"
11334-0001	A	SIMPLEX	NEMA-4X	120/208/240	1	15 TO 20	30	14" X 12" X 6"
11344-0001	A	SIMPLEX	NEMA-4X	120/208/240	1	20 TO 30	50	14" X 12" X 6"
11354-0001	A	SIMPLEX	NEMA-4X	120/208/240	1	0 TO 20	25	14" X 12" X 6"
12124-0001	A	DUPLEX	NEMA-4X	120	1	7 TO 15	20	14" X 12" X 6"
12134-0001	A	DUPLEX	NEMA-4X	120	1	15 TO 20	30	14" X 12" X 6"
12314-0001	A	DUPLEX	NEMA-4X	120/208/240	1	0 TO 7	15	14" X 12" X 6"
12324-0001	A	DUPLEX	NEMA-4X	120/208/240	1	7 TO 15	20	14" X 12" X 6"
12334-0001	A	DUPLEX	NEMA-4X	120/208/240	1	15 TO 20	30	14" X 12" X 6"
12344-0001	A	DUPLEX	NEMA-4X	120/208/240	1	20 TO 30	50	14" X 12" X 6"
12354-0001	A	DUPLEX	NEMA-4X	120/208/240	1	0 TO 20	25	14" X 12" X 6"
114A4-0001	B	SIMPLEX	NEMA-4X	208/240/480	3	1.0 TO 1.6	1.0 TO 1.6	14" X 12" X 6"
114B4-0001	B	SIMPLEX	NEMA-4X	208/240/480	3	1.6 TO 2.5	1.6 TO 2.5	14" X 12" X 6"
114C4-0001	B	SIMPLEX	NEMA-4X	208/240/480	3	2.5 TO 4	2.5 TO 4	14" X 12" X 6"
114D4-0001	B	SIMPLEX	NEMA-4X	208/240/480	3	4 TO 6.3	4 TO 6.3	14" X 12" X 6"
114E4-0001	B	SIMPLEX	NEMA-4X	208/240/480	3	6 TO 10	6 TO 10	14" X 12" X 6"
114F4-0001	B	SIMPLEX	NEMA-4X	208/240/480	3	9 TO 14	9 TO 14	14" X 12" X 6"
114G4-0001	B	SIMPLEX	NEMA-4X	208/240/480	3	13 TO 18	13 TO 18	14" X 12" X 6"
114H4-0001	B	SIMPLEX	NEMA-4X	208/240/480	3	17 TO 23	17 TO 23	14" X 12" X 6"
114Q4-0001	B	SIMPLEX	NEMA-4X	208/240/480	3	20 TO 25	20 TO 25	14" X 12" X 6"
11604-0001	B	SIMPLEX	NEMA-4X	575	3	30 TO 40	30 TO 40	14" X 12" X 6"
116A4-0001	B	SIMPLEX	NEMA-4X	575	3	1.0 TO 1.6	1.0 TO 1.6	14" X 12" X 6"
116B4-0001	B	SIMPLEX	NEMA-4X	575	3	1.6 TO 2.5	1.6 TO 2.5	14" X 12" X 6"
116C4-0001	B	SIMPLEX	NEMA-4X	575	3	2.5 TO 4	2.5 TO 4	14" X 12" X 6"
116D4-0001	B	SIMPLEX	NEMA-4X	575	3	4 TO 6.3	4 TO 6.3	14" X 12" X 6"
116E4-0001	B	SIMPLEX	NEMA-4X	575	3	6 TO 10	6 TO 10	14" X 12" X 6"
116F4-0001	B	SIMPLEX	NEMA-4X	575	3	9 TO 14	9 TO 14	14" X 12" X 6"
116R4-0001	B	SIMPLEX	NEMA-4X	575	3	23 TO 32	23 TO 32	14" X 12" X 6"
12404-0001	B	DUPLEX	NEMA-4X	208/240/480	3	30 TO 40	30 TO 40	16" X 14" X 7"
124A4-0001	B	DUPLEX	NEMA-4X	208/240/480	3	1.0 TO 1.6	1.0 TO 1.6	14" X 12" X 6"
124B4-0001	B	DUPLEX	NEMA-4X	208/240/480	3	1.6 TO 2.5	1.6 TO 2.5	14" X 12" X 6"
124C4-0001	B	DUPLEX	NEMA-4X	208/240/480	3	2.5 TO 4	2.5 TO 4	14" X 12" X 6"
124D4-0001	B	DUPLEX	NEMA-4X	208/240/480	3	4 TO 6.3	4 TO 6.3	14" X 12" X 6"
124E4-0001	B	DUPLEX	NEMA-4X	208/240/480	3	6 TO 10	6 TO 10	14" X 12" X 6"
124F4-0001	B	DUPLEX	NEMA-4X	208/240/480	3	9 TO 14	9 TO 14	14" X 12" X 6"
124G4-0001	B	DUPLEX	NEMA-4X	208/240/480	3	13 TO 18	13 TO 18	14" X 12" X 6"
124H4-0001	B	DUPLEX	NEMA-4X	208/240/480	3	17 TO 23	17 TO 23	14" X 12" X 6"
124Q4-0001	B	DUPLEX	NEMA-4X	208/240/480	3	20 TO 25	20 TO 25	14" X 12" X 6"
124R4-0001	B	DUPLEX	NEMA-4X	208/240/480	3	23 TO 32	23 TO 32	16" X 14" X 7"
126A4-0001	B	DUPLEX	NEMA-4X	575	3	1.0 TO 1.6	1.0 TO 1.6	14" X 12" X 6"
126B4-0001	B	DUPLEX	NEMA-4X	575	3	1.6 TO 2.5	1.6 TO 2.5	14" X 12" X 6"
126C4-0001	B	DUPLEX	NEMA-4X	575	3	2.5 TO 4	2.5 TO 4	14" X 12" X 6"
126D4-0001	B	DUPLEX	NEMA-4X	575	3	4 TO 6.3	4 TO 6.3	14" X 12" X 6"
126E4-0001	B	DUPLEX	NEMA-4X	575	3	6 TO 10	6 TO 10	14" X 12" X 6"
126F4-0001	B	DUPLEX	NEMA-4X	575	3	9 TO 14	9 TO 14	14" X 12" X 6"

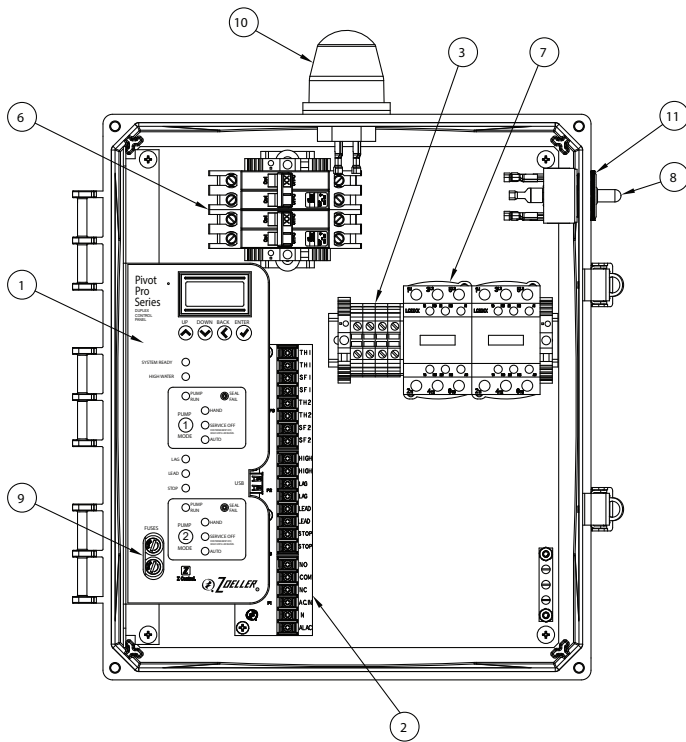


Simplex, 1PH Pivot Pro

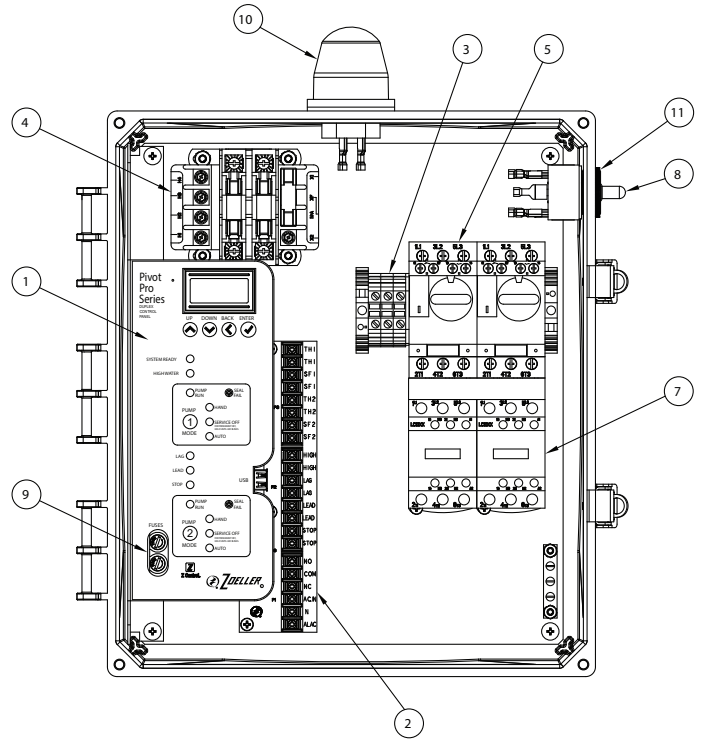


Simplex, 3PH Pivot Pro

- 1) User Interface
- 2) Terminal Board
- 3) Pump Power Terminals (TB1)
- 4) Transformer (3PH Only)
- 5) Overload(s) (3PH Only)
- 6) Circuit Breaker(s) (1PH Only)
- 7) Motor Contactor(s)
- 8) Test/Silence/Reset Switch
- 9) Fuses
- 10) Globe
- 11) Alarm Buzzer



Duplex, 1PH Pivot Pro



Duplex, 3PH Pivot Pro

SK3296

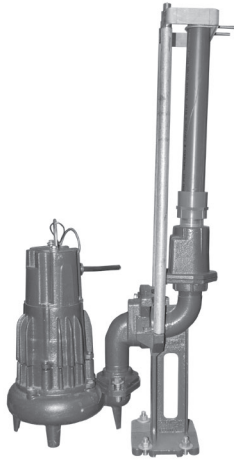
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Z-RAIL® DISCONNECT SYSTEMS

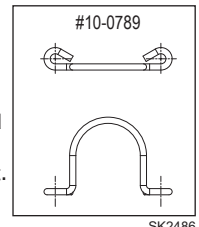
THREADED DISCHARGE PUMPS 1-1/4" THRU 3" NPT



Z-Rail® Disconnect System shown

FEATURES

- Sewage, storm water and effluent pump systems
- For concrete, steel, or fiberglass tanks
- Allows for removal of pumps from ground level
- Coupling base with positive machine fit and o-ring seal provides a reliable seal.
- Guide rails direct the pump to and from the base discharge elbow. Systems are supplied complete with coupling base, sealing plate, pump discharge elbow, and upper rail support bracket.
- All systems use 3/4" schedule 40 pipe rails (not included).
- Refer to Z-Rail® installation instructions ZM2821.



#10-0789 lifting bails are required on 6160, 6180, 6280, 6290, 7008/7010, and 7020/7021 models to balance pump and rail plate evenly. Other models already include proper lifting device.

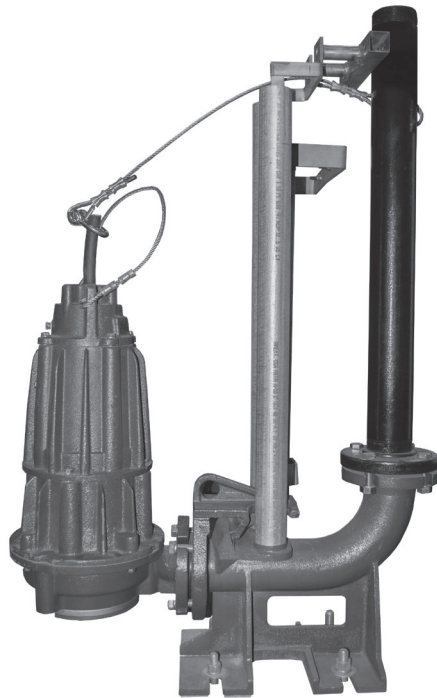
SPECIFICATIONS					
Rail System	Pump Discharge	Rail System Discharge	Materials of Construction*	Weight	Type
39-0134	1-1/4" V	2" V	Powder coated, ductile iron	41	Z-Rail®
39-0135	1-1/4" V	2" V	Powder coated, ductile iron w/ SS upper rail support bracket	43	Z-Rail®
39-0136	1-1/4" V	2" V	Powder coated, ductile iron / brass for non-sparking	44	Z-Rail®
39-0143	1-1/4" V	2" V	Powder coated, ductile iron w/ SS upper rail support / brass for non-sparking	43	Z-Rail®
39-0137	1-1/4" H	1-1/4" V	Powder coated, ductile iron (models 7020, 7021 only)	41	Z-Rail®
39-0138	1-1/4" H	1-1/4" V	Powder coated, ductile iron w/ SS upper rail support bracket (models 7020, 7021 only)	43	Z-Rail®
39-0131	1-1/2" V	2" V	Powder coated, ductile iron	41	Z-Rail®
39-0132	1-1/2" V	2" V	Powder coated, ductile iron w/ SS upper rail support bracket	43	Z-Rail®
39-0133	1-1/2" V	2" V	Powder coated, ductile iron / brass for non-sparking	44	Z-Rail®
39-0142	1-1/2" V	2" V	Powder coated, ductile iron w/ SS upper rail support / brass for non-sparking	43	Z-Rail®
39-0128	2" V	2" V	Powder coated, ductile iron	42	Z-Rail®
39-0129	2" V	2" V	Powder coated, ductile iron w/ SS upper rail support bracket	43	Z-Rail®
39-0130	2" V	2" V	Powder coated, ductile iron / brass for non-sparking	45	Z-Rail®
39-0141	2" V	2" V	Powder coated, ductile iron w/ SS upper rail support / brass for non-sparking	44	Z-Rail®
39-0146	2" V	2" V	71 Series Grinder - Powder coated, ductile iron	43	Z-Rail®
39-0148	2" V	2" V	71 Series Grinder - Powder coated, ductile iron w/ SS upper rail support bracket	45	Z-Rail®
39-0147	2" V	2" V	71 Series Grinder - Powder coated, ductile iron / brass for non-sparking	43	Z-Rail®
39-0149	2" V	2" V	71 Series Grinder - Powder coated, D.I. w/ SS upper rail support / brass for non-sparking	44	Z-Rail®
39-0122	3" V	3" V	Powder coated, ductile iron	47	Z-Rail®
39-0123	3" V	3" V	Powder coated, ductile iron w/ SS upper rail support bracket	47	Z-Rail®
39-0124	3" V	3" V	Powder coated, ductile iron / brass for non-sparking	47	Z-Rail®
39-0125	3" V	3" V	Powder coated, ductile iron w/ SS upper rail support / brass for non-sparking	47	Z-Rail®
ACCESSORIES - Intermediate rail brackets are required for each 12' of basin depth					
39-0139	Intermediate rail bracket 1-1/4", 1-1/2" and 2" discharge - stainless steel			4	Z-Rail®
39-0140	Intermediate stabilizer, SS, for 3" system			4	Z-Rail®
10-0789**	SS lifting bail for 6160, 6180, 6280, 6290, 7008/7010 and 7020/7021 series (Pictured above)			1	Both

* Coupling base / sealing plate / upper support / bracket and rail guide.

** Lifting bails are required on the following models to balance pump and rail plate evenly. Other models already include proper lifting device.

FLANGED RAIL SYSTEMS (2-1/2" TO 6" Discharge) FIELD ASSEMBLED

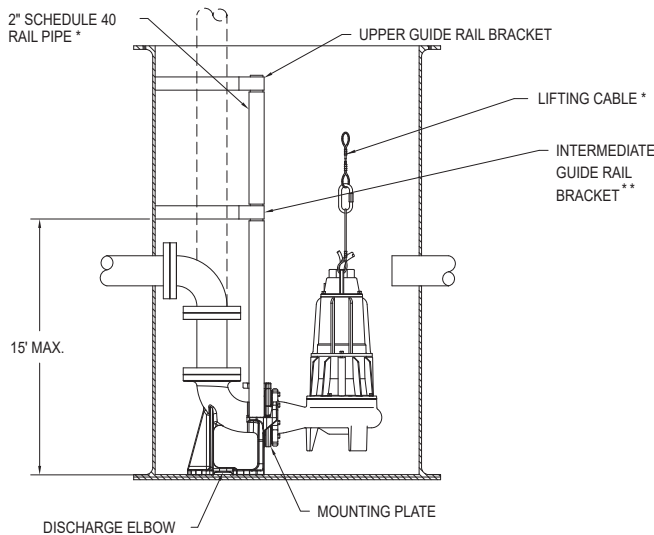
Guide rail system for removal and installation of flanged, horizontal discharge pumps without getting in or removing fluid from pit.



2-1/2" & 3" Horizontal Flanged



4" System



SK3419

* Not included

** One intermediate guide rail bracket is required for every
□ 20 ft. for 3" system or
□ 15 ft. for 4" system, of basin depth. See chart for part number.

SPECIFICATIONS

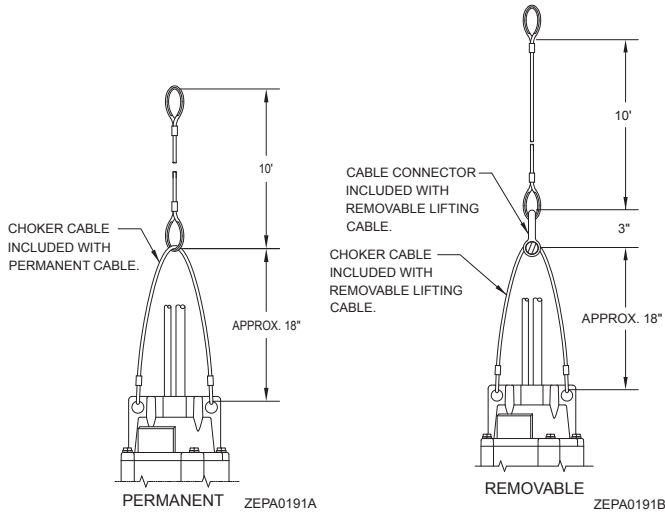
Part Number	Description	Pump Discharge	Rail System Discharge	Guide Rails*
39-0094	2-1/2" / 3" guide rail system SS	2-1/2" or 3" horizontal flange	3" Flange	2" SS or galv.
39-0154	4" guide rail system SS flange	4" horizontal	4" Flange	2" SS or galv.
39-0185	6" guide rail system SS flange	6" horizontal	6" Flange	2" SS or galv.
39-0095	2-1/2" / 3" guide rail system SS non-sparking for Class I Group C and/or Group D Division 1 installation	2-1/2" or 3" horizontal flange	3" Flange	2" SS or galv.
39-0155	4" guide rail system SS non-sparking for Class I Group C and/or Group D Division 1 installation	4" horizontal flange	4" Flange	2" SS or galv.
39-0190	6" guide rail system SS non-sparking for Class I Group C and/or Group D Division 1 installation	6" horizontal flange	6" Flange	2" SS or galv.

ACCESSORIES - Intermediate rail brackets

Part Number	Pump Discharge	Discharge Pipe	Discharge Pipe Description
39-0096	2-1/2" / 3"	2-1/2" / 3"	PVC, Stainless Steel, Galvanized
6039-0014	4"	4"	PVC, Stainless Steel, Galvanized
39-0187	4"	4"	Ductile Iron
39-0188	4"	6"	Ductile Iron
6039-0021	6"	6"	PVC, Stainless Steel, Galvanized

PUMP LIFTING CABLES

1/4" Lifting Cables for pump models: 1-20 BHP Solids Handling Models 3-15 HP Grinder Models



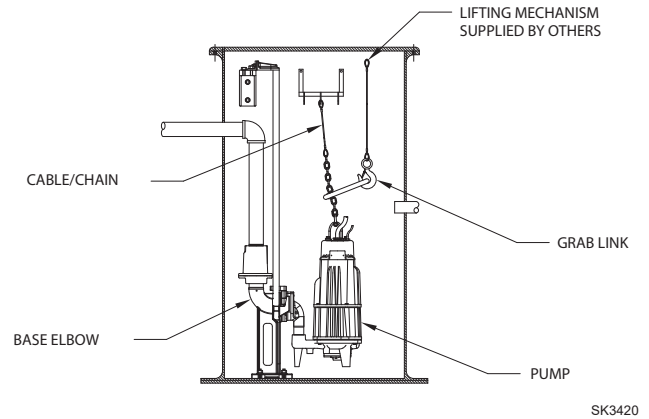
P/N	Description	Material	Wt. Lbs.
6039-0026	Choker Cable	Stainless Steel	1
6039-0027	Choker Cable	Galvanized Steel	1
6039-0028	Permanent Cable - 10'	Stainless Steel	4
6039-0029	Permanent Cable - 10'	Galvanized Steel	4
6039-0030	Removable Cable - 10'	Stainless Steel	5
6039-0031	Removable Cable - 10'	Galvanized Steel	5
6039-0032	Permanent Cable - 15'	Stainless Steel	6
6039-0062	Permanent Cable - 20'	Stainless Steel	7
6039-0061	Permanent Cable - 25'	Stainless Steel	8
6039-0068	Permanent Cable - 30'	Stainless Steel	9
6039-0067	Removable Cable - 15'	Stainless Steel	7
6039-0039	Removable Cable - 20'	Stainless Steel	8
6039-0036	Removable Cable - 25'	Stainless Steel	9

1/8" Stainless steel lifting for pump models: commercial duty and 1-2 HP grinders

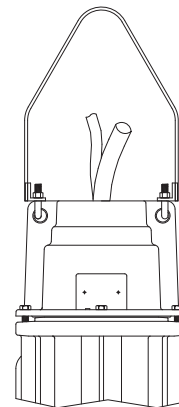
Part Number	Length
39-0031	8'
39-0032	12'
39-0033	16'
39-0034	20'
39-0035	24'

316 SS Single Leg With Cable & Shackle

P/N	Chain Length	Chain Size	Lifting Weight
6039-0115	20'	1/4"	1,375 lbs.
6039-0116	25'		
6039-0117	30'		
6039-0118	35'		
6039-0119	Grip Eye Bracket	1/4" - 1/2"	7,300 lbs.



Rigid Lifting Bail



3/8" removable lifting cable: 25-60 HP 64 HD and X64 HD pumps

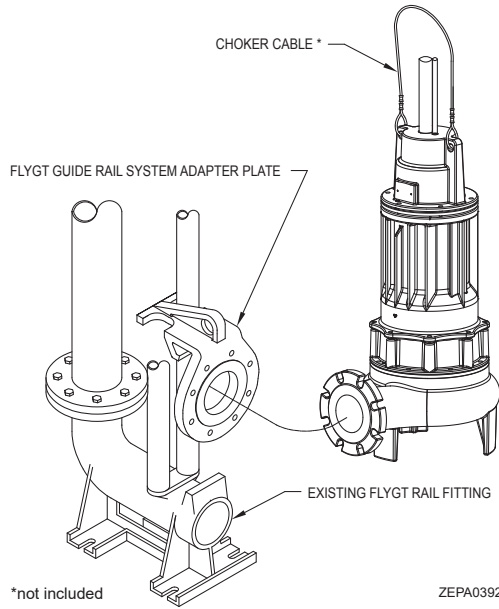
P/N	Description	Material	Wt. Lbs.
6039-0094	16' Cable w/ zinc plates shackle	Stainless Steel	5
6039-0105	20' Cable w/ zinc plates shackle	Stainless Steel	5
6039-0098	25' Cable w/ zinc plates shackle	Stainless Steel	6
6039-0097	30' Cable w/ zinc plates shackle	Stainless Steel	9
6039-0100	50' Cable w/ zinc plates shackle	Stainless Steel	16

* Used with a Rigid Lifting Bail

PUMP SERIES	P/N	Material	Wt. Lbs.
61 HD & X61 HD	39-0175	Stainless Steel	4
62 HD & X62 HD	39-0175	Stainless Steel	4
71 & X71	39-0175	Stainless Steel	4
64 HD	6039-0042	Stainless Steel	5
X64 HD, 25 - 40 HP	39-0175	Stainless Steel	4
X64 HD, 50 - 60HP	39-0176	Stainless Steel	5

3", 4" & 6" FLYGT GUIDE RAIL SYSTEM ADAPTERS

Adapter plates for retrofitting 3", 4" & 6" horizontal discharge pumps to existing Flygt rail systems.



DESIGN FEATURES

- Cast iron construction
- Flange conforms to ANSI B16.10 fully flat/MSS SP-6.
- For use with all 6400, 61 HD and 62 HD series pumps with 3", 4" or 6" discharges and 2" NPT rail pipe.
- Flange gasket and stainless steel bolts included.

Pump Discharge	Part Number
3"	6039-0070
4"	6039-0048
6"	6039-0053

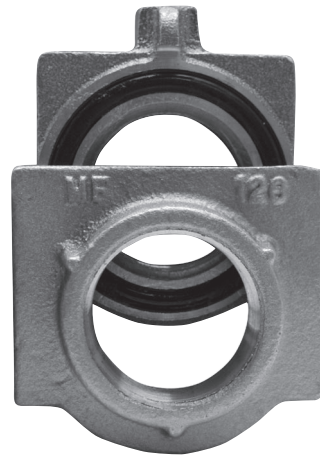
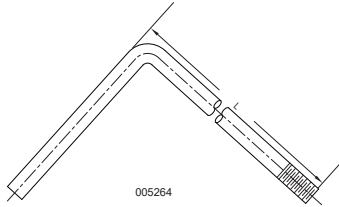
DISCONNECT ONLY

(1-1/4", 1-1/2" & 2" Discharge)

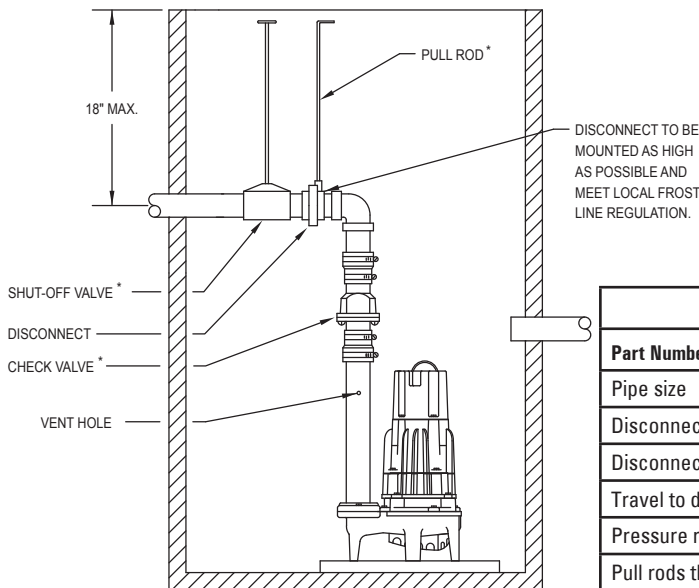
Disconnect fitting; used for shallow systems where guide rails are not necessary. (pull rod not included)

Stainless Steel Pull Rods

3/8" - 16 UNC	
Part Number	Length
39-0069	1'
39-0006	2-1/2'
39-0007	3-1/2'
39-0008	4-1/2'
39-0009	5-1/2'



39-0053, 1-1/4" NPT
39-0001, 1-1/2" NPT
39-0002, 2" NPT



*not included

SPECIFICATIONS			
Part Number	39-0053	39-0001	39-0002
Pipe size	1-1/4"	1-1/2" NPT	2" NPT
Disconnect material	brass	brass	brass
Disconnect weight	1.6 lb.	2.0 lbs.	2.5 lbs.
Travel to disengage	3-3/4"	3"	3-1/2"
Pressure rating	150 PSI	150 PSI	150 PSI
Pull rods thread size	3/8" - 16 UNC	3/8" - 16 UNC	3/8" - 16 UNC

NOTE: All pumps should be supported underneath with concrete blocks or basin floor.