



City of
Los Banos
At the Crossroads of California

Contract Documents
for
Construction of

AG Sports Complex
Pickleball Courts

October 2024

Bid Proposals must be received no later than 2:00 p.m. November 7, 2024
City of Los Banos City Clerk
520 J Street
Los Banos, CA 93635

City of Los Banos
Public Works Department

Table of Contents

Advertisement for Bids

Information for Bidders

Bid

Bid Bond

Sample Forms

- Agreement
- Certificate of Contractor
- Payment Bond
- Performance Bond
- Notice of Award
- Notice to Proceed
- Change Order

General Provisions

1. Terms and Definitions
2. Order of Precedence of Contract Documents
3. Venue
4. Giving Notice
5. Cumulative Remedies
6. Non-Discrimination
7. Non-Discrimination of the Disabled
8. Additional Instructions and Detail Drawings
9. Schedules, Reports and Records
10. Drawings and Specifications
11. Shop Drawings, Product Data and Samples
12. Materials, Services and Facilities
13. Inspection and Testing
14. Substitutions
15. Patents
16. Surveys, Permits and Regulations
17. Protection of Work, Property and Persons
18. Supervision by Contractor
19. Changes in the Work
20. Changes in Contract Price
21. Time for Completion and Liquidated Damages
22. Correction of Work
23. Suspension of Work, Termination and Delay
24. Progress Estimates
25. Progress Payments
26. Prompt Payment
27. Acceptance and Final Payment
28. Quantities and Unit Prices
29. Insurance
30. Contract Security
31. Assignments
32. Indemnification
33. Separate Contracts
34. Subcontracting
35. Employment of Apprentices
36. Payment of Prevailing Wages

37. Registration to Train Apprentices
38. Penalties
39. Engineer's Authority
40. Land and Rights-of-Way
41. Warranty and Guarantee
42. One (1) Year Warranty Period
43. Correction of Defective Work
44. Early Completion
45. Extended Warranties and Guarantees
46. Arbitration
47. Taxes
48. Contractor's Understanding
49. Accidents
50. Safety and Sanitation
51. Climatic Conditions
52. Officials Not to Benefit
53. Clean-Up
54. Notice to Owner
55. Payment of Withheld Funds
56. Storm Water Pollution Prevention Measures

Special Provisions

1. Requirements
2. Description of Work
3. Commencement, Prosecution and Completion of Work
4. Hours of Work
5. City Permits and Business Licenses
6. Testing
7. Responsibility Regarding Existing Utilities and Private Property
8. Obstructions
9. Materials Furnished By Owner
10. Materials Furnished By Contractor
11. Schedule of Values, Material List and Substitutions
12. Request for Extension of Time
13. Rights-of-Way
14. Coordination with Other Work
15. Closure of Streets
16. Construction Signs, Barricades, Lights and Flagmen
17. Traffic Control Plan
18. Disposal of Waste Materials
19. Noise Control
20. Water Supply
21. Notifications
22. Work Not Listed in Proposal
23. Submittals
24. Bid Item Descriptions

Technical Specifications

1. SECTION 00 72 00 General Requirements
2. SECTION 01 57 13 Erosion Control
3. SECTION 02 41 13 Demolition
4. SECTION 09 91 13 PAINTING
5. SECTION 31 22 00 EARTHWORK AND GRADING
6. SECTION 31 23 00 TRENCHING AND BACKFILLING
7. SECTION 32 01 90 LANDSCAPE MAINTENANCE

8. SECTION 32 01 91 TREE PROTECTION AND PRUNING
9. SECTION 32 12 16 ASPHALT PAVING
10. SECTION 32 13 13 SITE CONCRETE
11. SECTION 32 18 23 COURT SURFACING
12. SECTION 32 31 13 CHAIN LINK FENCING
13. SECTION 32 33 00 SITE FURNISHINGS
14. SECTION 32 41 23 SIGNAGE
15. SECTION 32 84 00 PLANTING IRRIGATION
16. SECTION 32 91 13 LANDSCAPE SOIL PREPARATION
17. SECTION 32 93 00 LANDSCAPE PLANTING
18. SECTION 33 40 00 SITE DRAINAGE UTILITIES

APPENDIX A Geotechnical Investigation Report AG Sports Complex Pickleball Courts prepared
by BSK Associates dated May 6, 2024

APPENDIX B Ag Sports Complex Structural Calculations by RW Consulting Engineers, Inc. dated
September 20, 2024

Advertisement for Bids

CITY OF LOS BANOS
520 J Street
Los Banos, California 93635

Notice is hereby given that separate sealed bids for the award of contract for the **Construction of AG Sports Complex Pickleball Courts** will be received by the City of Los Banos at the office of the City Clerk until 2:00 p.m. Pacific Standard Time, November 7, 2024 and then at said office publicly opened and read aloud.

The major work consists of PG&E coordination and associated work, clear and grub and minor demolition of existing park facilities, erosion control, grading, bio-retention area, soil off-haul, drainage, post-tension concrete slabs, court surfacing, concrete pavement, concrete bands, chain link fencing and gates, pickleball courts, ball wall, site furnishings, site electrical conduit/feeder and pull boxes, planting and irrigation improvements.

The time for completion shall be one hundred and eighty (180) working days.

The Contract Documents, in their entirety, can be viewed and/or obtained from the City of Los Banos website at www.losbanos.org or at the following locations:

Central California Builders Exchange (www.cencalbx.com)

Builders Exchange of Stockton (www.besonline.com)

Valley Builders Exchange, Inc. (www.valleybx.com)

Builders Exchange of Santa Clara County (www.bxscco.com)

Dodge Data & Analytics (www.construction.com/plans/)

A payment bond prepared and executed in accordance with California Civil Code Section 9550 and a bond for faithful performance of the contract will be required of the successful bidder who is awarded the contract.

The successful bidder must comply with the latest general prevailing rate of per diem wages as determined by the Director of Industrial Relations, State of California, Department of Industrial Relations and is to be paid to the various craftsmen and laborers required to construct said improvements and is made a part of the specifications and contract for said work to which reference is hereby made for further particulars.

No contractor or subcontractor may be listed on a bid proposal or awarded a contract for public work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. Contractor registration information can be found at:

<http://www.dir.ca.gov/Public-Works/PublicWorks.html>

Each bid shall be accompanied by cashier's or certified check or by a bidder's bond, made payable to the City of Los Banos and executed by a corporate surety licensed to issue surety bonds in the State of California, for an amount equal to at least ten percent (10%) of the amount of said bid and no bid shall be considered unless such cashier's or certified check or bidder's bond is enclosed therewith.

The successful bidder of this project shall have the following current and active California State Contractor's License at the time of the submission of the bid and throughout the duration of the contract: **Class A.**

Prospective bidders are required to attend a mandatory pre-bid meeting on October 17, 2024.

Bids will not be considered from bidders who were not physically in attendance at the mandatory pre-bid meeting.

Bidders shall refer to the Contract Document's Information for Bidders for complete instructions.

Bidders are solely responsible for the cost of preparing their bids.

The City specifically reserves the right, in its sole discretion, to reject any or all bids, to re-bid, or to waive inconsequential defects, in bidding not involving time, or quality of the work. The City may reject any and all bids and waive any minor irregularities in the bids.

Information for Bidders

Sealed bids will be received by the City of Los Banos (herein called the "Owner"), at the office of the City Clerk until 2:00 p.m. Pacific Standard Time (PST), on November 7, 2024, then at said office, publicly opened and read aloud. Owner shall reject all bids received after the specified time and will return such bids to bidder, unopened. Bidders must submit bids in accordance with these instructions. No emailed or faxed bids will be accepted.

The major work consists of PG&E coordination and associated work, clear and grub and minor demolition of existing park facilities, erosion control, grading, bio-retention area, soil off-haul, drainage, post-tension concrete slabs, court surfacing, concrete pavement, concrete bands, chain link fencing and gates, pickleball courts, ball wall, site furnishings, site electrical conduit/feeder and pull boxes, planting and irrigation improvements.

The time for completion is one hundred and eighty (180) working days.

Each bid must be submitted in a sealed envelope and addressed to the City of Los Banos at 520 J Street, Los Banos, CA 93635. Each sealed envelope containing a bid must be plainly marked on the outside as **"AG Sports Complex Pickleball Courts: Attention City Clerk"**, and the envelope shall also bear on the outside, the name of the bidder, and their address. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed to the City of Los Banos at 520 J Street, Los Banos, CA, 93635, and also clearly state, **"AG Sports Complex Pickleball Courts: Attention City Clerk"**.

A complete bid includes the Bid Form, List of Subcontractors, Equal Employment Opportunity, Non-Collusion Affidavit, Debarment and Suspension Certification, Bid Schedule, Experience, Bid Bond with surety, and a copy of a current California State Contractor's License. A signed Addendum, if issued, must also be submitted with the sealed bid. The Total Bid Amount must be filled in, in ink or typewritten, and the bid must be fully completed and executed when submitted. Only one set of original bid forms are required to be submitted. Mistakes must be corrected and the correction inserted; correction must be initialed in ink by person or persons signing the bid. No conditional bids will be accepted.

The bid shall be signed by a person or persons legally authorized to bind bidder to the contract. The individual or individuals signing each document shall warrant that they are authorized to bind the bidder.

The Owner may waive any informalities or minor defects or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No bidder may withdraw a bid within 30 days after the actual date of the opening thereof. Should there be reasons why the contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the Owner and the bidder.

Each bid must be accompanied by a bid bond payable to the Owner for ten percent (10%) of the total amount of the bid. As soon as the bid amounts have been compared, the Owner will return the bid security of all except the three lowest responsive and responsible bidders. Once a bid has been awarded, and the payment bond and performance bond of the successful bidder has been received by the Owner, the bid security of the three remaining lowest responsive and responsible bidders will be returned.

All bonds must be acknowledged before a Notary Public by both the bidder and the surety. Attorneys-in-fact who sign bid bonds or payment bonds and performance bonds must file with each bond a certified and effective dated copy of their power of attorney.

Award and Execution of Contract

The party to whom the contract is awarded will be required to execute the Agreement, and obtain the performance bond and payment bond along with satisfactory evidence of insurance within ten (10) calendar days from the date when the Notice of Award is delivered to the successful bidder. The Notice of Award shall be accompanied by the necessary agreement and bond forms. In case of failure of the bidder

to execute the Agreement, the Owner may, at his option, consider the bidder in default, in which case the bid bond accompanying the bid shall become the property of the Owner.

A performance bond and a payment bond, each in the amount of 100 percent of the Contract Price, with a corporate surety named on the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570, will be required for the faithful performance of the contract. The payment bond must be issued by an admitted surety insurer holding a certificate of authority to transact surety insurance in California issued by the Insurance Commissioner.

All bonds must be acknowledged before a Notary Public by both the bidder and the surety. Attorneys-in-fact who sign bid bonds or payment bonds and performance bonds must file with each bond a certified and effective dated copy of their power of attorney.

The Owner, within 15 days of receipt of the performance bond, payment bond and agreement signed by the party to whom the contract was awarded, shall sign the Agreement and return to such party an executed duplicate of the agreement. Should the Owner not execute the Agreement within such period, the bidder may, by written notice, withdraw his signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the Owner.

The Notice to Proceed shall be issued within 10 days of the execution of the Agreement by the Owner. Should there be reasons why the Notice to Proceed has not been issued within such period, the time may be extended by mutually agreed upon, and the bidder may terminate the Agreement without further liability on the part of either party.

All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the Contract throughout.

Subcontractors

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

Registration with California Department of Industrial Relations (DIR)

A contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, as defined in this chapter, unless currently registered and qualified to perform public work pursuant to Section 1725.5. It is not a violation of this section for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the business and Professions Code or by Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Section 1725.5 at the time the contract is awarded. Labor Code Section 1771.1(a) requires contractors and their subcontractors to possess and maintain such registration with DIR in order to be awarded and to perform on public works projects (regardless of funding source).

Pursuant to Section 1771.4, each contractor and subcontractor shall furnish certified payroll records to the Labor Commissioner at least monthly and in a format prescribed by the Labor Commissioner of the DIR. Until such time that the DIR gives awarding agencies direct access to all certified payrolls submitted by contractors and subcontractors, contractor and his subcontractors are also required to submit copies of payroll records to Owner on a monthly basis. Information on the above can be found at:

<http://www.dir.ca.gov/Public-Works/PublicWorks.html>

Prevailing Wage

This work is subject to prevailing wage requirements. If there is a difference between the minimum wage rates predetermined by the Secretary of Labor and the prevailing wage rates determined by the Director of the Department of Industrial Relations of the State of California for similar classification of labor,

the contractor and his subcontractor shall not pay less than the higher wage rate. In accordance with the provisions of Section 1773 of the Labor Code of the State of California, the Owner has obtained from the Director of the Department of Industrial Relations, the general prevailing rate for each craft, classification, or type of workman required for execution of the Agreement. A copy of said prevailing rate of per diem wages is on file in the office of the Owner, and available from the California Department of Industrial Relations' Internet web site at <http://www.dir.ca.gov/DLSR/PWD>.

The Federal minimum wage rates for this work as predetermined by the United States Secretary of Labor may be examined at the offices described above where the Contract Documents may be seen. Addenda to modify the Federal minimum wage rates, if necessary, will be posted on the internet at www.losbanos.org. Future effective general prevailing wage rates, which have been predetermined are on file with the California Department of Industrial Relations and are referenced but not printed in the general prevailing wage rates.

Pre-Bid Meeting

Prior to submitting a sealed bid, bidder will attend a mandatory pre-bid meeting starting at the Community Center. The date of the mandatory pre-bid meeting is October 17, 2024. The address for the mandatory meeting is 645 Seventh Street in Los Banos, California. The start time for the meeting is 10 a.m., sharp.

Bids will not be considered from bidders who were not physically in attendance at the mandatory pre-bid meeting.

Bidders must satisfy themselves as to the accuracy of the estimated quantities in the Bid Schedule by examination of the site and a review of the drawings and specifications including addenda. After bids have been submitted, the bidder shall not assert that there was misunderstanding concerning the quantities of work or the nature of the work to be done. The failure or omission of any bidder to do any of the foregoing shall not relieve any bidder from any obligation with respect to his bid.

The Contract Documents contain the provisions required for the construction of the project. The Owner will not be responsible for, nor be bound by, any oral instructions, interpretations, or explanations issued by the Owner or its representatives. Any request for clarifications or questions of the Contract Documents shall be made in writing or email and deliverable to:

City of Los Banos Public Works Department
Attn: Charles Bergson, P.E.
Charles.bergson@losbanos.org
411 Madison Avenue
Los Banos, CA 93635

Requests for clarification or questions shall be delivered to the Owner before 5:00 p.m. PST on October 21, 2024. Any Owner response to a request for clarification, questions and answers will be posted to the City's website at www.losbanos.org no later than 5:00 p.m. PST on October 28, 2024 and if necessary, shall become a part of the bid as an addendum.

Proposed timeline of events associated with the awarding of bid:

Release of Advertisement for Bid		October 9, 2024
Pre-Bid Meeting – Mandatory	10:00 a.m.	October 17, 2024
Deadline to Submit Questions/Clarifications	5:00 p.m.	October 21, 2024
Addendum/Questions/Clarifications posted	5:00 p.m.	October 28, 2024
Bid Opening	2:00 p.m.	November 7, 2024
City Council Considers Bid		November 20, 2024 (tentative)
Issuance of a Notice to Proceed	On or before:	December 2, 2024 (tentative)
Construction to Begin		December 16, 2024 (Tentative)

Qualification of Bidder

The Owner may make such investigation as it deems necessary to determine the ability of the bidder to provide the services requested, and the bidder shall furnish to the Owner all information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid should the evidence submitted by, or investigation of, the bidder fail to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the bid and to complete the requirements contemplated therein.

Governing Law and Venue

This bid, or any contract that may result from the award of this bid, shall be deemed to be made under, and shall be governed by and construed in accordance with, the laws of the State of California. Any action brought to enforce the terms, or provision of this bid or any contract that may result from the award of this bid, shall have venue in the County of Merced, State of California.

Mandatory Bid Protest Procedure

The lack of prompt procedure to resolve disputes regarding the bidding process would impair the Owner's ability to carry out its purpose of contracting this project in a timely manner. Therefore, to the maximum extent authorized by law and notwithstanding any other procedures specified in these Contract Documents, all disputes and/or protests regarding the bidding process shall be subject to the following procedure. In submitting a bid to the Owner for this work, the bidder agrees to comply with and to be bound by this procedure.

Any bid protest must be submitted in writing to the Owner before 5:00 p.m. on the fifth (5th) business day following bid opening.

1. The initial protest document must contain a complete statement of the basis for the protest, and all supporting documentation. A non-refundable fee of One Thousand Dollars (\$1,000.00) made payable to the "City of Los Banos" shall accompany the protest documents and will be used by the Owner to recover costs in evaluating the bid protest. A bid protest submitted without the requisite fee shall not be considered by the Owner.
2. The party filing the protest must have actually submitted a bid for the work. A subcontractor of a party submitting a bid for the work may not submit a bid protest. Only bidders who the Owner otherwise determines are responsive and responsible are eligible to protest a bid.
3. A party may not rely on the bid protest submitted by another bidder, but must timely pursue its own protest.
4. The protest must refer to the specific portion of the Contract Documents which forms the basis for the protest.
5. The protest must include the name, address and telephone number of the person representing the protesting party.
6. The party filing the protest must concurrently transmit a copy of the initial protest document and any attached documentation to all other parties with a direct financial interest which may be adversely affected by the outcome of the protest. Such parties shall include all other bidders who appear to have a reasonable prospect of receiving an award depending upon the outcome of the protest.
7. The Owner will give the protested bidder five (5) business days after the receipt of the protest to submit a written response. The responding bidder shall transmit the response to the protesting bidder concurrent with the delivery to the Owner.
8. The procedure and time limits set forth in this paragraph are mandatory and are the bidder's sole and exclusive remedy in the event of bid protest. The bidder's failure to comply with these procedures shall constitute a waiver of any right to further pursue the bid protest, including filing a Government Code Claim or legal proceedings.

If the Owner determines that a protest is frivolous, the protesting bidder may be determined to be non-responsive and/or non-responsible and that bidder may be determined to be ineligible for future

contract awards.

Cancellation of Contract

The Owner may terminate any contract derived from this bid as follows:

- WITHOUT CAUSE at any time by giving thirty (30) calendar days written notice to the successful bidder;
- WITH CAUSE (Default) at any time by giving ten (10) calendar days written notice to the successful bidder. Cancellation for cause shall be at the discretion of the Owner and shall be, but is not limited to, failure to supply the items, materials, equipment or services specified within the time allowed or within the terms, conditions or provisions of this bid. The successful bidder may not cancel any contract derived from this bid, without prior written consent of the Owner.

Bid Form

TO: City of Los Banos
520 J Street
Los Banos, CA 93635

In compliance with the Advertisement for Bids the undersigned, as bidder, hereby offers to provide to the Owner, in accordance with the terms and conditions in the provisions set forth in the Contract Documents the stated total bid amount quoted on this Bid Form for the work of

AG Sports Complex Pickleball Courts

Total Bid Amount: \$_____

(Total Bid Amount in Written Form)

The undersigned certifies under penalty of perjury under the laws of the State of California and the United States of America, that the above quotation constitutes a bona-fide offer for the work, that undersigned is a duly authorized representative of the company listed, that the quotation is in no way sham or collusive, and that the executed Agreement between the bidder and Owner constitutes acceptance of bidder's total bid for the work stated in the Contract Documents. The undersigned has read the General Provisions, Special Provisions, and Technical Specifications in these Contract Documents. The undersigned further certifies, under penalty of perjury that the Non-Collusion Affidavit required by Title 23 United States Code, Section 112 and Public Contract Code Section 7106; and the Title 49 Code of Federal Regulations, Part 29 Debarment and Suspension Certification are true and correct.

The undersigned acknowledges receipt of the following addenda: _____

Signature: _____ Date: _____

Print Name: _____ Title: _____

Name of Business: _____

Doing business as: (*Circle One*): An Individual A Partnership A Corporation

Business Address: _____

Telephone No.: _____ Fax No.: _____

E-Mail Address: _____

License Number: _____ Class & Expiration Date: _____

List of Subcontractors

As of March 1, 2015, Contractors (and sub-contractors) wishing to bid on public works contracts shall be registered with the State Division of Industrial Relations and certified to bid on Public Works contracts. Please register at: <https://www.dir.ca.gov/Public-Works/Contractor-Registration.html>

In accordance with Title 49, Section 26.11 of the Code of Federal Regulations, and Section 4104 of the Public Contract Code of the State of California, as amended, the following information is required for each sub-contractor who will perform work amounting to more than one half of one percent (0.5%) of the Total Base Bid of \$10,000 (whichever is greater). **Photocopy this form for additional firms.**

Project: **AG Sports Complex Pickleball Courts**

The following work will be performed (or provided) by the following subcontractors, and coordinated by bidder:

Bid Item No.	Description of Work to be Performed	Percent of Total Contract	Subcontractor's License No.	DIR Registration No.	Subcontractor's Name and Address

Equal Employment Opportunity

Contractor hereby certifies that bidder and subcontractors

- ☐ Have
☐ Have Not

participated in a previous contract or subcontract subject to the equal opportunity clauses, as required by Executive Orders 10925, 11114, or 11246, and that, where required, have filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

Note: The above certification is part of the bid. Signing this bid on the signature portion thereof shall also constitute signature of these certifications.

Non-Collusion Affidavit
PUBLIC CONTRACT CODE 7106

In conformance with Title 23 United States Code Section 112 and Public Contract Code 7106 the bidder declares that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

Debarment and Suspension Certification

TITLE 49, CODE OF FEDERAL REGULATIONS, PART 29

The bidder, under penalty of perjury, certifies that, except as noted below, he/she or any other person associated therewith in the capacity of owner, partner, director, officer, and manager:

- Is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any federal agency;
- Has not been suspended, debarred, voluntarily excluded or determined ineligible by any federal agency within the past 3 years;
- Does not have a proposed debarment pending; and
- Has not been indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

If there are any exceptions to this certification, insert the exceptions to an additional sheet of paper and include with the bid.

Exceptions will not necessarily result in denial of award, but will be considered in determining bidder responsibility. For any exception noted above, indicate on an additional sheet of paper to whom it applies, initiating agency, and dates of action.

NPDES/MS4 Compliance Certification

All construction projects within the City limits must comply with the National Pollutant Discharge Elimination System (NPDES) storm water regulation adopted by the EPA and the Phase II Small Municipal Separate Storm Sewer System (MS4) General Permit requirements, regardless of size.

The City is required under these permits to provide information to Contractors performing work within City limits about training opportunities to assist in managing potential pollutants from construction –related activities, selection, installation, implementation, and maintenance of Best Management Practices (BMPs), as well as overall program compliance. The City has provided such information and helpful links on their website at <http://www.losbanos.org/city-government/departments/public-works/>, under the Storm Water Management Plan tab.

The Bidder acknowledges that they are aware of the necessity to be in compliance with the NPDES and MS4 permits while working within City limits, and that information regarding such is available on the City's website.

Note: The above certifications are part of the bid. Signing this bid on the signature portion thereof shall also constitute signature of these certifications.

Experience

Bidder shall identify three (3) most recently completed projects similar to work described in these Contract Documents.

	1	2	3
Project Title			
Public Agency			
Address			
Telephone No.			
Engineer in Charge			
Project Value (\$)			
Date Accepted			
Claims Filed?*			

* If yes, please explain below:

**Bid Schedule
For
AG Sports Complex Pickleball Courts**

Bidder agrees to perform all the work described in the Contract Documents for the following unit and lump sum prices and understands that the quantity of work shown is approximate only. The schedule shall be completed by the bidder with the unit and lump sum prices entered in numerals. The extensions shall be made by the bidder. In case of discrepancy between the unit prices and the extension thereof, the unit price shall be considered as correct when evaluating bids.

ITEM NO.	ITEM	QUANTITY AND UNIT			UNIT PRICE		AMOUNT
1	Project Start-Up	1	LS				
2	Erosion Control	1	LS				
3	Demolition	1	LS				
4	Rough Grading	1	LS				
5	Soil Off-Haul	1	LS				
6	Catch Basin	14	EA				
7	Pop-up Bioretention Drain	1	EA				
8	Clean Out	1	EA				
9	Sold Drain Line, 6"	300	LF				
10	Sold Drain Line, 8"	280	LF				
11	Perforated Drain Line, 6"	120	LF				
12	French Drain	125	LF				
13	Bioretention Soil and Drain Rock	1,385	SF				
14	Post-Tensioned Concrete Slab	17,340	SF				
15	Court Surfacing	17,340	SF				
16	Concrete Pavement	5,460	SF				
17	Asphalt Pavement	225	SF				
18	Concrete band, 1' wide	1,500	LF				
19	Chain Link Fence, 6' Tall with Slats	280	LF				
20	Chain Link Fence, 6' Tall	440	LF				
21	Chain Link Fence, 4' Tall	760	LF				
22	Chain Link Gate, 6' Tall	3	EA				
23	Chain Link Gate, 4' Tall	6	EA				
24	Bench	10	EA				
25	Court Bench	2	EA				
26	Picnic Table	6	EA				
27	Trash Receptacle	1	EA				
28	Storage Container	1	EA				
29	Windscreen	435	LF				
30	Pickleball Court Net, Post, and Anchor	9	EA				
31	Ball Wall	1	LS				

32	Bollard	2	EA			
33	Entry Sign	1	EA			
34	Court Rules Sign	3	EA			
35	Court Number Sign	3	EA			
36	Accessible parking	1	LS			
37	Site electrical: conduit/feeder and pull boxes	1	LS			
38	PG&E conduit re-route and boxes	1	LS			
39	Irrigation	1	LS			
40	Soil Preparation	8,000	SF			
41	Shrub, 1 gallon	101	EA			
42	Shrub, 5 gallon	269	EA			
43	Tree	8	EA			
44	Mulch	10,655	SF			
45	Root barrier	70	LF			
46	Plant Establishment	3	MO			
47	Dog Park Irrigation & Planting Restoration	1	LS			

TOTAL: \$ _____

B-1	Shade Structure, type 1	1	LS			
B-2	Shade Structure, type 2	1	LS			
B-3	Shade Structure, type 3	1	LS			
B-4	Shade Structure, type 4	1	LS			
B-5	Site Electrical: pole lights, push-buttons, panel, cabinet, wiring, and cables	1	LS			

Note: The representations made herein are made under penalty of perjury. Any information contained in the bid which is proven false shall be considered nonresponsive and this bid shall be rejected.

Bid Bond

We, _____

as Contractor, and _____

as Surety, jointly and severally, bind ourselves, our heirs, representatives, successors and

assigns, as set forth herein, to the **City of Los Banos** (herein called "Owner") for payment

of the penal sum of _____

_____ Dollars (\$ _____),

lawful money of the United States. Contractor has submitted the accompanying bid proposal

for the construction of: **AG Sports Complex Pickleball Courts**

If the Contractor is awarded the contract and enters into a written agreement, in the form prescribed by the Owner, at the price designated by Bid Schedule, and files a payment bond and performance bond with the Owner, or substitute security in lieu thereof, in the time and manner specified by the Owner, and carries all insurance in type and amount which conforms to the General Provisions, Special Provisions, and Technical Specifications in these Contract Documents and furnishes required certificates and endorsements thereof, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

Forfeiture of this bond, or any deposit made in lieu thereof, shall not preclude the Owner from seeking all other remedies provided by law to cover losses sustained as a result of the Contractor's failure to do any of the foregoing.

Contractor and Surety agree that if the Owner is required to engage the services of an attorney in connection with the enforcement of this bond, each shall pay Owner's reasonable attorney's fees incurred with or without suit.

Executed on _____, 20

(Seal if Corporation)

Contractor

By: _____

Title _____

[SIGNATURE SHEET CONTINUES ONTO NEXT PAGE]

Any claims under this bond may be addressed to:

_____ (name and address of Surety)

_____ (name and address of Surety's agent for
service of process in California, if different from
above)

_____ (phone number of Surety's agent in California)

(Attach Acknowledgment)

Surety

By _____

(Attorney-in-Fact)

Notice: No substitution or revision to this bond form will be accepted. Sureties must be authorized to do business in and have an agent for service of process in California.

All bond forms must be acknowledged before a Notary Public by both the Contractor and the Surety. Attorneys-in-fact who sign bond forms must file with each bond a certified and effective dated copy of their power of attorney.

Agreement

SAMPLE

Note: Particulars left blank in this sample will be filled with project specific information as outlined in these bid documents.

THIS Agreement is dated as of the _____ day of _____ in the year 20__ by and between the **City of Los Banos, a California municipal corporation** ("Owner") and [ENTER NAME AND TYPE OF ENTITY] ("Contractor").

Owner and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

1. WORK. Contractor shall complete the work indicated in Owner's Contract Documents entitled "**AG Sports Complex Pickleball Courts.**"

The work is generally described as follows:

- PG&E coordination and associated work, clear and grub and minor demolition of existing park facilities, erosion control, grading, bio-retention area, soil off-haul, drainage, post-tension concrete slabs, court surfacing, concrete pavement, concrete bands, chain link fencing and gates, pickleball courts, ball wall, site furnishings, site electrical conduit/feeder and pull boxes, planting and irrigation improvements. The time for completion is one hundred and eighty (180) working days.
- Contractor shall furnish all of the material, supplies, tools, equipment, labor and other services necessary for the construction and completion of the work described herein.

2. CONTRACT TIME. Contractor shall commence the work required by the Contract Documents within 10 calendar days after the date of the Notice to Proceed and will complete the same within the time period set forth in the bid, unless the period for completion is extended otherwise by the Contract Documents.

3. LIQUIDATED DAMAGES. Owner and Contractor recognize that time is of the essence of this Agreement and that Owner will suffer financial loss if the work is not completed within the time specified in Paragraph 2 herein, plus any extensions thereof allowed in accordance with Paragraph 21, Time for Completion and Liquidated Damages, of the General Provisions. The parties also recognize the delays, expense and difficulties involved in proving in a legal proceeding the actual loss suffered by Owner if the work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty) Contractor shall pay Owner Eight Hundred Dollars (\$ 800.00) for each day that passes after the time specified in Paragraph 2 herein.

4. CONTRACT PRICE. Owner shall pay Contractor for completion of the work in accordance with the Contract Documents in current funds the amount set forth in the Bid Schedule(s). The Contractor agrees to perform all of the work described in the Contract Documents for the unit and lump sum prices set forth in the Bid Schedule(s).

5. PAYMENT PROCEDURES. Contractor shall submit applications for payment in accordance with Paragraph 24, Progress Estimates, of the General Provisions. Applications for payment will be processed by Owner as provided in the General Provisions.

6. CONTRACT DOCUMENTS. The Contract Documents which comprise the entire agreement between Owner and Contractor concerning the work consists of this Agreement and the following attachments to this Agreement:

- (A) Advertisement for Bids
- (B) Information for Bidders
- (C) Bid
- (D) Bid Bond
- (E) Agreement
- (F) Payment Bond
- (G) Performance Bond
- (H) Notice of Award
- (I) Notice to Proceed
- (J) Change Order
- (K) General Provisions
- (L) Special Provisions
- (M) Technical Specifications prepared by Callander Associates entitled "AG Sports Complex Pickleball Courts" dated September 20, 2024.
- (N) Drawings prepared by Callander Associates numbered 1 through 30.
- (O) Addenda

No. _____, dated _____ 2024

No. _____, dated _____ 2024

There are no Contract Documents other than those listed in this Paragraph 6. The Contract Documents may only be amended by change order as provided in Paragraph 19, Changes in the Work, of the General Provisions.

7. MISCELLANEOUS.

A. Terms used in this Agreement which are defined in Paragraph 1 of the General Provisions will have the meanings indicated in the General Provisions.

B. No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation monies that may become due and monies that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

C. Owner and Contractor each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents.

D. The Laws of the State of California shall govern this Agreement. Venue is Merced County. The provisions of this paragraph shall survive expiration or other termination of this Agreement regardless of the cause of such termination.

E. All bids become property of the Owner. All bids, including the accepted bid and any subsequent contract become public records per the requirements of the California Government Code, Sections 6250-6270, "California Public Records Act". Proprietary material must be clearly marked as such. Pricing and service elements of the successful bid

are not consider proprietary information. The Owner will treat all information submitted in a bid as available for public inspection once the Owner has selected a contractor. If you believe that you have a legally justifiable basis under the California Public Records Act (Government Section 6250 et. seq.) for protecting the confidentiality of any information contained within your bid, you must identify any such information, together with the legal basis of your claim in your bid. In order for the Owner to assess confidentiality of any such information on your behalf, you must request, execute and submit an Owner-prepared written agreement to defend and indemnify the Owner for any liability, costs, and expenses incurred in asserting such confidentiality as part of your bid. The final determination as to whether the Owner will assert your claim of confidentiality on your behalf shall be sole discretion of the Owner.

F. This Agreement shall not be interpreted in favor of any Party by virtue of said Party not having prepared this Agreement.

G. If any time period provided for in this Agreement ends on the day other than a Business Day, the time period shall be extended to the next Business Day.

IN WITNESS WHEREOF, Owner and Contractor have caused this Agreement to be executed the day and year first above written.

Date

By: _____
Authorized Representative of Owner

Title: _____

ATTEST:

Lucille L. Mallonee
City Clerk

APPROVED AS TO FORM:

William A. Vaughn
City Attorney

Date

By: _____
Authorized Representative of
Contractor

Title: _____

(Seal if Corporation)

(Attach Acknowledgement for Authorized Representative of Contractor)

Certificate of Contractor

I, _____
(Name)

certify that I am a/the _____
(Title)

designate sole proprietor, partner in partnership, or corporate officer with Contractor License

Number _____ in the entity named as Contractor in the foregoing Agreement. I

hereby expressly certify that the name of the entity to which I am associated is

(Company Name)

that this entity is in good standing and has complied with all applicable laws and regulations, and

that I have been expressly authorized by the proper parties in this entity to execute the Agreement
on behalf of the above-named entity.

ATTEST:

Signature: _____

This form must be acknowledged before a Notary Public. The acknowledgement must be attached.

Payment Bond

We, _____

as Contractor, and _____

as Surety, jointly and severally, bind ourselves, our heirs, representatives, successors and

assigns, as set forth herein, to the **City of Los Banos** (herein called "Owner") for payment

of the penal sum of _____

_____ Dollars (\$ _____),

lawful money of the United States. Owner has awarded the contract and entered into an

Agreement with the Contractor for the construction of:

AG Sports Complex Pickleball Courts

If Contractor or any of his subcontractors fails to pay any of the persons named in Section 9100 of the California Civil Code, or amounts due under the Unemployment Insurance Code with respect to work or labor performed under the contract or during the one-year guarantee period, or for any amounts required to be deducted, withheld, and paid over to the Franchise Tax Board from the wages of employees of the Contractor and his subcontractors pursuant to Section 13020 of the Unemployment Insurance Code, with respect to such work and labor, then Surety will pay the same in an amount not exceeding the sum specified above, and also will pay, in case suit is brought upon this bond, such reasonable attorney's fees as shall be fixed by the court.

This bond shall insure to the benefit of any of the persons named in Section 9100 of the California Civil Code, so as to give a right of action to them or their assigns in any suit brought upon this bond.

Surety agrees that no change, extension of time, alteration, or addition to the terms of the Contract, or the work to be performed, or the Provisions shall in any way affect its obligation on this bond, and it does hereby waive notice thereof.

Contractor and Surety agree that should Owner become a party to any action on this bond that each will also pay Owner's reasonable attorney's fees incurred therein in addition to the above sum.

[SIGNATURE SHEET BEGINS ON NEXT PAGE]

Executed in four original counterparts on: _____, 20____

Contractor

(Seal if Corporation)

By: _____

Title: _____

(Attach Acknowledgment of Authorized Representative of Contractor)

Any claims under this bond may be addressed to:

_____ (name and address of Surety)

_____ (name and address of Surety's agent for
service of process in California, if different from
above)

_____ (phone number of Surety's agent in California)

(Attach Acknowledgment)

Surety

By _____
(Attorney-in-Fact)

Notice: No substitution or revision to this bond form will be accepted. Sureties must be authorized to do business in and have an agent for service of process in California.

All bond forms must be acknowledged before a Notary Public by both the Contractor and the Surety. Attorneys-in-fact who sign bond forms must file with each bond a certified and effective dated copy of their power of attorney.

Performance Bond

We, _____

as Contractor, and _____

as Surety, jointly and severally, bind ourselves, our heirs, representatives, successors and

assigns, as set forth herein, to the **City of Los Banos** (herein called "Owner") for payment

of the penal sum of _____

_____ Dollars (\$ _____),

lawful money of the United States. Owner has awarded the contract and entered into an

Agreement with the Contractor for the construction of:

AG Sports Complex Pickleball Courts

The condition of this obligation is such that if the Contractor shall in all things abide by and well and truly keep and perform the covenants, and agreements in the said Contract Agreement, and any alteration thereof made as therein provided, on his part to be kept and performed at the time and in the manner therein specified, and shall faithfully fulfill the one-year guarantee of all materials and workmanship, and shall indemnify and save harmless the Owner and the Owner's Representative, and their consultants, and each of their directors, officers, employees and agents, as therein stipulated, this obligation shall become null and void, otherwise, it shall be and remain in full force and effect.

This Performance Bond shall remain in full effect during the one-year guaranty period following the completion of the work.

Surety agrees that no change, extension of time, alteration, or addition to the terms of the General Provisions, Special Provisions, and Technical Specifications in these Contract Documents shall in anyway affect its obligation in the bond, and it does hereby waive notice thereof.

Contractor and Surety agree that if the Owner is required to engage the services of an attorney in connection with the enforcement of this bond, each shall pay Owner's reasonable attorney's fees incurred with or without suit, in addition to the above sum.

[SIGNATURE SHEET BEGINS ON NEXT PAGE]

Executed in four original counterparts on : _____, 20____

Contractor

(Seal if Corporation)

By: _____

Title: _____

(Attach Acknowledgment of Authorized Representative of Contractor)

Any claims under this bond may be addressed to:

_____ (name and address of Surety)

_____ (name and address of Surety's agent for
service of process in California, if different from
above)

_____ (phone number of Surety's agent in California)

(Attach Acknowledgment)

Surety

By _____
(Attorney-in-Fact)

Notice: No substitution or revision to this bond form will be accepted. Sureties must be authorized to do business in and have an agent for service of process in California.

All bond forms must be acknowledged before a Notary Public by both the Contractor and the Surety. Attorneys-in-fact who sign bond forms must file with each bond a certified and effective dated copy of their power of attorney.

Notice of Award

To: _____

Date: _____
Project: _____

The Owner has considered the bid submitted by you for the above described work dated _____, 20____.

You are hereby notified that your bid has been accepted for the unit and lump sum prices set forth in the Bid Schedule totaling \$_____.

You are required by the Information for Bidders to execute the Agreement and furnish the required Contractor's performance bond and payment bond within ten (10) calendar days for the date of this Notice to you.

Before the Notice to Proceed can be issued, all required certificates of insurance, as stated in Section 29 of the General Provisions, and a copy of your Los Banos Business License must be submitted.

If you fail to execute said Agreement and to furnish said bonds within ten days from the date of this Notice, said Owner will be entitled to consider all your rights arising out of the Owner's acceptance of your bid as abandoned and as a forfeiture of your Bid Bond. The Owner will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this Notice of Award to the Owner.

Owner

By _____

Title _____

ACCEPTANCE OF NOTICE

Receipt of the above Notice of Award is hereby
acknowledged by

(Name of Contractor)

this _____ day of _____, 20____

By _____

Title _____

Notice to Proceed

To: _____

Date: _____
Project: _____

You are hereby notified to commence work in accordance with the Agreement dated _____, 20_____, on or before _____, 20_____, and you are to complete the work by _____, 20_____.

You are required to return an acknowledged copy of this Notice to Proceed to the Owner.

Owner

By _____

Title _____

ACCEPTANCE OF NOTICE

Receipt of the above Notice to Proceed is
hereby

acknowledged by

(Name of Contractor)

this _____ day of _____, 20_____

By _____

Title _____

Change Order

Order No. _____

Date: _____

Agreement Date: _____

Project: _____

Owner: _____

Contractor: _____

The following changes are hereby made to the Contract Documents:

Justification:

Change to Contract Price:

Original Contract Price: \$ _____

Current Contract Price adjusted by previous
Change Order: \$ _____

The Contract Price due to this Change Order
will be (increased) (decreased) by: \$ _____

The new Contract Price including this
Change Order will be: \$ _____

Change to Contract Time:

The Contract Time will be (increased) (decreased)
by calendar days. _____

The date for completion of all work will be: _____

The undersigned hereby agrees to the above-described amendment of the Agreement.

Contractor

Owner

This Change Order shall become a part of the Contract Documents only upon signature of both parties.

General Provisions

1. Terms and Definitions

Wherever used in the Contract Documents, the following terms shall have the meanings indicated, which shall be applicable to both the singular and plural thereof:

Addenda - Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the Contract Documents, by additions, deletions, clarifications or corrections.

ANSI – American National Standards Institute, current designation as of the Bid date unless otherwise indicated.

ASME – American Society of Mechanical Engineers, current designation as of the Bid date unless otherwise indicated.

ASTM – American Society for Testing Materials, current designation as of the Bid date unless otherwise indicated.

AWWA – American Water Works Association, current designation as of the Bid date unless otherwise indicated.

Bid - The offer or proposal of the bidder submitted on the prescribed form setting forth the prices for the work to be performed.

Bidder - Any person, firm or corporation submitting a bid for the work.

Bonds - Bid, Performance and Payment Bonds and other instruments of security, furnished by the Contractor and his surety in accordance with the Contract Documents.

Change Order - A written order to the Contractor authorizing an addition, deletion or revision in the work within the general scope of the Contract Documents, or authorizing an adjustment in the contract price or contract time.

Completion - That date as certified by the Engineer when the construction of the project or a specified part thereof is sufficiently completed, in accordance with the Contract Documents, so that the project or specified part can be utilized for the purposes for which it is intended.

Contract Documents - the contract, including Advertisement for Bids, Information for Bidders, Bid, including Bid Representations and Certifications, Bid Bond, Agreement, Payment Bond, Performance Bond, Notice of Award, Notice to Proceed, Change Order, General Provisions, Special Provisions, Technical Specifications, Drawings, and Addenda.

Contract Price – The total monies payable to the Contractor under the terms and conditions of the Contract Documents.

Contract Time – The number of calendar or working days as stated in the Contract Documents for the completion of the work.

Contractor – The person, firm or corporation with whom the Owner has executed the Agreement.

Drawings – The part of the Contract Documents which shows the characteristics and scope of the work to be performed and which have been prepared or approved by the Engineer.

Engineer – City Engineer of the City of Los Banos, acting either directly or through properly authorized agents, such agents, acting within the scope of the particular duties entrusted to them.

Field Order – A written order effecting a change in the work not involving an adjustment in the contract price or an extension of the contract time, issued by the Engineer to the Contractor during construction.

IEEE – Institute of Electrical and Electronics Engineers, current designation as of the bid date unless otherwise indicated.

NEMA – National Electrical Manufacturers Association, current designation as of the bid date unless otherwise indicated.

Notice of Award – The written notice of the acceptance of the Bid from the Owner to the successful bidder.

Notice to Proceed – Written communication issued by the Owner to the Contractor authorizing him to proceed with the work and establishing the date of commencement of the work.

Owner – City of Los Banos.

Production Data – All illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate a material, product or system for some portion of the work.

Project – The undertaking to be performed as provided in the Contract Documents.

REA – Rural Electrification Association, current designation as of the bid date unless otherwise indicated.

Samples – Physical examples which illustrate materials, equipment or workmanship, and establish standards by which the work will be judged.

Shop Drawings – All drawings, diagrams, schedules and other data which are specifically prepared for the work by the Contractor, a subcontractor, manufacturer, supplier or distributor, to illustrate some portion of the work.

Specifications – A part of the Contract Documents consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards and workmanship.

Standards - City of Los Banos Standard Specifications, The Standard Specifications of the Department of Transportation of the State of California (Caltrans) dated 2010 and subsequent updates to that 2010 edition, and The Standard Plans of the Department of Transportation of the State of California (Caltrans) dated 2010 and subsequent updates to this 2010 edition.

Subcontractor – An individual, firm or corporation having a direct contract with the Contractor or with any other subcontractor for the performance of a part of the work at the site.

Supplier – Any person or organization who supplies materials or equipment for the work, including that fabricated to a special design, but who does not perform labor at the site.

Work – All labor necessary to produce the construction required by the Contract Documents, and all materials and equipment incorporated or to be incorporated in the project.

Written Notice – Any notice to any party of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at his last given address, or delivered in person to said party or his authorized representative on the work.

2. Order of Precedence of Contract Documents

In resolving conflicts resulting from errors or discrepancies in any of the Contract Documents, the order of precedence shall be as follows:

1. Permits from other agencies as may be required by law
2. Change orders
3. Agreement
4. Addenda
5. Contractor's Bid (Bid Form)
6. Advertisement for Bids
7. Information for Bidders
8. Supplementary General Conditions
9. General Provisions
10. Special Provisions

11. Technical Specifications
12. Drawings
13. Referenced Standard Specifications

If the conflicts cannot be resolved by the precedence prescribed above, the most stringent requirements shall prevail.

3. Venue

Contractor, and any subcontractor, supplier and any other person or organization performing any part of work, agree that each of them will waive jurisdiction and venue and shall submit to the jurisdiction of the courts of the State of California in the County of Merced, regardless of residence or domicile, with respect to any actions or suits at law or in equity arising under or related to the bidding, award or performance of the work or with regard to any matter whatsoever arising out of or relating to the validity, construction, interpretation or reinforcement of the Agreement as against Owner or any of their consultants, and/or any of their respective directors, officers, employees, representatives or agents.

4. Giving Notice

Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

5. Cumulative Remedies

The duties and obligations imposed by these General Provisions and the rights and remedies available hereunder to the parties hereto, and, in particular but without limitation, the warranties, guarantees and obligations imposed upon Contractor by the General Provisions and all of the rights and remedies available to Owner thereunder are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by laws or regulations, by special warranty or guarantee or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which they apply.

6. Non-discrimination

During the performance of the project, Contractor and subcontractors shall not unlawfully discriminate against any employee or applicant for employment because of race, color, ancestry, religion, sex, national origin, marital status, age, medical condition (cancer related), physical handicap (including AIDS), or sexual orientation. Equal employment extends, but is not limited to recruitment, compensation, benefits, layoff, termination, and all other conditions of employment. Contractor and subcontractors shall ensure that the evaluation/treatment of their employees and applicants for employment are free of such discrimination. Contractor and subcontractors shall comply with the provisions of the Fair Employment and Housing Act (Government Code, Section 12900 et seq.) and the applicable regulations promulgated there under (California Administrative Code, Title 2, Section 7285.0 et seq.). The applicable regulations of the Fair Employment and Housing Commission implementing Government Code, Section 12900, set forth in Chapter 5 of Division 4 of Title 2 of the California Administrative Code and incorporated into this agreement by reference and made a part hereof as if set forth in full.

Contractor and any subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement.

Contractor shall include the nondiscrimination and compliance provisions of the clause in all subcontracts to perform work under the contract.

Contractor shall grant access by representative of the Department of Fair Employment and Housing and the Owner upon reasonable notice at any time during normal business hours, but in no case less than

twenty-four (24) hours notice, to such of its books, records, accounts, other sources of information and its facilities as said Owner shall require to ascertain compliance with this clause.

7. Non-discrimination of the Disabled

The Owner will not aid or perpetuate discrimination against a qualified disabled individual by funding as an agency, organization, or person that discriminates on the basis of handicap in providing aid, benefit, or service to beneficiaries of the program or activity. The Owner is committed to provide access to all Owner services, programs, and meetings open to the public for people with disabilities. In this regard the Owner and all of its vendors and Contractor will take all reasonable steps to ensure that disabled individuals have the maximum opportunity for the same level of aid, benefit, or service as any other individual.

8. Additional Instructions and Detail Drawings

The Contractor may be furnished additional instructions and detail drawings by the Engineer, as necessary to carry out the work required by the Contract Documents. The additional drawings and instructions thus supplied will become a part of the Contract Documents. The Contractor shall carry out the work in accordance with the additional detail drawings and instructions.

9. Schedules, Reports and Records

The Contractor shall submit to the Owner such schedules, reports, records and other data as the Owner may request concerning work performed or to be performed.

Prior to the first partial payment estimate, the Contractor shall submit schedules showing the order in which he proposed to carry on the work, including dates at which he will start the various parts of the work, estimated date of completion of each part and, as applicable:

- A. A detailed cost breakdown of the work under each bid item awarded. The breakdown, after receiving favorable review by the Engineer, will become the basis for partial payment determination. Elements of work shall be grouped by building, structure, pipeline, system, etc. Within each grouping, work shall be itemized by readily measurable quantities of work completed in place. For example, concrete should be in units of cubic yard including form work and reinforcing steel. Mobilization costs, bond and insurance costs, and overhead costs shall not be prorated over items of work. In the event the cost breakdown is not favorably reviewed by the Engineer, another cost breakdown shall be submitted that is mutually acceptable to the Contractor and the Engineer.
- B. The dates at which special detail drawings will be required; and respective dates for submission of shop drawings, the beginning of manufacture, the testing and the installation of materials, supplies and equipment. The Contractor shall also submit a schedule of payments that he anticipates he will earn during the course of the work.

10. Drawings and Specifications

The intent of the drawings and specifications is that the Contractor shall furnish all labor, materials, tools, equipment, and transportation necessary to complete the project in an acceptable manner, ready for use, occupancy or operation by the Owner.

In case of conflict between the drawings and specifications, the specifications shall govern. Figure dimensions on drawings shall govern over scale dimensions and detailed drawings shall govern over general drawings.

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

The Owner will furnish to the Contractor, free of charge, six copies of drawings and specifications for the

work. The Contractor shall keep one copy of all current drawings and specifications on the job site, in good order, available to the Engineer and his representatives.

All drawings, specifications, and copies thereof furnished by the Owner are the property of the Owner. They are not to be used on other work, and, with the exception of the signed contract set, are to be returned to the Owner on request, at the completion of the work.

11. Shop Drawings, Production Data and Samples

The Contractor shall review, approve and submit to the Engineer all Shop Drawings, Production Data and Samples as may be necessary for prosecution of the Work and as required by the Contract Documents. The Contractor shall review and approve all Shop Drawings, Production Data and Samples prior to submitting them to the Engineer. By approving and submitting Shop Drawings, Production Data and Samples, the Contractor represents that he has determined and verified all materials, measurements and criteria related thereto, and that he has checked and coordinated the information contained within such submittals with the requirements of the Contract Documents. Any Shop Drawing, Production Data or Sample submitted to the Engineer without having been approved by the Contractor will be returned unreviewed to the Contractor.

For each item where shop drawings, production data or samples are required, the Contractor shall submit a minimum of six approved sets, hard copies, or one set, electronically. The Engineer shall review all shop drawings, production data and samples and retain three sets after his review. The remaining sets shall be returned to the Contractor with actions defined as follows:

- A. NO EXCEPTIONS TAKEN – Accepted subject to its compatibility with future submissions and additional partial submissions for portions of the work not covered in this submission.
- B. MAKE CORRECTIONS NOTED – Same as NO EXCEPTIONS TAKEN except that minor corrections as noted shall be made by the Contractor.
- C. REVISE AND RESUBMIT – Rejected because of major inconsistencies or errors which shall be resolved by the Contractor prior to subsequent review by the Engineer.
- D. REJECTED – Submitted material does not conform to Contract Documents in major respect.

The Engineer's review is only for general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. It shall not include review of quantities, dimensions, weights or gauges, fabrications processes, construction methods, coordination with other trades, or construction safety precautions, all of which are the responsibility of the Contractor.

The Engineer shall not be responsible for any deviations from the Contract Documents not brought to the attention of the Engineer in writing by the Contractor and acknowledged in writing by the Engineer.

Portions of the work requiring shop drawings, production data and samples shall not begin until the submission has been favorably reviewed by the Engineer. A copy of each favorably reviewed shop drawing, product data and sample shall be kept in good order by the Contractor at the site and shall be available to the Engineer.

12. Materials, Services and Facilities

It is understood that, except as otherwise specifically stated in the Contract Documents, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, supervision, and all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the work within the specified time.

Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the work. Stored materials and equipment to be incorporated in the work shall be located so as to facilitate prompt inspection.

Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.

Materials, supplies and equipment shall be in accordance with samples submitted by the Contractor and reviewed by the Engineer.

Materials, supplies or equipment to be incorporated into the work shall not be purchased by the Contractor or any subcontractor subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.

13. Inspection and Testing

All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the Contract Documents.

The Contractor shall provide, at his expense, the necessary testing and inspection services required by the Contract Documents, unless otherwise provided. (See Section 6 of the Special Provisions)

The Owner shall provide all other inspections and testing services not required by the Contract Documents. If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction specifically require any work to be inspected, tested, approved by someone other than the Contractor, the Contractor will give the Engineer timely notice of readiness. The Contractor will then furnish the Engineer the required certificates of inspection, testing or approval.

Neither observations by the Engineer nor inspections, tests or approvals by persons other than the Contractor shall relieve the Contractor from his obligations to perform the Work in accordance with the requirements of the Contract Documents.

The Engineer and his representatives will at all times have access to the Work. In addition, authorized representatives and agents of the Owner and appropriate Federal or State agencies shall be permitted to inspect all work, material, payrolls, records of personnel, invoices of materials, and other relevant data and records. The Contractor will provide proper facilities for such access and observation of the Work and also for any inspection or testing thereof.

If any work is covered contrary to the written request of the Engineer, it must, if requested by the Engineer be uncovered of his observation and replaced at the Contractor's expense.

If any work has been covered which the Engineer has not specifically requested to observe prior to it being covered, or if the Engineer considers it necessary or advisable that covered work be inspected or tested by others, the Contractor, at the Engineer's request, will uncover expose or otherwise make available for observation, inspection or testing as the Engineer may require, that portion of the work in question, furnishing all necessary labor, materials, tools, and equipment. If it is found that such work is not found to be defective, the Contractor will be allowed an increase in the contract price of an extension of the contract time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction and an appropriate change order shall be issued.

14. Substitutions

Whenever a material, article or piece of equipment is identified on the Drawings or Specifications by reference to brand name or catalogue number, it shall be understood that this is referenced for the purpose of defining the performance of other salient requirements and that other products of equal capacities, quality and function shall be considered. The Contractor may recommend the substitution of a material, article or piece of equipment of equal substance and function for those referred to in the Contract Documents by reference to brand name or catalogue number, and if, in the opinion of the Engineer, such material, article, or piece of equipment is of equal substance and function to that specified, the Engineer may approve its substitution and use by the Contractor. The Contractor warrants that if substitutes are approved, no major changes in the function or general design of the project will result. Incidental changes or extra component parts required to accommodate the substitute will be made by the Contractor without a change in the contract price or contract time.

15. Patents

The Contractor shall pay all applicable royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and save the Owner harmless from loss on account thereof, except that the Owner shall be responsible for any such loss when a particular process, design, or the product of a particular manufacturer or manufacturers is specified, but if the Contractor has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the Engineer.

16. Surveys, Permits and Regulations

The Engineer will furnish lines and grades as required for the construction of the work. The Contractor shall make a general check of all lines, dimensions and elevations and shall make all necessary rechecks during the progress of the work to avoid errors in construction. The Contractor shall be responsible for proper dimensions and fittings of all items of work being performed by him. Should any discrepancy be found in lines, dimensions or elevations, they shall be reported to the Engineer immediately.

The Contractor shall protect all existing property and survey monuments, including survey control monuments for this work. The Contractor is responsible for protecting and preserving survey monuments and other survey markers. Any survey monuments damaged as a direct or indirect result of construction activities shall be re-established by a duly licensed land surveyor at the Contractor's sole expense. A corner record shall be filed in accordance with State law for any reset monuments at the Contractor's sole expense.

The Contractor shall carefully preserve benchmarks, reference points and stakes and, in case of willful or careless destruction, he shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance.

Permits and licenses of a temporary nature necessary for the prosecution of the work shall be secured and paid for by the Contractor. Permits, licenses and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the Owner, unless otherwise specified. The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the Work as drawn and specified. If the Contractor observes that the Contract Documents are at variance therewith, he shall promptly notify the Engineer in writing, and any necessary changes shall be adjusted as provided in Paragraph 19 of these General Provisions, Changes in the Work.

17. Protection of Work, Property and Persons

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the work. He will take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to all employees on the work and other persons who may be affected thereby, all the work and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

The Contractor shall comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. He shall erect and maintain, as required by the conditions and progress of the work, all necessary safeguards for safety and protection. He shall notify owners of adjacent utilities when prosecution of the work may affect them. The Contractor shall remedy all damages, injury or loss to any property caused, directly or indirectly, in whole or in part, by the Contractor, any subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, except damage or loss attributable to the fault of the Contract Documents or to the acts or omissions of the Owner or the Engineer or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the Contractor.

In emergencies affecting the safety of persons or the work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the Engineer or Owner, shall act to prevent

threatened damage, injury or loss. He will give the Engineer prompt written notice of any significant changes in the work or deviations from the Contract Documents caused thereby, and a change order shall thereupon be issued covering the changes and deviations involved.

18. Supervision by Contractor

The Contractor shall supervise and direct the work. He shall be solely responsible for the means, methods, techniques, sequences and procedures of construction. The Contractor shall employ and maintain on the work, a qualified supervisor or superintendent who shall have been designated in writing by the Contractor as the Contractor's representative at the site. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the work.

19. Changes in the Work

The Owner may at any time, as the need arises, order changes within the scope of the work without invalidating the Agreement. If such changes increase or decrease the amount due under the Contract Documents, or in the time required for performance of the work, an equitable adjustment shall be authorized by written change order.

The Engineer may also, at any time, by issuing a field order, make changes in the details of the work. The Contractor shall proceed with the performance of any changes in the work so ordered by the Engineer unless the Contractor believes that such field order entitles him to a change in contract price or contract time, or both, in which event he shall give the Engineer written notice thereof within seven (7) days after the receipt of the ordered change, and the Contractor shall not execute such changes pending the receipt of an executed change order or further instruction from the Owner.

20. Changes in Contract Price

The contract price may be changed only by a written change order. The value of any work covered by a change order or of any claim for increase or decrease in the contract price shall be determined by one or more of the following methods in the order of precedence listed below:

- A. Unit prices previously approved.
- B. An agreed lump sum.
- C. If a lump sum or unit price cannot be mutually agreed upon, the Contractor shall be entitled to the sum of the following costs of doing the extra work:
 1. Direct Labor Costs. Charges for cost of all the labor furnished and used by the Contractor shall be made for manual classifications up to and including general foreman. It will not include charges for assistant superintendents, superintendents, office personnel, timekeepers, and maintenance and mechanics. The time charged to extra work shall be subject to the daily approval of the Engineer and evidence of such daily approval shall be submitted with the billing. Labor rates used to calculate the costs shall be those so designated in the Advertisement for Bids. No time or charges will be allowed, except when the men are actually engaged in the proper, efficient, and diligent performance or completion of the extra work as authorized. Overtime shall not be worked without prior approval by the Engineer.
 2. Equipment Costs. Charges for the rental and operation of the equipment furnished and used by the Contractor shall be made for all prime construction and automotive equipment. It will not include charges for equipment or tools with a new cost of \$1,000.00 or less. Equipment time charges must be subject to the daily approval submitted with the billing. The equipment rental and operation rates used shall be those agreed upon by the Engineer and the Contractor prior to commencement of the extra work. No time or charges will be allowed except when equipment is actually being used for the proper and efficient performance or completion of the extra work as authorized.
 3. Material Costs. Charges for the cost of materials furnished by the Contractor shall

be made providing such furnishing was specifically authorized in the extra work order and the actual use verified by the Engineer. Charges must be net cost to the Contractor delivered at the job, and vendor's invoice must accompany the billing along with verification of use of such materials by the Engineer.

4. Tools, Supplies, Overhead, Supervision and Profit. A charge for tools, supplies, overhead, supervision and profit will be allowed in the amount of 15% of the Total Direct Labor Costs, and Material Costs, as defined above.

Any extra work performed hereunder shall be subject to all of the provisions of the contract and the Contractor's sureties shall be bound with reference thereto as under the Contract.

21. Time for Completion and Liquidated Damages

The date of beginning and the time for completion of the work are essential conditions of the Contract Documents and the work embraced shall be commenced on a date specified in the Notice to Proceed.

Time is of the essence in this Agreement. The Contractor shall proceed with the work at such a rate of progress to ensure full completion within the contract time. It is expressly understood and agreed, by and between the Contractor and the Owner, that the contract time for the completion of the work described herein is a reasonable time.

The parties hereto agree that it is extremely difficult and impractical in this case to determine the actual damages the Owner will suffer if the Contractor fails to complete the work within the contract time and for said reason, if the Contractor shall fail to complete the work within the contract time, or extension of time granted by the Owner, then the Contractor will pay to the Owner the amount for liquidated damages as specified in the Agreement for each calendar day that the Contractor shall be in default after the time stipulated in the Contract Documents. The time for completion of the work shall be extended, and the Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due to the following, and the Contractor has promptly given written notice of such delay to the Engineer:

- A. To any preference, priority or allocation order duly issued by the Owner.
- B. To unforeseeable caused beyond the control and without the fault or negligence of the Contractor, including but not restricted to, acts of God or of the public enemy, acts of the Owner, acts of another contractor in the performance of a contract with the Owner, fires, floods, epidemics quarantine restrictions, strikes, freight embargoes, and climatic conditions which, in the opinion of the Engineer, make prosecution of the work unreasonably difficult.
- C. To any delays of subcontractors occasioned by any of the causes specified in the above paragraphs.

22. Correction of Work

The Contractor shall promptly remove from the premises all work rejected by the Engineer for failure to comply with the Contract Documents, whether incorporated in the construction or not, and the Contractor shall promptly replace and re-execute the work in accordance with the Contract Documents and without expense to the Owner and shall bear the expense of making good all work of other contractors destroyed or damaged by such removal or replacement.

23. Suspension of Work, Termination and Delay

The Owner may, at any time and without cause, suspend the work or any portion thereof for a period of not more than ninety days, or such further time as agreed upon by the Contractor, by written notice to the Contractor and the Engineer, which notice shall fix the date on which work shall be resumed. The Contractor will resume that work on the date so fixed. The Contractor will be allowed an increase in the contract price or an extension of the contract time, or both, directly attributable to any such suspension.

If the Contractor is adjudged as bankrupt or insolvent, or if he makes a general assignment for the benefit of his creditors, or if a trustee or receiver is appointed for the Contractor or for any of his property, or if he

files a petition to take advantage of any debtor's act or to reorganize under the bankruptcy or applicable laws, or if he repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, or if he fails to make prompt payments to subcontractors or for labor, materials or equipment or if he disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction over the work or if he disregards the authority of the Engineer, or if he otherwise violates any provision of the Contract Documents, then the Owner may, without prejudice to any other right or remedy and after giving the Contractor and his surety a minimum of ten (10) days from delivery of a written notice, terminate the services of the Contractor, and finish the work by whatever method he may deem expedient. In such case the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance, the Contractor shall pay the difference to the Owner. Such costs incurred by the Owner will be determined by the Engineer and incorporated in a change order.

Where the Contractor's services have been so terminated by the Owner, said termination shall not affect any right of the Owner against the Contractors then existing or which may thereafter accrue. Any retention or payment of monies by the Owner due the Contractor will not release the Contractor from compliance with the Contract Documents.

After ten (10) days from delivery of a written notice to the Contractor and the Engineer, the Owner may without cause and without prejudice to any other right or remedy, elect to abandon the project and terminate the contract. In such case, the Contractor shall be paid for all work executed and any expense sustained plus reasonable profit.

If, through an act or fault of the Contractor, the work is suspended for a period of more than ninety (90) days by the Owner or under an order of court or other public authority, or the Engineer fails to act on any request for payment within thirty (30) days after it is submitted, or the Owner fails to pay the Contractor substantially the sum approved by the Engineer or awarded by arbitrators within thirty (30) days of its approval and presentation, then the Contractor may, after the (10) days from delivery of a written notice to the Owner and the Engineer stop the work until he has been paid all amounts then due, in which event and upon resumption of the work, change orders shall be issued for adjusting the contract price or extending the contract time or both to compensate for the costs and delays attributable to the stoppage of the work.

24. Progress Estimates

On or about the last day of the calendar month, the Contractor will, except as hereinafter provided, make in writing and certify to the Owner an estimate which, in his opinion, is just and fair of the amount and value of the work completed by the Contractor up to that time in the performance of the contract. In case of work for which unit prices are named in the contract, the estimate shall be computed on the basis of said unit prices. In the case of work for which a lump sum is named in the contract, the Engineer may use a breakdown of the lump sum price submitted by the Contractor, provided that such breakdown is submitted within 10 calendar days after the execution of the Agreement in a form acceptable to the Engineer. No payment will be made to the Contractor until such schedule has been submitted to and reviewed by the Engineer. To the figure thus arrived at shall be added any amounts due the Contractor for extra work and the amount of any approved claims for extra costs to the date of the progress estimate the retained percentage hereinafter provided for shall be deducted from the total thus computed; and from the remainder, there shall be further deducted any amounts due the Owner from the Contractor for supplies or materials furnished or services rendered and any other amounts that may be due the Owner under the terms of the contract. In preparing estimates for partial payment, consideration shall be given to delivery on the site of pipe, and fittings which will become a part of the finished construction work and for which payment in full has been made by the Contractor, but no consideration will be given to preparatory work done or other materials on hand. From the balance thus determined shall be deducted the amount of all previous payments and the remainder shall constitute the partial estimate for that month. Such partial estimates shall not be required to be made by strict measurement, but may be made by measurement or by estimation or partly by one method and partly by the other and it shall be sufficient if they are approximate only. Partial estimates may be withheld or reduced if, in the opinion of the Engineer, the Contractor is not diligently and efficiently endeavoring to comply with the intent of the Agreement.

25. Progress Payments

The Owner will make payments on account of the contract as follows: Not later than the 30th day of the month following the month in which the contract is awarded, and the 30th day of each calendar month thereafter, the Owner will pay to the Contractor 95% of the amount earned by the Contractor during the preceding month at the rate of prices set forth in the contract, based on the estimate of the Engineer.

The retention will be held by the Owner until 35 days following filing of the Notice of Completion.

26. Prompt Payment

The Contractor shall promptly pay all subcontractors and suppliers within ten (10) days of receipt of any progress payment, final payment or retention paid by the Owner to the Contractor. Contractor shall advise all subcontractors and suppliers that all second-tier subcontractors and suppliers must be paid within then (10) days of their receipt of payment from the Contractor.

27. Acceptance and Final Payment

Upon receipt of written notice from the Contractor that the work is ready for final inspection and acceptance, the Engineer will promptly make such inspection, and when he finds the work acceptable under the contract, and the contract fully performed, he will promptly issue a final certificate, over his own signature, stating that the work required by this contract has been completed. The Owner then shall issue a formal Notice of Completion, and the entire balance found to be due shall be paid to the Contractor by the Owner 35 days from the date of recording by the Owner of the Notice of Completion of all work covered by this contract.

Before issuance of the Notice of Completion, the Contractor shall submit evidence satisfactory to the Owner that all payrolls, material bills, and other indebtedness connected with the work have been paid, or if not paid, then the Contractor shall submit evidence of the status of any unpaid indebtedness.

The making and acceptance of the final payment shall constitute a waiver of all claims by the Owner except the following:

- A. those arising from unsettled liens;
- B. those arising from faulty work appearing within 12 months after the date of filing of the Notice of Completion;
- C. those arising from failure to meet the requirements of the Contract Documents or the specifications; or,
- D. those arising from manufacturers' guarantees.

The acceptance by Contractor of the final payment referred to in this paragraph 27 herein, shall be a release of Owner from all claims of liability to Contractor for anything done or furnished for, or relating to, the work or for any act or neglect of Owner or of any person relating to or affecting the work, except demands against Owner for the remainder, if any, of the amounts kept or retained under the provisions of Paragraph 25, Progress Payments, herein; and excepting pending, unresolved claims.

28. Quantities and Unit Prices

The quantities noted in the schedule are approximation for comparing bids, and no claim shall be made against the Owner for excess or deficiency therein. Payment at the unit prices set forth in the schedule will constitute payment in full for the completed work and will include materials, supplies, labor, tools, machinery, and all other expenditures incident to satisfactory compliance with the contract, unless otherwise specifically provided.

The quantities of work performed will be computed for payment by the Engineer on the basis of measurements taken by the Engineer, and these measurements shall be final and binding.

29. Insurance

The Contractor shall not commence work under this Agreement until he has obtained all the insurance required under this section and such insurance has been approved by the Owner, nor shall the Contractor allow any subcontractor to commence work on his subcontract until the insurance required of the subcontractor has been so obtained and approved. All insurance required under this section shall be maintained at the expense of the Contractor continuously during the life of the contract up to the date of acceptance of the work by the Owner.

Commercial General Liability and Automobile Liability Insurance – The Contractor shall provide and maintain the following commercial general liability and automobile liability insurance:

- A. Coverage – Coverage for commercial general liability and automobile liability insurance shall be at least as broad as the following:
 - 1. Insurance Services Office Commercial General Liability coverage (Occurrence Form CG 0001)
 - 2. Insurance Service Office Form Number CA 0001 (ed. 1/87) covering Automobile Liability, Code 1 (any auto)
- B. Limits – The Contractor shall maintain limits no less than the following:
 - 1. General Liability – Two million dollars (\$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 the project/location (with the ISO CG 2501 or insurer's equivalent endorsement provided to the Owner) or the general aggregate limit shall be twice the required occurrence limit.
 - 2. Automobile Liability – One million dollars (\$1,000,000) per accident for bodily injury and property damage combine single limit.
- C. Required provisions – The general liability and automobile liability policies are to contain, to be endorsed to contain the following provisions:
 - 1. The Owner and its directors, officers, employees, agents and volunteers are to be covered as insured 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 Owner and its directors, officers, employees, agents, and volunteers.
 - 2. For any claims related to this work, the Contractor's insurance shall be the primary insurance as respects the Owner and its directors, officers, employees, agents and volunteers. Any insurance, pooled coverage or self-insurance maintained by the Owner and its directors, officers, employees, agents and volunteers shall not contribute to it.
 - 3. Any failure to comply with reporting or other provisions of the policies including breaches of warranties shall not affect coverage provided to the Owner and their directors, officers, employees, agents and volunteers.
 - 4. 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.
 - 5. 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 Owner.

- D. Deductibles and Self-Insured Retentions – Any deductible or self-insured retention must be declared to and approved by the Owner. At the option of the Owner, either the insurer shall reduce or eliminate such deductibles or self-insured retentions.
- E. Acceptability of Insurers – Insurance is to be placed with insurers having a current A.M. Best's rating of no less than A-: VII or equivalent.

Workers' Compensation and Employer's Liability Insurance – The Contractor and all subcontractors shall cover or insure under the applicable laws relating to workers' compensation insurance, all of their employees working on or about the construction site, regardless of whether such coverage or insurance is mandatory or merely elective under law, and the Contractor shall defend, protect and save harmless the Owner and its directors, officers, employees, agents and volunteers from and against all claims, suits, and actions arising from any failure of the Contractor or any subcontractor to maintain such insurance. Before beginning work, Contractor shall furnish to the Owner satisfactory proof that Contractor has taken out for the period covered by the work under this Contract, full compensation insurance for all persons employed directly by Contractor or through subcontractors in carrying out the work contemplated under this Contract, all in accordance with the "Workers' Compensation and Insurance Act," Division IV of the Labor Code of the State of California and any Acts amendatory thereof.

The Contractor shall provide employer's liability insurance in the amount of, at least, \$1,000,000 per accident for bodily injury and disease.

The Contractor shall provide the Owner with a certificate of Workers' Compensation and Employers liability insurance coverage.

In signing the Agreement, Contractor makes the following certification required by Section 1861 of the Labor Code:

"I am aware of the provisions of Section 3700 of the Labor Code which requires each employer to be insured against liability for workmen'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."

Evidences and Cancellation of Insurance – Prior to execution of the Agreement, the Contractor shall file with the Owner evidence of insurance from an insurer or insurers certifying to the coverage of all insurance required herein. Such evidence shall include original copies of the ISO CG 2010 (or insurer's equivalent) signed by the insurer's representative and certificate of insurance (Accord Form 25-S or equivalent). All evidence of shall be certified by a properly authorized officer, agent or qualified representative of the insurer and shall certify the names of the insured, any additional primary insurers, where appropriate, the type and amount of the insurance, the location and operations to which the insurance applies, the expiration date, and that the insurer will give by certified mail, written notice to the Owner at least thirty (30) days prior to the effective date of any cancellation, lapse or material change in the policy.

The Contractor shall, upon demand of the Owner, deliver to the Owner all such policy or policies of insurance and the receipts for payment of premiums thereon; and should the Contractor neglect to obtain and maintain in force any such insurance or deliver such policy or policies and receipts to the Owner, then it shall be lawful for the Owner to obtain and maintain such insurance, and the Contractor hereby appoints the Owner the true and lawful attorney-in-fact to do all things necessary for this purpose. All money paid by the Owner for insurance premiums under the provisions of this article shall be charged to the Contractor.

30. Contract Security

The Contractor shall, within ten (10) days after the receipt of the Notice of Award, furnish the Owner with a performance bond and a payment bond in penal sums equal to 100% of the contract price, conditioned upon the performance by the Contractor of all undertakings, covenants, terms, conditions and agreements of the Contract Documents, and upon the prompt payment by the Contractor to all persons supplying labor

and materials in the prosecution of the work provided by the Contract Documents. Such bonds shall be executed by the Contractor and corporate bonding company licensed to transact such business in the state in which the Work is to be performed and named on the current list of "Surety Companies Acceptable Federal Bonds" as published in the Treasury Department Circular Number 570. The expense of these bonds shall be borne by the Contractor. If at any time a surety on any such bond is declared a bankrupt or loses its right to do business in the state in which the work is to be performed or is removed from the list of surety companies accepted on Federal bonds, Contractor shall within ten (10) days after notice from the Owner to do so, substitute an acceptable bond (or bonds) in such form and sum and signed by such other surety or sureties as may be satisfactory to the Owner. The premiums on such bond (s) shall be paid by Contractor. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable bond to the Owner.

Attached to the bonds shall be the original, or a certified copy, of the unrevoked appointment, power of attorney, bylaws or other instrument which entitles and authorizes the person to execute the bond to do so, a certified copy of the certificate of authority or the insurer issued by the Insurance Commissioner of the county in which the Owner is located which would state that the certificate of authority of the insurer (the bonding company) has not been surrendered, revoked, cancelled, annulled, or suspended.

The performance bond shall remain in full force and effect during the warranty period of 12 months from the date of acceptance of the work by the Owner.

If requested by the Owner or Engineer, copies of the insurer's most recent annual statement and quarterly statement filed with the Department of Insurance pursuant to Article 10 (commencing with Section 900) of Chapter 1 of Part 2 of Division 1 of the Insurance Code, shall be provided to the Owner or Engineer within 10 calendar days of the insurer's receipt of the request to submit the statements.

31. Assignments

Neither the Contractor nor the Owner shall sell, transfer, assign or otherwise dispose of the contract or any portion thereof, or of his right, title or interest therein, or his obligation thereunder, without written consent of the other party.

32. Indemnification

Contractor shall indemnify and hold harmless and defend the Owner and the Engineer and their directors, officers, employees, agents or volunteers, and each of them from and against:

- A. Any and all claims, demands, causes of action, damages, costs, expenses, losses or liabilities, in law or in equity, of every kind and nature whatsoever for, but not limited to, injury to or death of any person including Owner and/or Engineer and/or Contractor, or any directors, officers, employees, agents volunteers of the Owner, Engineer or Contractor, and damages to or destruction of property of any person, including but not limited to, Owner, Engineer and/or Contractor and their directors, officers, employees, agents or volunteers arising out of or in any manner directly or indirectly connected with the work to be performed under this Agreement, however caused regardless of any negligence of the Owner or the Engineer or their directors, officers, employees, agents, or volunteers, except the sole negligence of willful misconduct or active negligence of the Owner or the Engineer or their directors, officers, employees, agents or volunteers:
- B. Any and all actions, proceedings, damages, costs, expenses, penalties or liabilities in law or equity, of every kind or nature whatsoever, arising out of , resulting from or on account of the violation of any governmental law or regulation, compliance with which is the responsibility of Contractor.

Contractor shall defend, at Contractor's own cost, expense and risk, any and all such aforesaid suits, actions or other legal proceedings of every kind that may be brought or instituted against the Owner and the Engineer or their directors, officers, employees, agents or volunteers.

Contractor shall pay and satisfy any judgment, award or decree that may be rendered against the Owner and their directors, officers, employees, agents, or volunteers in any such suit, action or other legal

proceedings.

Contractor shall reimburse the Owner and their directors, officers, employees, agents and/or volunteers, for any and all legal expenses and costs incurred by them in connection therewith or in enforcing the indemnity herein provided.

Contractor agrees to carry insurance for this purpose as set out in the specifications. See Paragraph 29 of these General Provisions for insurance specifications and coverage. Contractor's obligation to indemnify shall not be restricted to insurance proceeds, if any, received by the Owner and the Engineer or their directors, officers, employees, agents and/or volunteers.

33. Separate Contracts

The Owner reserves the right to let other contracts in connection with this project. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate his work with theirs. If the proper execution or results of any part of the Contractor's work depend upon the work of any other contractor, the Contractor shall inspect and promptly report to the Engineer any defects in such work that render it unsuitable for such proper execution and results.

The Owner may perform additional work related to the project by himself, or he may let other contracts containing provisions similar to these. The Contractor will afford the Contractors who are parties to such contracts (or the Owner, if he is performing the additional work himself), reasonable opportunity for the introduction and storage of materials and equipment and the execution of work, and shall properly connect and coordinate his work with theirs.

In the performance of additional work by other contractors or the Owner is not noted in the Contract Documents prior to the execution of the Agreement, written notice thereof shall be given to the Contractor prior to starting any such additional work. If the Contractor believes that the performance of such requires additional expense or entitles him to an extension of the contract time, he may make a claim therefore as provided in Items 19 and 20 of these General Provisions.

34. Subcontracting

The Contractor may utilize the services of specialty subcontractors on those parts of the work which, under normal contracting practices, are performed by specialty subcontractors.

The Contractor shall be fully responsible to the Owner for the acts and omissions of his subcontractors, and of persons either directly or indirectly employed by them, as he is of the acts and omissions of persons directly employed by him.

The Contractor shall cause appropriate provisions to be inserted in all contracts relative to the work to bind subcontractors to the Contractor by the terms of the Contract Documents in so far as applicable to the work of subcontractors and to give the Contractor the same power as regards terminating any subcontract that the Owner may exercise over the Contractor under any provision of the Contract Documents.

Nothing contained in this contract shall create any contractual relation between any subcontractor and the Owner.

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

35. Employment of Apprentices

The Contractor and any subcontractor under him shall comply with the requirements of Sections 1777.5 and 1777.6 of the Labor Code in the employment of apprentices. The responsibility for compliance with the provisions of said Section 1777.5 for all apprenticeship occupations shall rest with the Contractor. Information relative to apprenticeship standards, wage schedules and other requirements may be obtained from the Division of Apprenticeship Standards, 455 Golden Gate Avenue, San Francisco, California, or from its branch offices.

36. Payment of Prevailing Wages

The Contractor and all subcontractors under him shall pay all laborers, workmen and mechanics on all work included in this contract no less than the general prevailing rate of per diem wages for work performed, (to-wit, within the limits of the City), and no less than the general prevailing rate of per diem wages for legal holiday and overtime work in said locality, which per diem wages shall not be less than the stipulated rate contained in a schedule thereof which has been ascertained and determined by the Council to be the general prevailing rate of per diem wages for each craft or type of workman or mechanic needed to execute this contract, and which is now on file with the City Clerk, as set forth in the Information for Bidders, and by reference it is incorporated herein and made a part hereof.

The Contractor shall forfeit, as a penalty to the Owner, two hundred dollars (\$200.00) for each laborer, workman or mechanic employed for each calendar day or portion thereof such laborer, workman or mechanic is paid less than the said stipulated rates for any work done under this contract by him or by any subcontractor under him in violation of Articles 1 and 2 of Chapter 1 Part 7 of Division 11 of the Labor Code of the State of California, and said sums and amounts which shall have been so forfeited pursuant to the herein paragraph and the said terms of said Labor Code shall be withheld and retained from payments due to the Contractor under said contract, pursuant to this contract and the said terms of said Labor Code; but no sum shall be so withheld, retained or forfeited except from the final payment without a full investigation by either the Division of Labor law Enforcement of the State Department of Industrial Relations or by said Council.

The difference between such stipulated prevailing wage rates and the amount paid to each workman for each calendar day, or a portion thereof, for which each workman was paid less than the stipulated prevailing wage rate shall be paid to each workman by the Contractor. The Contractor shall comply with the provisions of Section 1775 of the Labor Code of the State of California.

The Contractor and his subcontractors shall submit certified payroll information electronically to the Department of Industrial Relations as well as a hard copy of said certified payrolls to the Owner on a monthly basis.

37. Registration to Train Apprentices

Pursuant to Labor Code Section 1777.5, all contractors shall file with the appropriate Joint Apprenticeship Training Committee, a DAS-140 form registering to train apprentices. This requirement to register to train apprentices is mandated by Section 1777.5 whether or not you are signatory to or a party of any approved training program. Only those programs approved by the California Apprenticeship Council are applicable to accept DAS-140 registration forms.

If the contractor is approved to train apprentices, then apprentices must be called in a ratio not less than one apprentice hour for each five journeyman hours.

However, if the entire contract may be completed within 20 working days or the entire contract (nor subcontracts) is less than thirty thousand (\$30,000), then the Contractor is exempt from requesting apprentices under Labor Code Section 1777.5.

In addition, all contractors are required to make appropriate training contributions as set forth in the prevailing wage determination to each appropriate JATC, or in the alternative, to the California Apprenticeship Council. Payments shall be made not less than monthly, calculated and paid by the fifteenth of each month, for work performed that prior month.

The address for the applicable Joint Apprenticeship Training Committee and for the California Apprenticeship Council can be obtained by calling the Division of Apprenticeship Standards.

38. Penalties

Failure to pay the appropriate prevailing wage can result in penalties being assessed as follows:

- A. Up to \$50.00 per day per worker for each and every violation; and,
- B. debarment from future public works for a period not to exceed three years.

- C. \$50.00 per day per worker for each failure to comply with the payment of overtime for all hours worked in excess of 8 in one day or 40 in one week.

Failure to register to train apprentices or failure to pay the appropriate training contribution can result in penalties being assessed as follows:

- A. \$100.00 per day for each day of violation; and,
- B. debarment from future public works for a period not to exceed three years.

39. Engineer's Authority

The Engineer shall act as the Owner's representative. He shall decide questions which may arise as to quality and acceptability of materials furnished and work performed. He shall interpret the intent of the Contract Documents in a fair and unbiased manner. The Engineer will make visits to the site and determine if the work is proceeding in accordance with the Contract Documents.

The Contractor will be held strictly to the intent of the Contract Documents in regard to the quality of materials, workmanship and execution of the work. Inspections may be made at the factory or fabrication plant of the source of material supply.

The Engineer will not be responsible for the construction means, controls, techniques, sequences, procedures, or construction safety.

40. Land and Rights-of-Way

Prior to issuance of the Notice to Proceed, the Owner shall obtain all land and rights-of-way necessary for carrying out and for the completion of the work to be performed pursuant to the Contract Documents, unless otherwise mutually agreed.

The Owner shall provide to the Contractor information which delineates and describes the lands owned and rights-of-way acquired.

The Contractor shall provide, at his own expense and without liability to the Owner, any additional land and access thereto that the Contractor may desire for temporary construction facilities, or for storage of materials.

41. Warranty and Guarantee

Contractor warrants and guarantees to Owner that all work will be in accordance with the Contract Documents and will not be defective. Prompt notice of defects known to Owner shall be given to Contractor. All defective work, whether or not in place, may be rejected, corrected or accepted as provided in Paragraph 19, Changes in the Work, of these General Provisions. Defective work may be rejected even if approved by prior inspection.

42. One (1) Year Warranty Period

The warranty period shall commence when the Notice of Completion is issued, at notice of beneficial occupancy or at notice of partial utilization of the work to be warranted has been issued, or a later date if so specified in the Agreement, or mutually agreed to, and extend until one (1) year after that date or whatever longer period may be prescribed by laws or regulations or by the terms of any applicable special guarantee or specific provision of the Contract Documents.

43. Correction of Defective Work

If within the designated warranty period, or such longer period as may be required by Laws or Regulations, the work, or any part of the work, is discovered to be defective, Contractor shall promptly, without an adjustment in contract price and in accordance with Owner's written instructions, either correct that defective work, or if it has been rejected by Owner, remove it from the site and replace it with non-defective work. If circumstances warrant it, including but not limited to, in an emergency, Owner may have the defective work corrected or the rejected work removed and replaced. In that event, Contractor shall not be

allowed to recover any associated costs, and he shall reimburse Owner for all direct, indirect and consequential costs of Owner, and Owner shall be entitled to an appropriate decrease in contract price, to withhold a set-off against amount recommended for payment, or make a claim on Contractor's bond if Contractor has been paid in full. Where defective work (and damage to other work resulting therefrom) has been corrected, removed or replaced during the warranty period, the one (1) year warranty period with respect to such work will be extended for an additional period of one (1) year after such correction or removal and replacement has been satisfactorily completed.

44. Early Completion

The one (1) year warranty period will not begin until the Notice of Completion is filed. If Contractor completes the work or portions thereof prior to this time, he shall preserve the equipment and/or facilities by developing and implementing a preventive maintenance program in compliance with manufacturer's recommendations to maintain the equipment and/or facilities unless Owner has issued a notice of beneficial occupancy or notice of partial utilization for the warranted work. At start up, Contractor will be required to get his equipment and/or facilities ready to put into service.

45. Extended Warranties and Guarantees

Owner may at its sole discretion extend the one (1) year warranty period up to twenty-four (24) months, in which case Contractor shall maintain the warranties and guarantees. If such extension of the one (1) year warranty period causes an increase in the cost of the warranties and guarantees provided by Contractor, an adjustment in contract price shall be made as provided by the Contract Documents.

46. Arbitration

With the prior approval of the Owner and the Contractor, all claims, disputes and other matters in question arising out of, or relation to, the Contract Documents or the breach thereof, except for claims which have been waived by the making and acceptance of final payment as provided by Item 27 of these General Provisions, may be decided by arbitration in accordance with the Arbitration Rules of the American Arbitration Association. If entered into, the agreement to arbitrate shall be specifically enforceable under the prevailing arbitration law. The award rendered by the arbitrators shall be final, and judgment may be entered upon it in any court having jurisdiction thereof.

Notice of the request for arbitration shall be filed in writing with the other party to the Contract Documents and with the American Arbitration Association, and a copy shall be filed with the Engineer. The request for arbitration shall set forth specifically the dispute to be arbitrated. Acceptance by the other party of the request to arbitrate shall constitute the agreement to arbitrate and arbitration shall proceed forthwith. No legal proceedings other than to enforce arbitration shall be commenced on any issue covered by the arbitration agreement.

The Contractor shall carry on the work and maintain the progress schedule during any arbitration proceedings, unless otherwise mutually agreed in writing.

47. Taxes

The Contractor shall pay all sales, consumer, use and other similar taxes required by the law of the place where the work is performed.

48. Contractor's Understanding

It is understood and agreed that the Contractor has, by careful examination, satisfied himself as to the nature and extent of the work, the character, quality, and quantity of the materials to be encountered, the character of the equipment and facilities needed preliminary to and during the prosecution of the work, the general and local conditions, and all other matters which can in any way affect the work under this contract. No verbal agreement or conversation with any officer, agent or employee of the Engineer or the Owner, either before or after the execution of this Agreement, shall affect or modify any of the terms or obligations herein contained.

49. Accidents

The Contractor shall provide, at the site, such equipment and medical facilities as are necessary to supply first-aid service to anyone who may be injured in connection with the work. The Contractor must promptly report in writing to the Engineer all accidents whatsoever arising out of, or in connection with the performance of the work, whether on or adjacent to the site which causes death, personal injury, or property damages, giving full details and statements of witnesses. In addition, if death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to both the Engineer and the Owner. If any claim is made by anyone against the Contractor or any subcontractor on account of any accident, the Contractor shall promptly report the facts in writing to the Engineer, giving full details of the claim.

50. Safety and Sanitation

The Contractor shall provide adequate safety and sanitation facilities according to State laws and local ordinances.

The Contractor will assume sole and complete responsibility for job site conditions during the course of construction of the project, including safety of all persons and equipment. This responsibility shall apply continuously and not be limited to normal working hours.

51. Climatic Conditions

The Engineer may order the Contractor to suspend any work that may be subject to damage by climatic conditions. The Contractor may suspend work if climatic conditions are such that the Contractor is unable to work. In such case, the Contractor, within seven days, shall request in writing a change order to extend the contract time.

52. Officials Not To Benefit

No official of the Owner shall receive any benefit that may arise by reason of this contract.

53. Clean-Up

During the progress of the work, the Contractor shall maintain the site and related structures and equipment in a clean, orderly condition and free from unsightly accumulations of rubbish. Upon completion of the work, the Contractor shall remove from the vicinity of the work all plants, buildings, rubbish, unused materials, concrete forms, temporary bridging, and other like material, belonging to him or used under his direction during construction, and in the event of his failure to do so, the same may be removed by the Owner after 10 calendar days notice to the Contractor at the expense of the Contractor, and his surety or sureties shall be liable therefore.

As part of the final clean-up, the Contractor shall dress up and grade the right-of-way to match existing ground surfaces, and shall remove therefrom all weeds and other growth. Where the construction has crossed yards or driveways, they shall be restored to a condition equivalent to the condition existing prior to the construction as determined by the Engineer.

No direct payment will be made to the Contractor for any clean-up work, but all compensation therefore shall be included in the prices bid in the schedule for the various items of work.

54. Notice to Owner

In the event this contract involves digging trenches or excavations that extend deeper than four feet below the surface, the Contractor shall promptly, and before the following conditions are disturbed, notify Owner, in writing, of any:

- A. Material that the Contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law;
- B. Subsurface or latent physical conditions at the site differing from those indicated;

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

Owner shall promptly investigate the conditions. If Owner finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the work, Owner shall issue a change order under the procedures described in the contract.

In the event a dispute arises between Owner and Contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the work, the Contractor, shall not be excused from any scheduled completion date provided for by the contract, but shall proceed with all work to be performed under the contract. The Contractor shall retain any and all rights provided either by contract or by law which pertain to the resolution of disputes and protests between Contractor and Owner.

55. Payment of Withheld Funds

The Owner shall retain 5% of each payment from Contractor and shall make prompt and regular incremental acceptances of portions, as determined by the Owner, of the agreed upon work, and pay retention to the Contractor based on these acceptances. The Contractor, or subcontractor, shall return all monies withheld in retention from a subcontractor within 30 days after receiving payment for work satisfactorily completed and accepted including incremental acceptances of portions of the contract agreement work by the Owner. Federal law (49CFR26.29) requires that any delay or postponement of payment over 30 days may take place only for good cause and with the Owner's prior written approval. Any violation of this provision shall subject the violating Contractor or subcontractor to the penalties, sanctions and other remedies specified in Section 7108.5 of the Business and Professions Code. These requirements shall not be construed to limit or impair any contractual, administrative, or judicial remedies otherwise available to the Contractor or subcontractor in the event of a dispute involving late payment or nonpayment by the Contractor, deficient subcontract performance, or noncompliance. When the work is complete, the Owner will issue a Notice of Completion to the County. The Owner will pay all retention funds to the Contractor thirty-five (35) Days after Notice of Completion has been recorded.

56. Storm Water Pollution Prevention Measures

Storm Water Pollution Prevention Measures shall be performed in accordance with the provisions in Section 13-3, "Storm Water Pollution Prevention Plan," of the Standard Specifications.

A. GENERAL

In compliance with the State and Federal regulations regarding storm water management during construction, the Contractor shall not allow any debris, waste materials or pollutants, originating from the Contractor's operations, to enter the storm drainage system, which leads to contamination of local creeks and ponding basins.

The Contractor shall properly dispose of all wastes and excess materials in a legal manner to the satisfaction of the Owner.

B. SELECTIVE BMPS FOR STORM WATER POLLUTION PREVENTION

As applicable to the project or directed by the Engineer, the Contractor shall implement any or all of the following Best Management Practices (BMPs):

1. Material Handling and Storage

a. Nonhazardous Materials

i. Designated Delivery and Storage Area

The Contractor shall propose areas in the vicinity of or within the project site or within the Contractor's staging site, which are suitable for material

delivery and storage. To the maximum extent practicable, these areas shall be away from gutters, catch basins, drainage courses or creeks. The Contractor shall submit the proposed areas to and shall obtain the approval from the Engineer in writing prior to bringing in materials.

ii. Storage of Granular Materials

The Contractor shall store granular materials at least ten feet (10') away from any inlet or curb return and shall prevent the granular materials from entering the storm drain system, drainage courses or creeks. During wet weather or when rain is forecast within 24 hours, the Contractor shall cover granular materials with a tarpaulin and surround the material with sandbags or other approved heavy objects.

b. Hazardous Materials

i. Hazardous materials include, but are not limited to, petroleum products, antifreeze, paints, thinners, solvents, pesticides, herbicides and various other toxic chemicals.

ii. The Contractor shall propose, within the project site or the Contractor's staging site, an area that is suitable for hazardous material delivery and storage. To the maximum extent practicable, the area shall be away from inlets, gutters, drainage courses or creeks. The Contractor shall submit the proposed area to and shall obtain approval from the Engineer in writing prior to bringing in hazardous materials.

iii. The Contractor shall label and store all hazardous materials and hazardous wastes in accordance with secondary containment regulations, the City of Los Banos Hazardous Materials Storage Ordinance and all applicable Merced County, State and Federal laws and regulations.

iv. The Contractor shall keep all hazardous materials or waste in containers and fully covered to avoid contamination of storm runoff.

v. The Contractor shall keep an accurate, up-to-date inventory, including Materials Safety Data Sheets (MSDSs), of hazardous materials and hazardous wastes stored on-site to assist emergency response personnel in the event of a hazardous material incident.

2. Hazardous Material Usage

a. The Contractor shall follow all local, State and Federal policies, laws and regulations governing the use of hazardous materials.

b. The Contractor shall use only Category III pesticides for pest control. If Category III pesticides are unavailable, have been tried but proven ineffective, or when it is necessary to prevent a pest outbreak that poses an immediate threat to public health or significant economic loss, the City may consider allowing the use of Category II pesticides with a dose of up to LD50 (a dose that kills 50 percent of the targeted pest population in the laboratory) provided that the risk to the applicator and impact to the environment can be justified. Use of Category I pesticides is prohibited.

c. Apply pesticides at the appropriate time to maximize their effectiveness and minimize the likelihood of discharging non-degraded pesticides into storm water system, drainage courses and creeks.

d. Mix only as much material as is necessary for treatment. Calibrate application equipment prior to and during use to ensure desired application rate. Do not mix or load pesticides adjacent to storm drain system, drainage courses

or creeks.

e. The Contractor shall not overapply herbicides, pesticides or fertilizers and shall follow the manufacturer's instructions regarding uses, protective equipment, ventilation, flammability and mixing of chemicals. Over-application of a pesticide is a "label violation" subject to an enforcement action by the Merced County Agriculture Department.

f. When rain is forecast within 24 hours or during wet weather, the Contractor shall not apply chemicals in outside areas unless otherwise allowed by the Engineer in writing.

3. Integrated Pest Management Methods

The Contractor shall employ, in place of pesticides, integrated pest management methods including:

- a. No control
- b. Physical or mechanical methods
- c. Least toxic chemicals (insecticidal soaps and oil, etc.)

4. Vehicle and Equipment Cleaning, Maintenance and Fueling

a. Cleaning

The Contractor shall not clean or wash vehicles or equipment on-site or in the streets. If allowed by the Engineer in writing, cleaning and washing shall be performed in a designated and bermed area approved by the Engineer using water only. No soaps, solvents, degreasers, steam cleaning equipment or similar methods are permitted. The Contractor shall not allow wash water to flow into streets, gutters, storm drain system, drainage courses or creeks.

b. Maintenance and Fueling

i. The Contractor shall perform maintenance and fueling of vehicles or equipment in a designated, bermed area or over a drip pan that will prevent waste, leaks or spills from entering streets, gutters, storm drain system, drainage courses or creeks.

ii. The Contractor shall inspect all vehicles and equipment arriving on-site for leaking fluids and shall promptly repair leaking vehicles and equipment. Drip pans shall be used to catch leaks until repairs can be made. Shut-off valves on equipment must be working properly.

5. Spill Prevention and Control

a. If hazardous materials are used on the project, the Contractor shall keep a stockpile of spill clean-up materials, such as rags or absorbents, readily accessible on-site.

b. Above-ground storage tanks and their installations shall comply with City, State and Federal requirements.

c. The Contractor shall immediately contain and prevent spills or leaks from entering storm drain system, drainage courses or creeks and shall properly clean up and dispose of the spills or leaks. The Contractor shall not wash the spills or leaks into streets, gutters, storm drain system, drainage courses or creeks and shall not bury the spills or leaks.

d. In case of a hazardous material spillage, the Contractor shall immediately call 911 and shall handle the spilled material in accordance with the requirements of 6, "Disposal of Hazardous Waste," below.

6. Disposal of Hazardous Waste

- a. Unless the Contractor is a licensed hazardous waste handler, the Contractor shall contract with a licensed hazardous waste handler to remove and dispose of hazardous waste materials unless the waste quantities to be transported are below threshold limits for transportation as specified in the State and Federal regulations.
- b. The Contractor shall arrange for regular hazardous waste collection to comply with limits for storage of hazardous waste.
- c. The Contractor may dispose of dry, empty paint cans, buckets, paintbrushes, rollers, rags and drop cloths in the trash.
- d. The Contractor shall dispose of hazardous waste at facilities authorized for treatment, storage and disposal of hazardous waste only.

7. Street Sweeping

At the end of each day or as directed by the Engineer, the Contractor shall sweep roadways of all debris and excess materials attributed to the Contractor's operations.

8. Water Usage

- a. The Contractor shall use the least amount of water necessary for dust control and street sweeping operations.
- b. The Contractor shall not use water to flush dust and debris down the street in place of street sweeping.

9. Dumpsters and Portable Sanitary Facilities

- a. If dumpsters or portable sanitary facilities are used, they shall be stationed at least ten feet (10') away from storm drain facilities.
- b. The Contractor shall arrange for regular waste collection to keep dumpsters and portable sanitary facilities from overflowing and shall regularly inspect these facilities for leaks. If a leak is discovered, the Contractor shall arrange for the repair or replacement of facilities that leak. The Contractor shall not wash the dumpsters or portable sanitary facilities on-site.

10. Earthwork

The Contractor shall maximize the control of erosion and sediment by using the Best Management Practices for erosion and sedimentation control described in the California Storm Water Best Management Practice Handbook—Construction Activity or ABAG Manual of Standards for Erosion and Sediment Control Measures.

11. Dewatering

- a. The Contractor shall route water through a control device, such as a sediment trap, sediment basin or Baker tank, to remove settleable solids prior to discharging the water into the storm drain system. Refer to the California Storm Water Management Practice Handbook for these sediment control measures.
- b. Approval of the control device shall be obtained in advance from the Engineer.
- c. Filtration of the water following the control device may be required on a case-by-case basis.
- d. If the Engineer determines that the dewatering operation would not generate an appreciable amount of settleable solids, the control device may be waived.

12. Saw Cutting

- a. During saw cutting or grinding operation, use as little water as possible.
- b. During saw cutting, the Contractor shall cover or barricade catch basins using filter fabric, straw bales, sandbags or fine gravel dams to keep slurry out of the storm drain system. When protecting a catch basin, the Contractor shall ensure that the entire opening of the catch basin is covered. Refer to California Storm Water Best Management Practice Handbook for these control measures.
- c. The Contractor shall shovel, absorb or vacuum saw cut slurry and pick up the waste as the work progresses prior to moving to the next location, as specified elsewhere in these specifications or as directed by the Engineer.
- d. If saw cut slurry enters catch basins, the Contractor shall, at the Contractor's cost, clean up the storm drain system immediately.

13. Concrete, Grout and Mortar Related Work

- a. Material Handling
 - i. The Contractor shall avoid mixing excess amounts of fresh concrete or cement mortar on-site.
 - ii. The Contractor shall store concrete, grout and mortar away from storm drain facilities or drainage courses and shall ensure that these materials do not enter the storm drain system.
- b. Washing of Concrete Truck and Tools
 - i. The Contractor shall not wash out concrete trucks or equipment into streets, gutters, storm drain system, drainage courses or creeks.
 - ii. The Contractor shall perform washing of concrete trucks and tools off-site or in a designated area on-site where the water will flow onto dirt or into a temporary pit in a dirt area. The Contractor shall let the water percolate into the soil and dispose of the hardened concrete in a trash container. If a suitable dirt area is not available, the Contractor shall collect the wash water and dispose of it off-site.

14. Asphalt Concrete Paving

- a. Project Site Management
 - i. When rain is forecast within 24 hours or during wet weather, the Engineer may prevent the Contractor from paving.
 - ii. The Engineer may direct the Contractor to protect drainage courses by using earth dike, straw wattle or sandbag to trap and filter sediment. Refer to California Storm Water Best Management Practice Handbook for these control measures.
 - iii. The Contractor shall place drip pans or absorbent material under paving equipment when not in use.
 - iv. The Contractor shall cover catch basins and manholes when paving or applying prime coat, tack coat, seal coat, fog seal or slurry seal.
 - v. If the paving operation includes an on-site mixing plant, the Contractor shall comply with Merced County NPDES General Industrial Activities Storm Water Permit requirements.
 - vi. The Contractor shall preheat, transfer or load hot bituminous material away from storm drain system, drainage courses or creeks.

b. Paving Waste Management

The Contractor shall not sweep or wash down excess sand (placed as part of a sand seal or to absorb excess oil) into streets, gutters, storm drain system or creeks but shall collect the sand and dispose of it off-site. The Contractor shall not wash fresh asphalt concrete pavement.

15. Painting

a. General

i. The Contractor shall remove as much excess paint as possible from brushes, rollers and other tools before starting cleanup.

ii. The Contractor shall conduct cleaning of painting equipment and tools in a designated area approved by the Engineer.

iii. The Contractor shall not allow wash water from cleaning of painting equipment and tools into streets, gutters, storm drain system, drainage courses or creeks.

b. Water-Based Paint

To the maximum extent practicable, the Contractor shall dispose of wash water from water cleaning of brushes, rollers and other tools used in water-based painting work to the sanitary sewer or direct wash water onto dirt area and spade in.

c. Oil-Based Paint

The Contractor shall dispose of waste thinner and solvent and sludge from cleaning of brushes, rollers and other tools used in oil-based painting work as hazardous waste and the Contractor shall handle the waste as described in Section 6, "Disposal of Hazardous Waste," above. To the maximum extent practicable, the Contractor shall filter paint thinner and solvents for reuse.

16. Thermoplastic

a. The Contractor shall transfer and load hot thermoplastic away from drainage systems or drainage courses or creeks.

b. The Contractor shall sweep thermoplastic grindings into plastic bags. Yellow thermoplastic grindings may require special handling as they may contain paint.

C. CONTRACTOR TRAINING AND AWARENESS

1. The Contractor shall train all employees and subcontractors on the storm water pollution prevention requirements contained in these specifications.

2. The Contractor shall inform subcontractors of the storm water pollution prevention contract requirements and include appropriate subcontract provisions to ensure that these requirements are met.

3. The Contractor shall post warning signs in areas treated with chemicals.

D. BMP IMPLEMENTATION

The Contractor shall be responsible throughout the duration of the construction period for installing and maintaining the applicable BMPs and for removing and legally disposing of temporary control measures. Unless otherwise directed by the Engineer or specified elsewhere in these specifications, the Contractor's responsibility for BMP implementation shall continue throughout any temporary suspension of work ordered in conformance with the provisions in Section 8-1.06, "Suspensions," of the Standard Specifications.

Throughout the rainy season, all soil-disturbed areas of the site shall be fully protected with soil stabilization and sediment control device approved by the Engineer at the end of the same day the soil is disturbed unless fair weather is predicted the next day and the protective measures are exempt by the Engineer. The Contractor shall monitor the weather forecast on a daily basis and inform the Engineer of the forecast. The National Weather Service forecast shall be used for this purpose. If precipitation is predicted for the following day, construction schedule shall be altered as required to install appropriate BMPs or to ensure that the already installed BMPs are in good operating condition prior to the onset of rain.

E. BMP MAINTENANCE

To ensure proper implementation and effectiveness of the BMPs, the Contractor shall regularly inspect and maintain the deployed BMPs throughout the construction site. The Contractor shall identify corrective actions and the time needed to address any deficient BMPs or reinitiate any BMPs that have been discontinued. The Contractor shall keep written records of all BMP inspections, maintenance and corrective actions.

The frequency of the BMP inspection shall be as follows:

1. Prior to a forecast storm;
2. After any precipitation that causes runoff;
3. At 24-hour intervals during extended rain events; and
4. Routinely, at a minimum of once every week.

If the Contractor or the Engineer identifies a deficiency in the deployment or functioning of a BMP, the deficiency shall be corrected immediately. If requested by the Contractor and approved by the Engineer in writing, the deficiency may be corrected at a later time or date but the corrective action shall not be later than the onset of the subsequent rain event. The correction of deficient BMPs shall be at no additional cost to the City.

F. RESPONSIBILITIES, CONSEQUENCES, AND REMEDIES

1. Conformance with the provisions of this section or other requirements in various other sections of these specifications shall not relieve the Contractor from the Contractor's responsibilities as provided in various relevant articles of Section 7, "Legal Relations and Responsibilities to the Public," of the Standard Specifications, and as specified herein.
2. For purposes of this section, costs and liabilities include, but are not limited to, fines, penalties and damages, whether assessed against the City or the Contractor, including those levied under the Federal Clean Water Act and the State Porter-Cologne Water Act.
3. If solid or liquid materials or waste, hazardous or otherwise, or pollutants originating from the Contractor's operation enter the storm drain system or water courses, the Contractor will be required to thoroughly clean up the affected storm drain facilities and water courses to the satisfaction of the Engineer. If the Contractor fails to clean up the affected facilities as required, the City will issue a stop-work order and take necessary actions to effect the cleanup of the affected facilities.
4. The Contractor shall be responsible for all costs, including fines, the City's cost of defense, the cost of cleanup by others ordered by the City, and liabilities imposed by law as a result of the Contractor's failure or negligence in complying with the requirements specified herein.
5. In accordance with the provisions of Section 7-1.05, "Indemnification," of the standard Specifications if the Contractor fails to accept or reject a tender of defense and indemnity within fifteen (15) calendar days, the City may, in addition to the

remedies authorized by law, retain any sum due the Contractor until disposition has been made of all claims or suits for damages or until the Contractor accepts or rejects the tender of defense, whichever occurs first.

G. PAYMENT

Full compensation for storm water pollution control shall be considered as included in the payment for various other items of work and no additional compensation will be made therefore.

Special Provisions

1. Requirements

It is required that there be constructed and completed in accordance with the Contract Documents for "Construction of AG Sports Complex Pickleball Courts" for the City of Los Banos, all work as described in these Contract Documents.

2. Description of Work

The principal components of the work to be performed under these Contract Documents include the following:

PG&E coordination and associated work, clear and grub and minor demolition of existing park facilities, erosion control, grading, bio-retention area, soil off-haul, drainage, post-tension concrete slabs, court surfacing, concrete pavement, concrete bands, chain link fencing and gates, pickleball courts, ball wall, site furnishings, site electrical conduit/feeder and pull boxes, planting and irrigation improvements.

Any incidental work not described in the Contract Documents which is necessary to complete the Work shall be furnished and installed as part of this contract at no additional cost to the Owner. The work shall be complete and ready for service to the satisfaction of the Owner. The Contractor shall have had the opportunity to inspect the site and observe actual working conditions during the mandatory pre-bid meeting.

3. Commencement, Prosecution and Completion of Work

The Contractor shall commence work and shall complete all of the work in accordance with the schedule and within the time stated in the bid. The capacity of the Contractor's construction plant, sequence of operations, method of operations, and the forces employed shall at all times during the continuance of the contract, be subject to the approval of the Engineer and shall be such as to ensure the completion of the work within the time specified.

4. Hours of Work

Construction work shall be completed between the hours of 7:00 a.m. and 5:00 p.m. Monday through Friday using normal construction practices. No work shall be performed on Saturday or Sunday. The Contractor may request to the Owner to perform construction outside of these specified hours.

5. Permits and Business Licenses

The Contractor will need an Encroachment Permit from the Public Works Department prior to start of construction. The Contractor and all subcontractors working within the city limits of Los Banos shall apply for and have issued a business license from the City of Los Banos (209-827-7000) prior to commencement of work.

6. Testing

Field density tests shall be made of each compacted layer (subbase and aggregate base) as directed by the Engineer. When these tests indicate that the density of any layer of fill or portion thereof is less than the specified density, that layer shall be reworked until the required density has been obtained.

Field density tests (compaction testing) shall be performed by a geotechnical laboratory retained by the Owner and under the supervision of a registered geotechnical engineer.

Initial compaction testing will be paid by the Owner. Retesting of areas that failed the initial testing will be paid for by the Contractor.

7. Responsibility Regarding Existing Utilities and Private Property

The existence and location of public and private utilities indicated on the drawings are not guaranteed and any additional utilities and facilities not shown on the drawings shall be investigated and protected by the Contractor. The Contractor shall be held responsible for damage to and for maintenance and protection of existing pipelines, public utilities, drives, curbs and gutters, sidewalks, and fences. Excavation in the vicinity

of existing public utility structures, underground electrical or telephone cable, oil or gas pipelines, and waterlines shall be carefully done by hand. The Contractor shall adequately protect all adjoining property and structures from damage, whether within or without of the Owner furnished rights-of-way, and shall be fully responsible for any damage to adjoining property and structures which may result from work done under this contract. The Contractor shall use extreme care during construction to prevent damage from dust to crops and adjacent property. The Contractor shall sprinkle the areas where the passage of operation of vehicles and equipment creates a dust problem, or take other preventive measures as directed by the Engineer. The Contractor shall furnish all labor, equipment, materials and means required to control dust which is in any way a result of the Contractor's operations.

The Contractor shall be responsible for all damage or injury which may result to any property, outside of the construction right-of-way or within the right-of-way where so noted, from the Contractor's operations hereunder, or otherwise, from the performance of the Agreement by said Contractor or any of his subcontractors or employees.

The Contractor shall attempt to maintain access to the residential and commercial driveways within the construction area at all times during working hours and shall provide access during non-working hours, weekends and holidays.

Payment for all work specified above shall be included in the unit or lump sum prices bid in the schedule for the various items of work.

8. Obstructions

The Contractor shall notify the Engineer and the appropriate regional notification center for operators of subsurface installation at least 3 working days, but not more than 14 calendar days, prior to performing any excavation or other work close to any underground pipeline, conduit, duct, wire or other structure. Failure to contact the notification center prohibits excavation. Regional notification centers include but are not limited to the following:

NOTIFICATION CENTER	TELEPHONE
Underground Service Alert Northern California (USA) www.usanorth811.org	811 or 1-800-227-2600

9. Materials Furnished By Owner

No labor, material, or other facilities shall be provided by the Owner unless otherwise indicated on the drawings or in the Contract Documents.

10. Materials Furnished By Contractor

Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power, transportation, and other facilities necessary for the execution and completion of the work.

11. Schedule of Values, Material List and Substitutions

Prior to the commencement of work, and within 10 days following the signing of the contract by the Owner and the Contractor, the Contractor shall submit 2 copies of a Schedule of Values for all lump sum bid items in the Bid Schedule and a *complete* list of equipment and materials to be furnished, including all substitutions proposed to the Engineer for approval. Partial or incomplete material lists will not be considered. No substitutions will be considered thereafter. Only one request for substitution will be considered on each item of material or equipment.

12. Request for Extension of Time

All extension of time requests shall be made in writing to the Engineer within seven (7) calendar days from

the delay occurrence date. In the case of continuing cause of delay, only one claim is necessary.

13. Rights-of-Way

The Contractor shall not be entitled to extra compensation for hardships and increased cost caused by the work being adjacent to telephone-telegraph lines and guy wires, power lines and guy wires, buildings, fences, pipelines, ditches, roadways, and other obstacles which may physically restrict or limit the use of construction equipment. In some cases, such physical confinement may necessitate special methods of construction of the work. If the Contractor desires to utilize additional area, he shall obtain the necessary approvals from the landowner. No additional compensation shall be paid to the Contractor for the cost of obtaining additional right-of-way or for the inability to obtain such.

14. Coordination with Other Work

Other work including but not necessarily restricted to relocation of power and telephone poles, installation of a gas line and relocation of water meters may be in progress near or at the construction site at the time the Contractor is in performance of the work specified herein. The Contractor shall coordinate his work with that of others so that prosecution of all work will proceed smoothly.

15. Closure of Streets

The Contractor will be allowed to temporarily close the streets being paved to vehicular traffic between the hours 7:00 a.m. and 5:00 p.m. on the day the streets are being paved. All street closure dates shall be coordinated with and approved by the Engineer for approval no later than 10 working days prior to the earliest proposed closures and detours.

16. Construction Signs, Barricades, Lights and Flagmen

The Contractor shall furnish, erect and maintain adequate barricades, lights, signs and other devices and take other protective measures to prevent damage to the public. The Contractor shall also furnish adequate warning to the public of dangerous conditions to be encountered. Where one lane of a public road is closed, the Contractor shall furnish flagmen at each end of the closed lane to control traffic in the open lane. The Contractor shall also furnish adequate warning to the public of dangerous conditions to be encountered.

Payment for traffic control and other safety measures shall be included in the Traffic Control Plan lump sum price bid in the Bid Schedule.

17. Traffic Control Plan

It is the Contractor's sole responsibility to establish and implement a Traffic Control Plan conforming to Sections 7-1.08, "Public Convenience" 7-1.09, "Public Safety", and Section 12, "Construction Area Traffic Control Devices", of the Caltrans Standard Specifications. Nothing in these Contract Documents shall be construed as relieving the Contractor from his responsibility.

The Traffic Control Plan shall be prepared, stamped and signed by a professional engineer registered in California, and three copies provided to the Engineer before the Contractor is issued a Notice to Proceed.

Payment for the preparation and implementation of the Traffic Control Plan shall be made at the applicable lump sum price bid in the Bid Schedule.

18. Disposal of Waste Materials

Waste material shall be disposed of in accordance with local regulatory requirements. Provide watertight conveyance for liquid, semi-liquid or saturated solids which tend to bleed during transport. Liquid loss from transported materials is not permitted, whether being delivered to construction site or hauled away for disposal. Fluid materials hauled for disposal must be specifically acceptable at selected disposal site.

19. Noise Control

Conduct operations to cause least annoyance to residents in vicinity of work, and comply with applicable local ordinances. Equip compressors, hoists, and other apparatus with mechanical devices necessary to

minimize noise and dust. Equip compressors with silencers on intake lines. Equip gasoline or oil-operated equipment with silencers or mufflers on intake and exhaust lines.

20. Water Supply

Water will be available to the Contractor in performance of the work without charge from all Owner fire hydrants. Prior to the use of any hydrant the Contractor shall notify the Owner and obtain and install a meter furnished by the Public Works Department on the fire hydrant. It will be the Contractor's responsibility to convey the water to the work site. Regardless of the method of conveyance chosen, it shall not be cause for closure of any streets nor shall it create a nuisance to nearby residents. An air gap shall be maintained between the hose or pipe discharge to prevent possible backflow in the event of distribution system pressure loss. The Contractor shall pay a One Thousand Dollar (\$1,000) deposit per meter for the use of the fire hydrant meter. The deposit may be refunded in full if the fire hydrant meter is returned undamaged.

21. Notifications

The Owner will notify the Contractor in writing of any non-compliance with the foregoing provisions or of any environmentally objectionable acts and corrective action to be taken. State or local agencies responsible for verification of certain aspects of the environmental protection requirements shall notify the Contractor in writing, through the Owner, of any non-compliance with State or local requirements. The Contractor shall, after receipt of such notice from the Owner or from the regulatory agency through the Owner, immediately take corrective action. Such notice, when delivered to the Contractor or his authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails or refuses to comply promptly, the Owner may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess costs or damages by the Contractor unless it is later determined that the Contractor was in compliance.

22. Work Not Listed in Proposal

It is the intent of the plans, specifications and contract documents to provide for the construction of completed and finished facilities and works of improvement unless otherwise specifically provided. Except for authorized changes in the work, payment for said complete and finished facilities and works of improvement will be made only on the basis of the contract items of work listed in the proposal. All other work, including the furnishing of plants, labor, materials, tools, equipment, and incidentals, provided for in the plans, specifications and contract documents, or required for the proper completion of the work as a whole, for which no separate payment has been provided shall be a supplementary obligation of the Contractor and payment therefore shall be considered included in the prices paid for the various contract items of work listed in the proposal.

23. Submittals

The Contractor shall submit to the Engineer, a minimum of six sets, hard copies, or one electronic copy of the following submittals for review and approval:

1. Painting (09 91 13)
 - a. Submit a complete list of all materials proposed for use. The list shall show the specific label name of each product for each coat of finish. After review by the City's Representative, no deviation from the list will be permitted without further approval.
 - b. Provide sample finishes on the actual surfaces to be painted to verify appearance. Approved samples will become the standard for the work.
2. Landscape Maintenance (32 01 90)
 - a. Soil Testing: Contractor shall collect 1 one-quart sample in the bio-retention area and 2 one-quart samples in the container planting areas of the in-place topsoil 20 days after completion of planting, and submit the samples to Waypoint Analytical, Inc. Of Anaheim, (714) 282-8777, or approved equal, for maintenance period fertilizer recommendations. Test results shall be

made available to the City's Representative. Sample shall be a representative composite taken from several planting areas. Cost of soil testing shall be paid for by the Contractor.

- b. Herbicide/Fungicide/Insecticide: Submit a written recommendation from a State of California appropriately licensed individual along with complete product data from proposed manufacturer, for review by the City's Representative and/or the City's appropriately licensed individual.

3. Asphalt Pavement (32 12 16)

- a. Soil Sterilant: Submit written recommendation from a State of California appropriately licensed individual along with complete product data from proposed manufacturer, for review by the City appropriately licensed individual.
- b. Aggregate Base: Submit laboratory reports for aggregate gradation, durability, sand equivalency, and other requirements conforming to DTSS Section 26 "Aggregate Bases", for review by the City's Representative.
- c. Asphalt Pavement: Submit proposed mix design as prepared by the mixing plant and other requirements conforming to DTSS Section 39-2 "Hot Mix Asphalt", for review by the City's Representative.

4. Site Concrete (32 13 13)

- a. The proposed mix design, giving the brand of cement, type, gradations and source of aggregates, water/cement ratio, mix proportions, and unit weight.
- b. Manufacturer's literature for admixtures, embedded items, liquid membrane-form curing compound, and non-shrink grout.
- c. Certification that materials are in compliance with specification requirements.
- d. Method of transporting and placing concrete.

5. Court Surfacing (32 18 23)

- a. Manufacturer specifications for components, color chart and installation instructions, maintenance instructions and warranty information.
- b. ITF pace rating classification certificate for the system to be installed.
- c. Submit list of projects noted in part 1.7.
- d. Current Material Safety Data Sheets (MSDS).
- e. Product substitution: If other than the product specified, the contractor shall submit at least 7 days prior to the bid date a complete type written list of proposed substitutions with sufficient data, drawings, samples and literature to demonstrate to the City's satisfaction that the proposed substitution is of equal quality and utility to that originally specified. Information must include a (Q-panel laboratory U.V.) QUV weathering test of at least 1000 hours illustrating the UV stability of the system.

6. Chain Link Fencing (32 31 13)

- a. Submit product data and materials order confirmation within ten (10) working days after award of the contract.

7. Site Furnishings (32 33 00)

- a. Submit catalog information and/or shop drawings for items:
 - i. Bench
 - ii. Court Bench
 - iii. Picnic Table
 - iv. Bollard
 - v. Trash Receptacle
 - vi. Pickleball Net Post
 - vii. Pickleball Net
 - viii. Wind Screen
 - ix. Storage Container
 - x. Ball Wall

- xii. Bid Alternate #2: Shade Sail, Type 2
 - xiii. Bid Alternate #3: Shade Sail, Type 3
 - xiv. Bid Alternate #4: Shade Sail, Type 4
- 8. Signage (32 41 23)
 - a. Submit catalog information and/or shop drawings for items:
 - i. Court sign
 - ii. Court Rules Sign
 - iii. Entry Sign
 - iv. Accessible Parking Sign
 - v. Accessible Van Parking Sign
- 9. Landscape Soil Preparation (32 91 13)
 - a. Biotreatment Soil Mix Submittals: Submit to the City's Representative for approval:
 - i. A one-gallon size sample of biotreatment soil.
 - ii. Certification from the soil supplier or an accredited laboratory that the biotreatment soil mix meets the requirements of this specification.
 - iii. Grain size analysis results of the fine sand component performed in accordance with ASTM D 422, Standard Test Method for Particle Size Analysis of Soils or Caltrans Test Method (CTM) C202.
 - iv. Quality analysis results for compost performed in accordance with Seal of Testing Assurance (STA) Standards.
 - v. Organic content test results of biotreatment soil mix. Organic content test shall be performed in accordance with Testing Methods for the Examination of Compost and Composting (TMECC) 05.07A, "Loss-On-Ignition Organic Matter Method.
 - vi. Grain size analysis results of compost component performed in accordance with ASTM D 422, Standard Test Method for Particle Size Analysis of Soils.
 - vii. A description of the equipment and methods used to mix the sand and compost to produce biotreatment soil mix.
 - viii. Provide the name of the testing laboratory(s) and the following information:
 - 1. Contact person(s)
 - 2. Address(es)
 - 3. Phone contacts(s)
 - 4. E-mail address(es)
 - 5. Qualifications of laboratory(s) and personnel including date of current certification by U.S. Composting Council (USCC), ASTM, Caltrans, or approved equal.
- 10. Landscape Planting (32 93 00)
 - a. Plant Material: Within ten (10) working days after award of the contract, the Contractor shall submit notice to the City's Representative certifying the quantity and species of plant material ordered, the nursery supplying the material, any plant material unavailable at the time, and proposed plant substitutions. No plants shall be ordered or delivered prior to written acceptance by the City's Representative.
 - b. Mulch: Name of supplier and one quart-sized sample.
 - c. Certificates: All plant material shall meet the specifications of Federal, State, and County laws requiring inspection for plant diseases and insect infestations. Inspection certificates required by law shall accompany each shipment, invoice, or order of stock, and when such plants arrive at the site of work, the certificate of inspection shall be filed with the City's Representative.
- 11. Bid Alternate #5: Switchboard (26 24 13)
 - a. Shop Drawings - For each switchboard furnished under this Contract, submit manufacturer's information on the switchboard. Before construction of the main (service) switchboard, the contractor shall deliver two or more copies of the switchboard submittal to P.G.&E. For their

approval. The contractor shall deliver one P.G.&E. Approved copy of the submittal to the Electrical Engineer for record.

- b. Submit operation and maintenance data for switchboards, and circuit breakers including nameplate data, parts lists, manufacturer's circuit breaker time current coordination curves, factory and field test reports, recommended maintenance procedures and typewritten as-built panel and switchboard Schedules. Submit in accordance with Division 1.

12. General Electrical (26 05 73)

- a. Submit to the City's Representative shop drawings, manufacturer's data and certificates for equipment, materials and finish, and pertinent details for each system specified. Information to be submitted includes manufacturer's descriptive literature of cataloged products, equipment, drawings, diagrams, performance and characteristic curves as applicable, test data and catalog cuts. Obtain written approval before procurement, fabrication, or delivery of the items to the job site.
- b. Proposed substitutions of products will not be reviewed or approved prior to awarding of the contract. Substitutions shall be proven to the City's Representative to be equal or superior to the specified Product. City's Representative decision is final. The Contractor shall pay all costs incurred by the Architect and Engineer in reviewing and processing any proposed substitutions whether or not a proposed substitution is accepted.
- c. If a proposed substitution is rejected, the contractor shall furnish the specified product at no increase in contract price. If a proposed substitution is accepted, the contractor shall be completely responsible for all dimensional changes, electrical changes, or changes to other work which are a result of the substitution. The accepted substitution shall be made at no additional cost to the owner or design consultants.

13. Electrical Close Out Submittals (26 05 73)

- a. Manuals: Furnish manuals for equipment where manuals are specified in the equipment specifications.

14. Post-Tension Concrete Slab (Sheet S0.1)

- a. Contractor shall submit construction joint locations to engineer for approval prior to construction.
- b. Contractor to submit footing penetrations to structural engineer for review and approval prior to construction.
- c. Tendon supplier to submit shop drawings showing tendon layout, dead ends, stressing ends, and support system for review and approval by engineer.

15. Deferred Submittals:

- a. The following items are deferred submittals. Contractor shall prepare stamped and signed structural drawings and calculations required for City Building Department review and permit issuance for:
 - i. Bid Alternate #1: Shade Structure, Type 1
 - ii. Bid Alternate #2: Shade Structure, Type 2
 - iii. Bid Alternate #3: Shade Structure, Type 3
 - iv. Bid Alternate #4: Shade Structure, Type 4

Within 10 days after the effective date of the Agreement and before starting to perform any work, the Contractor shall submit to the Engineer for review and approval:

1. A work schedule indicating the times for starting and completing the various stages of the work. No progress payment shall be made to Contractor until an acceptable schedule has been submitted to the Engineer.
2. Traffic Control Plan
3. Notice to Residents in English and Spanish

4. A Schedule of Values - a breakdown of each lump sum price to be used to determine deductive change orders, if necessary.
5. A complete list of equipment and materials to be furnished
6. City of Los Banos Business License for Contractor and all subcontractors

If more than TWO submittals for a single item are required because of incorrect or insufficient data, or the submittal is unacceptable, or because the Contractor wishes to change previously approved material, then all costs incurred by the Owner for the additional review shall be deducted from monies due the Contractor.

A revised work schedule shall be submitted within 5 days of request by the Engineer. No future progress payments shall be made to Contractor until an acceptable schedule has been submitted to Engineer.

24. Bid Item Descriptions

TS = Technical Specifications

Bid Item #1: Project Start-Up (TS 00 72 00)

The contract lump sum price paid for **project start-up** shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **project start-up**, complete in place, including, but not limited to, bonding and mobilization, construction staking, temporary construction fence, and tree protection, 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 (TS 01 57 13)

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, including, but not limited to, stabilized construction entrance, wash down area, fiber rolls, and storm drain inlet protection, 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 (TS 02 41 13)

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**, complete in place, including, but not limited to, removal and disposal of chain link fence concrete pavement, and clearing and grubbing, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item #4: Rough Grading (TS 31 22 00)

The contract lump sum price paid for **rough grading** shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **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 #5: Soil Off-Haul (TS 31 22 00)

The contract lump sum price paid for **soil off-haul** shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **soil off-haul**, 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: Catch Basin, (TS 33 40 00)

The contract unit price for each **catch basin**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **catch basin**, 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: Pop-up Bioretention Drain, (TS 33 40 00)

The contract unit price for each **pop-up bioretention drain**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **pop-up bioretention drain**, 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: Clean Out, (TS 33 40 00)

The contract unit price for each **clean out**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **clean out**, 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: Solid Drainline, 6" (TS 33 40 00)

The contract price paid per linear foot for **solid drainline, 6"**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **solid drainline, 6"**, complete in place, including, but not limited to, trenching, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item #10: Solid Drainline, 8" (TS 33 40 00)

The contract price paid per linear foot for **solid drainline, 8"**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **solid drainline, 8"**, complete in place, including, but not limited to, 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: Perforated Drainline, 6" (TS 33 40 00)

The contract price paid per linear foot for **perforated drainline, 6"**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **perforated drainline, 6"**, complete in place, including, but not limited to, trenching, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item #12: French Drain (TS 33 40 00)

The contract price paid per linear foot for **french drain**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **french drain** complete in place, including, but not limited to, cobble, impermeable liner, and class II permeable material, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item #13: Bioretention Soil and Drain Rock (TS 33 40 00)

The contract paid price per square foot for **bioretention soil and drain rock** shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **bioretention soil and drain rock**, 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: Post-Tensioned Concrete Slab (sheet S.01)

The contract price paid per square foot for **post-tensioned concrete slab** shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **post-tensioned concrete slab**, complete in place, including, but not limited to, rock base, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item #15: Court Surfacing (TS 32 18 23)

The contract price paid per square foot for **court surfacing** shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **court surfacing**, 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 Pavement (TS 32 13 13)

The contract price paid per square foot for **concrete pavement** shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **concrete pavement**, complete in place, including, but not limited to, rock base, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item #17: Asphalt Pavement (TS 32 12 16)

The contract price paid per square foot for **asphalt pavement** shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **asphalt pavement**, 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: Concrete Band, 1' Wide (TS 32 13 13)

The contract price paid per linear foot for **concrete band, 1' wide**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **concrete band, 1' wide**, complete in place, including, but not limited to, rock base, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item #19: Chain Link Fence, 6' Tall with Slats (TS 32 31 13)

The contract price paid per linear foot for **chain link fence, 6' tall with slats**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **chain link fence, 6' tall with slats**, complete in place, including, but not limited to, concrete footing, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item #20: Chain Link Fence, 6' Tall (TS 32 31 13)

The contract price paid per linear foot for **chain link fence, 6' tall**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **chain link fence, 6' tall**, complete in place, including, but not limited to, concrete footing, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item #21: Chain Link Fence, 4' Tall (TS 32 31 13)

The contract price paid per linear foot for **chain link fence, 4' tall**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **chain link fence, 4' tall**, complete in place, including, but not limited to, concrete footing, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item #22: Chain Link Gate, 6' Tall (TS 32 31 13)

The contract unit price for each **chain link gate, 6' tall**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **chain link gate, 6' tall** complete in place, including, but not limited to, concrete footings, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item #23: Chain Link Gate, 4' Tall (TS 32 31 13)

The contract unit price for each **chain link gate, 4' tall**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **chain link gate, 4' tall** complete in place, including, but not limited to, concrete footings, as shown on the plans, as specified in the

Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item #24: Bench (TS 32 33 00)

The contract unit price for each **bench**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **bench**, 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: Court Bench (TS 32 33 00)

The contract unit price for each **court bench**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **court bench**, 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: Picnic Table (TS 32 33 00)

The contract unit price for each **picnic table**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **picnic 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 #27: Trash Receptacle (TS 32 33 00)

The contract unit price for each **trash receptacle**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **trash receptacle**, 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: Storage Container (TS 32 33 00)

The contract unit price for each **storage container**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **storage container**, 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: Entry Sign (TS 32 41 23)

The contract unit price for each **entry sign**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **entry sign**, complete in place, including, but not limited to, concrete footings, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item #30: Court Rules Sign (TS 32 41 23)

The contract unit price for each **court rules sign**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **court rules 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.

Bid Item #31: Court Number Sign (TS 32 41 23)

The contract unit price for each **court number sign**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **court number 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.

Bid Item #32: Wind Screen (TS 32 33 00)

The contract price paid per linear foot for **wind screen** shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **wind screen**, complete in

place, including, but not limited to, concrete footing, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item #33: Pickleball Court Net, Post, and Anchor (TS 32 33 00)

The contract unit price for each **pickleball court net, post, and anchor**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **pickleball court net, post, and anchor**, complete in place, including, but not limited to, concrete footings, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item #34: Ball Wall (TS 32 33 00)

The contract lump sum price paid for **ball wall** shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **ball wall**, complete in place, including, but not limited to, concrete footings, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item #35: Bollard (TS 32 33 00)

The contract unit price for each **bollard**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **bollard**, complete in place, including, but not limited to, concrete footings, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item #36: Accessible Parking (TS 09 91 13, TS 32 41 23)

The contract unit price for each **accessible parking**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **accessible parking**, complete in place, including, but not limited to, striping and concrete footings, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item #37: Site Electrical: Conduit/Feeder, Pull Boxes

The contract lump sum price paid for **site electrical: conduit/feeder, pull boxes** shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **site electrical: conduit/feeder, pull boxes**, complete in place, including, but not limited to, conduit, feeders and pull boxes, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item #38: PG&E Conduit Re-route & Boxes

The contract lump sum price paid for **PG&E conduit re-route & boxes** shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **PG&E conduit re-route & boxes**, complete in place, including, but not limited to, PG&E conduit re-route and PG&E primary boxes, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item #39: Irrigation (TS 32 84 00)

The contract lump sum price for **irrigation** shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **irrigation**, complete in place, including, but not limited to, point of connections, connection to existing 2-wire controller cables, splice boxes, surge protection, lateral lines, main lines, sleeves, decoders, remote control valves, quick coupler valves, shut-off valves, and bubblers, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item #40: Soil Preparation (TS 32 93 00)

The contract price paid per square foot for **soil preparation** shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **soil preparation**,

complete in place, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item #41: Shrub, 1 Gallon (TS 32 93 00)

The contract unit price for each **shrub, 1 gallon**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **shrub, 1 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: Shrub, 5 Gallon (TS 32 93 00)

The contract unit price 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 #43: Tree (TS 32 93 00)

The contract unit price for each **tree**, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **tree**, 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: Mulch (TS 32 93 00)

The contract 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**, complete in place, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bid Item #45: Root Barrier (TS 32 93 00)

The contract price paid per linear foot for **root barrier** shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **root barrier**, 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: Plant Establishment (TS 32 93 00)

The contract price paid per month for **plant establishment** shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **plant establishment**, 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: Dog Park Irrigation & Planting Restoration (TS 32 84 23 and TS 32 93 00)

The contract price paid per month for **dog park irrigation & planting restoration** shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **dog park irrigation & planting restoration**, 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 Alternate B-1: Shade Structure, Type 1 (TS 32 33 00)

The contract lump sum price paid for **shade structure, type 1** shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **shade structure, type 1**, including, but not limited to, structural calculations and concrete 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 Alternate B-2: Shade Structure, Type 2 (TS 32 33 00)

The contract lump sum price paid for **shade structure, type 2** shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **shade structure, type 2**, including, but not limited to, structural calculations and concrete 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 Alternate B-3: Shade Structure, Type 3 (TS 32 33 00)

The contract lump sum price paid for **shade structure, type 3** shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **shade structure, type 3**, including, but not limited to, structural calculations and concrete 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 Alternate B-4: Shade Structure, Type 4 (TS 32 33 00)

The contract lump sum price paid for **shade structure, type 1** shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **shade structure, type 4**, including, but not limited to, structural calculations and concrete 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 Alternate B-5: Site Electrical - Pole Lights, Push-Buttons, Panel, Cabinet, Wiring, and Cables

The contract lump sum price paid for **site electrical-pole lights, push-buttons, panel, cabinet, wiring, and cables** shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in **site electrical-pole lights, push-buttons, panel, cabinet, wiring, and cables**, including, but not limited to, concrete footings and concrete pad for panel and cabinet, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Technical Specifications

Technical Specifications
AG Sports Complex Pickleball Courts
Bid Submittal
September 20, 2024

TABLE OF CONTENTS

SECTION 00 72 00 GENERAL REQUIREMENTS
SECTION 01 57 13 EROSION CONTROL
SECTION 02 41 13 DEMOLITION
SECTION 09 91 13 PAINTING
SECTION 31 22 00 EARTHWORK AND GRADING
SECTION 31 23 00 TRENCHING AND BACKFILLING
SECTION 32 01 90 LANDSCAPE MAINTENANCE
SECTION 32 01 91 TREE PROTECTION AND PRUNING
SECTION 32 12 16 ASPHALT PAVING
SECTION 32 13 13 SITE CONCRETE
SECTION 32 18 23 COURT SURFACING
SECTION 32 31 13 CHAIN LINK FENCING
SECTION 32 33 00 SITE FURNISHINGS
SECTION 32 41 23 SIGNAGE
SECTION 32 84 00 PLANTING IRRIGATION
SECTION 32 91 13 LANDSCAPE SOIL PREPARATION
SECTION 32 93 00 LANDSCAPE PLANTING
SECTION 33 40 00 SITE DRAINAGE UTILITIES

APPENDIX A Geotechnical Investigation Report AG Sports Complex Pickleball Courts prepared by BSK Associates dated May 6, 2024

APPENDIX B Ag Sports Complex Structural Calculations by RW Consulting Engineers, Inc. dated September 20, 2024

SECTION 00 72 00 GENERAL REQUIREMENTS

PART 1 – INFORMATION AND DOCUMENTS

1.1 REFERENCE TERMS

- A. The term "Owner" or "City" shall mean "City of Los Banos" and the authorized representatives acting on the City's behalf.
- B. The term "Engineer" shall mean "City Engineer" or the City Engineer's authorized representative.
- C. The term "Inspector" shall be the City's authorized job inspector or any independent inspection service acting on the City's behalf.

1.2 DOCUMENTS

- A. Plans and Specifications Cooperative: The Plans and Specifications labeled "Ag Sports Complex Pickleball Courts" are intended to be complementary, and items or information shown in one but not the other are to be included as if shown in both. Anything not expressly set forth in either, but which is necessarily implied, shall be furnished as though specifically both shown and mentioned without extra charge. Should anything be omitted from the plans that are necessary for proper execution of the work herein described, it shall be the duty of the Contractor to notify the City before signing the contract.
- B. Scaling of Prints: Shall be avoided and, when done, shall be the Contractor's responsibility. Given dimensions shall take precedence. Consult the City's Representative for all necessary dimensions that are not given. Check all field dimensions and existing building conditions and sizes before proceeding.
- C. Additional Details: Shall be furnished by the City's Representative as they may be required, and shall be considered of equal force with those that accompany these Specifications.
- D. Omissions or Errors: If discovered in the Plans or Specifications, shall be brought to the attention of the City's Representative. No work is to proceed where there is any uncertainty as to the meaning of these documents.

1.3 QUALITY CONTROL

- A. Variations to Expedite the Work: Contractor shall consult the City if at any time a variation in the construction or in the quality of materials as specified is desired. The Contractor will be allowed to vary from the documents only after written approval from the City is obtained.
- B. Building Codes: Building Codes of this State and the specific County and City and the latest rules and regulations of the National Board of Fire Underwriters and all other applicable codes and regulations shall be accurately complied with.
- C. Layout of Work: Shall be executed under the supervision of the Contractor by a City-approved Land Surveyor licensed in California using professional-type instruments. Contractor shall establish elevations and locate and stake all on-site improvements and grading for approval by the City prior to proceeding and shall be responsible for any damage that may be sustained by the City or others from incorrect locations of site improvements.
- D. Substitutions: Substitutions in material or methods of construction, when necessary because of material shortages or in order to avoid serious delay, may be made only after they are approved by the City in writing.
- E. Alterations and Extras: No alterations shall be made in the work from that shown in the Plans and Specifications, and no claims will be allowed except in pursuance of a written change order countersigned by the City and the City's Representative, and any alterations or changes so ordered shall in no way invalidate the contract. Should the Contractor deem any work to be an extra, the City shall be notified in writing and a written change order shall be issued before any work is executed, or no claim will be allowed.
- F. Public Access: Continuous safe public access (both pedestrian and vehicular) shall be maintained along frontages. Construct temporary walkways as necessary.
 - 1. Barricade open depressions and holes that occur in the performance of this work. Post warning light adjacent to the depression.
 - 2. Operate warning light during hours from dusk to dawn each day, and as otherwise required.
 - 3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by operations under the specified work.
- G. Material and Workmanship: All materials and workmanship are to be the best of their respective kinds. The terms "or equal", "approved", "selected", and so forth,

shall mean as approved, etc. by the City's Representative. All materials and equipment used shall be in accordance with the manufacturer's printed directions.

1. Use adequate numbers of skilled work persons who are thoroughly trained and experienced in necessary crafts and who are completely familiar with the specified requirements and methods needed for proper performance of work specified. Use equipment adequate in terms of size, capacity, and numbers to accomplish work in a timely manner.
- H. Defective or Improper Work: Any work or materials not acceptable to the City's Representative must be removed by the Contractor and replaced by approved materials and/or work without extra compensation. In the event that such removal might cause injury to other portions of the work, or if the Contractor refuses or neglects to remove them, then the City may deduct from the contract price such sum as judged to be just and reasonable as damage caused by non-compliance with the plans and specifications, as well as for the difference in value between the balance that may be due to the Contractor.
- I. De-Watering: Contractor shall generally keep work areas free of all surface water so as to permit construction work to progress in an orderly and professional manner.

PART 2 – SUBMITTALS

2.1 SHOP DRAWINGS

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

2.2 SUBMITTALS

- A. Only where called for in the technical specifications, samples of materials to be used in fulfilling the requirements of the Specifications shall be deposited with the City's Representative at least three (3) working days prior to their use in the work to allow sufficient time for review.

- B. Submit manufacturers' samples to the City's Representative at least three (3) working days prior to execution of the work as required in the Specifications and in all cases where choice of color, finish, style, or texture is involved.

2.3 TESTING

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

2.4 JOB SITE SAFETY

- A. Neither the professional activities of the City's Representative, nor the presence of the City's Representative or their employees and subconsultants at a construction/project site, shall relieve the Contractor of their obligations, duties and responsibilities including, but not limited to, construction means, methods, sequence, techniques or procedures necessary for performing, superintending and coordinating the work in accordance with the contract documents and any health or safety precautions required by any regulatory agencies. The City Representative and their personnel have no authority to exercise any control over any construction contractor or their employees in connection with their work or any health or safety programs or procedures. The Contractor shall be solely responsible for job site safety, and the City's Representative and the City's Representative's subconsultants shall be indemnified by the Contractor and shall be made additional insureds under the Contractor's policies of general liability insurance.

PART 3 – TEMPORARY FACILITIES AND CONTROLS

3.1 TEMPORARY FACILITIES

- A. Utilities:

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

B. Protection:

1. The Contractor shall provide adequate protection for all portions of the existing site, its improvements, and its occupants throughout the work. All damage done to existing property shall be neatly repaired or replaced at the Contractor's expense. Work shall be executed in a careful, orderly manner with the least possible disturbance to the public and occupants of the area.
2. The Contractor shall protect and save any and all utilities. Any time existing utilities are exposed, the Inspector shall be notified. Repairs to existing utilities shall not be performed without prior approval and inspection by the City's Inspector.

C. Field Office and Enclosures:

1. Fences, enclosures, storage sheds, etc., required by the Contractor for the storing of tools and materials, shall be located where approved in advance by the City. Such fences, enclosures, storage sheds, etc., are at the Contractor's option.

- D. A 6 foot high temporary chain link construction fence shall be installed along the entire perimeter of the project site and shall be maintained for the duration of the project. The temporary construction fencing shall be in good condition, staked into the ground wherever possible, and installed with a top tension wire. The fence posts shall be 2 inch diameter galvanized steel. The fence fabric shall be 11 gauge, with knuckled barbs on the top edges.

3.2 CLEAN-UP

- A. During the construction period, the premises shall be kept free from the accumulation of waste materials or rubbish on a daily basis. The final cleaning shall leave the facilities ready for occupancy with no additional clean-up. Clean-up dirt, grease, asphalt, etc., from all surfaces. Use no cleaning materials that will damage finishes.

PART 4 – MATERIALS AND EQUIPMENT

4.1 GENERAL

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

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

4.2 SUBSTITUTIONS

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

4.3 MEASUREMENT AND PAYMENT

- A. Where the estimated quantities for a specific portion of the work are designated on the plans as final pay quantities, said estimated quantities shall be the final quantities for which payment for such specific portion of the work will be made, unless the dimensions of said portions of the work shown on the plans are revised by the Inspector or City's Representative. If such dimensions are revised, and such revisions result in an increase or decrease in the quantities of such work, the final quantities for payment will be revised in the amount represented by the changes

in the dimensions. The estimated quantities for such specific portion of the work shall be considered as approximate only and no guarantee is made that the quantities that can be determined by computations, based on the details and dimensions shown on the plans, will equal the estimated quantities. No allowance will be made in the event that the quantities based on computations do not equal the estimated quantities.

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

PART 5 – RECORD DRAWINGS

- 5.1 One complete set of prints or PDF shall be furnished to the Contractor by the City's Representative on that the Contractor will fully illustrate all revisions, with complete dimensions, made by all crafts in the course of work. This shall include all field changes, adjustments, variances, substitutions, and deletions, whether covered by Change Orders or not. Underground installations must be located precisely as constructed on the Record Drawings.
- 5.2 The Record Drawings shall be updated on a weekly basis and submitted complete to the City with each pay request. Pay requests will not be processed without the aforementioned Record Drawings.
- 5.3 Upon completion of the work, it shall be the responsibility of the Contractor to transfer all revisions to a complete set of reproducible prints or PDF, which will be furnished by the City's Representative and paid for by the City. The Contractor shall submit the reproducible Record Drawings to the City with request for final payment. Final payment will not be processed without the aforementioned Record Drawings.

PART 6 – GUARANTEES

- 6.1 The Contractor shall provide a written guarantee for all the work as required in the Technical Specification section.
- 6.2 Assemble and present three (3) bounded physical sets and one (1) digital set of all certificates, warranties, guarantees, and maintenance manuals into a clearly organized physical file and digital file to the City at the completion of the work.

PART 7 – NOT USED

END OF SECTION 00 72 00

SECTION 01 57 13 EROSION CONTROL

PART 1 – GENERAL

(See also General Provisions, Special Provisions, and General Requirements)

1.1 SCOPE

- A. Perform all storm water pollution prevention measures and furnish erosion control devices as shown on the plans and as specified herein including, but not necessarily limited to, the following:
 - 1. Material and waste management
 - 2. Spill prevention and control
 - 3. Vehicle and equipment cleaning, maintenance, and fueling
 - 4. Contractor training and awareness
 - 5. Construction activity specific requirements
 - 6. Temporary construction entrance
 - 7. Storm drain inlet protection
 - 8. Fiber rolls
- B. Related work specified elsewhere:
 - 1. Demolition – Section 02 41 13
 - 2. Earthwork and Grading – Section 31 22 00
 - 3. Site Drainage Utilities – Section 33 40 00

1.2 WORK INCLUDED

- A. The goal of these requirements is to prevent the pollution of storm water run-off on construction projects by keeping pollution out of storm drains, reducing the exposure and discharge of materials and wastes to storm water, and by reducing erosion and sedimentation. Storm drains discharge run-off directly into creeks and other natural water bodies without treatment.

1.3 GENERAL REQUIREMENTS

- A. The following requirements shall be met on all projects.
 - 1. Non-hazardous Material/Waste Management
 - a. Designated Areas: Identify designated areas of the project site that are suitable for material delivery, storage, and waste collection,

and submit the proposed areas to the City's Representative for approval. To the maximum practicable extent, these areas shall be near construction entrances and away from catch basins, gutters, drainage courses, and creeks.

2. Granular Material: Store granular material at least 10 feet away from catch basins and curb returns. Prevent granular material from entering storm drains or creeks. When rain is forecast within 24 hours or during wet weather, cover granular material with a tarpaulin and surround the material with sand bags.
 - a. Dust Control: Dust control shall be in accordance with Section 10, "Dust Control" of the Department of Transportation (Caltrans), Standard Specifications (DTSS), current edition.
 - b. Street Sweeping: At the end of each working day, or as directed by the City's Representative, clean and sweep roadways and on-site paved areas to remove materials attributed to or involved in the work. Water shall not be used to flush down streets in place of street sweeping.
 - c. Recycling: Recycle aggregate material, asphalt concrete, and Portland Cement concrete at an approved recycling site.
 - 1) Bright Wright Landfill, 17173 Bily Wright Road, Los Banos, CA 93635, (209) 723-4481
 - 2) Highway 59 Landfill, 7040 N. Highway 59, Merced, CA 95348, (209) 723-4481
 - 3) For additional information, contact the Merced County Regional Waste Authority at (209) 723-3153.
 - d. Disposal: At the end of each working day, collect all scrap, debris and waste materials and dispose of such materials properly. Inspect dumpsters for leaks and contact trash hauling contractors to replace or repair dumpsters that leak. Arrange for regular waste collection before dumpsters overflow.
3. Hazardous Material/Waste Management:
 - a. Storage: Label and store all hazardous materials, such as pesticides, paints, thinners, solvents and fuels, and all hazardous wastes, such as waste oil and anti-freeze. Store all hazardous materials and all hazardous waste according to all local City/County Regulations.

Keep an accurate up-to-date inventory of hazardous material and hazardous wastes stored on-site to assist emergency response personnel if there is a hazardous material incident.

- b. Usage: When rain is forecast within 24 hours or during wet weather, do not apply chemicals in outside areas. Do not over apply pesticides or fertilizers, and follow material manufacturer's instructions regarding, including, but not limited to, uses, protective equipment, ventilation, flammability, and mixing of chemicals.
- c. Disposal: Arrange for regular hazardous waste collection to comply with time limits on storage of hazardous waste. Dispose of hazardous waste only at authorized and permitted Treatment, Storage and Disposal Facilities. Use only licensed hazardous waste haulers to remove the waste off-site, unless quantities to be transported are below applicable threshold limits for transportation specified in State and Federal Regulations. For additional information, contact Merced County Regional Waste Authority at (209) 723-3153.

4. Spill Prevention and Control:

- a. Keep a stockpile of spill clean-up materials, such as rags or absorbents, readily accessible on-site.
- b. Immediately contain and prevent leaks and spills from entering storm drains, and properly clean-up and dispose of the waste and clean-up materials. If the waste is hazardous, handle the waste as described in Section 1.3A, 3c above.
- c. Prevent spilled materials from being washed into streets, gutters, storm drains, or creeks, and never bury spilled hazardous materials.
- d. Report any hazardous materials spill to the City's Representative.

5. Vehicle/Equipment Cleaning:

- a. Vehicle or equipment cleaning shall not be performed on-site or in the street using soaps, solvents, degreasers, steam cleaning equipment, or equivalent methods.
- b. Vehicle or equipment cleaning shall be performed with water only, in a designated bermed area that does not allow rinse water to run off-site or into streets, gutters, storm drains, or creeks.

6. Vehicle/Equipment Maintenance and Fueling:

- a. Maintenance and fueling of vehicles or equipment shall be performed in a designated bermed area, or over a drip pan that does not allow storm water run-off of spills.
- b. Use secondary containment, such as a drip pan, to catch leaks or spills any time that vehicle or equipment fluids are dispensed, changed or poured.
- c. Keep a stockpile of spill clean-up materials, such as rags or absorbents, readily accessible on-site.
- d. Clean-up leaks and spills of vehicle or equipment fluids immediately and dispose of the waste and clean-up materials as hazardous waste, as described in Section 1.3A, 3c above.
- e. Do not wash any spilled material into streets, gutters from drains, or creeks, and never bury spilled hazardous material.
- f. Report any hazardous materials spill to the City's Representative.
- g. Inspect vehicles and equipment arriving on-site for leaking fluids, and promptly repair leaking vehicles and equipment. Drip pans shall be used to catch leaks until repairs are made.
- h. Recycle waste oil and anti-freeze to the maximum practical extent.
- i. Comply with all Federal, State and City/County requirements for aboveground storage tanks.

7. Contractor Training and Awareness:

- a. The Contractor shall train all employees/subcontractors on the storm water pollution prevention requirements contained in these Specifications.
- b. Inform subcontractors about the storm water pollution prevention requirements, and include appropriate subcontract provisions to ensure that these requirements are met.
- c. Post warning signs in areas treated with chemicals.
- d. Paint new catch basins, constructed as part of the project, with "No Dumping."

B. Activity Specific Requirements: The following requirements shall be met on all projects that include the listed activities.

1. Dewatering Operation

- a. Sediment Control: Route water through a control measure, such as a sediment trap, sediment basin trap, or sediment basin, to remove settleable solids before discharge to the storm drain system.

Approval of the control measure shall be obtained in advance from the City's Representative. Filtration of the water following the control measure may be required on a case-by-case basis. If the City's Representative determines that the dewatering operation would not generate an appreciable amount of settleable solids, the control measure requirement may be waived. Reuse water for other needs, such as dust control or irrigation, to the maximum practicable extent.

- b. Contaminated Groundwater: If the project is within an area of known groundwater contamination, then water from dewatering operations shall be tested before discharge. If the water quality meets Regional Water Quality Control Board (RWQCB) standards, then it may be discharged to the storm drain system. Otherwise, the water must be treated or hauled off-site for proper disposal.

2. Paving Operations

- a. Project Site Management: When rain is forecast within 24 hours or during wet weather, the City's Representative may prevent the Contractor from paving. The City's Representative may direct the Contractor to protect drainage courses by using control measures, such as earth dikes, straw bales, and sand bags, to divert run-off or trap and filter sediment. Place drip pans or absorbent material under paving equipment when not in use. Cover catch basins and manholes when paving or applying a seal coat or tack coat.
- b. Paving Waste Management: Do not sweep or wash down excess sand or screenings (placed as part of a sand seal, chip seal or to absorb excess oil) into gutters, storm drains or creeks. Instead, either collect the sand and screenings and return it to the stockpile, or dispose of it in a trash container. Do not use water to wash down fresh asphalt concrete pavement.

3. Saw Cutting

- a. During saw cutting, cover or barricade catch basins using control measures such as filter fabric, straw bales, sand bags, and fine gravel dams, to keep slurry out of the storm drain system. When protecting a catch basin, ensure that the entire opening is covered.

- b. Shovel, absorb, or vacuum saw cut slurry, and pick-up waste before moving to the next location or at the end of each working day, whichever is sooner.
- c. If saw cut slurry enters catch basins, remove the slurry from the storm drain system immediately.

4. Contaminated Soil Management

- a. On all projects involving grading or excavation, look for contaminated soil as evidence by site history, discoloration, odor, differences in soil properties, abandoned underground tanks or pipes, or buried debris. If the project is not within an area of known soil contamination and no evidence of soil contamination is found, then testing of the soil shall only be required if directed by the City's Representative. If soil contamination is found, then follow Section 1.3B, 4b below.
- b. If the project is within an area of known soil contamination or evidence of soil contamination is found, then soil from grading or excavation operations shall be tested. The soil shall be managed as required by the Inspector City's Representative.

5. Concrete, Grout, and Mortar Waste Management

- a. Material Management: Store concrete, grout, and mortar away from drainage areas and ensure that these materials do not enter the storm drain system.
- b. Concrete Truck/Equipment Wash Out: Do not wash out concrete trucks or equipment into streets, gutters, storm drains, or creeks. Perform wash out of concrete trucks or equipment off-site or in a designated area on-site where water will flow onto dirt or into a temporary pit in a dirt area. Let the water percolate into the soil and dispose of the hardened concrete in a trash container. If a suitable dirt area is not available, then collect the wash water and dispose of it off-site.
- c. Exposed Aggregate Concrete Wash Water: Avoid creating run-off by draining water from washing of exposed aggregate concrete into a dirt area. If a suitable dirt area is not available, then filter the wash water through straw bales, or an equivalent material, before discharging it into the storm drain system. Collect and return

sweepings from exposed aggregate concrete to a stockpile or dispose of the waste in a trash container.

6. Painting

- a. Painting Clean-up/Designated Area: Conduct cleaning of painting equipment and tools in a designated area that will not allow run-on of storm water or run-off of spills. Prevent wash water from cleaning of painting equipment and tools from entering into streets, gutters, storm drains, or creeks.
- b. Water-Based Paint: Remove as much excess paint as possible from brushes, rollers, and equipment before starting clean-up. To the maximum practicable extent, dispose of wash water from aqueous cleaning of equipment and tools to the sanitary sewer. Otherwise, direct wash water onto a dirt area and spade in.
- c. Oil-Based Paint: Remove as much excess paint as possible from brushes, rollers, and equipment before starting clean-up. To the maximum practicable extent, filter paint thinner and solvents for re-use. Dispose of waste thinner and solvent and sludge from cleaning of equipment and tools as hazardous waste, as described in Section 1.3A, 3c above.
- d. Material/Waste Management: Store paint, solvents, chemicals and waste materials in compliance with all City/County Hazardous Materials Storage Regulations and all applicable State and Federal regulations. Store these materials in a designated area which will not allow run-on of storm water or run-off of spills. Dispose of excess thinners, solvents, oil and water-based paint as hazardous waste. Dispose of dry, empty paint cans/buckets, old brushes, rollers, rags, and drop cloths in the trash.

7. Earthwork

- a. Maximize the control of erosion and sediment by using the BMPs for erosion and sedimentation described in the California Storm Water Best Management Practice Handbook - Construction Activity and as noted on the Erosion Control Plan.

PART 2 – NOT USED

PART 3 – NOT USED

PART 4 – NOT USED

END OF SECTION 01 57 13

SECTION 02 41 13 DEMOLITION

PART 1 – GENERAL

(See also General Provisions, Special Provisions, and General Requirements)

1.1 SCOPE

- A. Perform all demolition activities as shown on the plans and as specified herein including, but not necessarily limited to, the following:
 - 1. Clearing and grubbing
 - 2. Stockpiling
 - 3. Chain link fence removal
 - 4. Concrete pavement removal
 - 5. Other miscellaneous demolition items
- B. Related work specified elsewhere:
 - 1. Earthwork and Grading – Section 31 22 00
 - 2. Landscape Planting – Section 32 93 00

1.2 REVIEW

- A. Contractor shall review with the City's Representative the exact limits of work and extent of materials to be removed.
 - 1. Examine site and structures and determine exact nature and status of structural elements and utilities prior to commencing demolition.
 - 2. City assumes no responsibility for actual condition of items or structures to be demolished.
 - 3. Prior to commencing the work, perform a site survey to identify existing areas of damage to adjacent building areas and other buildings.

1.3 STANDARDS

- A. All work shall conform to ANSI A10.6, Safety Requirements for Demolition Operations and to the codes and regulations of the City.

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 utility services as required.

1. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of adjacent building uses.
2. Coordinate continued occupancy with adjacent building tenants.

PART 2 – NOT USED

PART 3 – EXECUTION

3.1 DEMOLITION OF STRUCTURES

- A. Provide a minimum of 72 hours advance notice of demolition activities.
- B. Protection: Provide temporary barricades and other forms of protection as required to protect general public from injury due to selective demolition work. Provide protective measures as required to provide free and safe passage of general public to and from occupied portions of park site. Erect temporary covered passageways as required by authorities having jurisdiction.
- C. Environmental Controls: 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.
- D. Utilities: Disconnect all utilities to structures to be demolished in the manner prescribed by the utility company.
- E. Selective Demolition: Perform selective demolition work in a systematic manner. Use methods required to complete work indicated on the plans in accordance with demolition schedule and governing regulations. Conduct selective demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.
- F. Traffic: Do not close, block or otherwise obstruct streets, walks, or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- G. Extent: Demolish footings to a depth of not less than 12 inches below finish grade. Demolish and remove below-grade wood or metal construction. Break up below grade concrete slabs. Completely fill below-grade areas and voids resulting from demolition work. Provide fill consisting of approved earth, gravel or sand, free of trash and debris, stones over 6 inch diameter, roots or other organic matter.

- H. Clean-up: Remove debris, rubbish, and other materials resulting from demolition operations from building site. Transport and legally dispose of materials off site.
- I. Damages: Promptly repair damages caused to adjacent facilities by demolition work at no cost to the City.
- J. Contractor Salvage: Items indicated to be removed but of salvageable value to the Contractor may be removed as work progresses. Transport Contractor salvaged items from the site as they are removed. Storage or sale of removed items on site will not be permitted.

3.2 CLEARING AND GRUBBING

- A. 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 the Contractor's expense, except as otherwise noted on the plans. Items to be disposed of off-site include but are not limited to the following:
 - 1. weeds, roots and other organic material, wood and trash.
 - 2. Chain link fencing and footings.
 - 3. Chain link fabric and portions of posts from existing fence section to be modified.
- B. Strip and remove weeds and trash from unpaved areas to be improved. Leave intact ornamental shrubs and trees as identified by the City's Representative. The contractor shall protect surrounding areas from damage by equipment or construction operations.
- C. Tree stumps shall be removed to a minimum of one foot below existing grade and deeper if necessary to accomplish construction.
- D. All edges of existing paving to remain shall be sawcut in a neat and clean manner.
- E. All excavation within the drip line of trees to remain shall be accomplished in a careful manner. No roots greater than 1 inch diameter shall be cut. Where excavation reveals roots greater than 1 inch diameter that will interfere with construction, the Contractor shall notify the City's Representative 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 City's Representative or the agencies or service utility companies having jurisdiction thereof, 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 the Contractor at the Contractor's 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 the 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. Service connections to adjacent properties requiring removal or adjustment, due to new construction, will be so removed or adjusted during the course of construction operations. The Contractor shall cooperate with the utility companies and/or agencies in such work.
- I. Prior to commencement of site grading work, the Contractor shall notify the City's Representative that the site has been cleared. Site grading shall not commence until the City's Representative has completed review of the site and has given approval to proceed.

PART 4 – NOT USED

END OF SECTION 02 41 13

SECTION 09 91 13 PAINTING

PART 1 – GENERAL

(See also General Provisions, Special Provisions, and General Requirements)

1.1 SCOPE

- A. Furnish and apply all paint, and other finishes as shown on the plans and as specified herein including, but not necessarily limited to, the following:
 - 1. Striping and painting accessible parking stalls
- B. Related work specified elsewhere:
 - 1. Site Furnishings – Section 32 33 00

1.2 STANDARDS

- A. All work shall conform to the applicable requirements for Type II "Premium" Specifications as prepared by the Painting and Decorating Contractors of America, except as modified herein.
- B. The paint manufacturer's standard specifications will be considered as the minimum standard for the work.

1.3 SUBMITTALS

- A. Submit a complete list of all materials proposed for use. The list shall show the specific label name of each product for each coat of finish. After review by the City's Representative, no deviation from the list will be permitted without further approval.
- B. Provide sample finishes on the actual surfaces to be painted to verify appearance. Approved samples will become the standard for the work.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Special care shall be taken in the handling of paint materials to prevent spillage and fire. Remove rags, waste, and empty containers from the site at the end of each work day.

PART 2 – PRODUCTS**2.1 MATERIALS**

- A. General: All materials shall be "first line" or best quality as manufactured by Pratt & Lambert, Sherwin-Williams, Sinclair, Dunn-Edwards, Fuller-O'Brien, Olympic, Conrad Sovig, or approved equal. Mention of these manufacturers does not necessarily constitute approval of all of their products. Where a product is specified by name, it is intended to establish the quality required for that use.
- B. Painting and Finishing Schedule
1. Striping and painting for the parking lot area shall be Traffic line paint, white, (with blue for international accessibility symbol). Paint for traffic stripes and pavement markings shall be 4 inches wide. All painting shall receive a minimum of two coats paint, and additional coats as required to produce opaque quality.

Paint	State Specification No.
Rapid Dry Water Borne, white or blue	#8010-32F-30

PART 3 – EXECUTION**3.1 PREPARATION**

- A. Take special care to prevent spilling paint materials on surfaces not intended to receive them.
- B. Verify that the work to be painted is in a suitable condition to receive each coat of paint. Should the Contractor find surfaces and conditions unacceptable, they shall at once report such conditions to the City's Representative and cease operations on the portion of the work affected. Application of paint shall occur only upon acceptance of surface and working conditions, and the Contractor shall be held responsible for the results. Clean all surfaces before painting.
- C. All work shall be scraped, sandpapered, sandblasted, rubbed, or otherwise brought to a smooth surface before finish is applied. Fill all minor cracks and depressions, backfill and trim between edges of trim, and finish to a clean-cut edge.

- D. All metal, except prefinished items and unless primed under other sections, shall be degreased with an approved metal cleaner that will not affect the galvanized coat where it occurs.
- E. Pavement surfaces to receive paint shall be in a condition to ensure complete bonding of the applied material, and shall be subject to inspection and approval before such work commences.

3.2 APPLICATION

- A. Apply all finishes in strict accordance with manufacturer's recommendations. There shall be no perceptible difference in the shades of each successive coat of paint. No coat of paint shall be applied before a previous coat is thoroughly dry.
- B. Paint shall be applied on dry surfaces only, and worked thoroughly into all joints, crevices, and open spaces.
- C. Painting shall be completed at such times as approved, but no painting shall occur during wet weather, or when any surface is damp or moist.
- D. Painting shall be completed in a neat, professional manner by skilled mechanics, and shall be uniform in appearance, smooth, free from runs, sags, defective brushing and clogging of the lines and angles.
- E. Edges of paint adjoining other materials or other colors shall be sharp and clean without overlapping. After application, paint shall not run or sag and shall dry to the touch within 18 hours.
- F. Wherever complete and satisfactory coverage is not obtained, the Contractor shall apply additional coats at no expense to the City.
- G. Painter shall repair any scratches, chips, etc. that occur during construction.
- H. All hardware shall be pre-painted on both sides prior to use.
- I. Paint traffic markings and parking stall lines to the width and spacing indicated on the plans. Paint may be applied by a spray or striping machine in strict accordance with printed instructions by the manufacturer. Paint shall be applied at a wet film thickness of 15 mils, and shall hide solidly at that rate of spread. A second coat of paint shall be applied to all lines and markings.

3.3 CLEANING

- A. Take special care to keep surrounding surfaces clean as the work progresses, and upon completion, carefully remove all paint from surfaces not intended to receive it. Use no materials or methods that will damage surfaces.

PART 4 – NOT USED

END OF SECTION 09 91 13

SECTION 31 22 00 EARTHWORK AND GRADING

PART 1 – GENERAL

(See also General Provisions, Special Provisions, and General Requirements)

1.1 SCOPE

- A. Perform all earthwork and grading as shown on the plans and as specified herein including, but not necessarily limited to, the following:
 - 1. Stockpile topsoil
 - 2. Rough grading operations
 - 3. Excavation for foundations and footings
 - 4. Placement of import soil
 - 5. Establish subgrade elevations
 - 6. Subgrade compaction
- B. Related work specified elsewhere:
 - 1. Demolition – Section 02 41 13
 - 2. Trenching and Backfilling – Section 31 23 00
 - 3. Site Concrete – Section 32 13 13
 - 4. Decomposed Granite Paving – Section 32 15 40
 - 5. Landscape Soil Preparation – 32 91 13
 - 6. Site Drainage Utilities – Section 33 40 00

1.2 STANDARDS/REFERENCES

- A. Unless otherwise shown or specified, all materials and methods shall conform to the most current Section 19 “Earthwork” of the State of California, Department of Transportation, Standard Specifications (DTSS) as they reasonably apply to this work, except for measurement and payment requirements.
- B. “Geotechnical Investigation Report, Ag Sports Complex Pickleball Courts, 700 Mercey Springs Road, Los Banos, California”, prepared by BSK Associates dated May 6, 2024.

1.3 QUALITY CONTROL

- A. Submit a one-gallon sample of the proposed fill material for testing and review by the Geotechnical Engineer at least two (2) weeks prior to proposed use on site.

material shall be used unless approved by the Geotechnical Engineer retained by the City.

- B. All excavation, for the construction of benches and keyways, subdrain installation, placement and compaction of fill and preparation of subgrade shall be reviewed by the Geotechnical Engineer. The Contractor shall schedule the work and notify the City and the Geotechnical Engineer at least three (3) working days in advance of each portion of grading operations for their review, testing and approval.
 - 1. The Contractor shall cooperate with the City in performing these tests.
 - 2. All tests indicating conformance to project requirements shall be paid for by the City.
 - 3. Costs of retesting and re-inspection required as the result of inadequate, insufficient, or incomplete work by the Contractor shall be deducted from the contract amount.
- C. Compaction Test Method: Where referred to in these specifications, "compaction" or "relative compaction" shall mean the in-place dry density of soil expressed as a percentage of the maximum dry density of the same material as determined by ASTM D-1557-02e1.
- D. The Contractor shall provide compaction testing as required to confirm compliance with these specifications and plans. All costs of such testing will be borne by the City, except as specified under paragraph 1.3B, 3 above.
- E. The Geotechnical Engineer shall be present during all site clearing and grading operations to test and to observe earthwork construction. This representative shall be notified at least three (3) working days prior to commencement of any grading operations to allow for discussion and planning with the earthwork, underground, and paving contractors.

1.4 LAYOUT AND GRADING CONTROL

- A. Grade the site to the tolerances shown. Vertical control is established by the benchmark indicated on the plans.
- B. The Contractor shall engage the services of a City -approved Land Surveyor licensed in California to layout the work. This Surveyor shall certify that the work is completed in a manner that the City can check for conformance as the work progresses.

- C. Tolerances: Site grading shall be to the elevations shown on the plans, plus or minus 0.1 foot vertically.
- D. Dewatering: No soil shall be compacted during periods of rain or when the ground is not drained of all free water. Soil that has been stockpiled and wetted by rain or by any other cause shall not be compacted until it is completely drained and until the moisture content is within the limits approved by the City.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Existing material may be used for fill after removal of all debris, and after being moisture-conditioned, if it meets the criteria in paragraph B below.
- B. Soil imported to the site and used for compacted fill shall be free of perishable organic material, and shall meet the following requirements:
 - 1. Physical: 100% passing 4 inch size, 10 to 75% passing the No. 200 sieve. Plasticity Index of 12 maximum when tested in accordance with ASTM D 4318 75.
 - 2. Chemical: Salinity Limit (ECe) saturation extract of 4.0 sodium (SAR) limit of less than 8.0.
 - 3. Boron: Saturation extract concentration less than 1.0 ppm.
- C. Minor quantities of material not meeting the above gradation may be mixed and blended with other on-site material if the resulting mixture conforms to the specifications. If the quantity of material not in conformance with the specifications becomes excessive in the opinion of the Geotechnical Engineer, it shall be removed from the site.
- D. Topsoil: See Landscape Soil Preparation Section 32 91 13 for topsoil requirements.

PART 3 – EXECUTION

3.1 STRIPPING AND STOCKPILING OF NATIVE TOPSOIL

- A. All vegetation, including the top one to two inches of roots, shall be removed from areas to be graded. The remaining 6 to 12 inches of topsoil shall be stripped and stockpiled in sufficient quantities as required to provide a 6 inch layer of topsoil in all planting areas.

3.2 ROUGH GRADING

- A. Prior to commencement of site grading work, the Contractor shall notify the City's Representative that the site has been cleared. The City's Representative shall have sufficient time to review the site. Site grading shall not commence until the City's Representative has completed review of the site and the City has given approval to proceed.
- B. Perform all cut and fill required to bring the site to the grades indicated, with proper allowances for finish materials such as paving and base. Prior to placing new fill, the exposed ground surface should be scarified to a depth of 6 inches (or greater as indicated on the plans), brought to near optimum moisture content, and compacted. Areas to be planted shall be compacted to 85 percent, and areas to be paved shall be compacted to at least 90 percent relative compaction as determined from ASTM Test Method D 1557 78.
- C. Placement and Compaction: Approved fill material shall be placed in layers of 6 to 8 inches in loose thickness and moisture-conditioned as necessary to achieve moisture content suitable for re-compacting. Fill material shall be compacted with equipment of such weight and design as necessary to obtain the specified compaction. Fill shall be compacted to 85 percent relative compaction in areas to be planted and at least 90 percent relative compaction in areas to be paved unless otherwise directed. In pavement areas, the upper 9 inches of subgrade shall have a minimum relative compaction of 95 percent. The resulting subgrade should be smooth and essentially unyielding. In planting areas, the upper 8 inches shall have a minimum relative compaction of 85 percent. Between successive lifts, the fill surface shall be scarified or otherwise processed to obtain satisfactory bonding between the fill lifts.
- D. Re-compaction: Where, in the judgment of the City's Representative, the moisture content is not suitable or insufficient compaction has been obtained, the fill shall be reconditioned and/or re-compacted to the specified density prior to placing any additional fill material. The Contractor shall be responsible for placing and compacting approved fill material in accordance with these specifications. If the Contractor fails to meet the compaction requirements, they shall reduce their rate of haul, furnish additional spreading, moisture conditioning and/or compacting equipment or make any other adjustments necessary to produce a satisfactorily compacted fill.

- E. All excess material and all material that is unsuitable for paving subbase or finish grading shall be disposed of off-site at Contractor's expense, including all testing and fees required by the disposal site.
- F. Where any marked or unmarked utility lines or other underground obstruction or piping may be encountered within the work area, notify the City or the Agencies or service utility companies having jurisdiction thereof, and take necessary measures to prevent interruption of service (if live). Should such lines or service be damaged, broken, or interrupted through the Contractor's own negligence, those services shall be repaired immediately and restored by them at their own expense. 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.
- G. Rock Removal: All rocks 8 cubic inches or larger shall be removed completely from the top 6 inches of subgrade prior to placement of topsoil in all planting areas. See Landscape Soil Preparation Section 32 91 13 for additional requirements. All rocks not meeting criteria for fill material shall be legally disposed of off-site as the Contractor's own property.
- H. Earthen Swales: Shall be constructed as shown and described on the plans. All swales shall provide positive drainage.

3.3 EROSION CONTROL AND CLEAN-UP

- A. Spillage: Prevent spillage when hauling on, or adjacent to, any public street or highway. In the event that spillage occurs, sweep, wash, or otherwise clean the street or highway until the spillage has been removed.
- B. Dust Control: Take all precautions needed to prevent a dust nuisance to adjacent public and private properties, and to prevent erosion and transportation of soil to adjacent properties, due to work under this contract. All damage caused by the Contractor's work under this contract shall be corrected or repaired by the Contractor at no cost to the City. If the Contractor fails to take the necessary precautions, or make the corrections or repairs promptly, the City shall take the steps deemed necessary and deduct the cost from the contract amount.
- C. Clean-up: The job site shall be kept neat and clear at all times, with all public walks swept clean at the end of each day, and all materials neatly stored. Upon completion of the work under this Section, remove immediately all surplus materials, rubbish and equipment associated with or used in the performance of

EARTHWORK AND GRADING 31 22 00

Ag Sports Complex Pickleball Courts

Page 6 of 6

this work. Failure to perform such clean-up operations within 48 hours of notice by the City shall be considered adequate grounds for having the work completed by others at the Contractor's expense.

PART 4 – NOT USED

END OF SECTION 31 22 00

SECTION 31 23 00 TRENCHING AND BACKFILLING

PART 1 – GENERAL

(See also General Provisions, Special Provisions, and General Requirements)

1.1 SCOPE

- A. Perform all structural excavation, trenching, and backfilling work as shown on the plans and as specified herein including, but not necessarily limited to, the following:
 - 1. Utility trenches
 - 2. Footings
 - 3. Irrigation lines
- B. Related work specified elsewhere:
 - 1. Earthwork and Grading – Section 31 22 00
 - 2. Site Concrete – Section 32 13 13
 - 3. Planting Irrigation – Section 32 84 00
 - 4. Landscape Soil Preparation – Section 32 91 13
 - 5. Site Drainage – Section 33 40 00

1.2 STANDARDS

- A. Unless otherwise shown or specified, all materials and methods shall conform to the most current Section 19 “Earthwork” of the State of California, Department of Transportation, Standard Specifications (DTSS) as they reasonably apply to this work, except for measurement and payment requirements.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Backfill material shall consist of the same material specified under paragraph 2.1B in Section 31 22 00 Earthwork and Grading, unless otherwise indicated on the plans.
- B. General Backfill: Backfill material shall be approved by the City’s Representative prior to its use. Excavated material and excess material from site grading may be re-used for backfilling and grading, provided such fill is homogeneous, free from rocks, rubbish, organic material, etc., and consists of fragments capable of being

thoroughly crushed and consolidated into a dense, uniform compact fill, and shall meet the following requirements:

Sieve Size	Percent Passing
1 inch	100
3/4 inch	95 - 100
No. 200	10 - 75
Plasticity index	12 maximum

PART 3 – EXECUTION

3.1 EXCAVATING AND BACKFILLING FOR TRENCHES

- A. Perform all necessary excavation, shoring, pumping and dewatering, and backfilling required for the proper laying of all underground pipes and conduits.
- B. All piping in ground shall have a minimum cover of 1'-6", except as otherwise indicated on the plans, and shall be laid in ditches dug true to grade and line, avoiding sharp breaks. Piping shall bear equally over its entire length at the bottom of the ditch. Rock or unstable material encountered at grade shall be replaced with sand fill to a depth of 6 inches below pipe.
- C. Backfill (drainage trenches): Drain rock as defined in Section 33 40 00 Site Drainage Utilities.
- D. Backfill (non-drainage trenches): Fill trenches with excavated material in 6 to 8 inch uncompacted thick layers, compacted to 90% relative density. Backfill shall be moisture-conditioned to near-optimum in accordance with ASTM D 1557-02e1.
- E. Backfilling shall be commenced as soon as practical after subsurface work is installed and reviewed by the City's Representative.
- F. No wood or debris shall be buried in any fill. The fill material shall be non-expansive, meeting the criteria of paragraph 2.1B in Section 31 22 00 Earthwork and Grading.
- G. Provide shoring, excavation, pumping, and other requirements as necessary at excavations for points of connection.

3.2 STRUCTURAL EXCAVATION AND BACKFILL

- A. Structural Excavation: Make all excavation to the grades and elevations shown on the plans, or to the subgrades required to obtain the finished grades shown thereon. Accurately cut footing trenches. Where footings are to be cut "neat", the trench or excavation width shall be increased by 2 inches from the dimensions shown on the plans, so as to permit pouring footings against earth banks. If soil type or weather does not permit such excavations, excavate wide enough to permit full forming of footings. If any excavation is made below proper grade, the City's Representative shall be immediately notified, and the grade shall be restored in whatever manner the City's Representative directs, at no expense to the City. All excavation shall be kept free of standing water until concrete work, paving, or backfilling is complete. Shore and brace excavations when required to prevent cave ins.
- B. Foundations from previous structures, underground utilities, or other buried structures shall be removed in their entirety and replaced with compacted engineered fill.
- C. When zones of soft or saturated soils are encountered at the over-excavated levels during excavation and compaction, deeper excavation shall be required to expose firm soil. This shall be determined in the field by the City's Representative.

3.3 SURPLUS MATERIAL

- A. Any excavated material which proves to be unsuitable, or which is not required for backfilling, shall be removed from the immediate work area and disposed of off-site.

3.4 CLEAN-UP

- A. Upon completion of the work under this Section, remove immediately all surplus materials, rubbish, and equipment associated with or used in the performance of this work. Failure to perform such clean-up operations within 48 hours shall be considered adequate grounds for having the work completed by others at the Contractor's expense.

PART 4 – NOT USED

END OF SECTION 31 23 00

SECTION 32 01 90 LANDSCAPE MAINTENANCE

PART 1 – GENERAL

(See also General Provisions, Special Provisions, and General Requirements)

1.1 SCOPE

- A. Perform all landscape maintenance operations as shown on the plans and as specified herein including, but not necessarily limited to, the following:
 - 1. Soil testing
 - 2. Plant establishment
 - 3. Insect and disease control
 - 4. Irrigation system maintenance
- B. Related work specified elsewhere:
 - 1. Planting Irrigation – Section 32 84 00
 - 2. Landscape Soil Preparation – Section 32 91 13
 - 3. Landscape Planting – Section 32 93 00

1.2 SUBMITTALS

- A. Soil Testing: Contractor shall collect 1 one-quart sample in the bio-retention area and 2 one-quart samples in the container planting areas of the in-place topsoil 20 days after completion of planting, and submit the samples to Waypoint Analytical, Inc. of Anaheim, (714) 282-8777, or approved equal, for maintenance period fertilizer recommendations. Test results shall be made available to the City's Representative. Sample shall be a representative composite taken from several planting areas. Cost of soil testing shall be paid for by the Contractor.
- B. Herbicide/Fungicide/Insecticide: Submit a written recommendation from a State of California appropriately licensed individual along with complete product data from proposed manufacturer, for review by the City's Representative and/or the City's appropriately licensed individual.

1.3 SCHEDULE

- A. Work in this Section will not begin until the irrigation audit has been completed.
- B. Maintenance Period shall be for a minimum period of ninety (90) calendar days after pre-final inspection.

- C. Maintenance and Warranty Period shall be per City of Los Banos Standard Specifications.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Fertilizer: Used during the course of the maintenance period shall be determined by the soils test required under paragraph 1.2A above. For bidding purposes only, assume the use of ammonium sulfate (21 0 0) at 5 lbs. per 1000 sq. ft., 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 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. The Contractor shall be responsible for all overspray, spreading, runoff, plant health, and other impacts from the use of the chemical(s).
- D. Animal Control Materials: None required under these specifications.
- E. Fencing: Temporary construction fence, per General Requirements 00 72 00, shall remain around the site until the end of the landscape maintenance period.

PART 3 – EXECUTION

3.1 GENERAL

- A. Time Limits: The Maintenance Period shall commence from the date of Substantial Completion of planting as defined in paragraph 3.3A below, and extend for the time period specified in paragraph 1.3B above, or until the acceptance of Final Completion.
- B. Fertilizer Application: Fertilizer(s) shall be applied per Waypoint Analytical, Inc. recommendations. For bidding purposes only, assume initial application to be four weeks after planting and subsequent applications to be at 45-day intervals.

- C. 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.
- D. 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.

3.2 RESPONSIBILITIES AND GUARANTEE

- A. Damage Repairs: 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.
- B. Planting Guarantee: No planting shall be guaranteed beyond the Maintenance Period, except as to conformance to specified species and variety, and except as to conditions specified under paragraph 2.1D "Root Systems" in Section 32 93 00 Landscape Planting.

3.3 SUBSTANTIAL COMPLETION

- A. Shall be deemed as the time when 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 in a checklist compiled by the City's Representative. The Maintenance Period shall not commence until work is deemed substantially complete by the City's Representative.

3.4 FINAL REVIEW

- A. Contractor shall request a final review of the project at least five (5) working 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.

PART 4 – NOT USED

END OF SECTION 32 01 90

SECTION 32 01 91 TREE PROTECTION AND PRUNING

PART 1 – GENERAL

(See also General Provisions, Special Provisions, and General Requirements)

1.1 SCOPE

- A. Perform all tree protection and pruning as shown on the plans and as specified herein including, but not necessarily limited to, the following:
 - 1. Installation of tree protection fencing
 - 2. Tree protection measures
 - 3. Tree pruning
- B. Related work specified elsewhere:
 - 1. Demolition – Section 02 41 13
 - 2. Earthwork and Grading – Section 31 22 00
 - 3. Trenching and Backfilling – Section 31 23 00
 - 4. Site Drainage Utilities – Section 33 40 00

1.2 STANDARDS

- A. All work shall be performed in accordance with ANSI-A300 best management practices for tree protection during construction.

1.3 REFERENCES

- A. ANSI-A300, Part 5: Management of Trees and Shrubs during Site Planning, Site Development, and Construction, current edition.
- B. Glossary of Arboricultural Terms, International Society of Arboriculture, Atlanta, GA.

1.4 DEFINITIONS

- A. The term “Tree Protection Zone” (TPZ) shall mean the area beneath a tree’s canopy, or all area within a distance from the trunk equal to five times the tree’s Diameter at Breast Height (DBH), whichever is greater.

1.5 ACCESS AND STORAGE

- A. Prior to commencement of work, the Contractor shall meet on-site with the City's Representative to review scope of work, work procedures, access routes, storage areas, and tree protection measures.
- B. No grading, demolition, trenching, parking, storage or dumping of any construction materials is allowed within the TPZ, unless specifically noted on the plans. Exceptions must be reviewed and approved by the City's Representative as noted in paragraph 1.6B below.

1.6 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 so that trenching, irrigation installation, and backfilling can be done in an expedient manner.
- B. Any work that must occur within the TPZ shall be reviewed and approved by the City's Representative. The contractor shall notify the City's Representative a minimum of 48 hours in advance of any activity in the TPZ. After obtaining approval to work in the TPZ, the contractor must prioritize completion of the work in the TPZ and may temporarily remove portions of the temporary fence as needed to access the TPZ. After completing the work within the TPZ, the contractor must immediately re-fence the TPZ.

PART 2 – PRODUCTS

2.1 FENCING

- A. All trees to be retained shall be temporarily fenced as indicated on the plans, and in accordance with City standards for tree protection during construction. If plans and City standards conflict, the more stringent standard shall prevail.

PART 3 – EXECUTION

3.1 PRESERVATION OF EXISTING TREES

- A. Protection: Shall be as indicated on the plans and in accordance with City Standard Details.

1. Fencing shall be erected before any demolition or construction activities take place on-site and shall not be removed or modified before the end of the project without written authorization from the City's Representative.
 2. Fencing may be installed in a single run around multiple trees.
- B. Pruning: Pruning of branches and/or roots shall be performed under the supervision of an Arborist certified by the International Society of Arboriculture (ISA) and approved by the City's Representative.
- C. Removal: Shall be as specified in Section 02 41 13 Demolition.
- D. Root Cutting: Prior to approved excavation within a TPZ, a trench shall be dug along the edge of the excavation closest to the tree trunk. This trench shall be dug by hand or with an air spade to a depth of 30 inches, and shall be of a sufficient width to manually sever any roots encountered greater than 1 inch diameter. Cuts shall be made perpendicular to the direction of the root's growth, using a clean hand saw. After roots are cleanly severed, excavation equipment may be used as required on the side of the trench farthest from the tree.
1. Within one hour of cutting or exposure, roots shall be covered with moist soil or with burlap that is kept wet until the excavation can be backfilled and watered thoroughly.
- E. Debris Removal: All trimmings, stumps, roots, logs, sod, or any other form of debris resulting from this work shall be cleaned up and legally disposed of off-site at the Contractor's expense. Stumps shall be ground to 12 inches below grade.
- F. Watering: Provide supplemental irrigation as necessary during construction to prevent drought stress.
1. If trees show stress, it may become necessary for the Contractor to perform deep root watering as required at no extra cost to the City.

PART 4 – NOT USED

END OF SECTION 32 01 91

SECTION 32 12 16 ASPHALT PAVING

PART 1 – GENERAL

(See also General Provisions, Special Provisions, and General Requirements)

1.1 SCOPE

- A. Furnish and install all asphalt paving as shown on the plans and as specified herein including, but not necessarily limited to, the following:
 - 1. Aggregate base
 - 2. Asphaltic concrete (A.C.) paving
 - 3. Trenching in parking lot
- B. Related work specified elsewhere:
 - 1. Painting – Section 09 91 13
 - 2. Earthwork and Grading – Section 31 22 00

1.2 STANDARDS

- A. Unless otherwise shown or specified, all materials and methods shall conform to the cited sections of the most current State of California, Department of Transportation Standard Specifications (DTSS).

1.3 SUBMITTALS

- A. Soil Sterilant: Submit written recommendation from a State of California appropriately licensed individual along with complete product data from proposed manufacturer, for review by the City appropriately licensed individual.
- B. Aggregate Base: Submit laboratory reports for aggregate gradation, durability, sand equivalency, and other requirements conforming to DTSS Section 26 “Aggregate Bases”, for review by the City’s Representative.
- C. Asphalt Pavement: Submit proposed mix design as prepared by the mixing plant and other requirements conforming to DTSS Section 39-2 “Hot Mix Asphalt”, for review by the City’s Representative.

1.4 TOLERANCES

- A. Tolerances for subgrade, subbase and finished grade shall be as specified by DTSS Section 19 “Earthwork”, except that Contractor shall deliver the full aggregate

base and asphaltic concrete thickness shown. No combination of high and low tolerances that compromise the section will be permitted.

1.5 TESTING AND INSPECTION

- A. Notify the City's Representative at the completion of the various stages of the operation indicated below. Allow two (2) working days for testing operations prior to proceeding with subsequent construction.
 - 1. After all rough grading is complete and the subgrade has been prepared to receive aggregate base.
 - 2. After final placement and compaction of aggregate base or subbase and subgrade has been prepared to receive asphalt prime or other following operation.
 - 3. When paving equipment is at the site and paving operation is ready to start.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Soil Sterilant: Shall be a commercially available herbicide material recommended for this project by a State of California appropriately licensed individual. The licensed individual shall review the type of construction, soils, base, adjacent plantings, time and season of application, and other project requirements; verify compatibility; and recommend procedures for proper application. The Contractor shall be responsible for all overspray, spreading, or runoff of material into adjacent areas.
- B. Aggregate Base: DTSS Section 26 "Aggregate Bases", Class 2, with 3/4 inch maximum size.
- C. Liquid Asphalt for Prime Coat: DTSS Section 94 "Asphaltic Emulsions".
- D. Asphaltic Emulsion for Tack Coat: DTSS Section 94 "Asphaltic Emulsions", SS1h.
- E. Asphalt Binder: DTSS Section 92 "Asphalt Binders", performance graded asphalt binder, PG 64-10 or PG-64-16.
- F. Mineral Aggregates for HMA Types A & B Plant-Mixed Asphalt: DTSS Section 39-2 "Hot Mix Asphalt", maximum size 1/2 inch, medium gradation.

2.2 MIXES

- A. Proportioning and mixing of the asphaltic concrete shall conform to DTSS Section 39-2 "Hot Mix Asphalt".

PART 3 – EXECUTION

3.1 PREPARATION

- A. Verify that the subbase is properly compacted and at suitable grade for receiving aggregate base. Clear the area to be paved of all debris and organic material. Recompact and regrade as necessary to place aggregate base.
- B. Before beginning base and paving work and during construction, take all steps necessary for protection of existing improvements. As the asphalt concrete is being placed, extreme care shall be taken to not discolor or damage the curbs, fences, or wall surfaces. If damage occurs, repair, and if satisfactory repair cannot be made, remove and replace the section as directed.
- C. Dispose of all excavated material as described in Section 31 22 00 Earthwork and Grading.

3.2 INSTALLATION

- A. Soil Sterilant: Shall be applied to the subgrade soil of areas to be paved prior to base rock operations and uniformly applied according to the label. Take all precautions necessary to avoid overspray, spreading, or runoff of material into adjacent areas.
- B. Place and compact aggregate base as specified for Class 2 aggregate base in DTSS Section 26-1.03 "Aggregate Bases, Construction". Verify grades to allow for finish paving.
- C. Clear aggregate base surface of all loose or unsuitable material. Apply prime coat in accordance with DTSS Section 94 "Asphaltic Emulsions" and at a rate of 0.25 gallons per square yard. After the liquid asphalt has penetrated the surface, the excess shall be removed with sufficient sand to absorb the excess liquid asphalt. Remove excess sand.
- D. Apply tack coat in accordance with DTSS Section 39-2 "Hot Mix Asphalt". Tack coat shall be applied in one application to existing pavement and planed surfaces and all vertical surfaces of existing pavement, curbs, gutters, catch basins, and

construction joints, and other surfaces designated by the City's Representative. The tack coat shall be provided in sufficient quantity to produce a thin, uniform black, glossy coat of asphalt. Pools in unevenly distributed areas shall be redistributed by means of hand brooms.

- E. Before placing surfacing, additional prime coat or tack binder shall be applied to areas where the prime coat or tack coat has been destroyed.
- F. Asphalt concrete shall be transported, spread and compacted uniformly to a closed, smooth surface and a layer of uniform density, in accordance with DTSS Section 39-2 "Hot Mix Asphalt".
- G. Finish grades shall be as indicated, smooth and without sharp breaks and shall allow the pavement to drain. Upon completion of the paving, flood the area as directed by the City's Representative. Reconstruct any low areas as directed. Finish grades that allow ponding or puddling of water will not be accepted.

3.3 CLEAN-UP

- A. Upon completion of the work under this Section, remove immediately all surplus materials, rubbish and equipment associated with or used in the performance of this work. Failure to perform such clean-up operations shall be considered adequate grounds for having the work completed by others at the Contractor's expense.

PART 4 – NOT USED

END OF SECTION 32 12 16

SECTION 32 13 13 SITE CONCRETE

PART 1 – GENERAL

(See also General Provisions, Special Provisions, and General Requirements)

1.1 SCOPE

- A. Furnish and install all site concrete as shown on the plans and as specified herein including, but not necessarily limited to, the following:
 - 1. Concrete pavement
 - 2. Concrete band
 - 3. Miscellaneous concrete work
 - 4. Forms and reinforcing
 - 5. See structural plans for post-tensioned slab and foundation concrete
- B. Related work specified elsewhere:
 - 1. Earthwork and Grading – Section 31 22 00
 - 2. Site Drainage Utilities – Section 33 40 00

1.2 STANDARDS

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

1.3 TOLERANCES

- A. Tolerances for subgrade, subbase, and finished grade shall be as specified by the DTSS except that the Contractor shall deliver the full aggregate base and concrete thickness shown. No combination of high and low tolerances that compromise the section will be permitted.

1.4 QUALITY CONTROL

- A. Concrete Final Finishes: The Contractor shall demonstrate to the satisfaction of the City's Representative that they, or their subcontractor, possesses sufficient skills and experience to perform the work. Photographs and/or site visits of past work may be required to supply this information.
- B. Sample Mockups: A 5'x5' sample of the concrete pavement shall be poured and finished at the site for the City's Representative to review prior to commencing concrete pouring. Once the samples have been reviewed, the Contractor shall meet or exceed that quality of finish in all subsequent work. The Contractor shall be responsible for removal of the samples at the completion of the work.

1.5 SUBMITTALS

- A. The following shall be submitted by the Contractor to the City's Representative in accordance with the applicable portions of the referenced specifications:
 - 1. The proposed mix design, giving the brand of cement, type, gradations and source of aggregates, water/cement ratio, mix proportions, and unit weight.
 - 2. Manufacturer's literature for admixtures, embedded items, liquid membrane-form curing compound, and non-shrink grout.
 - 3. Certification that materials are in compliance with specification requirements.
 - 4. Method of transporting and placing concrete.

1.6 JOB CONDITIONS

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

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Forms and Reinforcing: Per DTSS Section 52 "Reinforcement".

- B. Concrete: All curbs shall conform to "Minor Concrete" as defined in DTSS Section 73 "Concrete Curbs and Sidewalks". All other concrete structures shall conform to "Minor Concrete" as defined in DTSS Section 90 "Concrete".
1. Cement: Type II modified conforming to ASTM-C-150-02a.
 2. Aggregate: Shall not be less than 3/8 inch or more than 1 inch in size.
 3. Compression strength at 28 days to be a minimum 3,000 p.s.i.
- C. Color Admixture
1. For concrete pavement type 1, integral color shall be Pewter 860 as available from Davis Colors, 3700 E. Olympic Blvd., Los Angeles, CA, 90023, (800) 356-4848, or approved equal, or approved equal.
 2. For concrete pavement type 2 and concrete bands, integral color shall be Cobble Stone 860 as available from Davis Colors, 3700 E. Olympic Blvd., Los Angeles, CA, 90023, (800) 356-4848, or approved equal, or approved equal.
 3. For concrete footings and all other visible concrete, add Hi-con black at a rate of 1/8 lb. per sack.
- D. Expansion Joint Filler: Shall be Sikaflex-1A, color limestone, manufactured by Sikaflex, or approved equal.
- E. Cleaning Agents: As required.
- F. Aggregate Base: Per DTSS Section 26 "Aggregate Bases", Class 2, with 3/4 inch maximum size.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Clear area to be paved of all debris and organic material. Recompact and regrade as necessary prior to placement of concrete. Verify that the subgrade and/or aggregate base is properly compacted and at suitable grade.
- B. Before beginning paving work and during construction, take all steps necessary for protection of existing improvements. As the concrete is being placed, extreme care shall be taken not to discolor or damage any improvements. If damage occurs, repair same, and if satisfactory repair cannot be made, remove and replace the section as directed.

C. Formwork and Reinforcement:

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

3.2 INSTALLATION

A. Finishes

1. Medium Sandblast: Provide a uniformly textured medium sandblast finish to expose the sand particles in the mix. Sample finish shall be reviewed prior to pouring the concrete. Shall be at section of concrete pavement under picnic tables.
2. Broom Finish: Provide a light broom finish with strokes perpendicular to direction of travel along walks. Shall be at concrete pavement pathways.
3. Trowel Finish: Smooth, parallel to longest surface direction. Shall be at concrete bands.

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

PART 4 – NOT USED

END OF SECTION 32 13 13

SECTION 32 18 23 COURT SURFACING

PART 1 – GENERAL

(See also General Provisions, Special Provisions, and General Requirements)

1.1 SCOPE

- A. Furnish and install acrylic resurfacer as shown and specified including, but not necessarily limited to, textured colored acrylic, and court resurfacing related items.
- B. Related work specified elsewhere:
 - 1. Site Concrete – Section 32 13 13

1.2 REFERENCES

- A. United States Tennis Association (USTA)
- A. International Tennis Federation (ITF)
- B. “Pickleball Courts: A Construction and Maintenance Manual” Current Edition, published by American Sports Builders Association (ASBA), as it pertains to asphalt pavement construction.

1.3 QUALITY ASSURANCE

- A. Surfacing shall conform to the guidelines of the ASBA for planarity.
- B. The contractor shall record the batch number of each product used on the site and maintain records of it through the warranty period and submit to City within one (1) week of substantial completion.
- C. The contractor shall provide the inspector, upon request, an estimate of the volume of each product to be used on the site.
- D. The manufacturer’s representative shall be available to help resolve material questions.

1.4 SUBMITTALS

- A. Manufacturer specifications for components, color chart and installation instructions, maintenance instructions and warranty information.

- B. ITF pace rating classification certificate for the system to be installed.
- C. Submit list of projects noted in part 1.7 below.
- D. Current Material Safety Data Sheets (MSDS).
- E. Product substitution: If other than the product specified, the contractor shall submit at least 7 days prior to the bid date a complete type written list of proposed substitutions with sufficient data, drawings, samples and literature to demonstrate to the City's satisfaction that the proposed substitution is of equal quality and utility to that originally specified. Information must include a (Q-panel laboratory U.V.) QUV weathering test of at least 1000 hours illustrating the UV stability of the system.

1.5 MATERIAL HANDLING AND STORAGE

- A. Store materials in accordance with manufacturer specifications and MSDS.
- B. Deliver product to the site in original unopened containers with proper labels attached.
- C. All surfacing materials shall be nonflammable.

1.6 GUARANTEE

- A. The Contractor shall warrant the court surfacing against settlement, peeling of surface, surface cracking, and any other defects of materials or workmanship for a period of five (5) years from date of acceptance.

1.7 INSTALLER QUALIFICATIONS

- A. Installer shall be actively engaged in construction and surfacing of acrylic courts, play courts or similar surfaces.
- B. Reference list from the installer of at least three (3) pickleball court projects successfully completed for a public agency in California in the past five (5) years of similar scope. Each listed project shall equal or exceed 10,000 sf in size. Provide project location, date of installation, square footage of court surfacing for each project, and project contact name, address, and phone number with each installation listed.

1.8 MANUFACTURER QUALIFICATIONS

- A. Installer shall provide documentation that the finished surface to be installed has been classified by the ITF as a medium pace surface rating between 35 and 39.

1.9 TOLERANCES

- A. The finished surface of the courts shall not vary more than $\frac{1}{4}$ " in 10'-0" when measured in any direction using a straight edge. At no point shall the surface fail to drain.

PART 2 – PRODUCTS

2.1 COURT SURFACING

- A. Acrylic Resurfacer (no asphaltic emulsions will be permitted). Shall be California Sports Surfaces, Cool Top, or approved equal acrylic resurfacer and mixed as follows:

Acrylic Resurfacer	55 gals.
Water	20 - 40 gals.
Sand (60 - 80 Mesh)	600 – 900 lbs

- B. Filled Acrylic Finish Color: Shall be California Sports Surfaces, Cool Top, or approved equal. No field mixing of sand will be allowed. Colors shall be 'Bells Blue' for inner court playing area, 'Stirling Grey' for the non-volley area (kitchen), and 'Nordic Blue' for the outer court area. .

- C. Playing Lines: Shall be California Sports Surfaces, Cool top, Line Paint, or approved equal. Court line paint color shall be white. No oil-based paint shall be allowed.

- D. Surface Course, Aggregate:

Sieve Size	% Passing
#4	100
#8	95-100
#16	70-100
#30	40-75
#50	10-35
#100	2-15

- E. Water (used for mixing): Potable water.

PART 3 – EXECUTION

3.1 WEATHER LIMITATIONS

- A. Do not install surfacing when rainfall is occurring or is imminent.
- B. Do not apply unless surface and air temperature are 50°F and rising.
- C. Do not apply if surface temperature is in excess of 140°F.

3.2 PREPARATION

- A. Surface: Fully cured post-tension slab court surface shall be clean, free of dirt, water, soil and other foreign materials. Broom or clean surface so it is clean and dust free. Surface must be thoroughly dried prior to application. Any area showing algae growth shall be treated with Chlorox or approved equal to kill organisms and then the court shall be properly rinsed.

3.3 COURT SURFACING

- A. Court Surfacing Application:
 - 1. Acrylic Resurfacer: Apply resurfacer by pouring from a can or wheeled container to continuous parallel lines and spreading immediately with a rubber-faced squeegee. There shall be two applications of surfacer. The total amount of surfacer shall not be less than 60 gallons per 1,000 square feet.
 - 2. Filled Acrylic Finish Color: After the resurfacer application has been completed and allowed to cure a minimum of 48 hours, filled acrylic finish color shall be applied in three (3) applications.
 - a. Apply two squeegee applications of filled acrylic finish color. Minimum amount of undiluted filled acrylic material to be applied is 15 gallons per 1,000 square feet.
 - b. Apply one brush or roller application of unfilled acrylic finish. Minimum amount of undiluted unfilled acrylic to be applied is 9 gallons per 1,000 square feet.
 - 3. Playing Lines: Playing lines shall be accurately located and marked by snapping a chalked line on the court surface. Standard dimensions per

ASBA shall be used. The lines shall be solidly opaque, 2" wide, straight and true.

4. Contractor shall notify the City at the completion of each stage of the operation and shall allow reasonable time for testing and inspection prior to proceeding with each following stage until authorization to proceed has been received from the City.

3.4 PROTECTION

- A. The area shall be protected from traffic during all operations and shall not be opened for use for at least 24 hours after the finished surface has dried completely.

3.5 CLEAN-UP

- A. Remove all containers, surplus materials and debris. Dispose of materials in accordance with local, state and Federal regulations.
- B. Remove residual chalk from line marking.
- C. Leave site in a clean, safe, and orderly condition each day.

PART 4 – NOT USED

END OF SECTION 32 18 23

SECTION 32 31 13 CHAIN LINK FENCING

PART 1 – GENERAL

(See also General Provisions, Special Provisions, and General Requirements)

1.1 SCOPE

- A. Furnish and install all chain link fencing as shown on the plans and as specified herein including, but not necessarily limited to, the following:
 - 1. Chain link fencing
 - 2. Chain link gates
 - 3. Concrete footings
- B. Related work specified elsewhere:
 - 1. Site Concrete – Section 32 13 13

1.2 SUBMITTALS

- A. Submit product data and materials order confirmation within ten (10) working days after award of the contract.

1.3 STANDARD SPECIFICATIONS

- A. Unless otherwise shown or specified, all materials and methods shall conform to the most current Section 80-3 “Chain Link Fences” of the State of California, Department of Transportation, Standard Specifications (DTSS) as they reasonably apply to this work, except for measurement and payment requirements.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Chain Link Fence 6'-0" High: Shall be Master Halco Spectra Bond Chain Link, color shall be black, with 2" mesh size, and 9 gauge core, or approved equal.
- B. Chain Link Fence, 4'-0" High: Shall be Master Halco Spectra Bond Chain Link, color shall be black, with 2" mesh size, and 9 gauge core.
- C. Chain Link Fence with Slats: Shall be Maxlink Plus System from Slat Depot, 98% site blockage, 3-1/2"x5" mesh, 2.880" polyethylene slats, color shall be black, 9 gauge core, and royal blue slats, or approved equal.

- D. Posts: Intermediate posts shall be Sch. 40 steel pipe, 2-3/8 inches outside diameter. Terminal posts shall be 2-7/8 inches outside diameter. Posts to be powder-coated black.
- E. Top Rail and Bottom Rail and/or Tension Wire: The fence shall have a continuous top and bottom rail for its full length of galvanized steel 1-5/8 inches outside diameter tubing, weighing 1.73 pounds per foot, and a bottom 6 gauge tension wire. Rails to be powder-coated black.
- F. Truss Braces: Truss braces and truss rods with turnbuckle attachments shall be installed between terminal posts and each adjacent intermediate post. Sizes and specific locations shall be as engineered by the fabricator and shown on the shop drawings. Truss braces to be powder-coated black.
- G. Fittings: All fixed component parts, such as tie wire, hog rings, post tops, bands, connections and rail ends, shall be galvanized and painted black with exterior grade paint. Post tops shall be simple can-type without ornamentation. Tie wires and hog rings shall be 9 gauge.
- H. Hinges: Hydraulic 180 degree gate closer and hinge (D00000173-CARACAL-USA), with chain link bracket for Caracal gate closer (P00016016-CLB-CARACAL) from Locinox, 1-877-LOCINOX, or approached equal. Color to be black.
- I. Lever: For 6'-0" High Chain Link Gate, surface mounted anti-panic gate lock (D00000008-LPKQU2) with Chain Link Tension Bar Adapter (D00000119-CLH), color shall be black, from Locinox, 1-877-LOCINOX, or approached equal.
- J. Concrete Footings: Per structural drawings.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Fabric: Shall be installed on the court side of the posts, with top and bottom selvage knuckled. Attach fabric to posts with double-wrap tie wires spaced no further than 1'-0" on center spacing.
- B. Tension Wire: Secure fabric to tension wire with hog rings spaced no further than 2'-0" on center spacing.
- C. Top and Bottom Rail: Shall pass through openings provided in the post tops and each length shall be coupled with a sleeve coupling, or by a 3 inch long swaged

end. Fabric shall be attached to rails with double-wrap tie wires spaced no further than 2'-0" on center spacing.

- D. Posts: Shall be installed integral with the concrete band, where occurs, and as indicated on the plans.

PART 4 – NOT USED

END OF SECTION 32 31 13

SECTION 32 33 00 SITE FURNISHINGS

PART 1 – GENERAL

(See also General Provisions, Special Provisions, and General Requirements)

1.1 SCOPE

- A. Furnish and install all site furnishings as shown on the plans and as specified herein including, but not necessarily limited to, the following:

1. Benches
2. Court Benches
3. Picnic Table
4. Bollards
5. Trash Receptacle
6. Pickleball Net Posts
7. Pickleball Nets
8. Wind Screen
9. Storage Container
10. Ball Wall
11. Bid Alternate #1: Shade Sail, Type 1
12. Bid Alternate #2: Shade Sail, Type 2
13. Bid Alternate #3: Shade Sail, Type 3
14. Bid Alternate #4: Shade Sail, Type 4

- B. Related work specified elsewhere:

1. Site Concrete – Section 32 13 13

1.2 ACCEPTANCE

- A. Prior to the purchase of the items and within ten (10) working days after award of the contract, the Contractor shall supply the City's Representative with samples of the finishes for approval. No materials for this Section shall be purchased until such approval is granted.

1.3 CERTIFICATION

- A. Delivery schedules shall be verified and certified in writing to the City's Representative within ten (10) working days after award of the contract.

1.4 SUBMITTALS

- A. Submit catalog information for items:
1. Bench
 2. Court Bench
 3. Picnic Table
 4. Bollard
 5. Trash Receptacle
 6. Pickleball Net Post
 7. Pickleball Net
 8. Wind Screen
 9. Storage Container
 10. Ball Wall
 11. Bid Alternate #1: Shade Sail, Type 1
 12. Bid Alternate #2: Shade Sail, Type 2
 13. Bid Alternate #3: Shade Sail, Type 3
 14. Bid Alternate #4: Shade Sail, Type 4

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Bench: Shall be Outdoor Creations, model 425 with back and armrests, surface mounted, tan color smooth finish, or approved equal. Available through Outdoor Creations, 2270 Barney Rd., Anderson, CA, 96007, (530) 365-6106.
- B. Court Bench: Shall be Ultrasite Hartford bench with back #11 premium, 6'-0" length, surface mount, with blue powder-coated finish or approved equal.
- C. Picnic Table: Shall be DuMor, model 298-60HS, embedment mounted, black color, or approved equal. Available through Ross Recreation Equipment, 100 Brush Creek Road, Suite #206, Santa Rosa, CA 95404, (707) 538-3800.
- D. Bollard: Shall be QCP, custom pickleball 36" diameter sphere bollard, with recesses to represent the holes in a pickleball. Color shall be RAL 1016, , embedment mounted, or approved equal. Available through QCP, 731 Parkridge Ave, Norco, CA 92860, (866)703-3434.
- E. Trash Receptacle: Shall be DuMor, model 287-32-SO, surface mounted, black color, or approved equal. Available through Ross Recreation Equipment, 100 Brush Creek Road, Suite #206, Santa Rosa, CA 95404, (707) 538-3800.

- F. Pickleball Net Post: Douglas Sports Premier RD-36 Pickleball Posts, 3" OD post and center pipe anchor, 11 gauge steel, powder-coated black, self-locking gears, welded lacing rods, installed in aluminum ground sleeves.
- G. Pickleball Net: Douglas Sports JTN-30 Pickleball Net, 36" x 21'-9", 1-3/4" square mesh braided 3.0mm polyethylene, 5mm PVC coated aircraft cable, 34 oz. vinyl-coated polyester headband with center strap.
- H. Wind Screen: Putterman Athletics Tenn-Air Pro, light blue color, 100% vinyl-coated polyester mesh, 78% shade factor.
- I. Storage Container: Kobalt Blue Steel Jobsite Box, 24"W x 60"L x28"H with keyed padlock, surface mounted
- J. Ball Wall: Professional Flat 20' wide backboard from Bakko Backboards, 6618 Randolph Blvd, San Antonio, TX 78233, 1-800-445-BORD, or approved equal. Install white line to represent net at standard pickleball net height per manufacturer's recommendation.
- K. Bid Alternate #1: Shade Structure, Type 1: Shall be USA Shade, custom T-Cantilever Single, size 8'-8"x18'-5", 10' height, Aquatic Blue Commercial 95-340 FR Fabric, tele-grey posts and frame, or approved equal. Available through USA Shade, 11515 Vantory Dr, Suite 100, Huntersville, NC 28078, (408) 478-1646.
- L. Bid Alternate #2: Shade Structure, Type 2: Shall be USA Shade, custom 4 Post Hip, size 10'-4"x21'-6", 10' height, Aquatic Blue Commercial 95-340 FR Fabric, tele-grey posts and frame, or approved equal. Available through USA Shade, 11515 Vantory Dr, Suite 100, Huntersville, NC 28078, (408) 478-1646.
- M. Bid Alternate #3: Shade Structure, Type 3: Shall be USA Shade, custom Hip Joined, size 10'-4"x32'-10", 10' height, Aquatic Blue Commercial 95-340 FR Fabric, tele-grey posts and frame, or approved equal. Available through USA Shade, 11515 Vantory Dr, Suite 100, Huntersville, NC 28078, (408) 478-1646.
- N. Bid Alternate #4: Shade Structure, Type 4: Shall be USA Shade, custom T-Cantilever Single, size 15'-4"x24'-6", 10' height, Aquatic Blue Commercial 95-340 FR Fabric, tele-grey posts and frame, or approved equal. Available through USA Shade, 11515 Vantory Dr, Suite 100, Huntersville, NC 28078, (408) 478-1646.

PART 3 – EXECUTION

3.1 LAYOUT

- A. Prior to commencing installation, the Contractor shall stake the site furnishing layout and request a review by the City's Representative to determine adjustments on-site from locations shown on the plans.

3.2 INSTALLATION

- A. All site furnishings shall be installed per the manufacturer's specifications.

PART 4 – NOT USED

END OF SECTION 32 33 00

SECTION 32 41 23 SIGNAGE

PART 1 – GENERAL

(See also General Provisions, Special Provisions, and General Requirements)

1.1 SCOPE

- A. Furnish and install all signage as shown on the plans and as specified herein including, but not necessarily limited to, the following:
 - 1. Entry Sign
 - 2. Accessible Parking Sign
 - 3. Accessible Van Parking Sign
 - 4. Court Rules Sign
 - 5. Court Sign
- B. Related work specified elsewhere:
 - 1. Painting – Section 09 91 13
 - 2. Site Concrete – Section 32 13 13

1.2 QUALITY CONTROL

- A. Reviews: Submit shop drawings and color samples for all sign faces to the City's Representative prior to fabrication.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Entry Sign: Per plans.
- B. Accessible Van Parking Sign: Shall be two signs with the van accessible sign 1" max from the Handicap sign – R99C (CA) HANDICAP (symbol) PARKING ONLY – MINIMUM FINE \$250 Sign, 12"Wx24"H, aluminum, reflectorized, diamond grade cubed, VAN ACCESSIBLE Plaque R7-8b, 12"Wx6"H, aluminum, reflectorized, diamond grade cubed. Available through TAPCO at tapconet.com, 1-800-236-0112, or approved equal.
- C. Accessible Parking Sign: Shall be R99C (CA) HANDICAP (symbol) PARKING ONLY – MINIMUM FINE \$250 Sign, 12"Wx24"H, aluminum, reflectorized, diamond grade cubed. Available through TAPCO at tapconet.com, 1-800-236-0112, or approved equal.

D. Court Rules Sign: Per plans.

E. Court Sign: Per plans.

PART 3 – EXECUTION

3.1 PREPARATION

A. Surrounding areas, surfaces, and appurtenances already in place shall be protected during installation of signage.

PART 4 – NOT USED

END OF SECTION 32 41 23

SECTION 32 84 00 PLANTING IRRIGATION

PART 1 – GENERAL

(See also General Provisions, Special Provisions, and General Requirements)

1.1 SCOPE

- A. Furnish and install a complete automatic irrigation system as shown on the plans and as specified herein including, but not necessarily limited to, the following:
 - 1. Water point of connection
 - 2. Trenching and piping
 - 3. Electrical components
 - 4. Irrigation equipment
- B. Related work specified elsewhere:
 - 1. Trenching and Backfilling – Section 31 23 00
 - 2. Landscape Maintenance – Section 32 01 90
 - 3. Landscape Soil Preparation – Section 32 91 13

1.2 QUALITY CONTROL

- A. Standards: Unless otherwise shown or specified, all materials and methods shall conform to the most current Section 20-2 “Irrigation” of the State of California Department of Transportation Standard Specifications (DTSS) as they reasonably apply to this work, except for measurement and payment requirements.
- B. All irrigation shall be provided and performed in accordance with the current City of Los Banos Standard Specifications and Details. Wherever these plans and the City Standards conflict, the higher quality standard or specification will apply.
- C. Reviews: The Contractor shall specifically request the following reviews prior to progressing with the work:
 - 1. Layout of system
 - 2. Points-of-connection excavation
 - 3. Trenching and pipe assembly
 - 4. Valve box installation
 - 5. Operation of system.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Quality: All materials shall be new and the best quality available unless otherwise specified. All materials shall be clearly marked by the manufacturer on all material, containers, or certificates of contents for inspection.
- B. Plastic Pipe and Fittings: All mainline pipe 3/4 inch to 1-1/2 inch in size shall be polyvinyl chloride (PVC) Schedule 40, and sizes 2 inch and larger shall be Class 315. Unless otherwise noted, all laterals shall be Class 200 PVC pipe. Solvent weld fittings, if used, shall be Schedule 40 or Schedule 80 as called for on details. Solvent for piping shall be as recommended by the manufacturer. All pipe shall be clearly labeled with the manufacturer type and specification numbers.
- C. 2 Wire Control Wire: Type to match existing. Contractor to field verify existing 2 wire control wire type.
- D. Valve Boxes: Precast concrete or plastic of type and size indicated. Free of all cracks, chips or structural defects. Boxes located in pavement (asphalt or concrete) and/or subject to vehicular traffic shall be concrete and have heavy duty steel covers. Boxes shall be sized to provide a 4 inch minimum clearance around the irrigation equipment inside the box, excluding all pipes and fittings.
- E. Irrigation Equipment: Refer to plans. Any desired substitutions require submittals in duplicate for specific written approval.
- F. Thread Sealant: Permatex Thread Sealant, part #14H, white in color.
- G. Valve ID Tags: All control valves to be labeled with standard yellow valve ID tags, available from Ewing Irrigation, (650) 592-9530, or approved equal.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Grading: The Contractor shall be responsible for installing all irrigation features to their finished grade and at the depths indicated. All rough grading shall be completed before trenching commences.
- B. Layout and Trenching: All features of the irrigation system shall be staked and pipe alignments marked prior to trenching for review by the City's Representative.

3.2 INSTALLATION

- A. Backfilling: Do not cover joints until the system has been reviewed by the City's Representative. Backfill with damaging rocks and debris shall not be permitted. Compact all backfill and eliminate settlement. Previously prepared soil shall be replaced as the top 6 inches of backfill.
- B. Fabrication: Snake pipe from side to side when trench exceeds 30 feet in length. All manifolds shall be neat, orderly, and constructed for ease in maintenance operations. Construct manifolds to allow valve boxes to be parallel to each other and to adjacent walls, walks, curbs, and buildings. Cuts and joints shall be free of burrs, smooth, and minimum in quantity. All pipe above finish grade shall be galvanized unless noted otherwise.
- C. Pipelines: All pipelines shown parallel on the drawing may be installed in a common trench. Where pipelines are shown parallel or adjacent to shrub or groundcover areas, they shall be installed in these areas. All changes in depth of pipe shall be accomplished using 45-degree fittings.
- D. Testing: Test mainline at 125 p.s.i. for 6 hours. Test and repair as necessary until satisfactory test conditions are obtained.
- E. 2-Wire Control Wire: Install control wire in pipe trenches wherever practical in conduit per plans. Splices shall occur in splice boxes and valve boxes only and shall be accomplished utilizing approved connectors. All wire shall be installed below or level with the bottom of adjacent pipes.
- F. Adjustments: Adjust all heads for arc, radius, riser height, and distribution for uniform and optimum coverage. Such adjustments shall include nozzle changes without additional cost to City.
- G. Finish Grade: Unless otherwise noted, all heads shall be set at finish grade and on double or triple swing joints as called for on the plans. The top of all valve boxes shall be flush with finish grade.

3.3 IRRIGATION SYSTEM AUDIT

- A. The Contractor shall coordinate and provide assistance to a third-party certified irrigation auditor to complete the irrigation audit. Schedule the audit once the irrigation system is in operation. Provide a two-week (14 day) notice for scheduling the audit. Provide staff to assist auditor during the process, allow up to 8 hours at site.

3.4 RECORD DRAWING

- A. Regularly update a print of the system and any changes made to the system throughout the project. Features below ground shall be indicated with at least two measurements from surface features such as walks, building, or sprinkler heads. All changes shall be recorded on this plan before trenches are backfilled. The record drawing shall be completed and submitted to City before final payment is made for work installed.

PART 4 – NOT USED

END OF SECTION 32 84 00

SECTION 32 91 13 LANDSCAPE SOIL PREPARATION

PART 1 – GENERAL

(See also General Provisions, Special Provisions, and General Requirements)

1.1 SCOPE

- A. Furnish and install all landscape soil preparation as shown on the plans and as specified herein including, but not necessarily limited to, the following:
 - 1. Soil testing
 - 2. Stockpiling of native soil
 - 3. Topsoil placement
 - 4. Organic amendment
 - 5. Fertilizer
 - 6. Finish grading
- B. Related work specified elsewhere:
 - 1. Earthwork and Grading – Section 31 22 00
 - 2. Landscape Planting – Section 32 93 00

1.2 QUALITY CONTROL

- A. Reviews: Contractor shall specifically request at least three (3) working days in advance of the following reviews prior to progressing with the work:
 - 1. Completion of rough grading
 - 2. Verification of amendment incorporation depths
 - 3. Finish grade
- B. Certification: Written certificates stating quantity, type, and composition, weight, and origin for all amendments and chemicals shall be delivered to the City's Representative before the material is used on the site.
- C. Soil Testing: Provide soil samples to Waypoint Analytical, Inc. of Anaheim, (714) 282-8777 or approved equal, for testing in accordance with these specifications. Test results shall be made available to the City's Representative. Allow sufficient time for testing prior to preparing soil for planting.
 - 1. The following soil tests are required under these specifications:

- a. Native Soil: Prior to construction, submit native soil for horticultural soil analysis, consisting of 2 one-quart samples from proposed container planting areas and 1 on-quart sample from proposed bio retention area. Samples shall be a representative composite taken from several planting areas.
 - b. Pre-Plant: Following amendment and fine grading and prior to installation of plant material, submit for horticultural soil analysis: one quart-sized sample of in-place topsoil. Sample shall be a representative composite taken from several planting areas.
 2. If test results indicate that soils fail to meet the specifications, obtain other sources of import material or re-amend as required. Retest and resubmit until passing results are obtained.
 3. Testing costs for initial samples and costs for any additional samples due to non-compliance shall be paid for by the Contractor.
 4. No material shall be delivered to the site until the City's Representative approves the material.
 5. The Contractor shall allow for sufficient time for testing prior to construction.
- D. Amendment Samples: Provide an analysis of the amendment from a Seal of Testing Assurance (STA) Certified Compost Lab, designated by the U.S. Composting Council (USCC). Or, send a one-gallon sample of each proposed amendment to Soil Control Lab of Watsonville (831) 724-5422, for their testing for conformance to this specification.
1. No material shall be delivered to the site until the City's Representative approves the samples.
 2. Testing costs shall be paid for by the Contractor.
 3. If an alternate laboratory is used, the laboratory must be STA certified by the USCC, using test methods described in the "Test Methods of the Examination of Composting and Compost" (TMECC) test methods manual.
- E. Biotreatment Soil Mix Submittals: Submit to the City's Representative for approval:
1. A one-gallon size sample of biotreatment soil.
 2. Certification from the soil supplier or an accredited laboratory that the biotreatment soil mix meets the requirements of this specification.

3. Grain size analysis results of the fine sand component performed in accordance with ASTM D 422, Standard Test Method for Particle Size Analysis of Soils or Caltrans Test Method (CTM) C202.
 4. Quality analysis results for compost performed in accordance with Seal of Testing Assurance (STA) Standards.
 5. Organic content test results of biotreatment soil mix. Organic content test shall be performed in accordance with Testing Methods for the Examination of Compost and Composting (TMECC) 05.07A, "Loss-On-Ignition Organic Matter Method.
 6. Grain size analysis results of compost component performed in accordance with ASTM D 422, Standard Test Method for Particle Size Analysis of Soils.
 7. A description of the equipment and methods used to mix the sand and compost to produce biotreatment soil mix.
 8. Provide the name of the testing laboratory(s) and the following information:
 - a. Contact person(s)
 - b. Address(es)
 - c. Phone contacts(s)
 - d. E-mail address(es)
 - e. Qualifications of laboratory(s) and personnel including date of current certification by U.S. Composting Council (USCC), ASTM, Caltrans, or approved equal.
- F. Planting Areas: All areas to be planted, whether in container stock or otherwise, are defined as planting areas in these documents.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Native Topsoil: Shall be the existing surface layer of soil on-site. This layer typically will be a different color and texture than the subsoil, and may be of varying thicknesses. The Contractor shall be responsible for reviewing the area limits and depths of native topsoil on-site with the City's Representative.
- B. Fertilizer: Shall be determined from the soils test results. For purposes of bidding only, assume the use of 6-20-20 commercial fertilizer, iron sulfate, and 20-10-5 Best-Pak planting packets by J.R. Simplot Company.

C. Organic Amendment: If recommended by the horticultural soils test, the following materials shall be used as soil amendment.

1. Compost: Shall be Z-Best's Organic Compost available through Florin Perkins Landscape Materials, (916) 303-9900 and shall conform to:
 - a. Seal of Testing Assurance Program from the U.S. Composting Council.
 - b. Compost parameters, below:

Property	Test Method	Unit of Measurement	Requirement
pH	TMECC 04.11-A Elastomeric pH 1:5 slurry method pH	units	6–8.5
Soluble salts	TMECC 04.10-A Electrical conductivity 1:5 slurry method	dS/m (mmhos/cm)	0–10
Moisture content	TMECC 03.09-A Total solids & moisture at 70 ± 5 °C	% wet weight basis	30–60
Organic matter Content	TMECC 05.07-A Loss-on-ignition organic matter method (LOI)	% dry weight basis	30–60
Maturity	TMECC 05.05-A Germination and vigor	% relative to positive control	Seed emergence 80 or above Seedling vigor 80 or above
Stability	TMECC 05.08-B Carbon dioxide evolution rate	mg CO ₂ -C/g OM per day	4 or below
Pathogen	TMECC 07.01-B Salmonella < 3 MPN per 4 grams, dry weight basis	Pass/ Fail	Pass
Pathogen	TMECC 07.01-B Fecal coliform bacteria < 1,000 MPN per gram, dry weight basis	Pass/ Fail	Pass
Physical contaminants	TMECC 02.02-C Man-made inert removal and classification: Plastic, glass, and metal % > 4 mm fraction	% dry weight basis	combined total: < 0.5%
Physical contaminants	TMECC 02.02-C Man-made inert removal and classification: Sharps (sewing needles, straight pins and hypodermic needles) % > 4mm fraction	% dry weight basis	none detected

Property	Test Method	Unit of Measurement	Requirement
Particle size fine for compost used as soil amendment	TMECC 02.02-B Sample sieving for aggregate Size classification	% dry weight basis	Pass 2 inch sieve 98% min., Pass 3/8 inch sieve 95% min.
Heavy metals	PASS / FAIL	mg/kg (ppm), dry weight basis	All EPA 503 metal contaminant limits
Carbon:Nitrogen Ratio		Carbon:Nitrogen	≤25:1
Note: TMECC refers to "Test Methods for the Examination of Composting and Compost," published by the United States Department of Agriculture and the United States Compost Council (USCC). (Table modified from the US Composting Council Landscape Architectural Specifications 2005.)			

D. Biotreatment Soil Mix: Shall meet the following criteria:

1. General Requirements: Biotreatment soil mix shall achieve a long-term, in-place infiltration rate of at least 5 inches per hour. Biotreatment soil mix shall also support vigorous plant growth.
 - a. Biotreatment soil mix shall be a mixture of fine sand, sandy loam, and compost, measured on a volume basis:
 - 1) 65% Sand
 - 2) 20% Sandy Loam
 - 3) 15% Compost
2. Sand for Biotreatment Soil Mix:
 - a. General: Sand shall be free of wood, waste, coating such as clay, stone, dust, carbonate, etc., or any other deleterious material. All aggregate passing the No. 200 sieve size shall be non-plastic.
 - b. Sand for Biotreatment Soil Mix Texture: Sand for Biotreatment Soil Mix shall be analyzed by an accredited lab using #200, #100, #40 or #50, #30, #16-, #8-, #4-, and 3/8 inch sieves (ASTM D 422, CTM 202 or as approved by municipality), and meet the following gradation:

Sieve Size	Percent Passing (by weight)
3/8 inch	100
No. 4	90 - 100
No. 8	70 - 100

Sieve Size	Percent Passing (by weight)
No. 16	40 - 95
No. 30	15 - 70
No. 40 or No. 50	5 - 55
No. 100	0 - 15
No. 200	0 - 5

- 1) Note: All sands complying with ASTM C33 for fine aggregate comply with the above gradation requirements.

3. Sandy Loam for Biotreatment Soil Mix: Sandy loam shall be free of wood, waste, and coatings such as carbonate, stone, dust, or other deleterious material. All aggregate passing the No. 200 sieve size shall be non-plastic. Sandy loam shall be a mixture of sand, silt, and clay measured on weight basis:
 - a. 50% - 74% Sand
 - b. 0% - 48% Silt
 - c. 2% - 15% Clay

4. Compost for Biotreatment Soil Mix: Compost shall be produced from a facility inspected and regulated by the local enforcement agency for CalRecycle. Upon request, the past 3 inspection reports shall be submitted to verify testing compliance with CalRecycle Title 14 and EPA 40 CFS 503. Compost shall also conform to the Seal of Testing Assurance Program from the U.S. Composting Council and to the parameters below:
 - a. Bulk Density: Shall be between 400 and 600 dry lbs./cubic yard
 - b. Moisture Content: Shall be between 30% - 60% of dry solids
 - c. Organic Matter Content: 65% - 75% by dry wt.
 - d. Ph: 6.0 - 8.0
 - e. Carbon and Nitrogen Ratio: 15:1 to 25:1
 - f. Maturity/Stability: Solvita® > 5 Index value
 - g. Metals:
 - 1) Arsenic: < 20 mg/kg dry wt.
 - 2) Cadmium: < 10 mg/kg dry wt.
 - 3) Chromium: < 600 mg/kg dry wt.
 - 4) Copper: < 750 mg/kg dry wt.

- 5) Lead: < 150 mg/kg dry wt.
 - 6) Mercury: < 8 mg/kg dry wt.
 - 7) Nickel: < 210 mg/kg dry wt.
 - 8) Selenium: < 18 mg/kg dry wt.
 - 9) Zinc: < 1400 mg/kg dry wt.
- h. Pathogens:
- 1) Salmonella < 3 MPN/4 grams
 - 2) Coliform Bacteria < 1,000 MPN/gram
- i. Inerts: Compost shall be relatively free of inert ingredients including glass, plastic, and paper < 1% by weight, and sharps (> 4 mm) 0% by weight
5. Compost for Biotreatment Soil Mix Texture: Compost for biotreatment soil mix shall be analyzed by an accredited lab using #200 and 1/2 inch, sieves (ASTM D 422 or as approved by municipality), and meet the following gradation:

Sieve Size	Percent Passing (by weight)
1/2 inch	97 - 100
No. 200	2 - 5

PART 3 – EXECUTION

3.1 LIMITS AND GRADES

- A. Grade Review: Prior to commencing soil preparation operations, Contractor shall request a review by the City's Representative to verify specified limits and grades of work completed to date and soil preparation work to commence. Complete the rough grading as necessary to round the top and toe of all slopes, providing naturalized contouring to integrate newly graded areas with the natural topography. Finish grading under this Section shall be completed in accordance with the grades indicated on the plans.
- B. Grading at Existing Trees: Soil work within the dripline of existing trees shall be performed in accordance with tree protection requirements indicated on the plans and Section 32 01 91 Tree Protection and Pruning.

3.2 STRIPPING AND STOCKPILING OF EXISTING TOPSOIL

- A. Excavation Areas: The native topsoil shall be stripped and stockpiled on-site in sufficient quantities to provide a 6 inch layer throughout all planting areas. Topsoil to be stripped and stockpiled shall be taken from the surface layer after all organic litter and foreign debris has been removed and properly disposed of.
- B. Existing Grade Unchanged: In those areas where grades are not proposed to be modified (areas of no excavation or fill) the native topsoil shall be left in place. All debris, as well as all rocks over 3/4 inches in diameter, shall be removed from the surface of planting areas.

3.3 TOPSOIL PLACEMENT

- A. Depths indicated in this Section are for bidding purposes only. Depth of scarification, height of soil lifts, and depths of incorporation shall be as recommended by the soil testing lab.
- B. Soil Moisture: If soils are saturated, suspend soil work operations until the soil moisture drains to below field capacity.
- C. Subgrade preparation: Excavate planting areas to the proposed subgrade and remove all construction debris and materials.
 - 1. Do not over excavate compacted subgrades of adjacent pavement or structures.
 - 2. Subgrades shall slope approximately parallel to the finished grade and/or toward the subsurface drain lines as shown on the plans.
 - 3. Scarify or rip subgrade to a depth of 7 inches and protect from compaction.
- D. Topsoil Incorporation: Uniformly distribute a 3 inch layer of topsoil and incorporate it into the top 6 inches of subsoil by ripping, scraping, or tilling to mix the subsoil with the topsoil into a homogeneous mixture. Repeat until the total depth of topsoil placed is as indicated on the plans. The final layer of topsoil shall be uniformly distributed in the planting areas and compacted in place to 85% compaction.
- E. Existing Topsoil to Remain: Except within tree protection zones, in those planting areas where native topsoil is to be left in place, cross rip to a depth of 10 inches. Then incorporate the amendments to a homogeneously blended soil depth of 6 inches.

3.4 BIOTREATMENT SOIL MIX PLACEMENT

- A. Do not excavate, place soils, or amend soils during wet or saturated conditions.
- B. Operate equipment adjacent to (not in) the biotreatment soil mix facility. If machinery must operate in the facility, use lightweight, low ground-contact pressure equipment.
- C. Place soil in 12 inch lifts with machinery adjacent to the facility. If working within the facility, to avoid over-compacting, place the first lifts at the far end from the entrance and place subsequent lifts backwards toward the entrance.
- D. Allow biotreatment soil mix lifts to settle naturally. Boot pack (walk around to firm) lifts to achieve 85% compaction. After all lifts are placed, wait a few days to check for settlement and add additional media as needed.
- E. Verify biotreatment soil mix elevations before applying mulch or installing plants.

3.5 ORGANIC AMENDMENT AND FERTILIZER INCORPORATION

- A. Organic amendment: After topsoil placement and compaction, spread organic amendment at a rate of 6 cubic yards per 1000 square feet, unless otherwise specified by the soils test results.
- B. Fertilizer: Spread uniformly on top of compost at rates determined by the soils test. For bidding purposes only, assume per 1000 square feet:
 - 1. 30 pounds commercial fertilizer (6-20-20)
 - 2. 10 pounds iron sulfate
 - a. Note: Iron sulfate should be applied cautiously, avoiding contact with concrete, since permanent staining may result. Any such stained concrete shall be replaced at Contractor's expense.
- C. Incorporate organic amendment and fertilizer into the top 6 inches of topsoil, until homogeneously blended.

3.6 PLANT PITS

- A. Plant Pit Preparation: Plant pits shall have their sides and bottoms loosened or otherwise broken to prevent glazed or compacted surfaces, and shall be as shown on the planting detail.

3.7 BACKFILL

- A. Backfill Material and Placement: Only unamended soil shall be used beneath the root ball. Cultivate the bottom of plant pits to improve porosity. Backfill around sides of the rootball shall be the amended soil taken from adjacent prepared areas. Spread material excavated from plant pits onto adjacent areas as replacement. Should additional backfill be necessary, a mixture of one third organic amendment/fertilizer mix and two thirds topsoil may be used for the top 12 inches of backfill.

3.8 PLANT PACKETS

- A. Packet Quantities: All container plants shall receive plant packets as follows:

Container Size	Number of Packets
one-gallon plants	one 10-gram packet
five-gallon plants	two 10-gram packets
fifteen-gallon plants	nine 10-gram packets
24-inch box trees	sixteen 10-gram packets

1. Space the packets evenly around the root ball in the backfill, 6 - 8 inches from soil surface and 1 inch away from root ball. City's Representative may require excavation of up to 5% of all plants selected at random for conformance review.

3.9 FINISH GRADING

- A. Grading Operations: Finish grade all irrigated planting areas unless otherwise noted, and remove all rocks and clods over 1 cubic inch to a depth of 1 inch below finish grade. All areas shall be smooth and uniformly graded. All erosion damage during the construction period shall be repaired by the Contractor.
- B. Finish Grades: Unless otherwise noted, all soil finish grades shall be 1 inch below finish grade of walks, pavements, and curbs.

PART 4 – NOT USED

END OF SECTION 32 91 13

SECTION 32 93 00 LANDSCAPE PLANTING

PART 1 – GENERAL

(See also General Provisions, Special Provisions, and General Requirements)

1.1 SCOPE

- A. Furnish and install all landscape planting as shown on the plans and as specified herein including, but not necessarily limited to, the following:
 - 1. Trees
 - 2. Shrubs
 - 3. Root barrier
 - 4. Mulch
 - 5. Staking
- B. Related work specified elsewhere:
 - 1. Landscape Maintenance – Section 32 01 90
 - 2. Landscape Soil Preparation – Section 32 91 13

1.2 REFERENCES

- A. Interpretations of plant names and descriptions shall reference the following documents. Where the names or plant descriptions disagree between the several documents, the most current document shall prevail.
 - 1. USDA – The Germplasm Resources Information Network (GRIN)
<http://www.ars-grin.gov/npgs/searchgrin.html>
 - 2. Manual of Woody Landscape Plants, Michael Dirr, Stipes Publishing, Champaign, Illinois, most current edition.
 - 3. New Sunset Western Garden Book, Oxmoor House, most current edition.
- B. ANSI American Standard for Nursery Stock
- C. Federal, State, and County laws requiring inspection for plant disease and insect control.

1.3 QUALITY CONTROL

- A. Reviews: The Contractor shall specifically request the following reviews prior to progressing with the work:

1. Plant material approval
2. Plant layout
3. Finish grade
4. Substantial completion
5. Final completion

1.4 SUBMITTALS

- A. Plant Material: Within ten (10) working days after award of the contract, the Contractor shall submit notice to the City's Representative certifying the quantity and species of plant material ordered, the nursery supplying the material, any plant material unavailable at the time, and proposed plant substitutions. No plants shall be ordered or delivered prior to written acceptance by the City's Representative.
- B. Mulch: Name of supplier and one quart-sized sample.
- C. Certificates: All plant material shall meet the specifications of Federal, State, and County laws requiring inspection for plant diseases and insect infestations. Inspection certificates required by law shall accompany each shipment, invoice, or order of stock, and when such plants arrive at the site of work, the certificate of inspection shall be filed with the City's Representative.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Nomenclature and Labels: Plant botanical names shall conform to current literature noted in Section 1.2 above. All plants of each clone, species, and cultivar shall be delivered to the site labeled with their full botanical names. Every plant species shall be labeled with no less than one label for every ten plants of a species.
- B. Quality: The minimum quality of all plant material shall conform to prevailing published specifications of the California Association of Nurserymen and the American Association of Nurserymen's American Standard for Nursery Stock unless otherwise indicated. Additional specifications shall be indicated on the plans.
- C. Quantities: The quantities shown on the plant list and in labels are for the City's use and are not to be construed as the complete and accurate limits of the contract. The Contractor shall furnish and install all plants shown schematically on

the plans. Any unlabeled plants shall be considered as the smaller size shown for that type on the plans.

- D. Root Systems: All container-grown stock shall be grown in its container for at least 6 months prior to its planting. Contractor shall allow one percent of the quantity of plants for removal and inspection. Any plant material, within one year following the final acceptance of the project, determined by the City's Representative to be defective, restricted, declining, or otherwise deficient due to abnormal root growth, shall be replaced by Contractor to the equal condition of adjacent plants at the time of replacement.
- E. Trees: All trees shall have straight trunks of uniform taper, larger at the bottom. Trunks shall be free of girdling roots or damaged bark, with all minor abrasions and cuts showing healing tissue. Sucker basal growth and sucker lateral growth shall be removed and treated to eliminate re-sprouting. Normal lower side branching shall remain. Trees that are unable to stand upright without support shall be rejected.
- F. Health: Foliage, roots, and stems of all plants shall be of vigorous health and normal habit of growth for its species. All plants shall be free of all diseases, insect stages, burns, or disfiguring characteristics.
- G. Untrue Species: All plant material, within two years following the final acceptance of the project, that is determined by the City's Representative to be untrue to the species, clone, and/or variety specified, shall be replaced by the Contractor, to the equal condition of adjacent plants at the time of replacement.
- H. Mulch: Except as otherwise noted below, mulch shall be walk-on bark, free of disease, invasive weeds and seeds. Maximum 3" grind. Available from Redi-Gro (800) 654-4358, or Lyngso Garden Materials, 345 Shoreway Road, San Carlos, CA 94070, (650) 364-1730, or approved equal.
 - 1. Mulch on slopes 3:1 or greater shall be Shredded Cedar or Redwood Bark. Mulch shall be derived from 100% Western Red Cedar, Redwood, or a combination, with woody and fibrous particles of various sizes. Available from Redi-Gro (800) 654-4358 or Reuser (800) 356-7943.
 - 2. Mulch in bioretention areas shall be Z-Best Organic Mulch, (408) 846-1577, or Wonder Mulch, available from Vision Recycling (831) 479-7857.

PART 3 – EXECUTION

3.1 GENERAL

- A. Plant Material Approvals: Before planting operations commence, all or a representative sampling of plant material shall be reviewed at the site by the City's Representative. Defective plants installed without such review shall be removed from the site upon request by the City's Representative and an acceptable plant shall be substituted in its place.
- B. Storage and Handling:
 - 1. Plant materials shall be protected and maintained in good condition. Bare root and balled materials shall be watered regularly and placed in a cool area. Plant material shall be protected at all times from animal damage, vandalism, drought damage, wind damage, frost damage, toxic irrigation water, or any other condition that would damage or reduce the viability of the plants. Plants shall be kept moist at all times and shall be completely watered 12 hours or less before planting and shall be moist when installed.
- C. Layout: Only those plants to be planted in any single day shall be laid out. Locations of all plants shall be reviewed prior to planting. Plants installed without this review shall be transplanted as directed by the City's Representative.
- D. Protection of Plants: Maintain all plant material in a healthy growing condition prior to and during planting operations. The Contractor shall be responsible for vandalism, theft, and damage to plant material until the commencement of the maintenance period.
- E. Root Systems: The Contractor shall be responsible for inspection of all root systems on plant materials. Inspection shall include, but not be limited to, checking for rootbound stock, encircling roots at the perimeter of the container, evidence of girdling roots, and other defective root conditions. Such inspections shall include the complete removal of soil from one percent of plant material containers, or at least one plant from each nursery and each plant type. The Contractor shall cut defective or potentially defective girdling, rootbound, and encircling roots, and spread the root system into the surrounding backfill. Plants with excessively defective root systems shall be rejected by the Contractor.

- F. Pruning: The Contractor shall not prune plant material without the specific approval of the City's Representative. Plants pruned without approval shall be replaced by the Contractor, if required.
- G. Basins: Construct basins as necessary to water plants. Remove basins from all plants under a permanent irrigation system prior to final inspection and finish grade the planting area. Basins for plants to be hand-watered shall remain in place. Basin bottoms shall drain away from the plant stem.
- H. Staking: All trees shall be staked as shown on the plans with stakes driven securely into existing soil and aligned with the trunk and perpendicular to the direction of prevailing winds. A minimum of two figure-eight rubber tree ties is required per stake.
- I. Plant Pits, Backfill and Finish Grading: See Landscape Soil Preparation Section 32 91 13 for materials and installation requirements.
- J. Clean-up: After completion of all operations, remove all trash, excess soil and other debris. All walks and pavement shall be swept and washed clean, leaving the entire area in a neat, orderly condition.

PART 4 – NOT USED

END OF SECTION 32 93 00

SECTION 33 40 00 SITE DRAINAGE UTILITIES

PART 1 – GENERAL

(See also General Provisions, Special Provisions, and General Requirements)

1.1 SCOPE

- A. Furnish and install all storm drain lines and appurtenances as shown on the plans and as specified herein including, but not necessarily limited to, the following:
 - 1. Catch basins
 - 2. Clean out
 - 3. French drain
 - 4. Solid drainline
 - 5. Perforated drainline
- B. Related work specified elsewhere:
 - 1. Earthwork and Grading – Section 31 22 00
 - 2. Trenching and Backfilling – Section 31 23 00
 - 3. Site Concrete – Section 32 13 13

1.2 STANDARDS

- A. Unless otherwise specified or shown, all materials and methods shall conform to the appropriate current sections of the State of California, Department of Transportation Standard Specifications (DTSS) as they reasonably apply to this work, except for measurement and payment requirements.

1.3 TOLERANCES

- A. Tolerances for pipe trenches, pipe placement, catch basins, clean outs, and french drains shall be as specified by DTSS. No combination of high and low tolerances that compromise the lines and grades as shown will be permitted.

1.4 REVIEWS

- A. 24 hours prior to placement of backfill above the pipe bedding, the City's Representative shall be notified by the Contractor, and shall be allowed a reasonable amount of time to inspect the placement of the pipe and pipe bedding.

1.5 RECORD DRAWINGS

- A. The Contractor shall maintain a daily log of on-site installation and changes from the Contract Documents on a set of prints provided to the Contractor by the City for record purposes. A clearly legible and detailed print of said log, acceptable to the City's Representative, shall be submitted to the City prior to final payment.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Drain Pipe (solid and perforated): PVC sewer pipe, SDR-35, size as indicated on the plans, conforming to ASTM D3034 for 4 inch to 15 inch diameter size, and ASTM F679 for 16 inch to 24 inch diameter size.
- B. Drain Rock: 3/8 inch pea gravel unless shown otherwise on the plans.
- C. Catch Basin: Christy V-12 with appropriate extensions to extend 2 inches below invert elevations as shown on the plans.
- D. Filter Fabric: Lightweight polyester engineering fabric, LandMaster Polyspun "XL", or approved equal. As available from Horizon Irrigation, 4060 Campbell Avenue, Menlo Park, CA 94025, (650) 323-5161.
- E. Impermeable Liner: HDPE trench liner, 60 mil thick, Trench Liner-Water Proof, or approved equal. Use manufacturer recommended materials and recommendations to join sections of trench liner. As available from Pro Fabric Supply Geotextile Fabrics, 1312 17th street, Unit 2427, Denver, CO 80202, (800) 520-7731.
- F. Cobble for French Drain: Noiya River Cobblestone 2" to 4" from EarthStoneRock, 800-215-732, or approved equal.
- G. Geotextile Fabric: Mirafi 140N non-woven geotextile fabric, or approved equal. As available from SiteOne Landscape Supply, 1145 N. 13th St., San Jose, CA 95112, (408)-295-3376.

PART 3 – EXECUTION

3.1 TRENCH EXCAVATION

- A. Excavation of pipe trenches shall conform to DTSS Section 19-3 "Structure Excavation and Backfill" and Section 31 23 00 Trenching and Backfilling of these specifications.

3.2 INSTALLATION

- A. Pipes, catch basins, and appurtenances shall be installed to the lines and grades shown and in accordance with applicable sections of the DTSS.

PART 4 – NOT USED

END OF SECTION 33 40 00

APPENDIX A

Geotechnical Investigation Report AG Sports Complex Pickleball Courts

**prepared by BSK Associates
dated May 6, 2024**



GEOTECHNICAL INVESTIGATION REPORT AG SPORTS COMPLEX PICKLEBALL COURTS 700 MERCY SPRINGS ROAD LOS BANOS, CALIFORNIA

BSK PROJECT NO.: B24000127

PREPARED FOR:

CALLANDER ASSOCIATES
2025 GATEWAY PLACE, SUITE 285
SAN JOSE, CA 95110



City of
Los Banos
At the Crossroads of California

May 6, 2024

Table of Contents

1. SITE AND PROJECT DESCRIPTION 1

2. SUBSURFACE INVESTIGATION 2

3. PERCOLATION TEST HOLES 2

4. LABORATORY TESTING 3

5. SITE GEOLOGY AND SEISMICITY 3

6. SUBSURFACE CONDITIONS 4

7. PERCOLATION TEST RESULTS 6

8. CONCLUSIONS 7

9. RECOMMENDATIONS 7

9.1 Site Preparation and Grading..... 7

9.2 New Utility Trench Excavation and Backfill 10

9.3 Foundation Recommendations 11

9.3.1 Post-Tensioned Slabs 11

9.3.2 Spread Footings and Mat Foundations 11

9.3.3 Additional Considerations for Shallow Foundations 14

9.3.4 Drilled Piers 14

9.3.5 Additional Considerations for Drilled Piers..... 15

9.3.6 2022 CBC Mapped Seismic Design Parameters 16

9.4 Below-Grade Walls 17

9.4.1 Seismic Wall Pressures 18

9.4.2 Wall Drainage 18

9.4.3 Surcharge Loads 18

9.5 Exterior Concrete Flatwork and Pavers 19

9.6 Pavements 20

9.6.1 Asphalt Concrete for Pickleball Courts 20

9.6.2 Portland Cement Concrete Pavements 20

9.6.3 Additional Pavement Recommendations 20

9.7 Effect of Plants on Foundation, Flatwork, and Paver Performance 20

9.8 Landscaping Irrigation 21

9.9 Site Drainage 21

9.10 Storm Water Runoff Mitigation..... 21



9.11	Corrosion Potential.....	22
9.12	Plan Review and Construction Observation	23
10.	ADDITIONAL SERVICES AND LIMITATIONS	23
10.1	Additional Services.....	23
10.2	Limitations	24
11.	CLOSURE	25

Figures and Appendices

FIGURES

Figure 1 – Vicinity Map

Figure 2 – Site Plan

APPENDIX A – Laboratory Test Results

Figure A-1 – Atterberg Limits

Figure A-2 – Unconsolidated-Undrained Triaxial Test

CERCO Analytical Results (2 pages)

APPENDIX B – Important Information About This Geotechnical-Engineering Report





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May 6, 2024

BSK Project No. B24000127

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Principal, Landscape Architect
Callander Associates
2025 Gateway Place, Suite 285
San Jose, California 95110

**SUBJECT: Geotechnical Investigation Report
 AG Sports Complex Pickleball Courts
 700 Mercey Springs Road
 Los Banos, California**

Dear Mr. Rubin:

We are pleased to submit our geotechnical investigation report for the planned pickleball courts at the AG Sports Complex in Los Banos, California (Site). 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 limited field and laboratory data. The purpose of this investigation was to obtain and classify near subsurface soil samples to provide geotechnical recommendations for the planned improvements. The scope of services, as outlined in our proposal (BSK Proposal No. P24000127) dated February 2, 2024, included the following:

- Project setup and limited subsurface investigation,
- Percolation testing,
- 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

The AG Sports Complex (located at 700 Mercey Spring Road in Los Bano, California) is relatively flat with minor topographic relief and located at the northernmost edge of Los Banos. According to Google Earth Pro, the elevations of the complex range from approximately 95 to 100 feet. The AG Sports Complex is bounded by Mercey Springs Road (Highway 165) to the west, Del Rio Drive and residential properties to

the south, agricultural land to the north, and undeveloped property to the east. The planned pickleball courts (referred herein as the "Site") will be located near the northeast corner of the complex situated between an existing dog park to the east and a baseball field to the west. According to the conceptual plan, the project will include nine pickleball courts, three shade structures, benches, flatwork, perimeter fencing, landscaping, and a bioretention area. The pickleball courts will likely consist of asphalt concrete or post-tensioned (PT) slabs.

We assume grading for the project will be limited to 2 feet or less of cuts and fill to reach finished design grades and that excavations for the biotreatment area and underground utilities will be up to about 5 feet deep.

If the actual project differs significantly from that described above, particularly the amount of grading anticipated, we should be contacted to review and/or revise the conclusions and recommendations presented in this report.

2. SUBSURFACE INVESTIGATION

Our limited subsurface investigation was performed on March 19, 2024 and consisted of manually advancing six (6) borings (labeled HA-1 through HA-6) using an approximately 4-inch-diameter hand auger to depths of approximately 4½ to 5 feet below the existing ground surface (BGS) each at the approximate locations shown on Figure 2. Soils encountered in each hand auger boring were visually classified and recorded on a boring log, the results of which are tabulated in the "Subsurface Conditions" section below. The borings were logged by a field geologist from BSK and backfilled with on-site soils. Relatively undisturbed samples of the subsurface materials were obtained using a hand-held sampler with a 2.0-inch stainless steel liner driven 6-inches using a hand-held slide hammer. Prior to sealing the samples, strength characteristics of the relatively undisturbed cohesive soil samples recovered were evaluated using a hand-held pocket penetrometer. These test results are shown in the tabulated boring logs presented in the "Subsurface Conditions" section of this report.

3. PERCOLATION TEST HOLES

Two (2) percolation test holes (labeled PH-1 and PH-2) were installed at borings HA-2 and HA-5 as shown on Figure 2. The depths of the percolation test holes were approximately 5 feet BGS each. A 2-inch diameter perforated PVC pipe was installed in each test hole and the annulus was backfilled with ¾-inch drain rock. The percolation test holes were pre-soaked overnight. The following day, March 20, 2024, percolation testing was conducted at each location for six consecutive 60-minute intervals until percolation rates stabilized. Following completion of the percolation tests, the PVC pipes were removed and backfilled with drain rock and on-site soil. During construction, the percolation test hole locations should be over-excavated and backfilled with engineered fill as described in the "Site Preparation and Grading" section of this report.



4. LABORATORY TESTING

Our laboratory testing program consisted of performing dry density and moisture content tests, sieve analysis tests, Atterberg limits, and unconsolidated-undrained triaxial tests (TXUU). Most of the test results are presented on the tabulated boring logs presented in the “Subsurface Conditions” section of this report, while the Atterberg limits and TXUU test results are presented graphically in Appendix A.

Analytical testing was performed on a bulk sample of soil collected from the upper 5 feet in boring HA-1 to assist in evaluating the corrosion potential of the on-site soils. The corrosivity testing was performed by CERCO Analytical of Concord, California, a State-Certified laboratory, using ASTM methods as described in the CERCO Analytical report. The corrosion results are also presented at the end of Appendix A.

5. SITE GEOLOGY AND SEISMICITY

The Site is located within the western/central portion of the Los Banos Quadrangle along the western/central portion of the Great Valley geomorphic province of California near the eastern boundary of the Coast Ranges geomorphic province. The Great Valley is an elongated basin that extends from the northwest to the southeast and is bounded between the Sierra Nevada and Coast Ranges to the east and west, respectively. The northern portion of the Great Valley consists of the Sacramento Valley, drained by the Sacramento River and its tributaries, while the southern portion consists of the San Joaquin Valley, drained by the San Joaquin River and associated tributaries. The Sacramento River and the San Joaquin River merge together within the central portion of the Great Valley creating the Sacramento-San Joaquin River Delta. The valley floor in the Great Valley includes dissected uplands, low alluvial fans and plains, river floodplains and channels, and overflow lands and lake bottoms. The dissected uplands include consolidated and unconsolidated Tertiary and Quaternary continental deposits. The alluvial fans along the western boundary include poorly sorted fine sand, silt, and clay. The alluvial fans along the eastern boundary consist of well sorted gravel and sand along major tributaries, and poorly sorted materials along intermittent streams. River and floodplains primarily consist of coarse sands and fine silts. The lake bottoms primarily occur in the southern San Joaquin Valley and are composed of clay layers.

According to the California Geological Survey (2022)¹, the Site is underlain by late Pleistocene and early Holocene San Luis Ranch alluvium, fine upper member deposits (map symbol Qsuf) and consists of fine-grained sediments derived from the Coast Range and deposited as middle and lower-fan and floodplain deposits (see Exhibit 1 below).

¹ Wills, C.J., O’Neal, M.D., Holland, P.J., and Key, E.L. (2022), Preliminary Geologic Map of the Merced 30’ x 60’ Quadrangle, California: California Geological Survey, Preliminary Geologic Map 22-10.





Exhibit 1 – Area Geology Map (CGS, 2022)

The Site is in a moderate seismic area being near a few active faults along the Diablo Range and San Luis Reservoir. The Site is not located within an Alquist-Priolo Earthquake Fault Zone and no mapped active fault traces are known to traverse the Site. The nearest active fault zone is the Ortigalita Fault located approximately 17 miles west of the Site. The Great Valley Thrust Fault runs along the eastern foothills of the Diablo Range, roughly parallel with Interstates 5. Since the Site is near active faults, we expect the Site to be subjected to moderate to intense ground shaking due to a future significant seismic event along the active faults in the region surrounding the Site during the design life of the project.

6. SUBSURFACE CONDITIONS

The table below summarizes the subsurface conditions encountered in our hand-auger borings. We generally encountered soils consisting predominantly of silty sand over sandy lean clay in the upper 5 feet BGS. According to our Atterberg limits test results, the surficial soils have a low to moderate shrink and swell potential (i.e., have a low to moderate expansion potential) when exposed to cycles of moisture fluctuation.

TABULATED LOGS OF HAND-AUGER BORINGS			
Boring (EL)	Approx. Depth Below Ground Surface (feet)	Description	Remarks
HA-1 (99)	0 to 1½	Silty Sand w/ Gravel (SM) – brown to grayish brown, moist, fine sand, fine angular gravel (Possibly FILL)	- Performed on 03/19/2024 - At 2 feet: PP = 2.75 TSF, DD = 97 pcf, MC = 19% - At 4½ feet: grayish brown to pale brown, PP = 2.5 TSF - Terminated at approx. 5 feet
	1½ to 5	Sandy Lean Clay (CL) – dark yellowish brown, moist, firm, medium plasticity, fine sand	
HA-2 (97)	0 to ¾	Silty Sand w/ Gravel (SM) – brown to grayish brown, moist, fine sand, fine angular gravel (Possibly FILL)	- Performed on 03/19/2024 - At 3½ feet: PP = 3.5 TSF, DD = 100 pcf, MC = 10%, LL = 25, PI = 9 (see Figure A-1), 60% passing No. 200 sieve - Terminated at approx. 5 feet - Boring converted to percolation test hole
	¾ to 5	Sandy Lean Clay (CL) – grayish brown, moist, medium plasticity, fine sand	
HA-3 (97)	0 to ¾	Silty Sand w/ Gravel (SM) – brown to grayish brown, moist, fine sand, fine angular gravel (Possibly FILL)	- Performed on 03/19/2024 - At 2 feet: PP >4.5 TSF - At 4½ feet: PP >4.5 TSF, TXUU – C = 3,440 psf (see Figure A-2), DD = 115 pcf, MC = 13% - Terminated at approx. 5 feet - Boring backfilled with soil cuttings
	¾ to 5	Sandy Lean Clay (CL) , grayish brown, moist, hard, medium plasticity, fine sand	
HA-4 (98)	0 to ¾	Silty Sand w/ Gravel (SM) – brown to grayish brown, moist, fine sand, fine angular gravel (Possibly FILL)	- Performed on 03/19/2024 - At 3½ feet: PP = 2.5 TSF, TXUU – C = 3,500 psf (see Figure A-2), DD = 117 pcf, MC = 14% - Terminated at approx. 4½ feet
	¾ to 4½	Sandy Lean Clay (CL) , grayish brown, moist, firm, medium plasticity, fine sand	
HA-5 (96)	0 to 5	Lean Clay with Sand (CL) , brown to grayish brown, moist, firm, medium plasticity, fine sand	- Performed on 03/19/2024 - At 2 feet: PP = 4.5 TSF, 73% passing No. 200 sieve - At 4½ feet: lower sand content, PP = 4.5 TSF, DD = 100 pcf, MC = 19%, LL = 45, PI = 24 (see Figure A-1), 91% passing No. 200 sieve - Terminated at approx. 5 feet - Boring converted to percolation test hole

TABULATED LOGS OF HAND-AUGER BORINGS			
Boring (EL)	Approx. Depth Below Ground Surface (feet)	Description	Remarks
HA-6 (96)	0 to ¼	Silty Sand w/ Gravel (SM) – brown to grayish brown, moist, fine sand, fine angular gravel (Possibly FILL)	- Performed on 03/19/2024 - At 2 feet: PP >4.5 TSF, DD = 98 pcf, MC = 14%
	¼ to 5	Sandy Lean Clay (CL) , brown to grayish brown, moist, firm, medium plasticity, fine sand	- At 4½ feet: PP >4.5 TSF - Terminated at approx. 5 feet
Notes/Abbreviations: -EL: elevation (feet), based on Google Earth Pro -No free groundwater observed in hand-auger borings -Borings backfilled with soil cuttings except for borings converted to percolation test holes -LL: liquid limit -PI: plasticity index -DD: in-situ dry unit weight (lb per cubic foot, pcf) -MC: in-situ moisture content (percent) -PP: pocket penetrometer in TSF (tons/sq. ft.) -TXUU: Unconsolidated-Undrained Triaxial Test -C: Cohesion from TXUU test (psf)			

Free groundwater was not observed within the maximum exploration depth of our hand-auger borings (approximately 5 feet BGS). According to the data available in the State of California Department of Water Resources website², we estimate that groundwater at the Site lies between 20 and 40 feet BGS. It should be noted that groundwater levels can fluctuate depending on factors such as seasonal rainfall, groundwater withdrawal, and construction activities on this or adjacent properties or if water seepage from leaking pipelines or other exposed improvements within excavations is encountered.

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.

7. PERCOLATION TEST RESULTS

We conducted percolation tests at two (2) locations as discussed in the “Percolation Test Holes” section of this report. The percolation rate measured at each test hole was converted into an infiltration rate using the Porchet method. The converted infiltration rates were approximately 0.05 and 0.9 inch/hour at percolation test holes PH-1 (at boring HA-2) and PH-2 (at boring HA-5), respectively. **The converted infiltration rates recorded should be considered only as index values because of the many factors related to the soils that may affect the results. Please refer to the “Storm Water Runoff Mitigation” section of this report for our conclusions and recommendations regarding storm water runoff mitigation for this project.**

² <https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#gwlevels>

8. CONCLUSIONS

Based on the results of our investigation, it is our opinion that the proposed project and related improvements are feasible geotechnically and that the Site may be developed as planned. This conclusion assumes that the recommendations presented in this report will be incorporated into the design and construction of this project.

The primary geologic and seismic hazards for the proposed improvements are the presence of low to moderate expansive surficial soils and the potential for moderate to intense ground shaking during a seismic event, which is typical of most of the State of California. 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 is low. Mitigation of expansive soil behavior is recommended through the use of higher lateral active and at-rest earth pressures for retaining walls, proper moisture conditioning of the subgrade soils, use of “non-expansive” fill, and by deepening footings. Mitigation of ground shaking should be addressed by incorporating pertinent requirements of the 2022 California Building Code (CBC) in the design of the new structures for the project.

Specific recommendations regarding geotechnical design and construction aspects for the project are presented in the “Recommendations” section of this report.

9. RECOMMENDATIONS

Presented below are our recommendations for earthwork, foundations, seismic considerations, retaining walls, exterior concrete flatwork and pavers, pavements, landscaping and irrigation considerations, site drainage, and storm water runoff mitigation as well as associated construction considerations for the planned improvements at this Site.

9.1 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 should be removed such that there are no roots thicker than approximately 1-inch in diameter and the remaining organics are no greater than 3 percent by dry unit weight within the upper 5 feet of finished subgrade or the depth of the root ball, whichever is shallower and laterally a minimum of 5 feet beyond the limits of the improvements (defined as the outside perimeter of walls or footing outer limits, whichever results in the greatest building envelope) and 3 feet beyond the edge of flatwork, pavers, and pavement where



achievable. A BSK representative should check the excavation bottoms before they are backfilled with engineered backfill.

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. Existing pipelines to remain, including subdrain lines, should be carefully located and protected during demolition and during construction.
4. **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.

If zones of loose/soft or saturated soils, including in existing fill areas, 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. Where deleterious matter is encountered in excavations, this material should be overexcavated and disposed off-site.

5. Controlled Low Strength Material (CLSM) typically consists of a mixture of cement, fly ash, coarse and fine aggregate, an air entrainment admixture, and water. Where foundations bear on CLSM, the CLSM should have a 28-day compressive strength of at least 50 pounds per square inch (psi) tested in conformance with ASTM D4832 and sampled in accordance with ASTM D5971. For future excavatability of the CLSM, its 28-day compressive strength should not exceed 1,000 psi. A minimum of one set of cylinders should be cast each day CLSM is placed. One flowability test should be conducted per ASTM D6103 each day CLSM is placed and should be at least 8 inches diameter prior to placement.

The CLSM mix design should be reviewed by the design team and BSK for approval at least 10 business days prior to its use. CLSM placement should be observed and tested by a qualified representative of BSK.

6. Proper granular bedding and shading should be used beneath and around new utilities. Imported fill material should not be any more corrosive than the on-site soils and 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 30%
% Passing #200 Sieve	8% – 40% (general fill) Less than 8% (bedding and shading)

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. Scarification and recompaction should extend laterally a minimum of 5 feet beyond the limits of structures (defined as the outside perimeter of building walls or foundation outer limits, whichever results in the greatest building envelope) and 3 feet beyond the edge of flatwork, pavers, and pavements, where achievable.
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. **Overexcavation and Backfill of Percolation Test Hole Locations:** Where new improvements are constructed over or within 3 feet laterally of the percolation tests holes performed for our investigation, the pertinent test hole areas should be overexcavated to the terminated depths discussed in the "Percolation Test Holes" section of this report during grading and replaced with properly compacted and moisture conditioned engineered fill. The overexcavated areas should measure 5 feet by 5 feet in plan dimensions, where achievable. The approximate location of our percolation test holes (PH-1 and PH-2) are shown on Figure 2.
10. **In 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, pavers, and pavements, where feasible. The aggregate base layer underneath such flatwork and pavement should be compacted to a minimum of 95 percent relative compaction at near optimum moisture content. In addition to these compaction requirements, areas to be exposed to vehicular traffic should be firm and stable and should be proof rolled with a heavy piece of construction equipment, such as a loaded dump truck or water truck, to check for signs of subgrade instability.
11. Compact the upper 12 inches of subgrade for **bioretention areas** to no more than 85 percent compaction at least 2 percent over optimum moisture content. No vibratory compaction should be applied to the subgrade for bioretention areas.
12. 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.

13. 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.
14. 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.

9.2 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. Based on the subsurface conditions encountered in our borings, we expect the sidewalls of trenches that extend to depths of up to about 5 feet to remain relatively vertical for a period of several days. Nevertheless, the longer the trenches remain open the higher the potential for the sidewalls to start to slough off or cave.

Although free groundwater was not observed within the maximum depth of our exploration (approximately 5 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 or if water seepage from leaking pipelines or other exposed improvements within excavations is encountered.

Material quality, placement, and compaction requirements for utility bedding and shading materials³ 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.

³ 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.



Where new utility trenches extend from the exterior into the interior limits of pavement, CSLM or lean concrete should be used as backfill material for a distance of 2 feet laterally on each side of the outside edges of pavement to reduce the potential for the trench to act as a conduit for exterior surface water. Utility trenches located in landscaped areas should also be capped with a minimum of 12 inches of compacted on-site clayey soils.

9.3 Foundation Recommendations

9.3.1 Post-Tensioned Slabs

Post-tensioned (PT) slabs may be used for the planned pickleball courts. PT slabs use high-strength tensioned steel strands to compress the slabs, keeping the majority of the concrete in compression thus allowing for longer spans. According to Section 6.13.3 of the Post-Tensioning Institute's "Design of Post-Tensioned Slab-on-Ground"⁴ manual and Appendix A.8 of the 2nd edition of the Design and Construction of Post-Tensioned Slabs-on-Ground⁵, the soil parameters required for design of a PT slab are: 1) soil type, 2) expected soil settlement, 3) allowable soil bearing pressure, and 4) expected differential settlement. The recommended values for these parameters for this project are listed below.

1. Soil Type: Sandy Lean Clay (CL)
2. Expected Soil Settlement³ $\delta = 1$ inch
3. Allowable soil bearing pressure: $q_{allow} = 1,500$ psf
4. Expected differential settlement: $y_m = \frac{1}{2}$ inch

The bottom of all PT slab excavations should be properly compacted per the recommendations of the "Site Preparation and Grading" section of this report. If moisture vapor through PT slabs is objectionable (i.e., moisture sensitive flooring or objects will be placed over slabs), a vapor barrier at least 15 mils thick, such as 15 mil Stego® Wrap vapor barrier or equivalent, and capillary moisture break consisting of a minimum 6-inch-thick layer of crushed drain rock should be installed underneath the PT slabs. The crushed rock layer should be $\frac{3}{4}$ -inch maximum size with no more than 10 percent by weight passing the #4 sieve. A thickened edge a minimum of 12 inches wide and extending at least 2 inches below the crushed drain rock layer should be installed along the perimeter of PT slabs.

9.3.2 Spread Footings and Mat Foundations

We recommend the criteria presented in the tables below be incorporated into the design of spread footings and mat foundations for this project.

⁴ Design of Post-Tensioned Slabs-on-Ground, 2004, Third Edition, Post-Tensioning Institute.

⁵ Design and Construction of Post-Tensioned Slabs-on-Ground, 1996, Second Edition, Post-Tensioning Institute.



FOOTING DESIGN CRITERIA	
Static Allowable Bearing Capacity ¹	2,500 psf
Seismic/Wind Allowable Bearing Capacity ¹	3,750 psf
Passive Resistance (Equivalent Fluid Pressure) ^{2,3}	300 pcf
Allowable Lateral Sliding Resistance Adhesion ³	600 psf
Minimum Embedment Depth ⁴	18 inches
Minimum Width	12 inches (continuous) 18 inches (isolated)
Notes: - 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). - Neglect upper 1 foot if surface is not confined by concrete slab or pavement. For foundations located on or proximate to sloping ground, such as bioretention areas, 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. - 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. - Below lowest adjacent grade considered to be bottom of slab on the interior or finished grade on the exterior.	

MAT SLAB FOUNDATION CRITERIA ¹	
Static Allowable Bearing Capacity ²	1,500 psf
Seismic/Wind Allowable Bearing Capacity ²	2,250 psf
Passive Resistance (Equivalent Fluid Pressure) ^{3, 4}	300 pcf
Allowable Coefficient of Friction ⁴	0.30
Modulus of Vertical Subgrade Reaction ⁵	120 psi/in
Minimum Slab Thickness ⁶ at the Edges	12 inches
Notes: 1. Mat slab foundations should be supported on a minimum of 12 inches of compacted Caltrans Class 2 aggregate base to provide enhance slab support. If moisture vapor through the slab is objectionable (i.e., moisture sensitive flooring or objects will be placed over slabs), a vapor barrier at least 15 mils thick, such as 15 mil Stego® Wrap vapor barrier or equivalent, and capillary moisture break consisting of a minimum 6-inch-thick layer of crushed drain rock should be installed underneath mat foundations. If used, the crushed drain rock layer may substitute an equivalent amount of the recommended aggregate base layer. The crushed rock layer should be ¾-inch maximum size with no more than 10 percent by weight passing the #4 sieve. 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, such as bioretention areas, 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 allowable coefficient of friction 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. 5. Based on a one square foot bearing plate. This unadjusted value needs to be adjusted for the actual size of the mat as follows: a. Multiply by [(m+0.5)/(1.5 x 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. 6. Below lowest adjacent finished grade. The thickened edge should be a minimum of 12 inches wide. 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 elastic settlements are estimated to be on the order of 1- and ½-inch, respectively. Differential settlement is defined in this report as the vertical difference in settlement 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.



9.3.3 Additional Considerations for Shallow Foundations

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. Where this is not possible or feasible, we recommend that CLSM be used to backfill the portion of the utility trench that extends below the 1H:1V projection. Also, if a utility crosses perpendicular to a footing, if it is located within a vertical distance of $2 \times W$ of the bottom of the footing, where W = width of footing, the utility should be encased in CLSM or lean concrete. If a perpendicular utility is located below a depth of $2 \times W$ below the footing, the utility does not need to be encased in CLSM or lean concrete.

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.

9.3.4 Drilled Piers

Shade structures, light poles, flag poles, fences, and gates, can be supported on shallow drilled piers. We recommend the following criteria be incorporated into the design of shallow drilled pier foundations for this project.



DRILLED PIER FOUNDATION CRITERIA	
Static Allowable Downward Skin Friction ¹	500 psf
Seismic/Wind Allowable Downward Skin Friction ¹	670 psf
Passive Resistance (Equivalent Fluid Pressure) ²	300 pcf
Minimum Pier Diameter	18 inches ³
Minimum Pier Depth Below Ground Surface	5 feet ³
Minimum Pier Center to Center Spacing	3D ⁴ (axial loading) 6D ^{4,5} (lateral loading)
Notes: - 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. - Neglect upper 1 foot if surface is not confined by concrete slab or pavement. For piers located on or proximate to sloping ground, such as bioretention areas, 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. - The pier diameter and embedment depth may be reduced to 12 inches and 3 feet, respectively, for chain link fences and chain link gates that are up to 6 feet in vertical height. - 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). - 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: - For trailing⁶ 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), - 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), - For trailing piers spaced 6D or greater apart, no reduction is needed, and - 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 on the order of ½-inch and ¼-inch, respectively. Differential settlement is defined in this report as the vertical difference in settlement 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.

9.3.5 Additional Considerations for Drilled Piers

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

⁶ 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.

Although free groundwater was not observed within the maximum depth of our exploration (approximately 5 feet BGS), the actual depth at which groundwater may be encountered in trenches and excavations may vary. 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.

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 Piers⁷. The recommendations provided within ACI 336.3R-14 should be followed, 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 and temporary smooth-walled casing should not be permanently left in the drilled pier holes unless BSK is consulted.**

The pier excavations should be monitored by a representative of BSK to confirm the soils encountered are similar to those encountered in our borings drilled for this project and check that the contractor properly mitigates the presence of groundwater and caving conditions (if applicable) during installation of the piers.

9.3.6 2022 CBC Mapped Seismic Design Parameters

The seismicity of the region surrounding the Site is discussed in the “Site Geology and Seismicity” section of this report. From that discussion, it is important to note that the Site is in a region of moderate seismic activity and will likely be subjected to moderate to intense ground 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.

Based on Section 1613.2.2 of the 2022 CBC, the Sites shall be classified as Site Class A, B, C, D, E or F based on the Site soil properties and in accordance with Chapter 20 of ASCE 7-16. Based on our investigation and the estimated shear wave velocity presented in the California Geological Survey’s Data Viewer

⁷ ACI Committee 336, 2014



website⁸, we recommend the Site be classified as a Site Class D. **We have not performed a site-specific ground motion hazards analysis for this project.** Instead, we have provided mapped CBC seismic parameters in the table below, including increased values for S_{M1} and S_{D1} per the exception for Site Class D sites provided in ASCE 7-16, Supplement 3, Section 11.4.8, Item 1.

2022 CBC SEISMIC DESIGN PARAMETERS (Lat: 37.089363, Lon: -120.833650)			
Seismic Design Parameter	Value		Reference
Site Class	D		ASCE 7-16, Table 20.3-1
MCE _R Mapped Spectral Acceleration (g)	S _S = 1.135	S ₁ = 0.391	USGS Mapped Values
Site Coefficients (Site Class D)	F _a = 1.046	F _v = 1.909 ^A	ASCE 7-16, Table 11.4-1 & -2 (Supplement 3)
MCE _R Mapped Spectral Acceleration Adjusted for Site Class Effects (g)	S _{MS} = 1.187	S _{M1} = 1.120 (See Note B below)	ASCE 7-16, Eq. 11.4-1 & -2 (Supplement 3)
Design Spectral Acceleration (g)	S _{DS} = 0.791	S _{D1} = 0.747 (See Note B below)	ASCE 7-16, Eq. 11.4-3 & -4 (Supplement 3)
Site Short Period – T _S (Seconds)	T _S = 0.944		T _S = S _{D1} /S _{DS}
Site Long Period T _L (Seconds)	8		USGS Mapped Value
Seismic Design Category (SDC)	D		ASCE 7-16, Section 11.6
MCE _G peak ground acceleration adjusted for Site Class effects (g)	PGA _M = 0.53		ASCE 7-16, Section 11.8.3
Definitions: MCE _R = Risk-Targeted Maximum Considered Earthquake MCE _G = Maximum Considered Earthquake Geometric Mean			
Notes: A. See requirements for site-specific ground motions in ASCE 7-16, Section 11.4.8. This value of F _v shall be used only for calculation of T _S , determination of Seismic Design Category, linear interpolation for intermediate values of S ₁ , and when taking the exceptions under Items 1 and 2 of Section 11.4.8 for the calculation of S _{D1} . B. S_{M1} and S_{D1} values with a 50% increase assuming the exception for Site Class D described in ASCE 7-16 Supplement 3, Section 11.4.8, Item 1 is taken. Otherwise, a site-specific ground motion analysis per ASCE 7-16 Section 21.2 is required.			

9.4 Below-Grade Walls

Short below-grade walls for bioretention areas up to 5 feet in height may be supported on spread footings per the recommendations presented in the “Spread Footings and Mat Foundations” section above. Lateral earth pressures for below-grade walls are presented in the table below and are expressed as equivalent

⁸ <https://maps.conservation.ca.gov/cgs/DataViewer/>

fluid pressures (unit weights) in units of pounds per cubic foot (pcf). In addition to these earth pressures, the designer should add hydrostatic pressures unless a drainage system is installed behind the walls.

RECOMMENDED LATERAL EARTH PRESSURES (FOR WALLS UP TO 5 FEET IN HEIGHT)	
Description	Level Backfill up to 6H:1V ¹
Active Earth Pressure (flexible walls) ²	45 pcf
At-Rest Earth Pressure (restrained walls) ²	60 pcf
Notes: 1. Horizontal to vertical. 2. Expressed as an equivalent fluid pressure. Does not include hydrostatic pressures that might be caused by groundwater or water trapped behind the walls.	

9.4.1 Seismic Wall Pressures

According to Section 1803.5.12 of the 2022 CBC, dynamic seismic lateral earth pressures need to be included in the design of walls supporting more than 6 feet of backfill height. Because the height of below-grade walls for this project will be limited to 5 feet or less, we conclude that seismic lateral earth pressures do not need to be included in the wall design.

9.4.2 Wall Drainage

Retaining walls higher than 2 feet should be either designed to resist hydrostatic pressures or be well-drained to reduce the potential for hydrostatic pressures to develop behind the walls. A typical drainage system for a cantilevered wall may consist of a 1- to 2-foot-wide zone of Caltrans Class 2 Permeable material immediately behind the wall with a perforated pipe at the base of the wall discharging to a storm drain or other appropriate discharge facility via gravity flow. As an alternative, a prefabricated drainage board may be used in lieu of the Class 2 Permeable material. Where conditions allow for the use of weep holes, they may be used in lieu of the perforated pipe. The holes should be a minimum of 2 inches in diameter and spaced at 4 feet or less on-center. Filter fabric or wire mesh should be placed over the holes at the backside of the wall to inhibit the permeable material, if used in lieu of a drainage board, from washing through the holes. **Unless the drainage zone behind below-grade walls is protected by concrete flatwork or impervious pavement, it should be capped with a minimum 12-inch-thick layer of properly compacted on-site clayey soil or CSLM to reduce the risk of surface runoff discharging into the wall drain.**

9.4.3 Surcharge Loads

Surcharge loads caused by vehicular and/or construction traffic adjacent to the walls may be assumed to consist of a rectangular distributed uniform pressure of 100 psf acting over a depth of 10 feet below the ground surface of the retained soil. For other surcharge loads, a rectangular distribution with a uniform



pressure equal to one-third and one-half of the surcharge pressure should be used for an unrestrained wall (active earth pressure condition) and for a restrained wall (at-rest earth pressure conditions), respectively. The wall designer should evaluate whether this surcharge is appropriate for the expected traffic loading. Additional analyses during design may be needed to evaluate the effects of non-uniform surcharge loads such as point loads, line loads, or other such presently undefined surcharge loads. In that case, we should be consulted for supplemental geotechnical recommendations.

9.5 Exterior Concrete Flatwork and Pavers

New exterior concrete flatwork and pavers 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 and pavers should be moisture conditioned according to the recommendations in the "Site Preparation and Grading" section of this report. In addition, all exterior flatwork and pavers should be supported on a minimum of 6 inches of "non-expansive" fill. Where concrete flatwork and pavers are to be exposed to vehicle traffic, the 6-inch layer of "non-expansive" fill should consist of Caltrans Class 2 aggregate base.

Practices recommended by the Portland Cement Association (PCA) and the American Concrete Institute (ACI) for proper placement and curing of concrete, as well as for joint spacing and construction, should be followed during exterior concrete flatwork slab construction. Due to the presence of low to moderately expansive soils near the site surface, flatwork should have control joints (i.e., weakened plane joints) spaced no more than 8 feet on centers. New pedestrian concrete flatwork should have a minimum thickness of 4 inches and minimum reinforcing of #4 bars at 18 inches on center (both ways). The rebar should be discontinued at expansion joints. Slip Dowels should be used at 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 and pavers 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 and pavers.

Prior to construction of the flatwork and pavers, 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 and paver 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/pavers and buildings, including concrete driveways.



9.6 Pavements

9.6.1 Asphalt Concrete for Pickleball Courts

If a concrete slab or a post-tensioned slab are not used for the pickleball courts, the pavement section for these courts should consist of a minimum of 3 inches of asphalt concrete over a minimum of 12 inches of Caltrans Class 2 aggregate base.

9.6.2 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. This section is equivalent to a Traffic Index of at least 6.0 to 6.5 based on our experience and is expected to support traffic loading from a fire engine, a delivery truck, or a maintenance truck. 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.

9.6.3 Additional Pavement Recommendations

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.

9.7 Effect of Plants on Foundation, Flatwork, and Paver Performance

Because of the expansive nature of some of the on-site soils, trees and other large plants can significantly contribute to differential settlement of a foundation, flatwork, pavers, and paved areas. 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, pavers, 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.



A root barrier should be considered between trees and adjacent improvements and should be designed and installed following the recommendations of a landscape architect.

9.8 Landscaping Irrigation

Vegetation should not be planted immediately adjacent to structures. If planting adjacent to structures is desired, we recommend using plants that require very little moisture with drip irrigation systems. Sprinkler systems should not be installed where they may cause ponding or saturation of subgrade soils within 5 feet of structures, slabs, pavements, concrete flatwork, or pavers. Otherwise, such ponding could cause loss of soil strength and movement of foundations, slabs, pavements, concrete flatwork, and pavers.

Irrigation of landscaped areas should be strictly limited to that necessary to sustain vegetation. Excessive irrigation could result in saturation and weakening of foundation soil.

9.9 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 new 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's perimeter foundations as required by the 2022 CBC, if feasible, when considering Americans with Disabilities Act (ADA) requirements. Water should not be allowed to pond anywhere on-site.

9.10 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 typically 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 could result in increased distress and reduced service life of foundations, flatwork, pavers, and pavement 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 slopes, foundations, flatwork, pavers, 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, lateral restraints for exterior flatwork and



pavers, or footings located adjacent to a bioretention area should be adequately keyed into the native soil and should be engineered using the recommendations provided for below-grade walls in the “Below-Grade Walls” section of this report to reduce the potential for rotation or lateral movement of these improvements. 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 and our percolation test results presented in the “Percolation Test Results” section of this report, we expect the near surface clayey soils encountered at the Site to have low to moderate permeability. The lower converted infiltration rate obtained at percolation test hole PH-1 is within the range of saturated hydraulic conductivities typical of Hydrologic Group D (i.e., values lower than 0.14 in/hr), while the higher converted infiltration rate obtained at percolation test hole PH-2 is within the range of saturated hydraulic conductivities typical of Hydrology Group C (i.e., 0.14 to 1.42 in/hr) per Chapter 7 of Part 630 Hydrology National Engineering Handbook (United States Department of Agriculture, 2007). **Because of the variability between the two test results, we recommend designing bioretention areas for this project using Hydrologic Group D.**

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. Also, denser soils have lower infiltration rates than less dense soils. Therefore, **it is important to not over-compact the bottom of bioretention areas and similar facilities beyond what is recommended in the “Site Preparation and Grading” section of this report.**

9.11 Corrosion Potential

A soil sample was collected during our field investigation in the upper approximately 5 feet BGS at hand-auger boring HA-1 and submitted for corrosion testing. The sample was tested by CERCO Analytical, a State-certified laboratory in Concord, California, for pH, resistivity, chloride content, and sulfate content in accordance with Caltrans test methods. The test results are presented at the end of Appendix A. Also included is the evaluation by CERCO Analytical of the corrosion test results.

Based upon the resistivity measurements, the sample tested was classified as "severely corrosive" by CERCO Analytical. The sulfate ion concentration was 270 mg/kg (ppm). This result is indicative of an exposure categories of 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. The redox potential was 59-mV, which is indicative of potentially “severely corrosive” soils resulting from anaerobic soil conditions. CERCO Analytical concluded that the sulfate ion concentration is sufficient to potentially be detrimental to reinforced concrete structures and cement mortar-coated steel. Therefore, they recommend the use of sulfate resistant cement, such as Type II, with a maximum water-to-cement ratio of 0.55. CERCO Analytical also recommends that all buried iron, steel, cast iron, ductile iron, galvanized steel, and dielectric coated steel or iron be properly protected against corrosion depending upon the critical nature of the structure. In addition, they recommend that all buried metallic pressure piping, such as ductile iron firewater



pipelines, should be protected against corrosion. Because we are not corrosion specialists, we recommend that a corrosion specialist be consulted for advice on proper corrosion protection for underground piping which will be in contact with the soils and other 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. BSK does not practice corrosion engineering. Consideration should also be given to soils in contact with concrete that will be imported to the Site during construction, such as topsoil and landscaping materials, which typically contain fertilizers and other chemicals that can be highly corrosive to metals and concrete. Any imported soil or landscaping 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 this investigation.

9.12 Plan Review and Construction Observation

BSK has been retained by the Client to review the geotechnical aspects of the project plans 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.

10. ADDITIONAL SERVICES AND LIMITATIONS

10.1 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,
- observations of site grading, including stripping, engineered fill construction, and backfill of excavations resulting from the demolition of existing improvements to be removed,



- observation of foundation construction, including drilled piers, and
- in-place density testing of fills, backfills, finished subgrades, and aggregate base.

10.2 Limitations

The findings, conclusions, and recommendations contained in this report are based on our field observations and subsurface exploration, limited field and laboratory tests, previous subsurface data by others, 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 air, 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. In the event BSK is not retained to review the final project plans 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.

11. 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

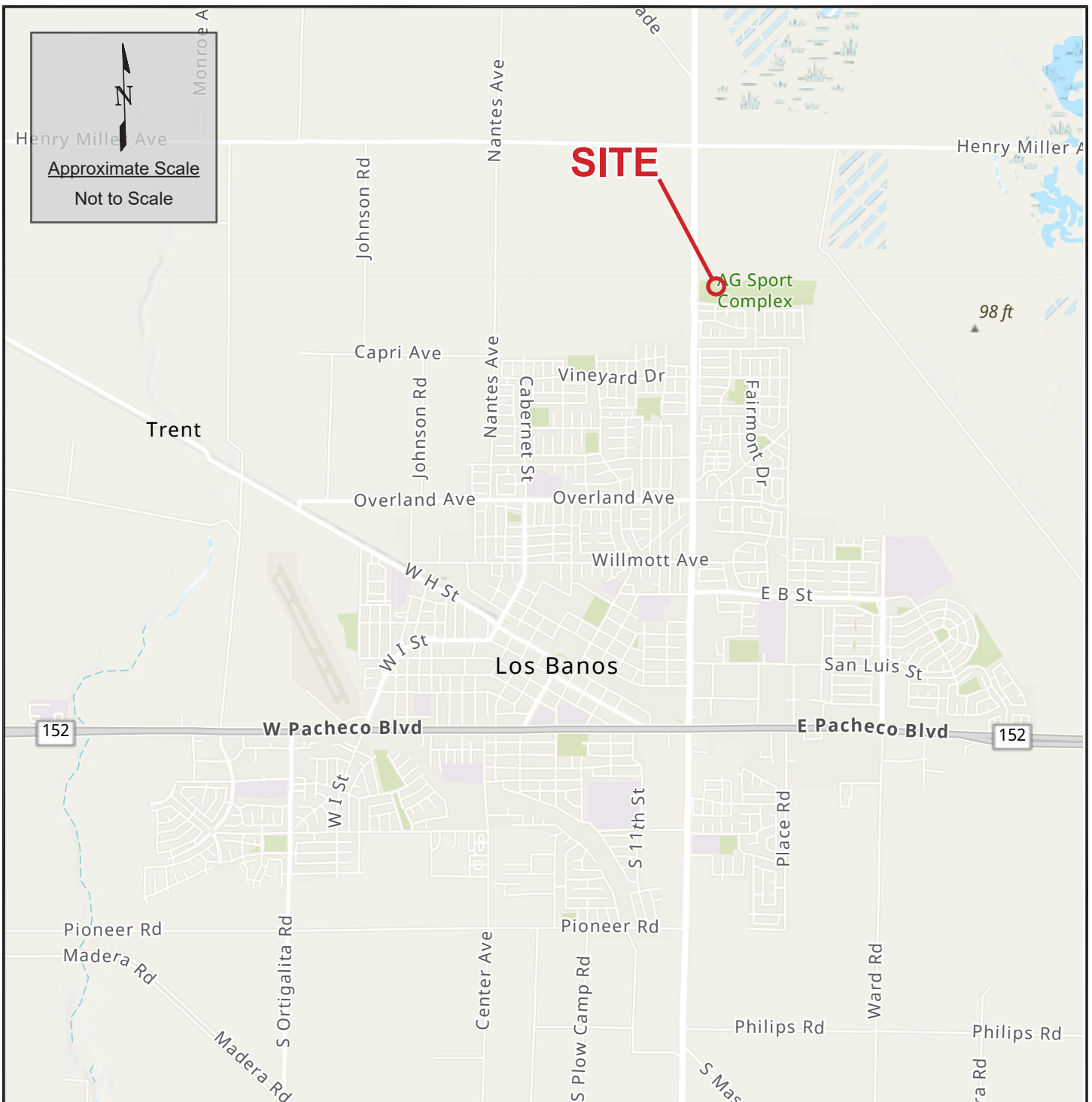

Omar K. Khan, PGiT
Project Professional II


Cristiano Melo, PE, GE #2756
Branch Manager



FIGURES





References: 1. <https://www.arcgis.com/apps/mapviewer/index.html>, 2023

Note: Locations are approximate

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PROJECT NO. B24000127

DRAWN: 03/21/2024

DRAWN BY: K. Yang

CHECKED BY: C. Melo

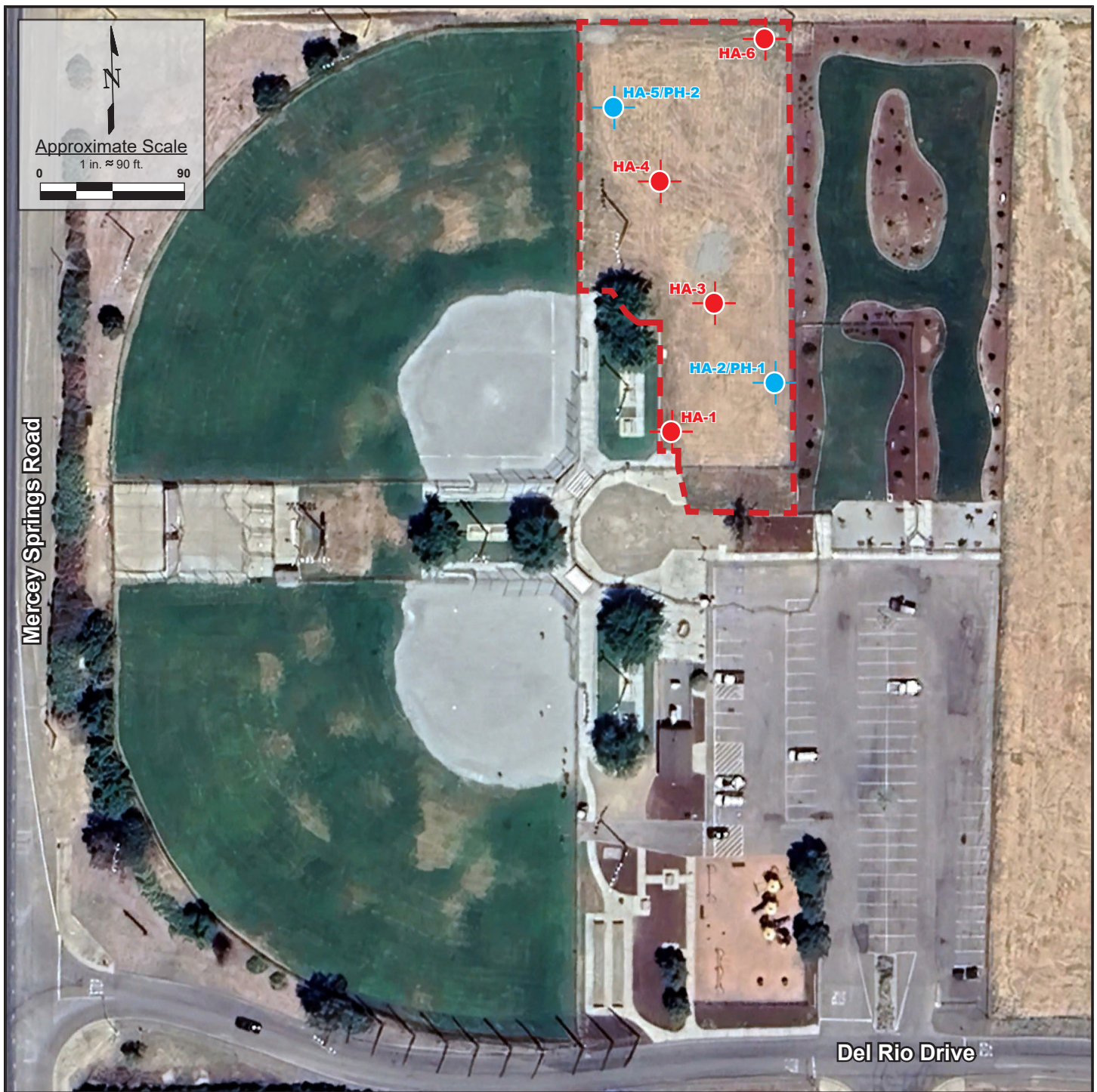
FILE NAME:
Figures.indd

VICINITY MAP

AG Sports Complex Pickleball Courts
700 Mercey Springs Road
Los Banos, California

FIGURE

1



References: 1. <http://earth.google.com>, 2024

Notes: 1. All locations are approximate

Legend

- B-1 Approximate Boring Location (By BSK, 2024)
- B-1/PH-1 Approximate Boring/Percolation Test Hole Location (By BSK, 2024)
- Approximate Limits of Project Boundaries

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PROJECT NO. B24000127

DRAWN: 03/21/2024

DRAWN BY: K. Yang

CHECKED BY: C. Melo

FILE NAME:
Figures.indd

SITE PLAN

AG Sports Complex Pickleball Courts
700 Mercey Springs Road
Los Banos, California

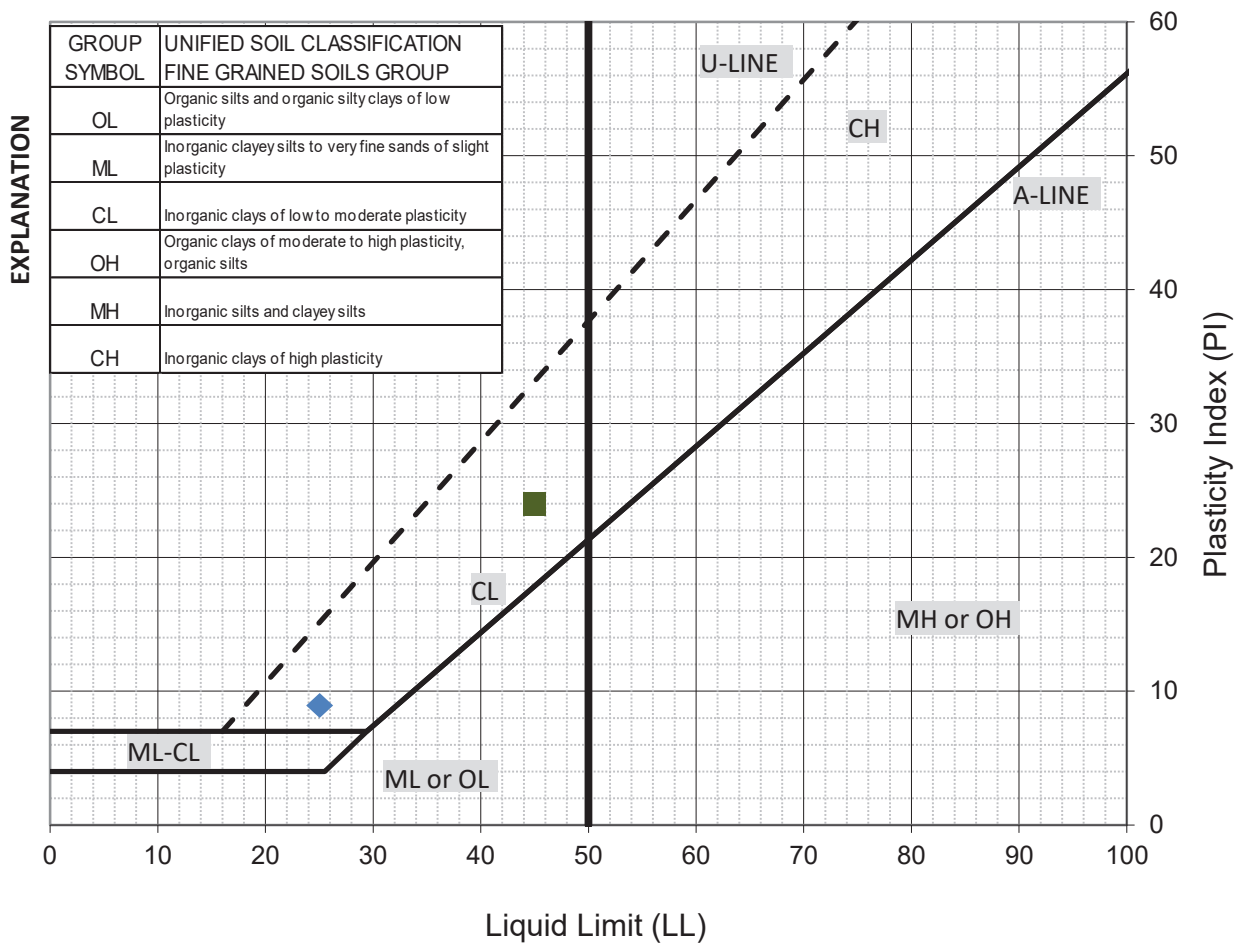
FIGURE

2

APPENDIX A

Laboratory Test Results





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PROJECT NO. B24000127

DRAWN: 04/05/24

DRAWN BY: B. Steen

CHECKED BY: C. Melo

FILE NAME:
Figures.indd

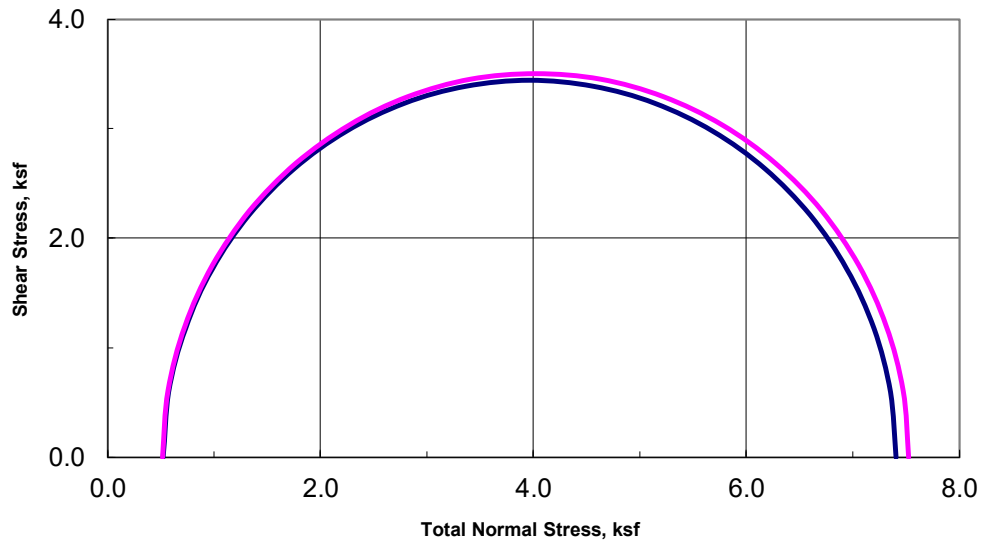
ATTERBERG LIMITS

AG Sports Complex Pickleball Courts
700 Mercey Springs Road
Los Banos, California

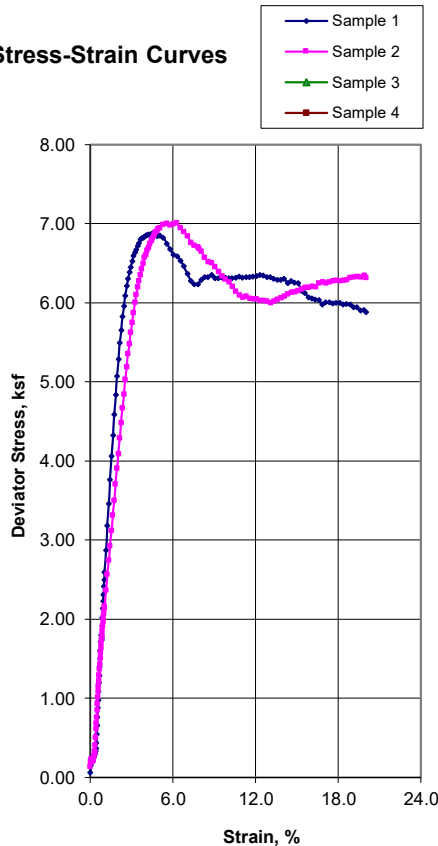
FIGURE

A-1

Unconsolidated-Undrained Triaxial Test ASTM D2850



Stress-Strain Curves



Sample Data

	1	2	3	4
Moisture %	13.1	14.2		
Dry Den,pcf	114.5	117.0		
Void Ratio	0.472	0.440		
Saturation %	75.1	87.2		
Height in	3.96	3.99		
Diameter in	1.91	1.91		
Cell psi	3.6	3.6		
Strain %	4.53	6.28		
Deviator, ksf	6.884	7.012		
Rate %/min	1.00	1.00		
in/min	0.040	0.040		
Job No.:	664-542			
Client:	BSK Associates			
Project:	B24000127			
Boring:	HA-3	HA-4		
Sample:	2	1		
Depth ft:	4.5-5	3.5-4		

Visual Soil Description

Sample #	
1	Sandy Lean CLAY (CL)
2	Sandy Lean CLAY (CL)
3	
4	
Remarks:	

Note: Strengths are picked at the peak deviator stress or 15% strain which ever occurs first per ASTM D2850.

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1100 Willow Pass Court, Suite A

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925 462 2771 Fax. 925 462 2775

www.cercoanalytical.com

4 April, 2024

Job No. 2403051

Cust. No. 12667

Mr. Kou Yang
BSK Associates Engineers & Laboratories
399 Lindbergh Avenue
Livermore, CA 94551

Subject: Project No.: B24000127
Project Name: AG Sports Complex Pickleball Courts
Corrosivity Analysis – ASTM Test Methods

Dear Mr. Yang:

Pursuant to your request, CERCO Analytical has analyzed the soil sample submitted on March 29, 2024. Based on the analytical results, this brief corrosivity evaluation is enclosed for your consideration.

Based upon the resistivity measurement, the 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 is 180 mg/kg and is determined to be insufficient to attack steel embedded in a concrete mortar coating.

The sulfate ion concentration is 270 mg/kg and is determined to be sufficient to potentially be detrimental to reinforced concrete structures and cement mortar-coated steel at these locations. Therefore, concrete that comes into contact with this soil should use sulfate resistant cement such as Type II, with a maximum water-to-cement ratio of 0.55.

The pH of the soil is 8.78, which does not present corrosion problems for buried iron, steel, mortar-coated steel and reinforced concrete structures.

The redox potential is 59-mV and is indicative of potentially "severely 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.


J. Darby Howard, Jr., P.E.
President

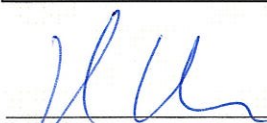
JDH/jdl
Enclosure

Client: BSK Associates Engineers & Laboratories
Client's Project No.: B24000127
Client's Project Name: AG Sports Complex Pickleball Courts
Date Sampled: 26-Mar-24
Date Received: 29-Mar-24
Matrix: Soil
Authorization: Chain of Custody

Date of Report: 4-Apr-2024

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)*
2403051-001	Bulk 1 @ 1-5'	59	8.78	-	370	-	180	270

Method:	ASTM D1498	ASTM D4972	ASTM D1125M	ASTM G57	ASTM D4658M	ASTM D4327	ASTM D4327
Reporting Limit:	-	-	10	-	50	15	15
Date Analyzed:	1-Apr-2024	1-Apr-2024	-	29-Mar-2024	-	3-Apr-2024	3-Apr-2024


Julia Clauson
Chemist

* Results Reported on "As Received" Basis

N.D. - None Detected

APPENDIX B

Important Information About This Geotechnical-Engineering Report



Important Information about This Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer

will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

Most of the “Findings” Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site’s subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual site-wide subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report’s Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals’ misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals’ plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note*

conspicuously that you’ve included the material for information purposes only. To avoid misunderstanding, you may also want to note that “informational purposes” means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled “limitations,” many of these provisions indicate where geotechnical engineers’ responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a “phase-one” or “phase-two” environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer’s services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, *proper implementation of the geotechnical engineer’s recommendations will not of itself be sufficient to prevent moisture infiltration.* Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. *Geotechnical engineers are not building-envelope or mold specialists.*



**GEOPROFESSIONAL
BUSINESS
ASSOCIATION**

Telephone: 301/565-2733

e-mail: info@geoprofessional.org www.geoprofessional.org

APPENDIX B

Ag Sports Complex Structural Calculations

prepared by RW Consulting Engineers, Inc.

Dated September 20, 2024



1450 Harbor Boulevard Suite F
West Sacramento, CA
p: 916.716.6910
www.rwengineers.com

AG Sports Complex

Los Banos, CA

Structural Calculations



September 20, 2024

AG Sports Complex

Los Banos, CA

1.	<i>Design Criteria</i>	1
2.	<i>Fence Pole & Footing Design</i>	5
3.	<i>Light Pole Footing & Anchorage Design</i>	12
4.	<i>Sport Court Slab Design</i>	24
5.	<i>Ball Wall Pole & Footing Design</i>	26

These calculations were prepared by

RW Consulting Engineers

September 24, 2024

Design Criteria**Project Scope**

The following calculations have been prepared by RW Engineers for design of fencing posts & footings, light pole footings, and post-tensioned sport courts.

General Criteria

Applicable Building Code: 2022 CBC Risk Category: II
Governing Jurisdiction:

Project Location: 700 Mercey Springs Road Loa Banos, CA 93635
Latitude: +37.08892 Degrees North
Longitude: -120.82932 Degrees West

Soils Criteria

Soils Report By: BSK
Project Number: B24000127 Dated: May 6, 2024
Allowable Bearing Pressure = 2,500 psf (For D + L Loads)
= 3,333 psf (Including W or E Loads)

Passive Pressure = 300 lb / cu ft Coefficient of Friction = 0.30
Active Pressure = 45 lb / cu ft At Rest Pressure = 60 lb / cu ft

Design Criteria



Hazards by Location

Search Information

Coordinates: 37.089520996355084, -120.8334100331005
Elevation: 97 ft
Timestamp: 2024-09-05T15:01:02.029Z
Hazard Type: Wind



ASCE 7-16

MRI 10-Year 64 mph
MRI 25-Year 70 mph
MRI 50-Year 75 mph
MRI 100-Year 80 mph
Risk Category I 87 mph
Risk Category II 93 mph
Risk Category III 100 mph
Risk Category IV 104 mph

ASCE 7-10

MRI 10-Year 72 mph
MRI 25-Year 79 mph
MRI 50-Year 85 mph
MRI 100-Year 91 mph
Risk Category I 100 mph
Risk Category II 110 mph
Risk Category III-IV 115 mph

ASCE 7-05

ASCE 7-05 Wind Speed 85 mph

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Please note that the ATC Hazards by Location website will not be updated to support ASCE 7-22. [Find out why.](#)

Disclaimer

Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer. Per ASCE 7, islands and coastal areas outside the last contour should use the last wind speed contour of the coastal area – in some cases, this website will extrapolate past the last wind speed contour and therefore, provide a wind speed that is slightly higher. NOTE: For queries near wind-borne debris region boundaries, the resulting determination is sensitive to rounding which may affect whether or not it is considered to be within a wind-borne debris region.

Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.

Design Criteria**ATC** Hazards by Location**Search Information**

Coordinates: 37.089520996355084, -120.8334100331005
Elevation: 97 ft
Timestamp: 2024-09-05T14:55:25.685Z
Hazard Type: Seismic
Reference Document: ASCE7-16
Risk Category: II
Site Class: D

**Basic Parameters**

Name	Value	Description
S_S	1.134	MCE_R ground motion (period=0.2s)
S_1	0.39	MCE_R ground motion (period=1.0s)
S_{MS}	1.186	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	0.791	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

Additional Information

Name	Value	Description
SDC	* null	Seismic design category
F_a	1.047	Site amplification factor at 0.2s
F_v	* null	Site amplification factor at 1.0s
CR_S	0.927	Coefficient of risk (0.2s)
CR_1	0.931	Coefficient of risk (1.0s)
PGA	0.468	MCE_G peak ground acceleration

Design Criteria

F _{PGA}	1.132	Site amplification factor at PGA
PGA _M	0.53	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	1.134	Probabilistic risk-targeted ground motion (0.2s)
SsUH	1.223	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.5	Factored deterministic acceleration value (0.2s)
S1RT	0.39	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.419	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.6	Factored deterministic acceleration value (1.0s)
PGAd	0.5	Factored deterministic acceleration value (PGA)

* See Section 11.4.8

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Please note that the ATC Hazards by Location website will not be updated to support ASCE 7-22. [Find out why.](#)

Disclaimer

Hazard loads are provided by the U.S. Geological Survey [Seismic Design Web Services](#).

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Fences**Criteria**

- 1) Fence heights are 4ft at interior, 6' at perimeter
- 2) All 6ft fences to be designed for solid wind screen. All 4ft fences to be designed for open mesh (50% open).

Wind Loads

Risk Category = II

[ASCE 7-16 Chapter 26]

$$\begin{aligned} \text{Exposure} &= C & K_z \text{ (Velocity Pressure Exposure Coefficient)} &= 2.01 (Z/Z_g)^{2/\alpha} \\ \text{Wind Speed (ASD)} &= 72 \text{ mph} & K_{zt} \text{ (Topographic Factor)} &= 1.00 \\ \text{Wind Speed (USD)} &= 93 \text{ mph} & K_d \text{ (Wind Directionality Factor)} &= 0.85 \\ & & K_e \text{ (Ground Elevation Factor)} &= 1.00 \end{aligned}$$

ASD Wind Pressures

$$\begin{aligned} q(z) &= 0.00256 \times K_z \times K_{zt} \times K_d \times K_e \times V^2 \\ q(0'-15') &= 0.00256 \times 0.85 \times 1.00 \times 0.85 \times 1.00 \times (72)^2 = 9.6 \text{ psf} \end{aligned}$$

Seismic Design Criteria

Risk Category = II

Seismic Design Category D

[ASCE 7-16 Ch 11]

I (Seismic) = 1.00

Equivalent Lateral Force Procedure

Site Class D

$$\begin{aligned} S_{DS} &= 2/3 \times F_a \times S_s = 2/3 \times 1.046 \times 1.135 = 0.791 \text{ g (0.2 s)} & [\text{ASCE 7-16, Eq. 11.4-3}] \\ S_{D1} &= 2/3 \times F_v \times S_1 = 2/3 \times 2.867 \times 0.391 = 0.747 \text{ g (1.0 s)} & [\text{ASCE 7-16, Eq. 11.4-4}] \end{aligned}$$

Ground Supported Cantilever Walls & Fences

$R = 1.25$

$\Omega_0 = 2.00$

$C_d = 2.50$

$$V = C_s \times W = \frac{S_{DS}}{R/I} \times W = \frac{0.791}{1.25 / 1.00} \times W = 0.633 \times W \quad [\text{ASCE 7-16, Eq. 12.8-2}]$$

Site-Specific Ground Motion Procedure required for Site Class D & $S_1 > 0.2$

[ASCE 7-16, Section 11.4.8-3]

*Site-Specific Ground Motion Procedure not required provided $T \leq 1.5T_s$.

[ASCE 7-16, Section 11.4.8, Excep. 2]

If $T > 1.5T_s$, increase C_s values per Eqn 12.8-3 & 12.8-4 by 50%.

$T_a = C_t h_n^x = 0.02 \times 6^{0.75} = 0.077 \text{ s}$

[ASCE 7-16, Eq 12.8-7]

$F_v = 2.867$

[ASCE 7-16, Table 11.4-2]

$T_L = 8 \text{ s}$

[ASCE 7-16, Fig 22-14]

$T_s = S_{D1} / S_{DS} = 0.747 / 0.791 = 0.944 \text{ s}$

$1.5 \times T_s = 1.416 \text{ s} \geq 0.077 \text{ s}$

Short period building - C_s determined by Eqn 12.8-2 as shown above

$E(\text{USD}) = \rho \times V = 1.0 \times 0.633 \times W = 0.633 \times W$

[ASCE 7-16, Eq. 12.4-3]

$E(\text{ASD}) = 0.7 \times V(\text{USD}) = 0.7 \times 0.633 \times W = 0.443 \times W$

Fences**Seismic Loads**

Fence Weight = 10 psf

Seismic Shear = 4.4 psf

Wind Loads Control**Wind Loads**

ASCE 7 Section 29.3

A) 6ft fence w/screening:

$$F = q_h G C_f = 16.3 \text{ psf (ASD)}$$

$$q_h = 9.6 \text{ psf}$$

$$G = 0.85$$

$$C_f = 2.0$$

B) 4ft fence w/no screening:

$$F = r q_h G C_f = 10.6 \text{ psf (ASD)}$$

$$q_h = 9.6 \text{ psf}$$

$$G = 0.85$$

$$C_f = 2.0$$

$$\varepsilon = 0.5 \text{ (9 gauge wire w/2" mesh, 50% open)}$$

$$r = 0.65$$

Fence Pole

$$Z_{reqd} = \frac{\Omega M}{F_y}$$

$$F_y = 35000 \text{ psi (A53)}$$

$$\Omega = 1.67$$

$$F_y = 50000 \text{ psi (A500 Grade C)}$$

Fence Force Summary

Fence Height (ft)	Post Spcg (ft)	Trib Area (ft ²)	Shear (lb)	Arm (ft)	Moment (ft-lb)
4.00	10.00	40.00	422	2.70	1139
6.00	10.00	60.00	979	3.80	3721

Fences**Fence Post Summary**

Fence Height (ft)	Post Spcg (ft)	A53		A500 Grade C	
		Z req'd (in ³)	Pole Size	Z req'd (in ³)	Pole Size
4.00	10.00	0.65239	Pipe 2 STD	0.45667	HSS 1.9 x.188
6.00	10.00	2.13052	Pipe 3 STD	1.49136	HSS 2.875x.25

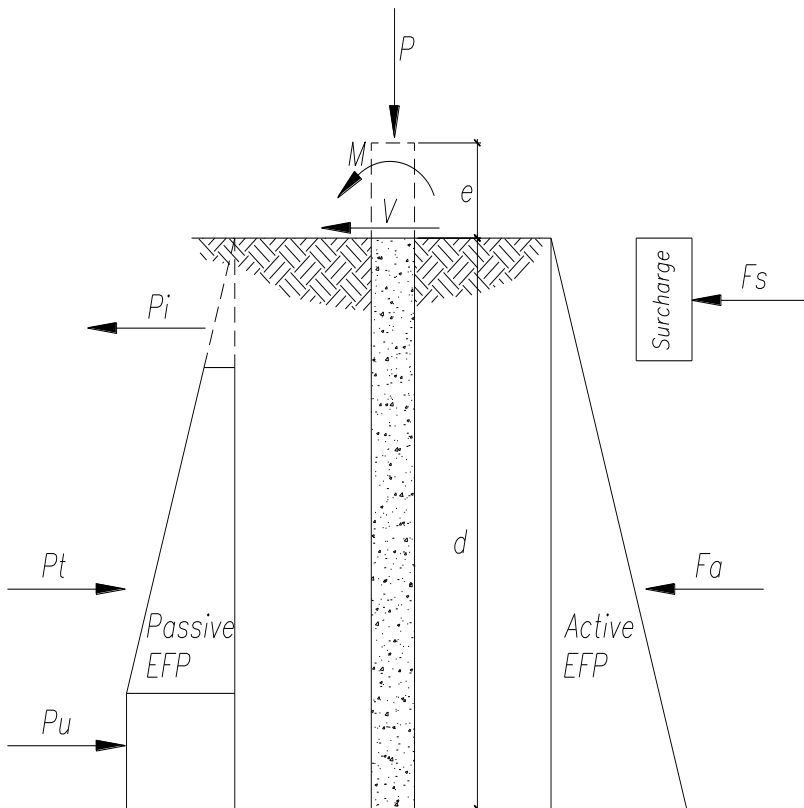
Fence Footing Summary

Fence Height (ft)	Post Spcg (ft)	Footing	
		Diam. (in)	Depth (ft)
4.00	10.00	12	4.00
6.00	10.00	12	6.00

Fences

4ft Fence 12" diameter ftg

(Passive reduced by 50% for 3D pier spcg)



Pier Data		
Pier Diameter =	12	in
d =	4.0	ft

Applied Loads		
Active EFP =	45	pcf
Eff. Width Factor =	1.0	
e =	2.70	ft
V =	422	lb
M =	1139	ft-lb
Surcharge =	0	plf
ds =	0	ft

Passive Resistance		
Passive EFP =	200	pcf
Eff. Width Factor =	2	
Ignore Passive =	1	ft
Passive max =	1500	psf
dt =	3.8	ft

Passive includes a 1/3 increase for wind/seismic loads

Overturning			
Load Type	Force (k)	Arm (ft)	Moment (ft-k)
Fa	0.36	1.33	0.5
V	0.42	6.70	2.8
Fs	0.00	4.00	0.0

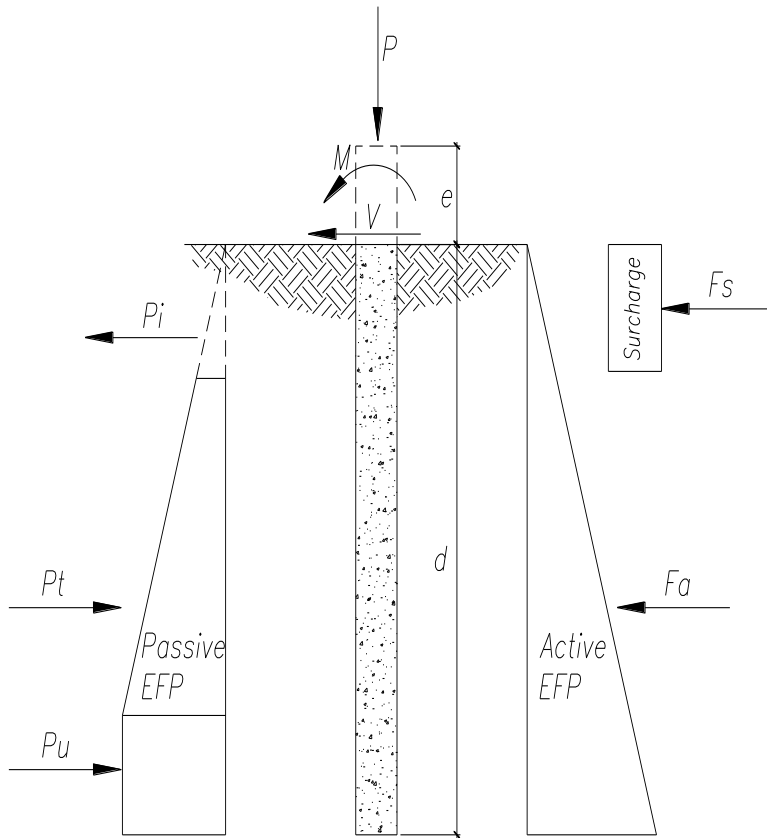
Pier Forces: Mmax = 1782 ft-lb @ d = 1.87 ft
Vmax = 445 lb

Resisting			
Passive Zone	Force (k)	Arm (ft)	Moment (ft-k)
Pi	0.20	3.33	-0.67
Pt	2.81	1.50	4
Pu	0.38	0.13	0

$\Sigma M_R = 4.0$
 $\Sigma M_{OT} = 3.3$

Fences

6ft Fence 12" diameter ftg



Pier Data		
Pier Diameter =	12	in
d =	6.0	ft

Applied Loads		
Active EFP =	45	pcf
Eff. Width Factor =	1.0	
e =	3.80	ft
V =	979	lb
M =	3721	ft-lb
Surcharge =	0	plf
ds =	0	ft

Passive Resistance		
Passive EFP =	200	pcf
Eff. Width Factor =	2	
Ignore Passive =	1	ft
Passive max =	1500	psf
dt =	3.8	ft

Passive includes a 1/3 increase for wind/seismic loads

Overturning			
Load Type	Force (k)	Arm (ft)	Moment (ft-k)
Fa	0.81	2.00	1.6
V	0.98	9.80	9.6
Fs	0.00	6.00	0.0

Pier Forces: Mmax = 5614 ft-lb @ d = 2.58 ft
Vmax = 1002 lb

Resisting			
Passive Zone	Force (k)	Arm (ft)	Moment (ft-k)
Pi	0.20	5.33	-1.07
Pt	2.81	3.50	10
Pu	3.38	1.13	4

$\Sigma M_R = 13.0$
 $\Sigma M_{OT} = 11.2$

Fences

HORIZ RAIL - 6FT FENCE

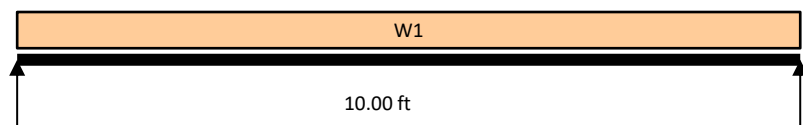
ASD LC[+ 1W]

Span = 10 ft
(0' to 10') $w_1 = 49'(0D + 1W) = 49 \text{ plf}$

$R_L = 0.25 \text{ k}$

$R_R = 0.25 \text{ k}$

Design Forces	V_{max} (k)	M_{max} (ft-k)
Span	0.25	0.61



a) Yielding $M_n = F_y Z = (35 \text{ ksi})(0.713 \text{ in}^3) / 12 = 2.08 \text{ ft-k}$

Pipe2STD

A53 Gr. B

b) Compression Flange Local Buckling $D/t = 16.60 \quad \lambda_p = 58.00 \quad \lambda_r = 256.86$
 $M_n = [.021E/(D/t) + F_y] S = \text{N/A} \quad \text{N/A} \quad \text{ft-k} \quad (\lambda_p < D/t < \lambda_r)$
 $M_n = F_{cr} S = \text{N/A} \quad \text{N/A} \quad \text{ft-k} \quad (D/t > \lambda_r)$
 $M_a = M_n / \Omega_b = (2.08 \text{ ft-k}) / 1.67 = 1.25 \text{ ft-k}$

c) Shear $F_{cr} = \frac{.78 E}{(D/t)^{1.5}} = \frac{.78 (29000 \text{ ksi})}{(16.60)^{1.5}} = 21.00 \text{ ksi} \quad A_g = 1.00 \text{ in}^2$
 $V_n = F_{cr} A_g / 2 = (21.00 \text{ ksi})(1.00 \text{ in}^2) / 2 = 10.5 \text{ k} \quad \Omega_v = 1.67$
 $V_a = V_n / \Omega_v = (10.5 \text{ k}) / 1.67 = 6.3 \text{ k}$

d) Deflections

$\Delta_{Main} = .606 \text{ in} \quad (L / 198) \quad CL$

Fences

HORIZ RAIL - 4FT FENCE

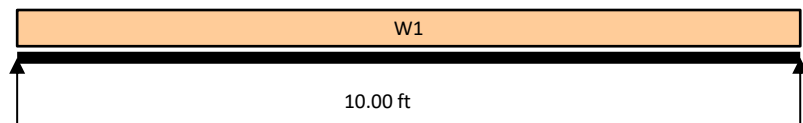
ASD LC[+ 1W]

Span = 10 ft
(0' to 10') $w_1 = 32.6'(0D + 1W) = 33 \text{ plf}$

$R_L = 0.16 \text{ k}$

$R_R = 0.16 \text{ k}$

Design Forces	V_{max} (k)	M_{max} (ft-k)
Span	0.16	0.41



a) Yielding $M_n = F_y Z = (35 \text{ ksi})(0.713 \text{ in}^3) / 12 = 2.08 \text{ ft-k}$

Pipe2STD

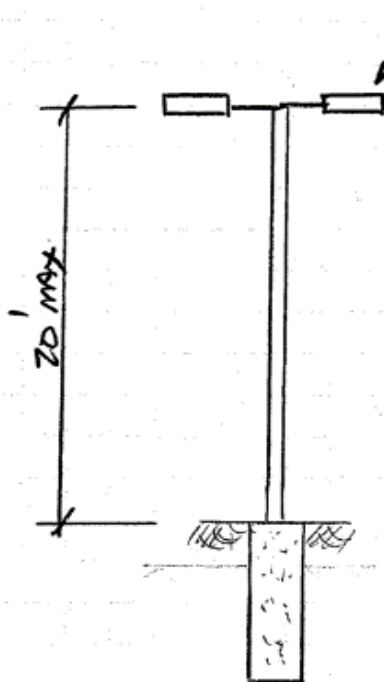
A53 Gr. B

b) Compression Flange Local Buckling $D/t = 16.60 \quad \lambda_p = 58.00 \quad \lambda_r = 256.86$
 $M_n = [.021E/(D/t) + F_y] S = \text{N/A} \quad \text{N/A} \quad \text{ft-k} \quad (\lambda_p < D/t < \lambda_r)$
 $M_n = F_{cr} S = \text{N/A} \quad \text{N/A} \quad \text{ft-k} \quad (D/t > \lambda_r)$
 $M_a = M_n / \Omega_b = (2.08 \text{ ft-k}) / 1.67 = 1.25 \text{ ft-k}$

c) Shear $F_{cr} = \frac{.78 E}{(D/t)^{1.5}} = \frac{.78 (29000 \text{ ksi})}{(16.60)^{1.5}} = 21.00 \text{ ksi} \quad A_g = 1.00 \text{ in}^2$
 $V_n = F_{cr} A_g / 2 = (21.00 \text{ ksi})(1.00 \text{ in}^2) / 2 = 10.5 \text{ k} \quad \Omega_v = 1.67$
 $V_a = V_n / \Omega_v = (10.5 \text{ k}) / 1.67 = 6.3 \text{ k}$

d) Deflections

$\Delta_{Main} = .403 \text{ in} \quad (L / 297) \quad CL$

Light Pole CriteriaLIGHT POLES

FIXTURE:

ZNM-30L-CT-40
30# MAX WEIGHT
MAX 3/POLE

POLE:

AMERON 16620 Round Pole

TOP OD = $4\frac{3}{8}$ "BOT OD = $6\frac{3}{4}$ "

WT = 490 #

BASE PL $\Rightarrow$ 10" X 10" ($9\frac{3}{4}$ " BOLT CIRCLE)AB'S $\Rightarrow$ $\frac{3}{4}$ " ϕ

Light Pole Wind LoadsWIND LOADS ASCE 7-16 29.4

$$F = q_z G C_f A_f (29.4-1)$$

$$q_z = 16.9 \text{ PSF (USD)}$$

$$G = .85$$

$$\text{POLE: } h/d = \frac{20(12)}{4.375} = 55 \Rightarrow C_f = 1.2$$

$$A_f = 9.3 \text{ FT}^2$$

$$F = 16.9(.85)(9.3)(1.2) = 160 \#$$

$$\text{FIXTURE: } C_f = 2.0$$

$$A_f = 31.3(7.6)/144 (2) = 3.3 \text{ FT}^2 (2 \text{ FIXTURES})$$

$$F = 16.9(.85)(2.0)(3.3) = 95 \#$$

$$V_u = 160 + 95 = 255 \#$$

$$M_u = 160(9.3) + 95(20) = 3388 \text{ ft}\cdot\#$$

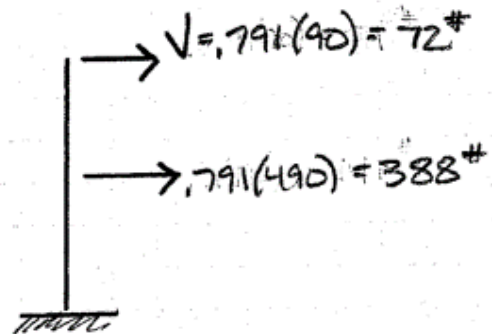
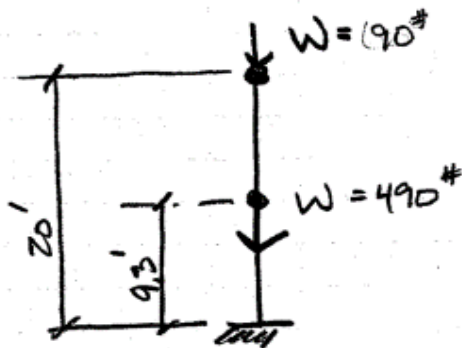
Light Pole Seismic LoadsSEISMIC LOADSASCE 7-16 TABLE 15.4-2 $\Rightarrow$ INVERTED PENDULUM

$$R = 2.0 \quad S_{DS} = .791$$
$$\Omega_0 = 2.0 \quad I_e = 1.0$$

$$C_s = \frac{S_{DS}}{(R/I_e)} = \frac{.791}{(2/1)} = .396 \text{ (USD)}$$

* CONSIDER Ω_0 FOR ANCHORAGE + FOOTING DESIGN

$$\therefore C_s = .791$$

SEISMIC

$$V_s = 460(.7) = 322\#$$

$$V_u = 388 + 72 = 460\#$$

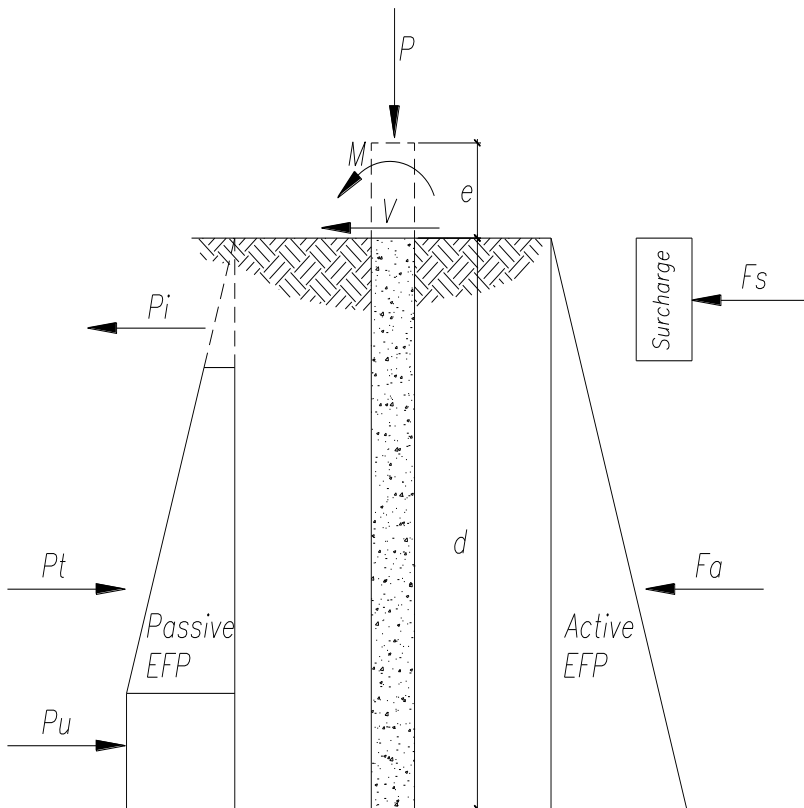
$$M_s = 5048(.7) = 3534\text{'}-\#$$

$$M_u = 72(20) + 388(9.3) = 5048\text{'}-\#$$

SEISMIC LOADS CONTROL

Light Pole Footings

Drilled Pier - Seismic



Pier Data		
Pier Diameter =	18	in
d =	6.0	ft

Applied Loads		
Active EFP =	45	pcf
Eff. Width Factor =	2.0	
e =	10.96	ft
V =	365	lb
M =	4005	ft-lb
Surcharge =	0	plf
ds =	0	ft

Passive Resistance		
Passive EFP =	200	pcf
Eff. Width Factor =	2	
Ignore Passive =	1	ft
Passive max =	1500	psf
dt =	2.5	ft

Passive includes a 1/3 increase for wind/seismic loads

Overturning			
Load Type	Force (k)	Arm (ft)	Moment (ft-k)
Fa	2.43	2.00	4.9
V	0.37	16.96	6.2
Fs	0.00	6.00	0.0

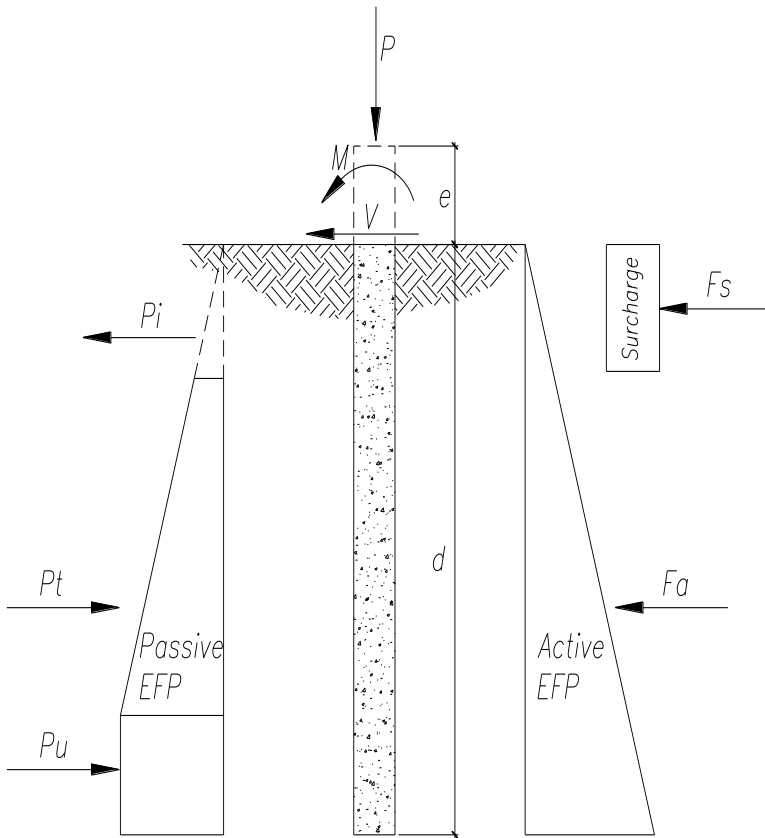
Pier Forces: Mmax = 4555 ft-lb @ d = 1.69 ft
Vmax = 433 lb

Resisting			
Passive Zone	Force (k)	Arm (ft)	Moment (ft-k)
Pi	0.30	5.33	-1.60
Pt	1.88	4.33	8
Pu	5.25	1.75	9

$\Sigma M_R = 16.0$
 $\Sigma M_{OT} = 11.1$

Light Pole Footings

Drilled Pier - Wind



Pier Data		
Pier Diameter =	18	in
d =	6.0	ft

Applied Loads		
Active EFP =	45	pcf
Eff. Width Factor =	2.0	
e =	13.29	ft
V =	153	lb
M =	2033	ft-lb
Surcharge =	0	plf
ds =	0	ft

Passive Resistance		
Passive EFP =	200	pcf
Eff. Width Factor =	2	
Ignore Passive =	1	ft
Passive max =	1500	psf
dt =	2.5	ft

Passive includes a 1/3 increase for wind/seismic loads

Overturning			
Load Type	Force (k)	Arm (ft)	Moment (ft-k)
Fa	2.43	2.00	4.9
V	0.15	19.29	3.0
Fs	0.00	6.00	0.0

Pier Forces: Mmax = 2255 ft-lb @ d = 1.40 ft
Vmax = 221 lb

Resisting			
Passive Zone	Force (k)	Arm (ft)	Moment (ft-k)
Pi	0.30	5.33	-1.60
Pt	1.88	4.33	8
Pu	5.25	1.75	9

$\Sigma M_R = 16.0$
 $\Sigma M_{OT} = 7.8$

Light Pole Anchorage



Hilti PROFIS Engineering 3.1.2

www.hilti.com

Company:
Address:
Phone / Fax:
Design: Concrete - Jul 29, 2024 (1)
Fastening point:

Page: 1
Specifier:
E-Mail:
Date: 8/7/2024

Specifier's comments:

1 Input data

Anchor type and diameter: Hex Head ASTM F 1554 GR. 36 5/8

Item number: not available

Additional plate or washer (17.4.2.8): $d_{plate} = 0.100$ in., $t_{plate} = 0.100$ in.

Specification text: Hilti Hex Head headed stud anchor with 24 in embedment, 5/8, Steel galvanized, installation per instruction for use

Effective embedment depth: $h_{ef} = 24.000$ in., $h_{ef,17.4.2.8} = 0.000$ in.

Material: ASTM F 1554

Evaluation Service Report: Hilti Technical Data

Issued / Valid: - / -

Proof: Design Method ACI 318-14 / CIP

Stand-off installation: $e_b = 0.000$ in. (no stand-off); $t = 0.500$ in.

Anchor plate^R: $l_x \times l_y \times t = 10.000$ in. x 10.000 in. x 0.500 in.; (Recommended plate thickness: not calculated)

Profile: Round HSS (AISC), HSS6-5/8X.280; (L x W x T) = 6.625 in. x 6.625 in. x 0.280 in.

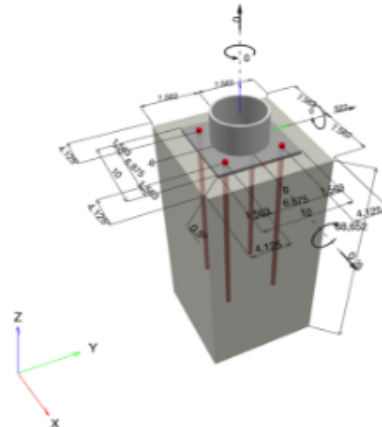
Base material: cracked concrete, 2500, $f'_c = 2,500$ psi; $h = 48.000$ in.

Reinforcement: tension: condition A, shear: condition B; anchor reinforcement: tension
edge reinforcement: none or < No. 4 bar



^R - The anchor calculation is based on a rigid anchor plate assumption.

Geometry [in.] & Loading [lb, in.lb]



Light Pole Anchorage

Hilti PROFIS Engineering 3.1.2

www.hilti.com

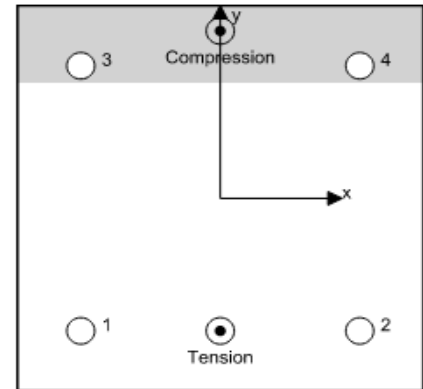
Company:
Address:
Phone / Fax:
Design: Concrete - Jul 29, 2024 (1)
Fastening point:Page: 2
Specifier:
E-Mail:
Date: 8/7/2024**1.1 Design results**

Case	Description	Forces [lb] / Moments [in.lb]	Seismic	Max. Util. Anchor [%]
1	Combination 1	N = 0; V _x = 0; V _y = 522; M _x = -68,652; M _y = 0; M _z = 0;	no	70

2 Load case/Resulting anchor forces**Anchor reactions [lb]**

Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	4,412	131	0	131
2	4,412	131	0	131
3	0	131	0	131
4	0	131	0	131

max. concrete compressive strain: 0.21 [‰]
max. concrete compressive stress: 894 [psi]
resulting tension force in (x/y)=(0.000/-3.438): 8,825 [lb]
resulting compression force in (x/y)=(0.000/4.342): 8,825 [lb]

Anchor forces are calculated based on the assumption of a rigid anchor plate.

3 Tension load

	Load N _{ua} [lb]	Capacity ϕN_n [lb]	Utilization $\beta_N = N_{ua} / \phi N_n$	Status
Steel Strength*	4,412	9,831	45	OK
Pullout Strength*	4,412	6,356	70	OK
Concrete Breakout Failure** ¹	N/A	N/A	N/A	N/A
Concrete Side-Face Blowout, direction y-**	8,825	21,309	42	OK

* highest loaded anchor **anchor group (anchors in tension)

¹ Tension Anchor Reinforcement has been selected!

Light Pole Anchorage



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Fastening point:

Page: 3
Specifier:
E-Mail:
Date: 8/7/2024

3.1 Steel Strength

$$N_{sa} = A_{se,N} f_{uts} \quad \text{ACI 318-14 Eq. (17.4.1.2)}$$

$$\phi N_{sa} \geq N_{ua} \quad \text{ACI 318-14 Table 17.3.1.1}$$

Variables

$A_{se,N} [\text{in.}^2]$	$f_{uts} [\text{psi}]$
0.23	58,000

Calculations

$N_{sa} [\text{lb}]$
13,108

Results

$N_{sa} [\text{lb}]$	ϕ_{steel}	$\phi N_{sa} [\text{lb}]$	$N_{ua} [\text{lb}]$
13,108	0.750	9,831	4,412

3.2 Pullout Strength

$$N_{pN} = \psi_{c,p} N_p \quad \text{ACI 318-14 Eq. (17.4.3.1)}$$

$$N_p = 8 A_{brg} f'_c \quad \text{ACI 318-14 Eq. (17.4.3.4)}$$

$$\phi N_{pN} \geq N_{ua} \quad \text{ACI 318-14 Table 17.3.1.1}$$

Variables

$\psi_{c,p}$	$A_{brg} [\text{in.}^2]$	λ_a	$f'_c [\text{psi}]$
1.000	0.45	1.000	2,500

Calculations

$N_p [\text{lb}]$
9,080

Results

$N_{pN} [\text{lb}]$	$\phi_{concrete}$	$\phi N_{pN} [\text{lb}]$	$N_{ua} [\text{lb}]$
9,080	0.700	6,356	4,412

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Address:		Specifier:	
Phone Fax:		E-Mail:	
Design:	Concrete - Jul 29, 2024 (1)	Date:	8/7/2024
Fastening point:			

3.3 Concrete Side-Face Blowout, direction y-

$$N_{sb} = 160 c_{a1} \sqrt{A_{reg}} \lambda_a \sqrt{f_c} \quad \text{ACI 318-14 Eq. (17.4.4.1)}$$

$$N_{sb} = \alpha_{group} N_{sb} \quad \text{ACI 318-14 Eq. (17.4.4.2)}$$

$$\phi N_{sb} \geq N_{ua} \quad \text{ACI 318-14 Table 17.3.1.1}$$

$$\alpha_{group} = \left(1 + \frac{s}{6 c_{a1}} \right) \quad \text{see ACI 318-14, Section 17.4.4.2, Eq. (17.4.4.2)}$$

Variables

c_{a1} [in.]	c_{a2} [in.]	A_{reg} [in. ²]	λ_a	f_c [psi]	s [in.]
4.125	4.125	0.45	1.000	2,500	6.875

Calculations

α_{group}	N_{sb} [lb]
1.278	22,235

Results

N_{sb} [lb]	$\phi_{concrete}$	ϕN_{sb} [lb]	$N_{ua, edge}$ [lb]
28,412	0.750	21,309	8,825

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Design:

Fastening point:

Concrete - Jul 29, 2024 (1)

Page:

Specifier:

E-Mail:

Date:

5

8/7/2024

4 Shear load

	Load V_{ua} [lb]	Capacity ϕV_n [lb]	Utilization $\beta_v = V_{ua} / \phi V_n$	Status
Steel Strength*	131	5,112	3	OK
Steel failure (with lever arm)*	N/A	N/A	N/A	N/A
Pryout Strength**	522	25,751	3	OK
Concrete edge failure in direction y+**	522	2,706	20	OK

* highest loaded anchor **anchor group (relevant anchors)

4.1 Steel Strength

$$V_{sa} = 0.6 A_{se,V} f_{uta} \quad \text{ACI 318-14 Eq. (17.5.1.2b)}$$

$$\phi V_{steel} \geq V_{ua} \quad \text{ACI 318-14 Table 17.3.1.1}$$

Variables

$A_{se,V} [\text{in.}^2]$	$f_{uta} [\text{psi}]$
0.23	58,000

Calculations

$V_{sa} [\text{lb}]$
7,865

Results

$V_{sa} [\text{lb}]$	ϕ_{steel}	$\phi V_{sa} [\text{lb}]$	$V_{ua} [\text{lb}]$
7,865	0.650	5,112	131

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Fastening point:

Page: 6
Specifier:
E-Mail:
Date: 8/7/2024

4.2 Pryout Strength

$$V_{cp} = k_{cp} \left[\left(\frac{A_{Nc}}{A_{Nc0}} \right) \psi_{ec,N} \psi_{ed,N} \psi_{c,N} \psi_{cp,N} N_b \right] \quad \text{ACI 318-14 Eq. (17.5.3.1b)}$$

$$\phi V_{cp} \geq V_{ua} \quad \text{ACI 318-14 Table 17.3.1.1}$$

$$A_{Nc} \text{ see ACI 318-14, Section 17.4.2.1, Fig. R 17.4.2.1(b)}$$

$$A_{Nc0} = 9 h_{ef}^2 \quad \text{ACI 318-14 Eq. (17.4.2.1c)}$$

$$\psi_{ec,N} = \left(\frac{1}{1 + \frac{2 e_{N1}}{3 h_{ef}}} \right) \leq 1.0 \quad \text{ACI 318-14 Eq. (17.4.2.4)}$$

$$\psi_{ed,N} = 0.7 + 0.3 \left(\frac{c_{a,min}}{1.5 h_{ef}} \right) \leq 1.0 \quad \text{ACI 318-14 Eq. (17.4.2.5b)}$$

$$\psi_{cp,N} = \text{MAX} \left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5 h_{ef}}{c_{ac}} \right) \leq 1.0 \quad \text{ACI 318-14 Eq. (17.4.2.7b)}$$

$$N_b = k_c \lambda_a \sqrt{f'_c} h_{ef}^{1.5} \quad \text{ACI 318-14 Eq. (17.4.2.2a)}$$

Variables

k_{cp}	h_{ef} [in.]	$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	$c_{a,min}$ [in.]
2	2.750	0.000	0.000	4.125
$\psi_{c,N}$	c_{ac} [in.]	k_c	λ_a	f'_c [psi]
1.000	∞	24	1.000	2,500

Calculations

A_{Nc} [in. ²]	A_{Nc0} [in. ²]	$\psi_{ec1,N}$	$\psi_{ec2,N}$	$\psi_{ed,N}$	$\psi_{cp,N}$	N_b [lb]
228.77	68.06	1.000	1.000	1.000	1.000	5,472

Results

V_{cp} [lb]	$\phi_{concrete}$	ϕV_{cp} [lb]	V_{us} [lb]
36,787	0.700	25,751	522

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Fastening point:

Page: 7
Specifier:
E-Mail:
Date: 8/7/2024

4.3 Concrete edge failure in direction y+

$$V_{cbg} = \left(\frac{A_{vc}}{A_{vc0}} \right) \psi_{ec,V} \psi_{ed,V} \psi_{c,V} \psi_{h,V} \psi_{parallel,V} V_b \quad \text{ACI 318-14 Eq. (17.5.2.1b)}$$

$$\phi V_{cbg} \geq V_{ua} \quad \text{ACI 318-14 Table 17.3.1.1}$$

$$A_{vc} \text{ see ACI 318-14, Section 17.5.2.1, Fig. R 17.5.2.1(b)}$$

$$A_{vc0} = 4.5 c_{a1}^2 \quad \text{ACI 318-14 Eq. (17.5.2.1c)}$$

$$\psi_{ec,V} = \left(\frac{1}{1 + \frac{2e_v}{3c_{a1}}} \right) \leq 1.0 \quad \text{ACI 318-14 Eq. (17.5.2.5)}$$

$$\psi_{ed,V} = 0.7 + 0.3 \left(\frac{c_{a2}}{1.5c_{a1}} \right) \leq 1.0 \quad \text{ACI 318-14 Eq. (17.5.2.6b)}$$

$$\psi_{h,V} = \sqrt{\frac{1.5c_{a1}}{h_a}} \geq 1.0 \quad \text{ACI 318-14 Eq. (17.5.2.8)}$$

$$V_b = \left(7 \left(\frac{l_a}{d_a} \right)^{0.2} \sqrt{d_a} \right) \lambda_a \sqrt{f_c} c_{a1}^{1.5} \quad \text{ACI 318-14 Eq. (17.5.2.2a)}$$

Variables

c_{a1} [in.]	c_{a2} [in.]	$e_{c,V}$ [in.]	$\psi_{c,V}$	h_a [in.]
4.125	4.125	0.000	1.000	48.000
l_a [in.]	λ_a	d_a [in.]	f_c [psi]	$\psi_{parallel,V}$
5.000	1.000	0.625	2,500	1.000

Calculations

A_{vc} [in. ²]	A_{vc0} [in. ²]	$\psi_{ec,V}$	$\psi_{ed,V}$	$\psi_{h,V}$	V_b [lb]
93.59	76.57	1.000	0.900	1.000	3,514

Results

V_{cbg} [lb]	$\phi_{concrete}$	ϕV_{cbg} [lb]	V_{ua} [lb]
3,865	0.700	2,706	522

5 Combined tension and shear loads

β_N	β_V	ζ	Utilization $\beta_{N,V}$ [%]	Status
0.694	0.193	5/3	61	OK

$$\beta_{NV} = \beta_N^{\zeta} + \beta_V^{\zeta} \leq 1$$

Input data and results must be checked for conformity with the existing conditions and for plausibility!
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Sport Court Slab Design**Design Method**

Sport court slabs are to be designed per PTI DC10.3-20 based on the following parameters:

- 1) *1/2" unbonded low relaxation cables w/ F_u = 270 ksi*
- 2) *Slab thickness = 5" w/ f'_c = 4000 psi*
- 3) *Minimum slab effective pre-compression = 100 psi*
- 4) *Slab subgrade friction, μ = .75 (slab placed over polyethylene sheeting) (PTI DC10.3-20 Table 2.3)*
- 5) *Anchor set = 1/4"*
- 6) *Creep, elastic shortening, shrinkage, relaxation combined losses = 15 ksi*

The slab design is not intended to resist movement of expansive soils or control deflections. Post-tensioning is provided for crack control only.

Note: Slabs are to be stressed no more than 7 days after pour

Sport Court Slab Design

PT SLABS

- * 5" SLAB THICKNESS ($W_{SLAB} = 63 \text{ PSF}$)
- * MIN PRE-COMPRESSION = 100 PSI (f_p)
- * SUBGRADE FRICTION, $\mu = .75$ (VAPOR BARRIER ON/ROCK BASE)
- * ANCHOR SET $\#1/4"$ ($\frac{P}{A} = \frac{\Delta E}{L}$) $E = 28,500 \text{ KSI}$
- * CREEP, SHRINKAGE, RELAXATION LOSS = 15 KSI

SLAB LENGTH (FT)	.7 f_{pu} INITIAL STRESS (KSI)	LOSSES		EFFECTIVE STRESS (KSI)	EFFECTIVE FORCE (K) F_e
		ANCHOR SET (KSI)	CREEP & SHR. (KSI)		
29	189	20.5	15	153.5	23.5
33	189	18.0	15	156.0	23.9
63	189	9.5	15	164.5	25.2
119	189	5.0	15	169.0	25.9
127	189	4.7	15	169.3	25.9

SLAB LENGTH (FT)	MAX TENDON SPACING (FT)	
29	3.5	$SPACING = \frac{F_e}{\frac{f_p(12H)}{6000} + \frac{W_{SLAB}(42)}{23.625L}}$
33	3.5	
63	3.3	
119	2.9	
127	2.8	

(considering slab subgrade friction)

Ball Wall Design

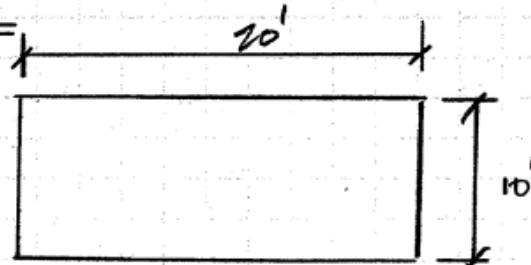
Bakko Backboard

Panels are 2 1/2" thick with metal interior frames dividing each panel into 20 sub-compartments. Each sub compartment is filled with sound deadening materials. Panels are encased in thick fiberglass and UV protective gel coat unitized under pressure in large molds. Front and edges of panels are sprayed with a high quality impact, solar and temperature resistant green polyurethane Imron paint. Panel faces have no holes; attachment is in back with wheels. Wheels allow panels to roll in galvanized metal channels horizontally attached to fence post. Each panel weighs 150 lbs. Flat backboards are traditional; this is Bakko's oldest model and over the years, a best seller. Typically purchased by country clubs, resorts and private court owners. Most common purchased size is 5 panels.

Specifications:

- 10' high panels, 2.5" thickness
- Heavy, reinforced metal, interior frame
- Sound deadening matrix interior
- Wheel attachments for easy installation
- Steel channels for horizontal supports
- Encased in thick fiberglass and gel coat
- Coated with solar and impact resistant polyurethane paint
- Multiples of 4' wide panels
- 10 Year pro-rated warranty on backboard structure
- 1 Year warranty on Imron paint

All backboard components and attachments per manufacturer specifications

Ball Wall DesignBALL WALL

ASCE 7 29.3 - WIND LOADS:

$$F = q_h G C_f A_s$$

$$B/s = 20/10 = 2 \therefore C_f = 2.25$$

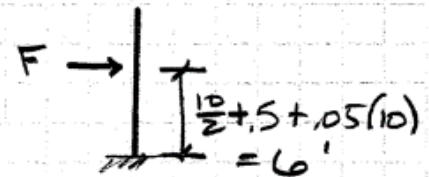
$$S/h = 1 \Rightarrow \text{REDUCTION} = 1.8 - 1 = .8$$

$$F = 9.6(.85)(2.25)(.8) = 14.7 \text{ PSF}$$

$$\therefore F = 14.7(10) = 147 \text{ PLF}$$

$$M = 147(6) = 882 \text{ lbf-ft}$$

WHERE: $G = .85$
 $q_h = 9.6 \text{ PSF}$



3 POST SYSTEM $\Rightarrow$ TRIB = 9'-6"

$$F = 147(9.5) = 1397 \text{ lbf}$$
$$M = 882(9.5) = 8379 \text{ lbf-ft}$$

4 POST SYSTEM $\Rightarrow$ TRIB = 6'-4"

$$F = 147(6.4) = 941 \text{ lbf}$$
$$M = 882(6.4) = 5645 \text{ lbf-ft}$$

 $\Rightarrow$ USE 4 POST

Ball Wall Design

END POST w/ FENCE LOAD:

$$\text{FENCE TRIS} = 5'$$

$$\text{FENCE } V = 979/2 = 490 \text{ \#}, M = 372/2 = 186 \text{ \#}$$

$$\text{BALL WALL } V = 147(4.2') = 617 \text{ \#}, M = 882(4.2) = 3704 \text{ \#}$$

$$\Sigma V = 1107 \text{ \#} \quad \Sigma M = 5565 \text{ \#}$$

$$h_{eq} = \frac{M}{V} = \frac{5565}{1107} = 5.0'$$

SEISMIC LOADS:

$$\text{WALL MASS} = 150 \text{ \#/panel}(5) = 750 \text{ \#}$$

$$\text{POST MASS} = 20 \text{ \#/ft}(10')(4) = 800 \text{ \#}$$

$$\Sigma \text{MASS} = 1550 \text{ \#}$$

$$V_{ASD} = .443(1550) = 687 \text{ \#}/20(6.4) = 220 \text{ \#}/\text{POST}$$

$$M = 220(6) = 1320 \text{ \#}$$

* WIND LOADS CONTROL

POST DESIGN FORCE SUMMARY:

$$V = 941 \text{ \#}$$

$$M = 5645 + 941(1.1) = 6680 \text{ \#} \text{ (ADD 13" FOR CURB HT)}$$

Ball Wall Design**Ball Wall Post**

$$\begin{array}{rcl} M_{wind} = & 6680 & \text{ft-lb} \\ \hline M_e = & 80 & \text{ft-lb} \quad (e = 4") \quad \text{wall panels hung off side of posts} \\ \hline M_{total} = & 6760 & \text{ft-lb} \end{array}$$

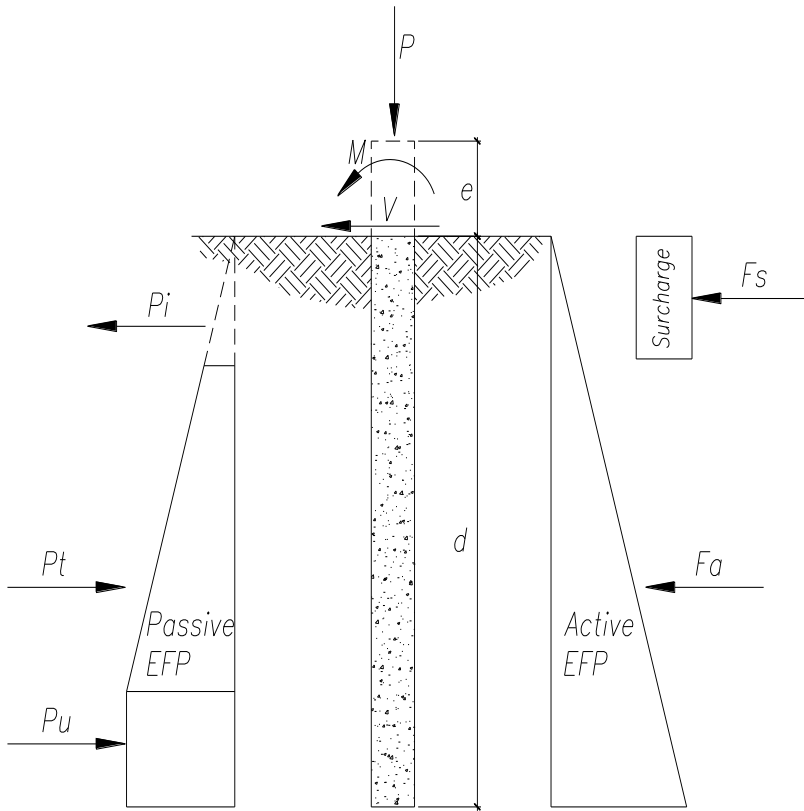
$$Z_{reqd} = \frac{\Omega M}{F_y} = 3.871 \text{ in}^3 \quad \begin{array}{l} F_y = 35000 \text{ psi (A53)} \\ \Omega = 1.67 \end{array}$$

4" STD pipe $Z = 4.05 \text{ in}^3$
 $I = 6.82 \text{ in}^4$

Deflection: $w_{eq} = 112 \text{ plf} \quad \Delta = 1.78663 \text{ in} \quad (2L/134)$

Ball Wall Design

Drilled Pier



Pier Data		
Pier Diameter =	24	in
d =	7.0	ft

Applied Loads		
Active EFP =	45	pcf
Eff. Width Factor =	1.0	
e =	7.18	ft
V =	941	lb
M =	6760	ft-lb
Surcharge =	0	plf
ds =	0	ft

Passive Resistance		
Passive EFP =	400	pcf
Eff. Width Factor =	2	
Ignore Passive =	1	ft
Passive max =	1500	psf
dt =	0.9	ft

Passive includes a 1/3 increase for wind/seismic loads

Overturning			
Load Type	Force (k)	Arm (ft)	Moment (ft-k)
Fa	2.21	2.33	5.1
V	0.94	14.18	13.3
Fs	0.00	7.00	0.0

Pier Forces: Mmax = 7986 ft-lb @ d = 1.52 ft
Vmax = 986 lb

Resisting			
Passive Zone	Force (k)	Arm (ft)	Moment (ft-k)
Pi	0.80	6.33	-5.07
Pt	0.70	6.38	4
Pu	9.09	3.03	28

$\Sigma M_R = 27.0$

$\Sigma M_{OT} = 18.5$