

**PROPOSAL, SPECIFICATIONS, BOND
AND AFFIDAVIT
FOR THE CONSTRUCTION OF
ZAMPERINI FIELD SECURITY PROJECT, FEAP 616**

B2013-52



**CRAIG S. BILEZERIAN
City Engineer**

October 2013

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SECTION A

NOTICE INVITING BIDS

CITY OF TORRANCE, CALIFORNIA

NOTICE INVITING BIDS

Notice is hereby given that sealed bids for performing the following described work will be received at the Office of the City Clerk of the City of Torrance, California, **until 3:00 p.m. on Wednesday, November 6, 2013**, after which time they will be publicly opened and read at 3:15 p.m. in the Council Chambers of said City:

**CONSTRUCTION OF
ZAMPERINI FIELD SECURITY PROJECT, FEAP 616**

B2013-52

Plans, Bid Schedule and Specifications are available for viewing and printing by prospective bidders and subcontractors on the City's website at ***<http://www.torranceca.gov/26625.htm>***

Those who only view and/or print the Plans, Bid Schedule and Specifications from the City's website will not be added to the City's Plan Holder list for this project.

- **The official and required form of Proposal must be obtained at the Office of the City Clerk (310) 618-2870, City Hall, 3031 Torrance Boulevard, Torrance, California. There is no cost if picked up at City Hall. A payment of \$5.00 is required if requested by mail.** The amount includes tax and is not refundable. A prospective bidder must provide to the City Clerk the firm's name, address, telephone and fax numbers, a contact person and a valid email address. This will ensure that your firm is listed as a "Plan Holder" and that you will be informed of any and all information issued subsequent to obtaining the official form of Proposal. Addenda will be issued only by email and only to those that provide the required information to the City Clerk. Receipt of any Addendum must be acknowledged by a bidder in its submitted form of Proposal.

Full-size 24" x 36" Plans and a bound Specifications booklet may also be obtained at the Office of the City Clerk (310) 618-2870, City Hall, 3031 Torrance Boulevard, Torrance, California upon payment of \$50 if picked up at City Hall, or payment of \$65 if requested by mail. Both amounts include tax. Neither amount is refundable. The \$65 includes a copy of the official form of Proposal.

If requesting any item(s) by mail, please send check to the following:

**CITY OF TORRANCE
OFFICE OF THE CITY CLERK
3031 TORRANCE BLVD
TORRANCE, CA 90509
ATTN: B2013-52**

The Engineer's Estimate of the Base Bid is between \$900,000 and \$1,000,000. The Estimate for the Additive Bid is between \$80,000 and \$90,000. The Basis of Award shall be the lowest responsive bid for the Base Bid only. The work includes installation of electric lighting, security cameras, manual vehicular gates and automated vehicular gates with card readers and license plate cameras; and the centralized access control computer system. All work shall be completed within ninety (90) working days from the date of the Notice to Proceed (NTP).

Per Division 2, Chapter 2 of the Torrance Municipal Code, the Torrance City Council may reject any and all bids, waive any informality or irregularity in such bids, and determine the lowest responsible bidder. No facsimile bids shall be accepted by the City.

Substitution of securities for withheld funds is permitted per Section 22300 of the Public Contract Code.

The City has determined that a Class **A** or Class **C10** Contractor's license is necessary to bid this project, but reserves the right to accept another Class at the sole discretion of either the Public Works Director or Engineer.

Pursuant to Section 1773 of the Labor Code, the general prevailing wage rates in the county, or counties, in which the work is to be done have been determined by the Director of the California Department of Industrial Relations. These wages are set forth in the General Prevailing Wage Rates for this project, available from the California Department of Industrial Relations' Internet web site at <http://www.dir.ca.gov/DLSR/PWD>. Certified payrolls shall be submitted monthly by the Contractor hired for this project.

By order of the City Council of the City of Torrance, California.

For further information, please contact Key Ebarle, Associate Civil Engineer, in the Public Works Department at (310) 618-3061 or via the main office at (310) 781-6900.

SECTION B

INSTRUCTIONS TO BIDDERS

CITY OF TORRANCE, CALIFORNIA

INSTRUCTIONS TO BIDDERS

A. QUALIFICATION OF BIDDERS

1. Competency of Bidders

The Bidder shall be thoroughly competent and capable of satisfactorily performing the Work covered by the Bid. As specified in the Bid Documents, the Bidder shall furnish statements of previous experience on similar work. When requested, the Bidder shall also furnish the plan of procedure proposed; the organization, machinery, plant and other equipment available for the Work; evidence of its financial condition and resources; and any other such documentation as may be required by the City to determine if the Bidder is responsible.

2. Contractor's License

At the time of submitting the Bid, the Bidder shall be licensed as a contractor in accordance with the provisions of Chapter 9, Division 3, of the California Business and Professions Code. The required prime contractor license class for the Work is shown in the project Notice Inviting Bids. However, the City reserves the right to award the Contract to a contractor with another class if the City determines that the license is proper for the work.

B. BIDDER RESPONSIBILITY

A responsible Bidder is a Bidder who has demonstrated the attribute of trustworthiness, as well as ability, fitness, capacity and experience to satisfactorily perform the work.

Bidders are notified that, in accordance with Division 2, Chapter 2 of the Torrance Municipal Code, the City Council may determine whether the Bidder is responsible based on a review of the Bidder's performance on other contracts.

If, based on the provision and criteria in Division 2, Chapter 2 of the Torrance Municipal Code, the Public Works Director proposes not to recommend the award of contract to the apparent low bidder, the Director shall notify the Bidder in writing of its intention to recommend to the City Council that the Council award the contract to the 2nd lowest responsible bidder. If the Bidder presents evidence in rebuttal to the recommendation, the Director shall evaluate the merits of such evidence, and based on that evaluation, make a recommendation to the City Council.

C. ADDENDA TO THE CONTRACT DOCUMENTS

The City may issue Addenda to the Contract Documents during the period of advertising for any reason. The Bidder shall acknowledge the receipt of the Addenda in their Bid. Failure of the Bidder to do so may result in the rejection of the Bid as non-responsive.

D. PREPARATION OF THE BID

1. Examination of Site, Plans and Specifications

Prior to submitting a Bid, the Bidder shall examine the Plans and the Work site, carefully read the Specifications, and satisfy itself that it has the abilities and resources to complete the Work. The Bidder agrees that if it is awarded the Contract, no claim will be made against the City based on ignorance or misunderstanding of the provisions of the Contract Documents, the nature and amount of the work, and the physical and climatic conditions of the work site.

2. Estimated Quantities

The quantities shown in the Bid are approximate only. The Contractor will be paid for the actual quantities of work based on field measurements as provided for in these Specifications. The City reserves the right to increase or decrease the amount of any item or portion of work to be performed or materials furnished, or to delete any item, in accordance with the Specifications.

3. Bid Instructions and Submissions

The Bid shall be submitted on the Bid Proposal forms included with the Specifications. All Bid Documents listed below must be completed, executed and submitted with the Bid by the Bidder.

Required eight (8) Bid Proposal Documents:

- 1) Bidder's Submittal
- 2) Addenda Acknowledgment Of Addenda Received
- 3) Contractor's Affidavit
- 4) Bid Bond (10%)
- 5) List of Subcontractors
- 6) References (2 pages)
- 7) Violations of Federal or State Law
- 8) Disqualification or Debarment

All prices submitted will be considered as including any and all sales or use taxes.

For any individual bid item, in the case of a discrepancy between its unit price and total bid, the unit price shall always prevail.

4. Disadvantaged Business Enterprise (DBE) Requirements

This project has no DBE requirements.

E. BID BOND

The Bid must be accompanied by either cash, a certified or cashier's check or a surety bond (bid bond) payable to the City of Torrance. Bids must be submitted on the proposal forms furnished by the Public Works Department. The Bid Guaranty shall be in an amount equivalent to at least 10% of the Total Contract Bid Price.

F. NONRESPONSIVE BIDS AND BID REJECTION

1. A Bid in which any one (1) of the required eight (8) Bid proposal documents are not completed, executed and submitted may be considered non-responsive and be rejected.
2. A Bid in which the Contract Unit Prices are unbalanced, which is incomplete or which shows alteration of form or irregularities of any kind, or which contains any additions or conditional or alternate Bids that are not called for, may be considered non-responsive and be rejected.

G. AWARD OF CONTRACT

In accordance with Division 2, Chapter 2 of the Torrance Municipal Code, the City Council reserves the right to reject any and all bids received, to take all bids under advisement for a period not-to-exceed one hundred (100) days after date of opening thereof, to waive any informality or irregularity in the Bid, and to be the sole judge of the merits of material included in the respective bids received.

No less than 2 weeks prior to the anticipated City Council meeting awarding a contract as a result of the Notice Inviting Bids, the City will notify all of the contractors that submitted a bid of the intention to award.

City of Torrance Bid/RFP Protest Procedures: The City of Torrance Bid/RFP Protest Procedures may be found on the City of Torrance website: [http://www.torranceca.gov/PDF/Bid RFP Protest Procedures.pdf](http://www.torranceca.gov/PDF/Bid_RFP_Protest_Procedures.pdf)

H. EXECUTION OF CONTRACT

After the Contract is awarded, the awardee shall execute the following eight (8) documents:

- 1) Performance Bond (100% of Bid)
- 2) Labor and Material Bond (100% of Bid)
- 3) Contract - Public Works Agreement
- 4) Verification of Insurance Coverage (Certificates and Endorsements)
- 5) Construction or Service Contract Endorsement
- 6) Workers' Compensation Insurance Certificate
- 7) Construction Permit Application Form
- 8) Business License Application Form

I. APPRENTICESHIP EMPLOYMENT STANDARDS

The Contractor is directed to the provisions in Sections 1776, 1777.5 and 1777.6 of the California Labor Code concerning the employment of apprentices by the contractor or any subcontractor under them.

J. PERMITS, LICENSES AND PUBLIC WORKS AGREEMENT

The Contractor shall procure and execute all permits, licenses, pay all charges and fees, and give all notices necessary and incidental to the completion of the Work. The Contractor shall execute a Public Works Agreement. No fee is charged for a Construction Permit

issued by the City of Torrance for a public works project. The Contractor shall obtain a City of Torrance Business License.

K. INSURANCE

The Contractor shall maintain Automobile Liability, General Liability and Workers' Compensation Insurance as specified in the Public Works Agreement included in the Project Specifications.

L. PRE-BID INQUIRIES

A Bidder with a Pre-Bid Inquiry must submit their question(s) in writing to the Torrance Public Works Department. You may email it to: Key Ebarle, Associate Civil Engineer, at KEbarle@TorranceCA.gov. All questions must be received no later than 5:00 p.m. on the Wednesday one week prior to the date for opening the bids. Questions received after this date may not be considered.

SECTION C
BID DOCUMENTS

BIDDER'S SUBMITTAL

Company: _____ Total Bid: _____

PROPOSAL, SPECIFICATIONS, BOND AND AFFIDAVIT FOR THE CONSTRUCTION OF ZAMPERINI FIELD SECURITY PROJECT, FEAP 616

B2013-52

Honorable Mayor and Members
of the Torrance City Council
Torrance, California

Members of the Council:

In accordance with the Notice Inviting Bids pertaining to the receiving of sealed proposals by the City Clerk of the City of Torrance for the above titled improvement, the undersigned hereby proposes to furnish all Work to be performed in accordance with the City of Torrance Plan No. AP-177, Specifications, Standard Drawings, and the Contract Documents, for the unit price or lump sum set forth in the following schedule.

BID SCHEDULE

BASE BID:

Item No.	Approx. Qty	Unit of Measure	Item Description	Unit Price	Total Bid
1	1	LS	Mobilization (5% MAX. OF CONTRACT BID)	\$	\$
2	1	LS	Maintain Airport Security & Traffic Control during Construction	\$	\$
3	9	EA	Bollards	\$	\$
4	1	LS	Pavement Markings	\$	\$
5	4	EA	Signage at Vehicle Gate (O, 23940, P, I)	\$	\$
6	1	EA	Signage at Door D1	\$	\$
7	600	SF	Restore AC Pavement	\$	\$
8	50	SF	Restore Sidewalk / PCC Gutter	\$	\$
9	200	LF	8-foot High Chain Link Fence	\$	\$

Item No.	Approx. Qty	Unit of Measure	Item Description	Unit Price	Total Bid
10	1	LS	44-foot Manual Double Swing Gate (O) Chain Link	\$	\$
11	1	EA	20-foot Cantilever Slide Gate (I) Chain Link	\$	\$
12	1	EA	50-foot V-Track Rolling Gate (23940) Chain Link	\$	\$
13	1	EA	50-foot V-Track Rolling Gate (P) Chain Link	\$	\$
14	3,500	LF	#6 AWG THHN 600V	\$	\$
15	60,250	LF	#8 AWG THHN 600V	\$	\$
16	6,500	LF	#10 AWG THHN 600V	\$	\$
17	2,100	LF	#12 AWG THHN 600V	\$	\$
18	400	LF	#14 AWG THHN 600V (Door mechanism to card reader)	\$	\$
19	1,200	LF	1" PVC Sch. 40 Conduit including Trench and Backfill	\$	\$
20	300	LF	1" PVC Sch. 40 Conduit Spare including Trench and Backfill	\$	\$
21	350	LF	1" RGS Conduit	\$	\$
22	22,600	LF	¾" RGS Conduit	\$	\$
23	2	EA	Mechanical Locking System at Door D1	\$	\$
24	2,500	LF	Rewire existing Street Lights	\$	\$
25	29	EA	Photoelectric Cell	\$	\$
26	13	EA	Concrete Hand Hole	\$	\$
27	30	EA	20-Amp Circuit Breaker	\$	\$
28	4	EA	14' Pole with Foundation, for Security Camera and APLR	\$	\$
29	6	EA	20' Pole with Light Mast Arm and Foundation, for Security Camera	\$	\$
30	141	EA	Lighting Fixture, LED 175W with installation	\$	\$

Item No.	Approx. Qty	Unit of Measure	Item Description	Unit Price	Total Bid
31	11	EA	Lighting Fixture, LED (Twin 175W) 350W with installation	\$	\$
32	3	EA	Gate Operator/Access Control, Uninterruptible Power Supply w/Enclosure and Foundation	\$	\$
33	1	LS	Staff Training – VMS, ALPR, Wireless Node and Access Control	\$	\$
34	1	LS	Miscellaneous Security/IT Equipment	\$	\$
35	3	EA	Outdoor Security Cabinet with Foundation	\$	\$
36	4	EA	Long Range Proximity Card Reader on Pedestal with Foundation	\$	\$
37	1	EA	Proximity Card Reader at Door D1	\$	\$
38	1	EA	Free- Exit Handle at Door D1	\$	\$
39	2	EA	Knox Box on Ingress Card Reader	\$	\$
40	4	EA	Maintenance Key on Ingress and Egress Card Reader	\$	\$
41	3	EA	Access Control Module	\$	\$
42	1	LS	Access Control System Software and License	\$	\$
43	300	EA	Proximity Card with Lanyard or Clip	\$	\$
44	2	*EA	Computer Workstation with UPS	\$	\$
45	1	EA	Photo ID Camera with Tripod	\$	\$
46	1	EA	System Printer	\$	\$
47	1	EA	Proximity Card Printer/Encoder, Single Sided with Photo ID Software	\$	\$
48	1	EA	Disable Core Card Reader at Gate Y	\$	\$
49	14	*EA	Outdoor PTZ Security Camera	\$	\$
50	1	*EA	Indoor Fixed Security Camera	\$	\$

Item No.	Approx. Qty	Unit of Measure	Item Description	Unit Price	Total Bid
51	15	*EA	Video Management System Software and Camera License	\$	\$
52	3	*EA	Remote Network Switch – 4 Port	\$	\$
53	3	EA	Automatic License Plate Reader Camera including Bracket and Termination Box	\$	\$
54	1	*LS	1U Server including Software	\$	\$
55	2	EA	Server Network Adapter – 24 Port	\$	\$
56	1	EA	IT Storage Switch – 24 Port	\$	\$
57	1	*LS	2U Video Storage System	\$	\$
58	1	LS	1U Rackmount Monitor and Keyboard	\$	\$
59	1	*LS	KVM Switch	\$	\$
60	1	LS	External Back-up System	\$	\$
61	13	EA	Outdoor Wireless Mesh Node	\$	\$
62	1	LS	Wireless Node Management Software	\$	\$
63	1	Allow	Additional Wireless Mesh Node	\$ 5,000	\$ 5,000

BASE BID:

TOTAL BID PRICE \$ _____
(Figures)*

TOTAL BID PRICE: _____
(Words)*

***BID MAY BE REJECTED IF TOTAL IS NOT SHOWN IN FIGURES AND WORDS.**

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ADDITIVE 1 (Gates A and F):

101	20	LF	PCC Curb and Gutter	\$	\$
102	6	LF	Ornamental Fence (Gate F)	\$	\$
103	2	EA	16-foot Cantilever Slide Gate (F) Ornamental	\$	\$
104	1	EA	35-foot V-Track Rolling Gate (A) Ornamental	\$	\$
105	1	EA	35-foot Hydraulic Gate Operator with Concrete including Loop Detectors and Photo Eye Sensor (Gate A)	\$	\$
106	2	EA	16-foot Hydraulic Gate Operator with Concrete including Loop Detectors and Photo Eye Sensor (Gate F)	\$	\$

ADDITIVE 1 (Gates A and F):

TOTAL BID PRICE \$ _____
(Figures)*

TOTAL BID PRICE: _____
(Words)*

***BID MAY BE REJECTED IF TOTAL IS NOT SHOWN IN FIGURES AND WORDS.**

B2013-52

BASIS OF AWARD:

The Basis of Award for this contract shall be the lowest responsive bid for the **Base Bid Proposal only**. However, the Bidder shall complete the Bid Proposals for the Additive Bid. The City reserves the right to award the Additive Bid to the same Contractor who was awarded this project.

The undersigned furthermore agrees to enter into and execute a contract, with necessary bonds, at the unit prices set forth herein and in case of default in executing such contract, with necessary bonds, the check or bond accompanying this bid and the money payable thereon shall be forfeited thereby to and remain the property of the City of Torrance.

The above unit prices include all work appurtenant to the various items as outlined in the Specifications and all work or expense required for the satisfactory completion of said items. In case of discrepancies between unit prices and totals, the unit prices shall govern.

The undersigned declares that it has carefully examined the Plans, Specifications, and Contract Documents, and has investigated the site of the work and is familiar with the conditions thereon.

Contractor: _____

Date: _____ By: _____

Contractor's State License No. _____ Class _____

Address: _____

Phone: _____

Fax: _____

ACKNOWLEDGMENT OF ADDENDA RECEIVED – B2013-52

The Bidder shall acknowledge the receipt of addenda by placing an "X" by each addendum received.

Addendum No. 1 _____

Addendum No. 2 _____

Addendum No. 3 _____

Addendum No. 4 _____

Addendum No. 5 _____

Addendum No. 6 _____

Addendum No. 7 _____

Addendum No. 8 _____

If an addendum or addenda have been issued by the City and not noted above as being received by the Bidder, the Bid Proposal may be rejected.

Bidder's Signature

Date

CONTRACTOR'S AFFIDAVIT

STATE OF CALIFORNIA }
 }
COUNTY OF _____ }

B2013-52

_____, being first duly sworn, deposes and says:

1. That he is the

Title

of _____
(Name of Partnership, Corporation, or Sole Proprietorship)

hereinafter called "Contractor," who has submitted to the City of Torrance a proposal for the Construction OF **ZAMPERINI FIELD SECURITY PROJECT, FEAP 616; B2013-52;**

2. That said proposal is genuine; that the same is not sham; that all statement of facts therein are true;
3. That such proposal was not made in the interest or behalf of any person, partnership, company, association, organization or corporation not named or disclosed;
4. That the Contractor did not, directly or indirectly, induce, solicit or agree with anyone else to submit a false or sham bid, to refrain from bidding, or to withdraw the bid, to raise or fix the bid price of the Contractor or anyone else, or to raise or fix any overhead, profit or cost element of the Contractor's price or the price of anyone else; and did not attempt to induce action prejudicial to the interest of the City of Torrance, or of any other bidder, or anyone else interested in the proposed contract;
5. That the Contractor has not in any manner sought by collusion to secure for itself an advantage over any other bidder or to induce action prejudicial to the interests of the City of Torrance, or of any other bidder or of anyone else interested in the proposed contract;
6. That the Contractor has not accepted any bid from any subcontractor or materialman through any bid depository, the bylaws, rules or regulations of which prohibit or prevent the Contractor from considering any bid from any subcontractor or materialman, which is not processed through said bid depository, or which prevent any subcontractor or materialman from bidding to any contractor who does not use the facilities of or accept bids from or through such bid depository;

CONTRACTOR'S AFFIDAVIT (CONTINUED)

B2013-52

7. That the Contractor did not, directly or indirectly, submit the Contractor's bid price or any breakdown thereof, or the contents thereof, or divulge information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, or to any individual or group of Individuals, except to the City of Torrance, or to any person or persons who have a partnership or other financial interest with said Contractor in its business.

Dated this _____ day of _____, 20__.

Subscribed and Sworn to
before me this _____ day
of _____, 20__.

(Contractor)

(Title)

Notary Public in and for said
County and State.
(Seal)

BID BOND (10%)

B2013-52

KNOW ALL MEN BY THESE PRESENTS: That we, _____

as principal, and _____

as sureties, are held and firmly bound unto the City of Torrance, State of California, in the penal sum of _____ dollars (\$_____), for the payment whereof we hereby bind ourselves, our successors, heirs, executors or administrators jointly and severally, firmly by these presents.

The condition of this obligation is such that, whereas the above bounded principal is about to file with and submit to the City of Torrance a bid or proposal for the performance of certain work as required in the City of Torrance, Project No. B2013-52, said work being: the ZAMPERINI FIELD SECURITY PROJECT, FEAP 616; and in compliance with the Specifications therefor under an invitation of said City contained in a notice or advertisement for bids or proposals; now if the bid or proposal of the said principal shall be accepted and if the said work be thereupon awarded to the principal by said City and if the said principal shall enter into a contract with the said City in accordance with said bid or proposal, or if the bid or proposal of the said principal is rejected, then this bond shall be void and of no effect and otherwise in full force and effect.

WITNESS our hands this _____ day of _____, 20____.

Principal

Surety/Attorney-in-Fact

Signature

Name: _____
Local Address: _____

Phone No.: _____
Fax No.: _____

**LIST OF SUBCONTRACTORS
B2013-52**

The Bidder is required to fill in the following blanks in accordance with the provisions of the California Public Contract Code Sections 4100-4114, CHAPTER 4. SUBLETTING AND SUBCONTRACTING. The contractor, sub recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of Title 49 CFR (Code of Federal Regulations) part 26 in the award and administration of US DOT assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy, as the recipient deems appropriate. Each subcontract signed by the bidder must include this assurance.

Failure of the bidder to fulfill the requirements of the Special Provisions for submittals required to be furnished after bid opening, including but not limited to escrowed bid documents, where applicable, may subject the bidder to a determination of the bidder's responsibility in the event it is the apparent low bidder on a future public works contracts.

Name Under Which Subcontractor is Licensed: _____

Subcontractor's Address: _____

Specific Description of Sub-Contract: _____

License Number: _____ CA License Classification/Type: _____

Name Under Which Subcontractor is Licensed: _____

Subcontractor's Address: _____

Specific Description of Sub-Contract: _____

License Number: _____ CA License Classification/Type: _____

Name Under Which Subcontractor is Licensed: _____

Subcontractor's Address: _____

Specific Description of Sub-Contract: _____

License Number: _____ CA License Classification/Type: _____

Subcontractors listed must be properly licensed under the laws of the State of California for the type of work which they are to perform. Do not list alternate subcontractors for the same work.

REFERENCES (Page 1 of 2)
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List work similar in magnitude and degree of difficulty completed by the Contractor within the past three (3) years.

1. Name (Firm/Agency): _____
Address: _____
Contact Person: _____ Telephone No.: _____
Title of Project: _____
Project Location: _____
Date of Completion: _____ Contract Amount: \$ _____

2. Name (Firm/Agency): _____
Address: _____
Contact Person: _____ Telephone No.: _____
Title of Project: _____
Project Location: _____
Date of Completion: _____ Contract Amount: \$ _____

3. Name (Firm/Agency): _____
Address: _____
Contact Person: _____ Telephone No.: _____
Title of Project: _____
Project Location: _____
Date of Completion: _____ Contract Amount: \$ _____

4. Name (Firm/Agency): _____
Address: _____
Contact Person: _____ Telephone No.: _____
Title of Project: _____
Project Location: _____
Date of Completion: _____ Contract Amount: \$ _____

REFERENCES (PAGE 2 OF 2)
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If Contractor has not performed work for the City of Torrance within the last five (5) years, list all work done within said five years (attach additional sheets if necessary). Note if work was done as subcontractor [include only subcontract amount]:

Work Description & Contract Amount	Agency	Date Completed

Contractor's License No.: _____ Class: _____

a. Date first obtained: _____ Expiration: _____

b. Has License ever been suspended or revoked? _____

If yes, describe when and why: _____

c. Any current claims against License or Bond? _____

If yes, describe claims: _____

Principals in Company (List all – attach additional sheets if necessary):

NAME	TITLE (If Applicable)	LICENSE NO.
_____	_____	_____
_____	_____	_____
_____	_____	_____

**VIOLATIONS OF FEDERAL, STATE OR LOCAL LAWS
B2013-52**

1. Has your firm or its officers been assessed any penalties by an agency for noncompliance or violations of Federal, State or Local labor laws and/or business or licensing regulations within the past five (5) years relating to your construction projects?

Yes/No: _____ Federal/State: _____

If "yes," identify and describe, (including agency and status): _____

Have the penalties been paid? Yes/No: _____

2. Does your firm or its officers have any ongoing investigations by any public agency regarding violations of the State Labor Code, California Business and Professions Code or State Licensing Laws?

Yes/No: _____ Code/Laws: _____ Section/Article: _____

If "yes," identify and describe, (including agency and status): _____

DISQUALIFICATION OR DEBARMENT

Has your firm, any officer of your firm, or any employee who has a proprietary interest in your firm ever been disqualified, removed, or otherwise prevented from bidding on, performing work on, or completing a federal, state or local project because of a violation of law or a safety regulation? Yes/No: _____. If yes, provide the following information (if more than once, use separate sheets):

Date: _____ Entity: _____

Location: _____

Reason: _____

Provide Status and any Supplemental Statement: _____

Has your firm been reinstated by this entity? Yes/No: _____

The Contractor's debarment status will be researched online at 'www.sam.gov (Federal Debarment list) and documented before the Contractor's bid will be evaluated. Bids submitted by Contractor found to be on the list will not be evaluated.

SECTION D

**DOCUMENTS TO BE COMPLETED
AND DELIVERED TO CITY PRIOR
TO AWARD OF CONTRACT**

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, _____ as Principal(s) and _____ a corporation, incorporated, organized, and existing under the laws of the State of _____, and authorized to execute bonds and undertakings and to do a general surety business in the State of California, as Surety, are jointly and severally held and firmly bound unto the City of Torrance, a municipal corporation, located in the County of Los Angeles, State of California, in the full and just sum of: _____ Dollars (\$ _____), lawful money of the United States of America, for the payment of which sum, well and truly to be made, we bind ourselves and our respective heirs, executors, administrators, representative, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that: WHEREAS, said Principal(s) have/has entered into, or are/is about to enter into, a certain written contract or agreement, dated as of the _____ day of _____, 20____, with the said City of Torrance for the Construction of ZAMPERINI FIELD SECURITY PROJECT, FEAP 616; B2013-52, all as is more specifically set forth in said contract or agreement, a full, true and correct copy of which is hereunto attached, and hereby referred to and by this reference incorporated herein and made a part hereof;

NOW, THEREFORE, if the said Principal(s) shall faithfully and well and truly do, perform and complete, or cause to be done, performed and complete, each and all of the covenants, terms, conditions, requirements, obligations, acts and things, to be met, done or performed by said Principal(s), including any guarantee period as set forth in, or required by, said contract or agreement, all at and within the time or times, and in the manner as therein specified and contemplated, then this bond and obligation shall be null and void; otherwise it shall be and remain in full force, virtue and effect.

The said Surety, for value received, hereby stipulates and agrees that no amendment, change, extension of time, alteration or addition to said contract or agreement, or of any feature or item or items of performance required therein or thereunder, shall in any manner affect its obligations on or under this bond; and said Surety does hereby waive notice of any such amendment, change, extension of time, alteration, or addition to said contract or agreement, and of any feature or item or items of performance required therein or thereunder.

PERFORMANCE BOND (CONTINUED)

In the event any suit, action or proceedings is instituted to recover on this bond or obligation, said Surety will pay, and does hereby agree to pay, as attorney's fees for said City, such sum as the Court in any such suit, action or proceeding may adjudge reasonable.

EXECUTED, SEALED AND DATED this _____ day of _____,
20____.

CORPORATE SEAL

PRINCIPAL(S):

BY _____

BY _____

CORPORATE SEAL

SURETY:

BY _____

LABOR AND MATERIAL BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, _____
As Principal(s) and _____ a
corporation, incorporated, organized, and existing under the laws of the State of _____,
and authorized to execute bonds and undertakings and to do a general surety business in the
State of California, as Surety, are jointly and severally held and firmly bound unto:

- (a) The State of California for the use and benefit of the State Treasurer, as ex-officio Treasurer and custodian of the Unemployment Fund of said State; and
- (b) The City of Torrance, California; and
- (c) Any and all persons who do or perform or who did or performed work or labor upon or in connection with the work or improvement referred to in the contract or agreement hereinafter mentioned; and
- (d) Any and all materialmen, persons, companies, firms, association, or corporations, supplying or furnishing any materials, provisions, provender, transportation, appliances or power, or other supplies used in, upon, for or about or in connection with the performance of the work or improvement contracted to be executed, done, made or performed under said contract or agreement; and
- (e) Any and all persons, companies, firms, associations, or corporations furnishing, renting, or hiring teams, equipment, implements or machinery for, in connection with, or contributing to, said work to be done or improvement to be made under said contract or agreement; and
- (f) Any and all persons, companies, firms, associations, or corporations who supply both work and materials;

and whose claim has not been paid by said Principal(s), in full and just sum of _____ Dollars (\$_____), lawful money of the United States of America, for the payment of which will and truly to be made, said Principal(s) and said Surety do hereby bind themselves and their respective heirs, executors, administrators, representatives, successors and assigns, jointly and severally, firmly by these presents.

LABOR AND MATERIAL BOND (CONTINUED)

THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH, THAT: WHEREAS, said Principal(s) have/has entered into or are/is about to enter into a certain written contract or agreement, dated as of the _____ day of _____ 20 ____, with the City of Torrance for the Construction of ZAMPERINI FIELD SECURITY PROJECT, FEAP 616; B2013-52 all as is more specifically set forth in said contract or agreement, a full, true and correct copy of which is hereunto attached, and hereby referred to and by this reference incorporated herein and made a part hereof;

NOW, THEREFORE, if the said Principal(s) (or any of his/her, its, or their subcontractors) under said contract or agreement fails or fail to pay:

- (1) For any materials, provisions, provender, transportation, appliances, or power, or other supplies; or
- (2) For the hire of any teams, equipment, implements, or machinery; or
- (3) For any work or labor; supplies, furnished, provided, used, done or performed in, upon, for or about or in connection with the said work or improvement; or
- (4) For amounts due under the Unemployment Insurance Act of the State of California with respect to such work or improvement;

the Surety on this bond will pay the same in an amount not exceeding the sum hereinabove specified in this bond; and, also, in case suit is brought upon this bond, said Surety will (and does hereby agree to) pay a reasonable attorney's fee, to be fixed and taxed as costs, and included in the judgment therein rendered.

This bond shall (and it is hereby made to) insure to the benefit of any and all persons entitled to file claims under Section 1192.1 of the Code of Civil Procedure of the State of California, so as to give a right of action to them or their assigns in any suit brought upon this bond, all as contemplated under the provisions of Section 4205 of the Government Code, and of Chapter 1 of Title 4 of Part 3 of the Code of Civil Procedure, of the State of California.

This bond is executed and filed in connection with said contract or agreement hereunto attached to comply with each and all of the provisions of the laws of the State of California above mentioned or referred to, and of all amendments thereto, and the obligors so intend and do hereby bind themselves accordingly.

LABOR AND MATERIAL BOND (CONTINUED)

The said Surety, for value received, hereby stipulates and agrees that no amendment, change, extension of time, alteration, or addition to said contract or agreement, or of any feature or item or items of performance required therein or thereunder, shall in any manner affect its obligations on or under this bond; and said Surety does hereby waive notice of any such amendment, change, extension of time, alteration, or addition to said contract or agreement, and of any feature or item or items of performance required therein or thereunder.

EXECUTED, SEALED AND DATED this _____ day of _____, 20 _____

CORPORATE SEAL

PRINCIPAL:

BY _____

CORPORATE SEAL

SURETY:

BY _____

PUBLIC WORKS AGREEMENT

This PUBLIC WORKS AGREEMENT ("Agreement") is made and entered into as of DATE (the "Effective Date"), by and between the CITY OF TORRANCE, a municipal corporation ("CITY"), and CONTRACTOR NAME, TYPE OF ENTITY ("CONTRACTOR").

RECITALS:

- A. The CITY wishes to retain the services of an experienced and qualified CONTRACTOR to construct the **PROJECT NAME & BID NUMBER**;
- B. In order to obtain the desired services, The CITY has circulated a Notice Inviting Bids for the construction of the **PROJECT NAME & BID NUMBER** (the "NIB"); and
- C. CONTRACTOR has submitted a Bid (the "Bid") in response to the NIB. CONTRACTOR represents that it is qualified to perform those services requested in the Plans and Specifications. Based upon its review of all Bids submitted in response to the NIB, The CITY is willing to award the contract to CONTRACTOR.

AGREEMENT:

1. SERVICES TO BE PERFORMED BY CONTRACTOR

CONTRACTOR will provide the services and install those materials listed in the Plans and Specifications, which are on file in the Public Works Department. The NIB and the Plans and Specifications are made a part of this Agreement. A copy of the Bid is attached as Exhibit A.

2. TERM

Unless earlier terminated in accordance with Paragraph 4 below, this Agreement will continue in full force and effect for two years from the Effective Date.

3. COMPENSATION

A. CONTRACTOR's Fee.

For services rendered pursuant to this Agreement, CONTRACTOR will be paid in accordance with CONTRACTOR's Bid; provided, however, that in no event will the total amount of money paid the CONTRACTOR, for services initially contemplated by this Agreement, exceed the sum of \$INSERT DOLLAR AMOUNT ("Agreement Sum"), unless otherwise first approved in writing by the CITY.

B. Schedule of Payment.

Provided that the CONTRACTOR is not in default under the terms of this Agreement, upon presentation of an invoice, CONTRACTOR will be paid monthly, within 30 days after the date of the monthly invoice.

4. TERMINATION OF AGREEMENT

A. Termination by CITY for Convenience.

1. CITY may, at any time, terminate the Agreement for CITY's convenience and without cause.
2. Upon receipt of written notice from CITY of such termination for CITY's convenience, CONTRACTOR will:
 - a) cease operations as directed by CITY in the notice;
 - b) take actions necessary, or that CITY may direct, for the protection and preservation of the work; and
 - c) except for work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.
3. In case of such termination for CITY's convenience, CONTRACTOR will be entitled to receive payment for work executed; and costs incurred by reason of such termination, along with reasonable overhead and profit on the work not executed.

B. Termination for Cause.

1. If either party fails to perform any term, covenant or condition in this Agreement and that failure continues for 15 calendar days after the nondefaulting party gives the defaulting party notice of the failure to perform, this Agreement may be terminated for cause; provided, however, that if during the notice period the defaulting party has promptly commenced and continues diligent efforts to remedy the default, the defaulting party will have such additional time as is reasonably necessary to remedy the default.
2. In the event this Agreement is terminated for cause by the default of the CONTRACTOR, the CITY may, at the expense of the CONTRACTOR and its surety, complete this Agreement or cause it to be completed. Any check or bond delivered to the CITY in connection with this Agreement, and the money payable thereon, will be forfeited to and remain the property of the CITY. All moneys due the CONTRACTOR under the terms of this Agreement will be retained by the CITY, but the retention will not release the CONTRACTOR and its surety from liability for the default. Under these circumstances, however, the CONTRACTOR and its surety will be credited with the amount of money retained, toward any amount by which the cost of completion exceeds the Agreement Sum and any amount authorized for extra services.
3. Termination for cause will not affect or terminate any of the rights of the CITY as against the CONTRACTOR or its surety then existing, or which may thereafter accrue because of the default; this provision is in

addition to all other rights and remedies available to the CITY under law.

C. Termination for Breach of Law.

In the event the CONTRACTOR or any of its officers, directors, shareholders, employees, agents, subsidiaries or affiliates is convicted (i) of a criminal offense as an incident to obtaining or attempting to obtain a public or private contract or subcontract, or in the performance of a contract or subcontract; (ii) under state or federal statutes of embezzlement, theft, forgery, bribery, falsification or destruction of records, receiving stolen property, or any other offense indicating a lack of business integrity or business honesty which currently, seriously, and directly affects responsibility as a public consultant or contractor; (iii) under state or federal antitrust statutes arising out of the submission of bids or proposals; or (iv) of violation of Paragraph 19 of this Agreement; or for any other cause the CITY determines to be so serious and compelling as to affect CONTRACTOR's responsibility as a public consultant or contractor, including but not limited to, debarment by another governmental agency, then the CITY reserves the unilateral right to terminate this Agreement or to impose such other sanctions (which may include financial sanctions, temporary suspensions or any other condition deemed appropriate short of termination) as it deems proper. The CITY will not take action until CONTRACTOR has been given notice and an opportunity to present evidence in mitigation.

5. FORCE MAJEURE

If any party fails to perform its obligations because of strikes, lockouts, labor disputes, embargoes, acts of God, inability to obtain labor or materials or reasonable substitutes for labor or materials, governmental restrictions, governmental regulations, governmental controls, judicial orders, enemy or hostile governmental action, civil commotion, fire or other casualty, or other causes beyond the reasonable control of the party obligated to perform, then that party's performance shall be excused for a period equal to the period of such cause for failure to perform.

6. RETENTION OF FUNDS

CONTRACTOR authorizes the CITY to deduct from any amount payable to CONTRACTOR (whether or not arising out of this Agreement) any amounts the payment of which may be in dispute or that are necessary to compensate the CITY for any losses, costs, liabilities, or damages suffered by the CITY, and all amounts for which the CITY may be liable to third parties, by reason of CONTRACTOR's negligent acts or omissions or willful misconduct in performing or failing to perform CONTRACTOR's obligations under this Agreement. In the event that any claim is made by a third party, the amount or validity of which is disputed by CONTRACTOR, or any indebtedness exists that appears to be the basis for a claim of lien, the CITY may withhold from any payment due, without liability for interest because of the withholding, an amount sufficient to cover the claim. The failure of the CITY to exercise the right to deduct or to withhold will

not, however, affect the obligations of CONTRACTOR to insure, indemnify, and protect the CITY as elsewhere provided in this Agreement.

7. THE CITY'S REPRESENTATIVE

The Public Works Director is designated as the "City Representative," authorized to act in its behalf with respect to the work and services specified in this Agreement and to make all decisions in connection with this Agreement. Whenever approval, directions, or other actions are required by the CITY under this Agreement, those actions will be taken by the City Representative, unless otherwise stated. The City Manager has the right to designate another City Representative at any time, by providing notice to CONTRACTOR.

8. CONTRACTOR REPRESENTATIVE(S)

The following principal(s) of CONTRACTOR are designated as being the principal(s) and representative(s) of CONTRACTOR authorized to act in its behalf with respect to the work specified in this Agreement and make all decisions in connection with this Agreement:

REPRESENTATIVE 1
REPRESENTATIVE 2

9. INDEPENDENT CONTRACTOR

The CONTRACTOR is, and at all times will remain as to the CITY, a wholly independent contractor. Neither the CITY nor any of its agents will have control over the conduct of the CONTRACTOR or any of the CONTRACTOR's employees, except as otherwise set forth in this Agreement. The CONTRACTOR may not, at any time or in any manner, represent that it or any of its agents or employees are in any manner agents or employees of the CITY. CITY has no duty, obligation, or responsibility to CONTRACTOR's agents or employees under the Affordable Care Act. CONTRACTOR is solely responsible for any tax penalties associated with the failure to offer affordable coverage to its agents and employees under the Affordable Care Act and any other liabilities, claims and obligations regarding compliance with the Affordable Care Act with respect to CONTRACTOR's agents and employees. CITY is not responsible and shall not be held liable for CONTRACTOR's failure to comply with CONTRACTOR's duties, obligations, and responsibilities under the Affordable Care Act. CONTRACTOR agrees to defend, indemnify and hold CITY harmless for any and all taxes and penalties that may be assessed against CITY as a result of CONTRACTOR's obligations under the Affordable Care Act relating to CONTRACTOR's agents and employees.

10. BUSINESS LICENSE

The CONTRACTOR must obtain a City business license prior to the start of work under this Agreement, unless CONTRACTOR is qualified for an exemption.

11. **OTHER LICENSES AND PERMITS**

CONTRACTOR warrants that it has all professional, contracting and other permits and licenses required to undertake the work contemplated by this Agreement.

12. **FAMILIARITY WITH WORK**

By executing this Agreement, CONTRACTOR warrants that CONTRACTOR (a) has thoroughly investigated and considered the scope of services to be performed, (b) has carefully considered how the services should be performed, and (c) fully understands the facilities, difficulties and restrictions attending performance of the services under this Agreement. If the services involve work upon any site, CONTRACTOR warrants that CONTRACTOR has or will investigate the site and is or will be fully acquainted with the conditions there existing, prior to commencement of services set forth in this Agreement. Should CONTRACTOR discover any latent or unknown conditions that will materially affect the performance of the services set forth in this Agreement, CONTRACTOR must immediately inform the CITY of that fact and may not proceed except at CONTRACTOR's risk until written instructions are received from the CITY.

13. **CARE OF WORK**

CONTRACTOR must adopt reasonable methods during the life of the Agreement to furnish continuous protection to the work, and the equipment, materials, papers, documents, plans, studies and other components to prevent losses or damages, and will be responsible for all damages, to persons or property, until acceptance of the work by the CITY, except those losses or damages as may be caused by the CITY's own negligence.

14. **CONTRACTOR'S ACCOUNTING RECORDS; OTHER PROJECT RECORDS**

Records of the CONTRACTOR's time pertaining to the project, and records of accounts between the CITY and the CONTRACTOR, will be kept on a generally recognized accounting basis. CONTRACTOR will also maintain all other records, including without limitation specifications, drawings, progress reports and the like, relating to the project. All records will be available to the CITY during normal working hours. CONTRACTOR will maintain these records for three years after final payment.

15. **INDEMNIFICATION**

CONTRACTOR will indemnify, defend, and hold harmless CITY, the Successor Agency to the Former Redevelopment Agency of the City of Torrance, the City Council, each member thereof, present and future, its officers, agents and employees from and against any and all liability, expenses, including defense costs and legal fees, and claims for damages whatsoever, including, but not limited to, those arising from breach of contract, bodily injury, death, personal injury, property damage, loss of use, or property loss however the same may be

caused and regardless of the responsibility for negligence. The obligation to indemnify, defend and hold harmless includes, but is not limited to, any liability or expense, including defense costs and legal fees, arising from the negligent acts or omissions, or willful misconduct of CONTRACTOR, its officers, employees, agents, subcontractors or vendors. It is further agreed, CONTRACTOR's obligations to indemnify, defend and hold harmless will apply even in the event of concurrent negligence on the part of CITY, the City Council, each member thereof, present and future, or its officers, agents and employees, except for liability resulting solely from the negligence or willful misconduct of CITY, its officers, employees or agents. Payment by CITY is not a condition precedent to enforcement of this indemnity. In the event of any dispute between CONTRACTOR and CITY, as to whether liability arises from the sole negligence of the CITY or its officers, employees, agents, subcontractors or vendors, CONTRACTOR will be obligated to pay for CITY's defense until such time as a final judgment has been entered adjudicating the CITY as solely negligent. CONTRACTOR will not be entitled in the event of such a determination to any reimbursement of defense costs including but not limited to attorney's fees, expert fees and costs of litigation.

16. NON-LIABILITY OF THE CITY'S OFFICERS AND EMPLOYEES

No officer or employee of the CITY will be personally liable to CONTRACTOR, in the event of any default or breach by the CITY or for any amount that may become due to CONTRACTOR.

17. INSURANCE

- A. CONTRACTOR must maintain at its sole expense the following insurance, which will be full coverage not subject to self insurance provisions:
1. Automobile Liability, including owned, non-owned and hired vehicles, with at least the following limits of liability:
 - a. Combined single limits of \$2,000,000 per occurrence.
 2. General Liability including coverage for premises, products and completed operations, independent contractors, personal injury and contractual obligations with combined single limits of coverage of at least \$3,000,000 per occurrence, with an annual aggregate of no less than \$5,000,000.
 3. Workers' Compensation with limits as required by the State of California and Employers Liability with limits of at least \$1,000,000.
- B. The insurance provided by CONTRACTOR will be primary and non-contributory.
- C. CITY, the Successor Agency to the Former Redevelopment Agency of the City of Torrance, the City Council and each member thereof,

members of boards and commissions, every officer, agent, official, employee and volunteer must be named as additional insureds under the automobile and general liability policies.

- D. CONTRACTOR must provide certificates of insurance and/or endorsements to the City Clerk of the City of Torrance before the commencement of work.
- E. Each insurance policy required by this Paragraph must contain a provision that no termination, cancellation or change of coverage can be made without thirty days notice to the CITY.
- F. CONTRACTOR must include all subcontractors as insureds under its policies or must furnish separate certificates and endorsements for each subcontractor. All coverage for subcontractors will be subject to all of the requirements of this Paragraph 17.

18. SUFFICIENCY OF INSURERS

Insurance required by this Agreement will be satisfactory only if issued by companies admitted to do business in California, rated "B+" or better in the most recent edition of Best's Key Rating Guide, and only if they are of a financial category Class VII or better, unless these requirements are waived by the Risk Manager of the CITY ("Risk Manager") due to unique circumstances. In the event the Risk Manager determines that the work or services to be performed under this Agreement creates an increased or decreased risk of loss to the CITY, the CONTRACTOR agrees that the minimum limits of any insurance policies and/or the performance bond required by this Agreement may be changed accordingly upon receipt of written notice from the Risk Manager; provided that CONTRACTOR will have the right to appeal a determination of increased coverage by the Risk Manager to the City Council of the CITY within 10 days of receipt of notice from the Risk Manager.

19. CONFLICT OF INTEREST

- A. No officer or employee of the CITY may have any financial interest, direct or indirect, in this Agreement, nor may any officer or employee participate in any decision relating to the Agreement that effects the officer or employee's financial interest or the financial interest of any corporation, partnership or association in which the officer or employee is, directly or indirectly interested, in violation of any law, rule or regulation.
- B. No person may offer, give, or agree to give any officer or employee or former officer or employee, nor may any officer or employee solicit, demand, accept, or agree to accept from another person, a gratuity or an offer of employment in connection with any decision, approval, disapproval, recommendation, preparation or any part of a program requirement or a purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing, or in any other advisory capacity in any way pertaining to any

program requirement, contract or subcontract, or to any solicitation or proposal.

20. NOTICE

- A. All notices, requests, demands, or other communications under this Agreement will be in writing. Notice will be sufficiently given for all purposes as follows:
1. Personal delivery. When personally delivered to the recipient: notice is effective on delivery.
 2. First Class mail. When mailed first class to the last address of the recipient known to the party giving notice: notice is effective three mail delivery days after deposit in an United States Postal Service office or mailbox.
 3. Certified mail. When mailed certified mail, return receipt requested: notice is effective on receipt, if delivery is confirmed by a return receipt.
 4. Overnight delivery. When delivered by an overnight delivery service, charges prepaid or charged to the sender's account: notice is effective on delivery, if delivery is confirmed by the delivery service.
 5. Facsimile transmission. When sent by fax to the last fax number of the recipient known to the party giving notice: notice is effective on receipt. Any notice given by fax will be deemed received on the next business day if it is received after 5:00 p.m. (recipient's time) or on a non-business day.

7. Addresses for purpose of giving notice are as follows:

CONTRACTOR: CONTRACTOR'S NAME AND ADDRESS

Fax: INSERT FAX NUMBER

CITY: City Clerk
City of Torrance
3031 Torrance Boulevard
Torrance, CA 90509-2970
Fax: (310) 618-2931

with a copy to: Attn: PROJECT MANAGER'S NAME
Public Works Department
City of Torrance
20500 Madrona Aveune
Torrance, CA 90503
Fax: (310)781-6902

- B. Any correctly addressed notice that is refused, unclaimed, or undeliverable because of an act or omission of the party to be notified, will be deemed effective as of the first date the notice was refused, unclaimed or deemed undeliverable by the postal authorities, messenger or overnight delivery service.
- C. Either party may change its address or fax number by giving the other party notice of the change in any manner permitted by this Agreement.

21. PROHIBITION AGAINST ASSIGNMENT AND SUBCONTRACTING

This Agreement and all exhibits are binding on the heirs, successors, and assigns of the parties. The Agreement may not be assigned or subcontracted by either the CITY or CONTRACTOR without the prior written consent of the other.

22. INTEGRATION; AMENDMENT

This Agreement represents the entire understanding of the CITY and CONTRACTOR as to those matters contained in it. No prior oral or written understanding will be of any force or effect with respect to the terms of this Agreement. The Agreement may not be modified or altered except in writing signed by both parties.

23. INTERPRETATION

The terms of this Agreement should be construed in accordance with the meaning of the language used and should not be construed for or against either party by reason of the authorship of this Agreement or any other rule of construction that might otherwise apply.

24. SEVERABILITY

If any part of this Agreement is found to be in conflict with applicable laws, that part will be inoperative, null and void insofar as it is in conflict with any applicable laws, but the remainder of the Agreement will remain in full force and effect.

25. TIME OF ESSENCE

Time is of the essence in the performance of this Agreement.

26. GOVERNING LAW; JURISDICTION

This Agreement will be administered and interpreted under the laws of the State of California. Jurisdiction of any litigation arising from the Agreement will be in Los Angeles County, California.

27. COMPLIANCE WITH STATUTES AND REGULATIONS

CONTRACTOR will be knowledgeable of and will comply with all applicable federal, state, county and city statutes, rules, regulations, ordinances and orders.

28. WAIVER OF BREACH

No delay or omission in the exercise of any right or remedy by a nondefaulting party on any default will impair the right or remedy or be construed as a waiver. A party's consent or approval of any act by the other party requiring the party's consent or approval will not be deemed to waive or render unnecessary the other party's consent to or approval of any subsequent act. Any waiver by either party of any default must be in writing and will not be a waiver of any other default concerning the same or any other provision of this Agreement.

29. ATTORNEY'S FEES

Except as provided for in Paragraph 15, in any dispute, litigation, arbitration, or other proceeding by which one party either seeks to enforce its rights under this Agreement (whether in contract, tort or both) or seeks a declaration of any rights or obligations under this Agreement, the prevailing party will be awarded reasonable attorney's fees, together with any costs and expenses, to resolve the dispute and to enforce any judgment.

30. EXHIBITS

All exhibits identified in this Agreement are incorporated into the Agreement by this reference.

31. CONTRACTOR'S AUTHORITY TO EXECUTE

The persons executing this Agreement on behalf of the CONTRACTOR warrant that (i) the CONTRACTOR is duly organized and existing; (ii) they are duly authorized to execute this Agreement on behalf of the CONTRACTOR; (iii) by so executing this Agreement, the CONTRACTOR is formally bound to the provisions of this Agreement; and (iv) the entering into this Agreement does not violate any provision of any other Agreement to which the CONTRACTOR is bound.

CITY OF TORRANCE,
a Municipal Corporation

BUSINESS OR INDIVIDUAL NAME
TYPE OF ENTITY

Frank Scotto, Mayor

By: _____
SIGNER, TITLE

ATTEST:

Sue Herbers, City Clerk

APPROVED AS TO FORM:

JOHN L. FELLOWS III
City Attorney

By: _____

Attachment: Exhibit A: Bid

EXHIBIT A

Bid

**CITY OF TORRANCE
CONSTRUCTION OR SERVICE CONTRACT ENDORSEMENT**

To be attached to and made a part of all policies insuring the liability of any person, form or corporation performing services under contract for the City of Torrance.

Notwithstanding any inconsistent expression in the policy to which this endorsement is attached, or in any other endorsement now or hereafter attached thereto, or made a part thereof, the protection afforded by said policy shall:

1. Include the City of Torrance as an additional insured. (To include the elected officials, appointed officials, and employees.)
2. Indemnify and save harmless the City of Torrance against any and all claims resulting from the undertaking specified in the contract known as:

**PROPOSAL, SPECIFICATIONS, BOND AND AFFIDAVIT
FOR THE CONSTRUCTION OF
ZAMPERINI FIELD SECURITY PROJECT, FEAP 616;**

B2013-52

This hold harmless assumption on the part of the underwriters shall include all costs of investigation and defense, including claims based on damage to substructures not shown, not located on the plans, or shown incorrectly.

3. Not be cancelled except by notice to the City Attorney of the City of Torrance at least thirty (30) days prior to the date of cancellation.
4. Provide single limit for Bodily Injury Liability and Property Damage Liability combined, \$3,000,000 each Occurrence, and \$5,000,000 Aggregate.
5. Limited classifications, restricting endorsements, exclusions or other special provisions contained in the policy shall not act to limit the benefits of coverage as they shall apply to the City of Torrance as enumerated in this endorsement. However, nothing herein contained shall affect any rights of the insurer against the insured.
6. It is further expressly agreed by and between the parties hereto that the following two provisions, (a) and (b), are a part of this contract:
 - (a) That the Contractor specifically agrees to comply with applicable provisions of Section 1777.5 of the Labor Code relating to the employment by contractor or subcontractor under it, of journeyman or apprentices, or workmen, in any apprenticeable craft or trade.
 - (b) By my signature hereunder, as Contractor, I certify that I am aware of the provisions of Section 3700 of the Labor Code which requires every employer to be insured against liability for Workers' Compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract.

The limits of liability as stated in this endorsement apply to the insurance afforded by this endorsement notwithstanding that the policy may have lower limits of liability applying elsewhere in the policy.

Duly Authorized Agent

Attached to and forming part of
Policy No. _____
of the _____

Date: _____
Expiration Date: _____

WORKERS' COMPENSATION INSURANCE CERTIFICATION

In compliance with Section 7-4 of the Standard Specifications, the Contractor shall complete and submit the following certification with a Certificate of Insurance before execution of the contract.

I am aware of, and will comply with, Section 3700 of the Labor Code, requiring every employer to be insured against liability for Workers' Compensation or to undertake self-insurance before commencing any of the work.

CONTRACTOR

By: _____

Title: _____

ZAMPERINI FIELD SECURITY PROJECT, FEAP 616

SECTION E

SPECIAL PROVISIONS

The following Special Provisions supplement and amend the Standard Specifications for Public Works Construction, "Greenbook" (2006 edition and the associated Supplement) and the Standard Specifications of the State of California Department of Transportation (Caltrans), latest edition, as noted herein. These Special Provisions have been arranged into a format that parallels the Standard Specifications for Public Works Construction.

SECTION E - SPECIAL PROVISIONS

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PART 2 - CONSTRUCTION MATERIALS

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PART 3 - CONSTRUCTION METHODS

See Section F: TECHNICAL SPECIFICATIONS

PART 1 - GENERAL PROVISIONS

SECTION 1 - TERMS, DEFINITIONS, ABBREVIATIONS, UNITS OF MEASURE, AND SYMBOLS

1-2 DEFINITIONS. Add or redefine the following:

Access Road-The right-of-way, the roadway and all improvements constructed thereon connecting the airport to a public highway.

Addendum-Written or graphic instrument issued prior to the opening of Bids which clarifies, corrects, or changes the bidding or Contract Documents. The term Addendum shall include bulletins and all other types of written notices issued to potential bidders prior to opening of Bids.

Advertisement-A public announcement as required by local law, inviting bids for work to be performed and materials to be furnished.

Agency-The City of Torrance, herein referred to as CITY.

Air Operations Area(AOA) -For the purpose of these specifications, the term air operations area shall mean any area of the airport used or intended to be used for the landing, takeoff, or surface maneuvering of aircraft. An air operation area shall include such paved or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiway, or apron.

Airport-Airport means an area of land or water, which is used or intended to be used for the landing and takeoff of aircraft, and includes its buildings and facilities, if any.

Award-The acceptance, by the City, of the successful bidder's proposal.

Bid Guaranty-The cash, certified check or Bidder's surety bond accompanying the Bid as a guaranty that the Bidder will enter into a Contract with the Board for the performance of the Work.

Board-The City Council of the City of Torrance, herein referred to as City Council.

Building Area-An area on the airport to be used, considered, or intended to be used for airport buildings or other airport facilities or rights-of-way together with all airport buildings and facilities located thereon.

Claim-A separate demand by the Contractor for (A) a time extension, (B) payment of money or damages arising from work done by or on behalf of the Contractor pursuant to the Contract and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to, or (C) an amount the payment of which is disputed by the Agency.

County Sealer-The Sealer of Weights and Measures of the county in which the Contract is let.

Days-Days shall mean consecutive calendar's days unless otherwise specified.

Electrolier-Street light assembly complete, including foundation, standard, luminaire arm, luminaire, etc.

Drainage System-The system of pipes, ditches, and structures by which surface or subsurface waters are collected and conducted from the airport area.

Engineer-The Public Works Director and/or City Engineer of the City of Torrance, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties entrusted to them.

Equipment-All machinery, together with the necessary supplies for upkeep and maintenance, and also all tools and apparatus necessary for the proper construction and acceptable completion of the work.

Extra Work-An item of work not provided for in the awarded contract as previously modified by change order or supplemental agreement, but which is found by the Engineer to be necessary to complete the work within the intended scope of the contract as previously modified.

FAA-The Federal Aviation Administration of the U.S. Department of Transportation. When used to designate a person, FAA shall mean the Administrator or his/her duly authorized representative.

Inspector - An authorized representative of the Engineer assigned to make all necessary inspections and/or tests of the work performed or being performed, or of the materials furnished or being furnished by the Contractor.

Intention Of Terms-Whenever, in these specifications or on the plans, the words "directed," "required," "permitted," "ordered," "designated," "prescribed," or words of the like import are used, it shall be understood that the direction, requirement, permission, order, designation, or prescription of the Engineer is intended; and similarly, the words "approved," "acceptable," "satisfactory," or words of like import, shall mean approved by, or acceptable to, or satisfactory to the Engineer, subject in each case to the final determination of the City.

Any reference to a specific requirement of a numbered paragraph of the contract specifications or a cited standard shall be interpreted to include all general requirements of the entire section, specification item, or cited standard that may be pertinent to such specific reference.

Laboratory-The official testing laboratories of the City or such other laboratories as may be designated by the Engineer.

Lighting-A system of fixtures providing or controlling the light sources used on or near the airport or within the airport buildings. The field lighting includes all luminous signals, markers, floodlights, and illuminating devices used on or near the airport or to aid in the operation of aircraft landing at, taking off from, or taxiing on the airport surface.

Pavement-The combined surface course, base course, and subbase course, if any considered as a single unit.

Payment Bond-The approved form of security furnished by the Contractor and his/her surety as a guaranty that he will pay in full all bills and accounts for materials and labor used in the construction of the work.

Performance Bond-The approved form of security furnished by the Contractor and his/her surety as a guaranty that the Contractor will complete the work in accordance with the terms of the contract.

Project-The agreed scope of work for accomplishing specific airport development with respect to a particular airport.

Proposal Guaranty-The security furnished with a proposal to guarantee that the bidder will enter into a contract if his/her proposal is accepted by the City.

Runway-The area on the airport prepared for the landing and takeoff of aircraft.

State-State of California

Structures-Airport facilities such as bridges; culverts; catch basins, inlets, retaining walls, cribbing; storm and sanitary sewer lines; water lines; underdrains; electrical ducts, manholes, handholes, lighting fixtures and bases; transformers; flexible and rigid pavements; navigational aids; buildings; vaults; and, other manmade features of the airport that may be encountered in the work and not otherwise classified herein.

Superintendent-The Contractor's executive representative who is present on the work during progress, authorized to receive and fulfill instructions from the Engineer, and who shall supervise and direct the construction.

Taxiway-For the purpose of this document, the term taxiway means the portion of the air operations area of an airport that has been designated by competent airport authority for movement of aircraft to and from the airport's runways or aircraft parking areas.

1-3 ABBREVIATIONS.

1-3.2 Common Usage:

Add the following:

Abbreviation
Approx

Word or Words
Approximate

CA	City Arborist
Exist.	Existing
L.A.C.D.P.W.	Los Angeles County Department of Public Works
Med.	Median
M.L.	Main Line
OH	Overhead
Ped.	Pedestrian
Reconst.	Reconstruct
SE	Sand Equivalent
Struc.	Structural/Structure
Temp.	Temporary
Theo.	Theoretical
AOA	Aircraft Operation Areas
FAA	Federal Aviation Administration

SECTION 2 - SCOPE AND CONTROL OF THE WORK

2-1 AWARD AND EXECUTION OF CONTRACT. Replace the entire subsection with the following:

Within ten (10) working days after the date of the CITY'S award of contract, the Contractor shall execute and return all Contract Documents required by the CITY. The CITY reserves the right to terminate the award if the above requirement is not met. Such termination will result in the forfeiture of the Proposal Guaranty.

The Contract shall not be considered binding upon the CITY until executed by the authorized CITY officials.

2-4 CONTRACT BONDS. Revise the second sentence of the fourth paragraph to read as follows:

The "Performance Bond" shall remain in effect for one year following the date specified in the Notice of Completion or, if no Notice of Completion is recorded, for one year following the date of final acceptance by the Engineer.

2-5. PLANS AND SPECIFICATIONS.

2-5.1 General. Add the following sentence to the first paragraph to read as follows:

The Contractor shall maintain a control set of Plans and Specifications on the Work site at all times. All final locations determined in the field, and any deviations from the Plans and Specifications, shall be marked in red on this control set to show as-built conditions. Upon completion of the Work, the Contractor shall submit the control set to the Engineer for approval. Final payment will not be made until this requirement is met.

Add the following subsections:

2-5.1.1 Plans. Included as part of the Contract Documents are the following, which show the location, character, dimensions or details of the Work:

1) Project Plans

The plans and data provided with the Contract Documents are based on existing plans and documents. The plans and data are provided for information only. The City does not guarantee their accuracy and correctness. If the Bidder in preparing the Bid Proposal uses this information, the Bidder assumes all risks resulting from conditions differing from the information shown. The Bidder, in consideration for the information being provided, hereby releases the City and Consulting Engineer from any responsibility of obligation as to the accuracy of such information or for any additional compensation for work performed due to assumptions based on the use of such information.

2) Standard Plans

- a. City of Torrance Standard Plans, latest edition
- b. Standard Plans for Public Works Construction, 2006 edition, promulgated by Public Works Standards, Inc.
- c. Standard Plans of the State of California Department of Transportation (Caltrans), latest edition
- d. Standard Plans of the Los Angeles County Department of Public Works, latest edition

Applicable Standard Plans and information for this project are included in Appendix of these Specifications.

2-5.1.2 Specifications. The Work shall be performed or executed in accordance with these Special Provisions and the following:

Project Specifications

- 1) Standard Specifications for Public Works Construction, 2006 edition and supplements thereto, hereinafter referred to as the Standard Specifications, as written and promulgated by Public Works Standards, Inc. The Standard Specifications are published by BNi Building News, Inc., 1612 South Clementine Street, Anaheim, CA 92802, Phone: (800) 873-6397.
- 2) Sections 56-2, 84, 85, 86 and 90-10 of the State of California Department of Transportation (Caltrans) Standard Specifications, latest edition
- 3) National Electrical Code (NEC 2011)

- 4) California Electrical Code (CEC 2013)
- 5) City of Torrance Municipal Code

2-5.2 Precedence of Contract Documents. Replace the entire subsection with the following:

If there is a conflict between any of the Contract Documents, the document highest in precedence shall control. The order of precedence shall be as follows:

- 1) Permits issued by other agencies.
- 2) Change Orders (including Plans and Specifications attached thereto).
- 3) Public Works Agreement
- 4) Addenda
- 5) Technical Provisions
- 6) Special and General Provisions
- 7) Plans
- 8) City Standard Plans
- 9) Other Standard Plans
- 10) Standard Specifications for Public Works Construction
- 11) Reference Specifications

With reference to the Plans/Drawings, the order of precedence is as follows:

- 1) Change Order plans govern over Addenda and Contract plans
- 2) Addenda plans govern over Contract plans
- 3) Contract plans govern over standard plans
- 4) Detail plans govern over general plans
- 5) Figures govern over scaled dimensions

Within the Specifications, the order of precedence is as follows:

- 1) Change Orders
- 2) Permits from other agencies/Supplemental Agreements
- 3) Technical Specifications
- 4) Special Provisions
- 5) Instruction to Bidders
- 6) Referenced Standard Plans
- 7) Referenced Standard Specifications

If the Contractor, in the course of the Work, becomes aware of any claimed errors or omissions in the Contract Documents or in the CITY's fieldwork, the Contractor shall immediately inform the Engineer. The Engineer shall promptly review the matter, and if the Engineer finds an error or omission has been made the Engineer shall determine the corrective actions and advise the Contractor accordingly. If the corrective work associated with an error or omission increases or decreases the amount of work called for in the Contract, the CITY shall issue an appropriate Change Order in accordance with 3-3. After discovery of an error or omission by the Contractor, any related work performed by the

Contractor shall be done at the Contractor's risk unless authorized by the Engineer.

2-5.3 Submittals

2-5.3.2 Working Drawings. Add the following:

In addition to the shop drawings required per Table 2-5.3.2 (A), the following shop drawings are required:

Item	Subsection Number	Title	Subject
F-166		Automatic V-track Rolling Ornamental Gate (A)	Additive 1
F-165		Automatic Cantilever Slide Ornamental Gate (F)	Additive 1
F-166		Manual V-track Rolling Chain Link Gate (P,23940)	
		Manual Chain Link Swing Gate (O)	
F-165		Manual Cantilever Slide Chain Link Gate (I)	
L-151-2.4		14' Security Pole and Foundation; 20' Light Pole and Foundation	

2-5.3.4 Supporting Information. Add the following:

Submittals are required for the following:

Item	Subsection Number	Title	Subject
F-162		Chain Link Fence	
F-164		Ornamental Fence	
F-170		Gate Operator – Cantilever Slide Gate (F)	Additive 1
F-170		Gate Operator – V-track Rolling Gate (A)	Additive 1
L-150		Photo Electric Cell	

Item	Subsection Number	Title	Subject
L-150		Circuit Breaker	
L-150		Mechanical Locking system at Door D1	
L-151		LED Lighting Fixture	
L-152		Uninterruptible Power Supply	
17782	2.3	**Indoor Fixed Security Camera	
17782	2.4	**Outdoor PTZ Security Camera	
17782	2.9	**Video Management Software and Camera License	
17782	2.10	**Remote Network Switch	
17782	2.5	**1U Server including Software and Network Adaptor	
17782	2.7	**2U Video Storage System	
17782	2.5E	**KVM switch	
17728	2.2	**Computer Stations with UPS	

Note: ** See Section 4-1.2.1, regarding early procurement.

In addition to the above, submittals may be required for any product, manufactured item, or system not specifically listed above.

2-6 WORK TO BE DONE. Add the following:

The Contractor shall perform all work necessary to complete the Contract in a satisfactory manner. Unless otherwise provided, the Contractor shall furnish all materials, equipment, tools, labor, and incidentals necessary to complete the Work.

The contract shall include the furnishing of all supervision, labor, materials, tools, equipment and incidentals necessary to construct an access control system and associated improvements to Zamperini Field and other appurtenant work and incidental work, all as indicated on City of Torrance Plan No. AP-177, Project Plans and Specifications, and in the Federal Aviation Administration requirements and specifications as noted herein and other provisions as specified herein.

Specific work tasks include, but are not limited to:

- a. Installation and maintenance of construction area barricades and fencing.
- b. Demolition, removal and/or relocation of miscellaneous items including gates, fences/barbed wires, and interfering concrete.
- c. Installation of chain link fence, electric lighting, security cameras, manual and automated vehicular gates with card readers and license plate cameras.
- d. Installation of centralized electronic access control host computers capable of monitoring the security equipment, storing and retrieving video data.
- e. Other appurtenant work and incidental work, all as indicated on the project plans, and specified herein, and the Federal Aviation Administration requirements and specifications as noted herein and other provisions as specified herein.

All work on this project is outside the Aircraft Operations Area (AOA). Contractor activities and equipment shall remain outside the AOA.

2-9 SURVEYING.

2-9.2 Survey Service. Replace the entire subsection with the following:

Construction surveying necessary to complete the Work shown on the Plans and provided in these Contract Documents shall be accomplished by or under the direction of a Registered Land Surveyor or Registered Civil Engineer authorized to practice land surveying in the State of California, retained or provided by the Contractor. The CITY reserves the right to direct additional construction survey work be performed at no additional cost when the City determines it is required to adequately construct the Work.

The Contractor shall notify the Engineer in writing at least 2 working days prior to the actual survey. The Contractor shall provide the traffic control necessary for construction surveying.

Stakes shall be set and stationed by the Contractor for fences, gates, curbs, curbs and gutters, driveways, rough grade, and other items as necessary. If any construction survey stakes are lost or disturbed and need to be replaced, such replacement shall be by the Contractor at its expense.

All costs for construction survey staking including construction staking, professional services, office calculations, furnishing all labor, materials, equipment, tools and incidentals, and for doing all work involved shall be considered as included in the price for which such work is appurtenant thereto, and no additional allowance will be made therefor.

The Contract does not include a pay item for construction surveying as specified above, and unless otherwise provided in these Special Provisions, full compensation for construction surveying required to complete the Work shall be included in the bid price for the appurtenant

items of work.

2-10 AUTHORITY OF BOARD AND ENGINEER. Add the following:

Failure of the Contractor to comply with the requirements of the Contract Documents, or to follow the directions of the Engineer, and/or to immediately remedy such noncompliance or to follow directions, may, upon notice from the Engineer, result in the suspension of the Contract monthly progress payments. Any monthly progress payments so suspended may remain in suspension until the Contractor is in compliance with the Contract Documents and the directions of the Engineer, as determined by the Engineer.

2-11 INSPECTION. Replace the entire subsection with the following:

The Work is subject to inspection and approval by the Engineer. The Contractor shall notify the Engineer a minimum of 48 hours in advance of the required inspection.

The Engineer will make, or have made, such inspections and tests as he deems necessary to see that the Work is in conformance with the Contract Documents. In the event such inspections or tests reveal noncompliance with the Contract Documents, the Contractor shall bear the cost of such corrective measures as deemed necessary by the Engineer, as well as the cost of subsequent re-inspection and re-testing.

Work done in the absence of inspection by the Engineer may be required to be removed and replaced under the inspection of the Engineer, and the entire cost of removal and replacement, including the cost of all materials which may be furnished by the CITY and used in the work thus removed, shall be borne by the Contractor, regardless of whether the work removed is found to be defective or not. Work covered without the approval of the Engineer shall, if so directed by the Engineer, be uncovered to the extent required by the Engineer, and the Contractor shall similarly bear the entire cost of performing all the work and furnishing all the materials necessary for the removal of the covering and its subsequent replacement, including all costs for additional inspection.

The Engineer and any authorized representatives shall at all times have access to the Work during its construction at shops and yards as well as the Work site. The Contractor shall provide every reasonable facility for ascertaining that the materials and workmanship are in accordance with the Contract Documents.

Inspection of the Work shall not relieve the Contractor of the obligation to fulfill all conditions of the Contract.

Add the following subsections:

2-11.1 Special Inspection Fees. If the Contractor elects to work under this Contract more than 8 hours/day or more than 40 hours/week, Saturday, Sunday, or CITY holidays, the Contractor shall arrange with the Engineer for the required inspection service and pay the Special Inspection Fees which will be charged at the following rates:

Mondays through Fridays - \$100.00 per hour

Saturdays, Sundays, Holidays - \$1,000.00 per day

Fees may be deducted from payments due to the Contractor at the discretion of the Engineer.

If the Contractor works under this contract at times other than within the allowed working hours without permission from or prior arrangement with the Engineer, the Contractor will be charged a lump sum amount of \$500.00 for each occurrence, in addition to the above fees. The amount will be deducted from a Progress Payment.

2-11.2 General Requirements. The Contractor shall comply with the following requirements:

- 1) No excavation or open trench may be backfilled without first securing inspection. If any work is installed prior to plan check approval and/or inspection, all or any portion of the system may be required to be exposed and corrected as necessary.

2-11.3 Inspections During Construction. During the construction, the Contractor shall make the Work site available for periodic inspections by the regulatory agencies. These agencies may include: Federal Aviation Administration, the City of Torrance, and Cal-OSHA.

2-11.4 Material Inspection/Testing and other City Expenses.

- (a) If a City subcontractor hired to perform material inspection and/or testing is required to work additional time to perform inspection and testing as a result of an action or delay caused by the Contractor, except for specific work allowed by the Engineer, the City subcontractor may charge the City an additional fee. The Engineer may deduct the additional fee for said inspection and testing from a Progress Payment to the Contractor. The Engineer also may deduct the cost to perform additional testing when an initial test fails to meet the requirements of this Contract. The typical rates for material testing and inspection are available upon request from the Public Works Department.
- (b) If the Contractor does not comply with a requirement of these Special Provisions or if it does not respond, after being informed, to a request by the Engineer to amend a site condition that jeopardizes the public health, safety or welfare, the Engineer may direct City crews to perform the work. For each occurrence, the City may charge the Contractor a base charge in the amount of \$750 in addition to all costs incurred by City crews for labor, equipment and materials. The standard rates for City crews are available upon request from the Public Works Department.
- (c) For each sign, drum, barricade, warning device, flagger or other type of required traffic control device that is not provided in accordance with the approved Traffic Control Plans, unless otherwise authorized by the Engineer, the Engineer may deduct \$50 per day from a Progress Payment for each missing device. The deduction does not apply to a device that is fraudulently removed by non-construction personnel.

- (d) Temporary lane closures maintained prior to **8:30 A.M. and/or after 3:30 P.M.** may have a negative economic effect on the local residential, commercial or industrial community. Unless a temporary lane closure is otherwise authorized, the Engineer may deduct a fee from a Progress Payment for each temporary lane closure maintained prior to **8:30 A.M. or after 3:30 P.M.** The fee will be assessed at a rate of \$700 per each travel lane per each thirty (30) minute interval, or fraction thereof.

SECTION 3 – CHANGES IN WORK

3-3 EXTRA WORK

3-3.1 General. Add the following:

Payment for additional work and all expenditures in excess of the Contract Price must be authorized in writing by the Engineer. Such authorization shall be obtained by the Contractor prior to engaging in additional work. It shall be the Contractor's sole responsibility to obtain written approval from the Engineer for any change(s) in material or in the work proposed by suppliers or subcontractors. No payment shall be made to the Contractor for additional work which has not been approved in writing, and the Contractor hereby agrees that it shall have no right to additional compensation for any work not so authorized.

The Contractor shall be responsible to provide all data and to obtain all approvals required by the Specifications, including submittal of Daily Extra Work Reports. No claims or extras shall be approved by the Engineer unless all work was done under the direction of and subject to the approval of the Engineer. Disputed work claims shall comply with 3-3 as modified herein.

3-3.2.2 Basis for Establishing Costs. Replace the second paragraph of part (c) with the following:

The Contractor will be paid for the use of equipment at the lower of the actual rental rates paid by the Contractor or the rental rates listed for such equipment in either the "Rental Rate Blue Book" published by Dataquest, Inc., 1290 Ridder Park Drive, San Jose, California 95131; telephone (408) 971-9000 or the California Department of Transportation publication entitled "Labor Surcharge and Equipment Rates" available at the Caltrans web site, www.dot.ca.gov/hq/eqsc/inforesources.htm, which is in effect on the date upon which the work is accomplished, and that hereby is made a part of the Contract, regardless of ownership or any rental or other agreement, if such may exist, for the use of such equipment entered into by the Contractor. If it is deemed necessary by the Engineer to use equipment not listed in the said publication, a suitable rental rate will be established by the Engineer. The Contractor may furnish any cost data that might assist the Engineer in the establishment of such rental rate.

3-3.2.3 Markup. Replace the entire subsection with the following:

The markups mentioned hereinafter shall include, but are not limited to, all costs for the services of superintendents, project managers, timekeepers and other personnel not working directly on the change order, and pickup or yard trucks used by the above personnel. These costs shall not be reported as labor or equipment elsewhere except when actually performing work directly on the change order and then shall only be reported at the labor classification of the work performed.

(a) Work by Contractor. The following percentages shall be added to the Contractor's costs and shall constitute the mark-up for all overhead and profit, which shall be deemed to include all items of expense not specifically designated as cost or equipment rental in Subsections 3-3.2.2(a), 3-3.2.2(b), and 3-3.2.2(c).

Labor	20
Materials	15
Equipment Rental	15
Other Expenditures	15

To the sum of the costs and markups provided for in this subsection, one (1) percent shall be added as compensation for bonding.

(b) Work by Subcontractor. When any part of the extra work is performed by a subcontractor, the markup established in 3-3.2.3(a) shall be applied to the subcontractor's actual cost of such work. A markup of ten (10) percent on the first \$5,000 of the subcontracted portion of the extra work and a mark-up of 5 percent on work added in excess of \$5,000 of the subcontracted portion of the extra work may be added by the Contractor.

The markups specified in parts (a) and (b) above shall be considered as including, but not limited to, the Contractor's labor costs for personnel not working directly on the extra work, including the cost of any tools and equipment that they may use. Such costs shall not be reported as labor or equipment costs elsewhere except when they are actually used in the performance of the extra work. Labor costs shall in that case be reported for the labor classification corresponding to the type and nature of extra work performed.

3-4 CHANGED CONDITIONS.

Add the following:

This subsection does not apply to utilities.

SECTION 4 – CONTROL OF MATERIALS

4-1 MATERIAL AND WORKMANSHIP.

4-1.1 General.

Add the following paragraph after the second paragraph:

If the work, or any portion thereof, shall be damaged in any way, or if any defective materials or faulty workmanship shall be discovered at any time prior to the final payment, the Contractor shall forthwith, at its own cost and expense, repair said damage, or replace such defective materials, or remedy such faulty workmanship in a manner satisfactory to the Engineer.

4-1.2 Protection of Work and Materials.

Add the following:

The Contractor shall assume all risks and expense of interference and delay in his operations, and the protection from or the repair of damage to improvements being built under the contract, as may be caused by water of whatever quantity from floods, storms, industrial waste, irrigation, underground or other sources. However, the Contractor shall be entitled to an extension of time in accordance with the provisions of Subsection 6-6. The Contractor shall also assume full responsibility and expense of protecting, or removing and returning to the site of Work, all equipment or materials under his care endangered by any action of the elements.

Furthermore, the Contractor shall indemnify and hold the City harmless from all claims or suits for damages arising from his operations in dewatering the Work and control of water.

Add the following:

4-1.2.1 Procurement of Security Cameras and Related Equipment

The security cameras and other related equipment will be funded by a grant from the State of California which is set to expire. In order for the City to be reimbursed by the State, the Contractor shall procure these materials and its appurtenances right at the start of the project and submit for payment prior to expiration of the grant. The City will identify the equipment eligible for State reimbursement, and the Contractor shall have approved shop drawings prior to purchase. The Contractor is responsible for storage and maintenance of these materials. Payment shall not be construed as transfer of ownership to the City. Responsibility of ownership shall remain with the Contractor who shall be obligated to store and maintain these materials or replace these materials if they are be damaged, lost, stolen or otherwise degraded prior to acceptance of the Work.

SECTION 5 – UTILITIES

5-1 LOCATION. Add the following:

The Contractor shall provide coordination with all the utility companies involved and shall provide protection from damage to their facilities. The Contractor shall be responsible for repair or replacement to said facilities made necessary by its failure to provide required

protection. The Contractor is required to include utility requirements in the Construction Schedule per Section 6-1.

The Contractor shall be solely responsible to check all utility record maps, books, and/or other data in the possession of the CITY, other agencies, and/or all utility companies, and no allowance shall be made for any failure to have done so.

The Contractor shall utilize the services of "Underground Service Alert-Southern California" for utility locating in all public right-of-ways by calling 1-800-227-2600 at least 48 hours prior to any excavation.

The Contractor shall pothole existing utilities as shown on the plans, as directed by the Engineer or as deemed necessary by the Contractor. The cost of potholing herein specified shall be included in the prices paid for other items of work and no additional compensation will be allowed.

Underground lines that are potentially hazardous such as oil company lines, natural gas mains, and electrical conduits will be carefully located by their owner as provided in the Standard Specifications. The Contractor shall take special precautions in determining the precise location and depth of these structures to insure that they will not be damaged by its operations.

Substitute the following for the last paragraph:

Prior to starting construction, the Contractor shall be responsible to determine the location and depth of all utilities which have been marked by the respective owners and which may affect or be affected by its operations. The Contractor also shall determine the location and depth of each utilities, whether or not marked. Full compensation for such work shall be considered as included in the prices bid for other items or work. If a utility which was marked is found to interfere with the work after construction has commenced, the Contractor shall be solely responsible for all costs of any delay and for any costs which could have been avoided if the Contractor had located the utility prior to start of construction.

5-2 PROTECTION. Add the following:

Add the following after the final paragraph:

As noted in subsections 5-2.1, 5-2.2 and 5-2.3 utilities are classified and are to be handled in one of three ways by the Contractor in the course of performing the contract.

5-2.1 Noninterfering Utilities

Utilities that are not abandoned by the owner and do not physically interfere with the permanent work in its final location shall be supported, protected and maintained in place by the Contractor, and the Contractor shall be solely responsible for any damage, loss or injury, or death resulting from his/her failure to do so and the Contractor shall indemnify and hold harmless the City from any and all such consequences. Noninterfering utilities may, with the permission of the owner and the Public Works Director, be relocated still farther from the

permanent work in its final locations, but the Contractor shall not so consider, in submitting his bid, unless the relocation is shown on the plans.

5-2.2 Abandoned Utilities

Abandoned utilities are those portions of any utility which are no longer needed or desired by the owner and whose destruction is consented to by the owner and/or is permitted by notation on the plans. Abandoned utilities which physically interfere with the permanent work or with the construction thereof shall be removed by the Contractor and the Contractor shall be solely responsible for any damage, loss or injury, or death resulting from the removal and the Contractor shall indemnify and hold harmless the City from any and all such consequences.

5-2.3 Interfering Utilities

Any utility shall be deemed an interfering utility (1) which physically occupies any part of the space to be occupied by the permanent work in its final locations, or (2) whose length within the theoretical width of excavation for the permanent work exceeds five times the width of said theoretical excavation whether or not the utility physically interferes with the permanent work. Interfering utilities that are not abandoned by the owner shall be relocated so as not to interfere with the permanent work in its final location. Such relocation will be performed by the owner or the City unless otherwise shown on the plans.

The Contractor shall exercise caution to prevent damage to or movement of the utilities while constructing the permanent work along and adjacent to the utilities.

5-2.4 Protection of Underground Hazardous Utilities. This Subsection shall apply to projects where there are underground utilities within the Work area which may be potentially hazardous if damaged. A hazardous substance shall be defined as one having the potential for an immediate disaster such as, but not limited to, gasoline, electricity, fuel oil, butane, propane, natural gas, chlorine or other chemicals.

Abandoned or inoperative utilities designed to carry hazardous substances and unidentified or unknown utilities shall be considered hazardous until determined otherwise. Whenever the Contractor is directed by the Engineer to tap these lines, the Contractor shall provide personnel specialized in this work and payment therefore will be considered as extra work per 3-3 of these Special Provisions.

The Contractor shall comply with the following requirements when working around underground hazardous utilities:

- 1)The Contractor shall not trench or excavate within the area where a utility known to carry a hazardous substance exists until its location has been determined by excavation or other proven methods acceptable to the Engineer. The intervals between exploratory excavations or location points shall be sufficient to determine the exact location of the line. Unless otherwise directed by the Engineer, excavation for underground hazardous utilities shall be performed by the Contractor and paid for as specified per 5-1 of these Special Provisions.

- 2) If it is determined that the horizontal or vertical clearance between the utility known to carry hazardous substances and the construction limit is less than 300 mm (12 inches) (450mm (18 inches) if scarifying), the Contractor shall confer with its owner. Unless the owner elects to relocate the line or take it out of service, the Contractor shall not excavate until the line has been completely exposed within the limits of construction.
- 3) Once the physical location of the utility known to carry hazardous substances has been determined, the Contractor, in cooperation with and with the concurrence of the utility owner, shall determine how to protect and/or support the utility from damage before proceeding with the Work.
- 4) During all excavation and trenching operations, the Contractor shall exercise extreme caution and protect the utilities from damage.
- 5) The Contractor shall notify the Engineer, the public agency maintaining records for the jurisdiction in which the Project is located and the owner, if known, whenever previously unidentified or unknown underground utilities are encountered so that the location can be accurately established and made a part of permanent substructure records.

Full compensation for protecting underground hazardous utilities as specified or noted on the Plans shall be considered as included in the prices bid for the various items of work.

5-3 REMOVAL.

Add the following:

It shall be the Contractor's responsibility irrespective of the notations on the plans to confirm or determine that a utility is to be abandoned before treating the same as an abandoned utility and shall assume all risks.

5-4 RELOCATION.

Substitute the following for the last paragraph:

For the purpose of these specifications, service connections shall be construed to mean all, or any portion of, the pipe, conduit, cable, or duct which connects a utility main distribution line up to the property line of an individual user, and further, shall include such portions of said pipe, conduit, cable or duct on the user's side which affect the contract work or its prosecution.

The City will arrange for the alteration or permanent relocation of only such service connections, except sewer house connections and water laterals, that interfere with the permanent work in its final location and such alteration or permanent relocation will be performed by others at no expense to the Contractor. The Contractor shall be responsible for the alteration or permanent relocation of sewer connections and water laterals, unless

otherwise approved by the Public Works Director.

In instances where the alteration or permanent relocation of interfering service connections can be avoided by encasing same in the slabs or walls of poured-in place concrete structures the Contractor shall, when directed by the Engineer, so encase such service connections, and any costs for such work shall be absorbed in the unit prices or included in the lump sum amounts bid for the various items of work.

Service connections which do not interfere with the project structures shall be maintained in place by the Contractor. The cost of such work shall be absorbed in the unit prices or included in the lump sum amounts bid for the various items of work.

5-5 DELAYS.

Substitute the following:

The Contractor is responsible for notifying the City in time to prevent delays attributable to utility relocations or alterations. The Contractor shall not be entitled to damage or additional payment, nor shall it be entitled to standby time for men or equipment if such delay does occur. The Engineer will determine the extent of the delay attributable to such interferences, the affect of the delay on the project as a whole, and any commensurate extension of time.

Any failure of the City and/or utility company to accomplish relocations in a reasonable manner in light of the Contractor's operations (to the extent such operations would otherwise be feasible and in accordance with the contract and as disclosed to the City prior to the Contractor encountering any such utility) shall entitle the Contractor to an extension of contract time to the extent that, in the judgment of the Engineer, the Contractor's completion of the overall contract work has been delayed; however, the Contractor shall be entitled to no other remedy and, in submitting its bid, thereby waives such other remedies, if any, unless the relocation delay is the result of arbitrary, capricious or malicious conduct by the City.

SECTION 6 - PROSECUTION, PROGRESS AND ACCEPTANCE OF THE WORK

6-1 CONSTRUCTION SCHEDULE AND COMMENCEMENT OF WORK. Replace the entire subsection with the following:

6-1.1 General. Within ten (10) working days after the date of the CITY's execution of the Contract, the Contractor shall submit a proposed construction schedule to the Engineer for approval. The schedule shall be in accordance with 6-1.2 and 6-1.3 and shall be in sufficient detail to show chronological relationship of all activities of the Work. These include, but are not limited to: estimated starting and completion dates of various activities, submittal of shop drawings to the Engineer for approval, procurement of materials and scheduling of equipment.

Prior to issuing the Notice to Proceed, the Engineer will schedule a Pre-Construction Meeting with the Contractor to review the proposed construction schedule and delivery dates,

arrange utility coordination and clarify inspection procedures.

Prior to starting any Work, the Contractor shall attend a Community Meeting to be scheduled by the Engineer. The meeting, to be held in the evening, will address the residents' questions and concerns regarding the Work, what can be expected during construction and vehicular and pedestrian access that may be temporarily restricted during construction.

Notwithstanding any other provisions of the Contract, the Contractor shall not be obligated to perform any work and the CITY shall not be obligated to accept or pay for any work performed by the Contractor prior to delivery of a Notice to Proceed. The CITY's knowledge of work being performed prior to delivery of the Notice to Proceed shall not obligate the CITY to accept or pay for such work. The Contractor shall provide all required Contract bonds and evidences of insurance prior to commencing work at the site.

6-1.2 Criteria. The construction schedule shall conform to the following criteria:

- 1) The schedule shall be prepared using the latest version of Primavera, Microsoft Project or approved equal.
- 2) Work activities shall be based on the items of work per 2-6, and the following:
 - a) Contract Unit Price items shall be subdivided into those portions to be constructed during each stage or phase of construction.
 - b) Lump sum items shall be subdivided into those portions to be constructed during each stage or phase of construction.
- 3) Utility relocations in coordination with the Contractor per 5-4 of these Special Provisions shall be considered as activities.
- 4) Required submittals, working and shop drawings shall be included as activities.
- 5) The procurement of construction materials and equipment with long lead times for deliveries shall be included as activities.
- 6) Work to be performed by subcontractors shall be identified and shown as work activities.
- 7) Start and completion dates of each activity shall be illustrated.
- 8) Completion of all Work under the Contract shall be within the time specified in 6-7 of these Special Provisions and in accordance with the Plans and Specifications.

6-1.3 Requirements. In preparing the construction schedule, the following items shall be considered:

Sequence of Construction - The Contractor shall sequence the Work in a manner to expeditiously complete the project with a minimum of inconvenience to the adjacent owners and to conform to the following:

- 1) Removals - All removals shall be hauled off the Work site no later than the calendar day following the day that the removal is performed.
- 2) PCC construction - Construction of PCC curbs, and gutters shall be formed and poured within 5 working days following removal of the existing material at any location.
- 3) Irrigation systems - Irrigation systems disrupted by the Contractor shall not be left inoperable for more than three working days.
- 4) Subsection 2-5.3.1 regarding review of material submittals
- 5) All Work shall only be performed between the hours of **7:30 a.m. and 4:30 p.m.** unless otherwise approved by the Engineer.
- 6) A move-in period of 10 calendar days will be allowed starting on the date in the Notice to Proceed.
- 7) Holiday Moratorium per 7-10.1.6. of these Special Provisions.
- 8) Trash pick-up. Trash pick-up days are established and will not be changed. The City utilizes automated refuse and recycling vehicles. After pick-up, the City will attempt to place the trash containers on parkways and driveways and off of the roadway areas. In some cases, however, this may not be possible, and the contractor will be responsible for moving the receptacles out of the way.
- 9) Stockpile area. Schedule shall indicate date for cleanup of stockpile area.
- 10) Gate Closure Schedule and Security and Phasing Plans shown on Sheets GN-2 and GN-3.
- 11) Security Cameras and appurtenances are being funded by a State Grant, which is set to expire. The Contractor shall procure the cameras and related equipments ahead of time and make a good faith effort to complete the installation of Security Camera System ahead of the rest of the project. See Section 4-1.2.1.

Should the Contractor fail to meet Requirements 1 to 3, the Engineer reserves the right to prohibit the Contractor from making further removals until the clean up, construction, or rehabilitation of sprinklers is in conformance with the aforementioned requirements. Furthermore, if after notice is given to the Contractor to perform work to meet these requirements, and the Contractor refuses or for any reason fails to perform sufficiently to meet these schedules, CITY may perform said work and charge the Contractor for all costs incurred.

6-1.4 Updates. The Contractor shall submit 2 paper copies of the updated construction schedule to the Engineer on the first working day of each month.

If the Contractor decides to make a major change in the method of operations after commencing construction, or if the schedule fails to reflect the actual progress, the Contractor shall submit to the Engineer a revised construction schedule in advance of beginning revised operations.

If the Contractor fails to submit an updated Construction Schedule to the Engineer on the first working day of each month, the CITY will deduct one-fifth the amount of the Contract Unit Price for each work day after the due date, up to maximum of \$300, that each monthly schedule update is not submitted.

6-1.5 Order of Work. The Contractor shall order equipment and/or other materials requiring a delivery delay upon receipt of a written notice from the CITY that the City Council has approved an Award of Contract. Contractor shall provide written proof(s) of timely material order(s) and shall include any delivery delays in the Construction Schedule.

6-2. PROSECUTION OF WORK.

Add the following to the first paragraph;

The total work area, covering elements of the Contractor's operation, shall be no more than allowed by the applicable permit or the area necessary to complete the work within the permitted work hours. Any portion of work started shall be diligently completed on the same work day. The work area shall be secured at all times and existing security measures shall be maintained or exceeded during and after work hours. The airport security and safety shall be maintained at all times.

6-7 TIME OF COMPLETION.

6-7.1 General. Replace the first sentence with the following:

Time shall be of the essence in the Contract. The Contractor shall begin Work after the mailing by the Engineer to the Contractor, first class mail, postage prepaid, a Notice to Proceed and shall diligently prosecute the same to completion with in **ninety (90) working days** from the start date specified in the Notice to Proceed. Award of Bid Additive 1 will add 15 working days to the contract.

6-8 COMPLETION, ACCEPTANCE AND WARRANTY. Replace the second paragraph with the following:

If, in the Engineer's judgment, the Work has been completed and is ready for acceptance, the Engineer will so certify and will determine the date when the Work was completed. This will be the date when the Contractor is relieved from responsibility to protect the Work. The Engineer may cause a Notice of Completion to be filed and recorded with the Los Angeles County Recorder's Office. At the Engineer's option, the Engineer may certify acceptance to

the City Council who may then cause a Notice of Completion to be filed and recorded with the Los Angeles County Recorder's Office.

Add the following subsection:

6-8.1 Manufacturer's Warranties. Manufacturer's warranties shall not relieve the Contractor of liability under these Specifications. Such warranties only shall supplement the Contractor's responsibility.

The Engineer may, at his option, require a manufacturer's warranty on any product offered for use.

6-9 LIQUIDATED DAMAGES. In each of the two paragraphs, substitute "\$1,000 in place of "\$250" as the amount of the liquidated damages per each consecutive calendar day.

Add the following subsection:

6-11 SEQUENCE OF CONSTRUCTION. Sequence of Construction shall be per Sheet GN-2 and GN-3. The phasing shall be reviewed regularly to determine which work can be performed simultaneously.

SECTION 7 - RESPONSIBILITIES OF THE CONTRACTOR

7.2 LABOR

Add the following subsections:

7-2.3 Payrolls and Payroll Records

Any payroll and payroll records required for this project shall be submitted, for each week in which any contract work is performed, to the Engineer. A retention of \$5,000 per report per pay period will be withheld from a progress payment for a late or missing report. A report shall be deemed as late or missing when not submitted to the Engineer within 10 calendar days from the close of the pay period for which the report applies. In addition, a non-refundable deduction of \$100 per report per day will be deducted from payments due the Contractor for each late or missing report. The \$100 non-refundable deduction per day will be incurred beginning on the first day the report is late or missing.

7-3 LIABILITY INSURANCE. Replace the second sentence of the second paragraph with the following:

The Contractor must maintain at its sole expense the following insurance, which will be full coverage not subject to self-insurance provisions:

- 1) Automobile Liability, including owned, non-owned and hired vehicles, with at least the following limits of liability:

- a). Combined single limits of \$2,000,000 per occurrence.
- 2) General Liability including coverage for premises, products and completed operations, independent contractors, personal injury and contractual obligations with combined single limits of coverage of at least \$3,000,000 per occurrence, with an annual aggregate of no less than \$5,000,000.

Add the following:

The Contractor must include all subcontractors as insureds under its policies or must furnish separate certificates and endorsements for each subcontractor.

7-4 WORKER'S COMPENSATION INSURANCE. Add the following after the first sentence of the second paragraph:

Worker's Compensation Insurance shall be with limits as required by the State of California and Employer's Liability with limits of \$1,000,000 per accident.

7-5 PERMITS. Replace the second paragraph with the following:

The Contractor shall obtain a City of Torrance Business License and a no-fee Construction Excavation Permit before commencing construction.

Full compensation for complying with the above requirements shall be considered as included in the prices bid for the appropriate items of work.

7-6 THE CONTRACTOR'S REPRESENTATIVE

Add a third paragraph to the section stating the following:

The Contractor's Representative shall be approved by the CITY prior to the start of the Work. If the designated representative is rejected, the Contractor shall immediately designate another representative in writing and submit to the City for consideration. The CITY shall have the authority to require the Contractor to remove its representative and/or alternate representative at any time and at no cost to the CITY.

7-8 PROJECT SITE MAINTENANCE.

7-8.1 Cleanup and Dust Control. The second paragraph is amended to read:

Unless directed otherwise by the Engineer, the Contractor shall furnish and operate a self-loading motor sweeper with spray nozzles at least once each working day to keep areas acceptably clean to the City whenever construction, including restoration, is incomplete.

Add the following subsection:

7-8.1.1 Construction and Demolition Debris Recycling.

General. Consistent with the Agency's efforts to comply with the California integrated Waste Management Act of 1989 (AB 939), the Contractor shall reduce, reuse, and/or recycle to the maximum extent feasible, the construction and demolition debris (debris) generated by this Contract hereby diverting the debris from disposal facilities, saving landfill space, and conserving virgin materials and natural resources.

Definitions.

"Construction and Demolition Debris or Debris" means materials resulting from building, construction or demolition-related activities such as excavation, grading, land clearing, renovation, repair, road work and site cleanup and are considered solid waste pursuant to Section 40191 of the California Public Resources Code. The materials include, but are not limited to, asphalt, brick, cardboard, carpet, cinder block, concrete, concrete with reinforcement bars, drywall, excavated materials, fixtures and fittings, glass, gravel, green waste, metal, mixed rubble, packaging materials, paper, plastics, porcelain, road work materials, roofing materials, rock, sand, site clearance materials, soil, trees, tree stumps and other vegetative matter, stones and wood waste.

"Deconstruction" means the process of carefully dismantling a structure, piece by piece prior to or instead of conventional demolition, to maximize the recovery of building materials for reuse and/or recycling.

"Delivery Site" means recycling facility and recycling or reuse site, or any place, including a transfer station, where the debris is delivered for the sole purpose of reuse and/or recycling in a manner acceptable to the Director/Designee.

"Disposal" means the process of disposing of debris at a Disposal Facility.

"Disposal Facility" means a Landfill or any location where the debris is taken for transformation as defined.

"Generation" means the quantity of debris produced by the Work before the debris is reused and/or recycled.

"Green Waste" means all vegetative cuttings, shrubs, stumps, logs, brush, tree trimmings, grass, and related materials which have been separated from other solid waste.

"Landfill" means a solid waste disposal facility that accepts solid waste for land disposal and is operating under a current Solid Waste Facility Permit issued by a local enforcement agency as defined in Section 40130 of the California Public Resources Code and concurred upon by the California Integrated Waste Management Board.

“Recyclable” means material that still has useful physical or chemical properties after serving its original purpose and that can be reused or re-manufactured into additional products.

“Recycle or Recycling” means the process of collecting, sorting, cleansing, treating, and reconstituting materials that would otherwise become solid waste and returning them to the economic mainstream in the form of raw materials for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace, and in a manner acceptable to the Agency. “Recycle” or “Recycling” does not include Transformation.

“Recycling Facility” means any facility (except a transformation facility) whose principal function is to receive, store, convert, separate, or transfer recyclable materials for processing.

“Recycling or Reuse Site” means any place other than a recycling facility acceptable to the Agency for recycling and/or reuse of debris.

“Reduce” means any action which causes a net reduction in the generation and/or disposal of solid waste.

“Reuse” means the use, in the form as it was produced, and in a manner acceptable to the agency of materials which might otherwise be discarded into a Disposal Facility.

“Site Clearance Material” means materials such as trees, brush, earth, mixed concrete, rubble, sand, steel, extraneous paper, plastics, and other waste materials generated from site clearance.

“Source Separation” means the segregation, by the generator, of materials designated for separate collection for materials recovery or special handling.

“Transfer Station” means a facility utilized to receive solid wastes and to temporarily store, separate, convert, or otherwise process the materials in the solid wastes, and/or to transfer the solid wastes directly from smaller to larger vehicles or railroad trains for transport.

“Transformation” means incineration, pyrolysis, distillation, gasification, or biological conversion other than composting.

“Wood Waste” means solid waste consisting of wood pieces or particles which are generated from the manufacturing or production of wood products, harvesting, processing or storage of raw wood materials, or construction or demolition activities.

Recycling Summary

The Contractor shall prepare and submit a Recycling Summary Report using the form included in the Appendix, summarizing the disposal, reuse, and/or recycling activities which occurred throughout the Contract duration. This report shall be submitted by the Contractor to the Agency, before or with its request for the final Progress Payment for said Contract.

Failure of the Contractor to submit the Recycling Summary within the time specified will result in damages being sustained by the Agency. Such damages re, and will continue to be,

impracticable and extremely difficult to determine. For failure to submit the Recycling Summary, as required, the Contractor shall pay to the Agency, or have withheld from monies due it, the sum of \$10,000 for a contract of \$500,000 or more. The contractor shall pay to the Agency, or have withheld from monies due it, 2% of the total contract amount for a contract of \$499,999 or less.

Execution of the Contract shall constitute agreement by the Agency and Contractor that \$10,000 (2% for contracts \$499,999 or less) is the minimum value of the costs and actual damage caused by the failure of the Contractor to submit the Recycling Summary within the time specified. Such sum is liquidated damages and shall not be construed as a penalty, and may be deducted from payments due the Contractor.

7-8.5 Temporary Light, Power, and Water. Add the following:

The Contractor shall obtain a construction water meter from the CITY with payment of a deposit, refundable upon return of the meter in good working condition. The Contractor shall pay for the water used, at the CITY's current water rates.

7-8.6 Water Pollution Control. Add the following subsections:

7-8.6.1 Best Management Practices (BMPs). Best Management Practices shall be defined as any program, technology, process, siting criteria, operating method, measure, or device which controls, prevents, removes, or reduces pollution. The Contractor shall obtain and refer to the California Storm Water Best Management Practice Handbooks, Volume 3 Construction BMP Handbook and the Los Angeles County Department of Public Works Best Management Practices Handbook for Construction Activities. These publications are available from:

Los Angeles County
Department of Public Works
Cashier's Office
900 S. Fremont Avenue
Alhambra, CA 91803
Telephone (626) 458-6959

The Contractor shall have a minimum of two (2) readily accessible copies of each publication on the Work site at all times.

The CITY, as a permittee, is subject to enforcement actions by the State Water Resources Control Board, the Environmental Protection Agency and private citizens. The CITY may assess the Contractor a penalty of \$1,000 for each calendar day that the Contractor has not fully implemented the appropriate BMPs and/or is otherwise in noncompliance with these provisions. In addition, the CITY will deduct, from the final payment due the Contractor, the total amount of any fines levied on the CITY, plus legal and staff costs, as a result of the Contractor's lack of compliance with these provisions and/or less than complete implementation of the appropriate BMPs.

Full compensation for the implementation of BMPs, including the construction, removal, and the furnishing of all necessary labor, equipment, and materials, shall be considered as included in the price bid for the various items of work.

Add the following subsections:

7-8.8 Contractor's Storage Yard. The Contractor shall be responsible for obtaining a storage yard for the duration of the Work. If the proposed location of the yard is located within the boundaries of the CITY, the Contractor shall obtain prior approval from the Engineer.

7-8.9 Graffiti Removal. The Contractor shall maintain the Work, all of its equipment, and all traffic control devices, including signage, free of graffiti throughout the duration of the Contract. The Contractor shall respond to any request from the Engineer to remove graffiti within 4 hours of notification. Should the Contractor fail to respond to such request, the CITY reserves the right to make other arrangements for the requested graffiti removal and deduct the cost from any monies due the Contractor.

7-9 PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS.

Add the following paragraph:

The Contractor shall be responsible to protect all new concrete work from being etched, scratched or otherwise marked or having wet slough material deposited thereon. If new concrete work is marked, the Contractor shall replace it at its expense.

The Contractor shall cooperate with the City of any public or private utility service, FAA, or a utility service of another government agency that may be authorized by the City to construct, reconstruct or maintain such utility services or facilities during the progress of the work. In addition, the Contractor shall control his/her operations to prevent the unscheduled interruption of such utility services and facilities.

It is understood and agreed that the City does not guarantee the accuracy or the completeness of the location information relating to existing utility services, facilities, or structures that may be shown on the plans or encountered in the work. Any inaccuracy or omission in such information shall not relieve the Contractor of his/her responsibility to protect such existing features from damage or unscheduled interruption of service.

It is further understood and agreed that the Contractor shall, upon execution of the contract, notify the City of all utility services or other facilities of his/her plan of operations. Such notification shall be in writing addressed to the respective utility owners. A copy of each notification shall be given to the Engineer. In addition to the general written notification hereinbefore provided, it shall be the responsibility of the Contractor to keep utility owners advised of changes in their plan of operations that would affect such City.

Prior to commencing the work in the general vicinity of an existing utility service or facility, the Contractor shall again notify each such utility owner of his/her plan of operation. If, in the Contractor's opinion, the City's assistance is needed to locate the utility service or facility or the presence of a representative of the City is desirable to observe the work, such advice

should be included in the notification. Such notification shall be given by the most expeditious means to reach the utility City's PERSON TO CONTACT no later than two normal business days prior to the Contractor's commencement of operations in such general vicinity. The Contractor shall furnish a written summary of the notification to the Engineer.

The Contractor's failure to give the two day's notice hereinabove provided shall be cause for the City to suspend the Contractor's operations in the general vicinity of a utility service or facility.

Where the outside limits of an underground utility service have been located and staked on the ground, the Contractor shall be required to use excavation methods acceptable to the Engineer within 3 feet (90 cm) of such outside limits at such points as may be required to ensure protection from damage due to the Contractor's operations.

Should the Contractor damage or interrupt the operation of a utility service or facility by accident or otherwise, he shall immediately notify the proper authority and the Engineer and shall take all reasonable measures to prevent further damage or interruption of service. The Contractor, in such events, shall cooperate with the utility service or facility and the Engineer continuously until such damage has been repaired and service restored to the satisfaction of the utility or facility.

The Contractor shall bear all costs of damage and restoration of service to any utility service or facility due to his/her operations whether or not due to negligence or accident. The City reserves the right to deduct such costs from any monies due or which may become due the Contractor or his/her surety.

7-10 PUBLIC CONVENIENCE AND SAFETY

7-10.1 Traffic and Access. Replace the fourth paragraph with the following:

It is the explicit intention of the contract that the safety of aircraft, as well as the Contractor's equipment and personnel, is the most important consideration. It is understood and agreed that the Contractor shall provide for the free and unobstructed movement of aircraft in the air operations areas of the airport with respect to his/her own operations and the operations of all his/her subcontractors. It is further understood and agreed that the Contractor shall provide for the uninterrupted operation of visual and electronic signals (including power supplies thereto) used in the guidance of aircraft while operating to, from, and upon the airport

With respect to his/her own operations and the operations of all his/her subcontractors, the Contractor shall provide marking, lighting, and other acceptable means of identifying: personnel; equipment; vehicles; storage areas; and any work area or condition that may be hazardous to the operation of aircraft, fire-rescue equipment, or maintenance vehicles at the airport.

When the contract requires the maintenance of vehicular traffic on an existing road, street, or highway during the Contractor's performance of work that is otherwise provided for in the contract, plans, and specifications, the Contractor shall keep such road, street, or highway open to all traffic and shall provide such maintenance as may be required to accommodate

traffic. The Contractor shall furnish erect, and maintain barricades, warning signs, flagmen, and other traffic control devices in reasonable conformity with the manual of Uniform Traffic Control Devices for Streets and Highways (published by the United States Government Printing Office), unless otherwise specified herein. The Contractor shall also construct and maintain in a safe condition any temporary connections necessary for ingress to and egress from abutting property or intersecting roads, streets or highways. Unless otherwise specified herein, the Contractor will not be required to furnish snow removal for such existing road, street, or highway.

The Contractor shall make his/her own estimate of all labor, materials, equipment, and incidentals necessary for providing the maintenance of aircraft and vehicular traffic as specified in this subsection.

The cost of maintaining the aircraft and vehicular traffic specified in this subsection shall not be measured or paid for directly, but shall be included in the various contract items.

The Contractor shall control his/her operations and the operations of his/her subcontractors and all suppliers so as to provide for the free and unobstructed movement of aircraft in the AIR OPERATIONS AREAS of the airport.

When the work requires the Contractor to conduct his/her operations within an AIR OPERATIONS AREA of the airport, the work shall be coordinated with airport management (through the Engineer) at least 48 hours prior to commencement of such work. The Contractor shall not close an AIR OPERATIONS AREA until so authorized by the Engineer and until the necessary temporary marking and associated lighting is in place.

When the contract work requires the Contractor to work within an AIR OPERATIONS AREA of the airport on an intermittent basis (intermittent opening and closing of the AIR OPERATIONS AREA), the Contractor shall maintain constant communications as hereinafter specified; immediately obey all instructions to vacate the AIR OPERATIONS AREA; immediately obey all instructions to resume work in such AIR OPERATIONS AREA. Failure to maintain the specified communications or to obey instructions shall be cause for suspension of the Contractor's operations in the AIR OPERATIONS AREA until the satisfactory conditions are provided.

The contractor shall conduct all operations in a manner that will cause no interference with airplane traffic or normal operation of the airport. It is the Contractor's responsibility to escort and regulate the movements of his vehicles and equipment when it is necessary for a vehicle or piece of equipment to cross an active taxiway, or when working within the safety area of an active taxiway or runway. Unescorted crossings of active runways and taxiways will not be allowed. All escorts shall be equipped with ground radios and shall contact the airport traffic control tower to receive permission to cross any active taxiways or runways. When an aircraft approaches work in progress adjacent to an active taxiway, the workers and equipment shall be withdrawn to a safe distance until the aircraft has passed. Aircraft shall always have the right-of-way. The Contractor shall be prepared to pullback his operations, workers, and equipment to allow for the safe passage of aircraft. Pullbacks made by the Contractor shall be considered incidental and no separate payment shall be made.

In all operations, the Contractor shall be governed by the regulations and rules of the airport and shall cooperate fully with the Engineer and Airport Manager. The Contractor shall consult the City's Airport Manager regarding operation of vehicles on the AOA. The Contractor shall also be bound by the operational safety requirements outlined in the Federal Aviation Administration (FAA) Advisory Circular No. 150/5370-2E, entitled "Operational Safety on Airports During Construction" and the provisions thereof. Should there be a conflict in the requirements, the provisions of the Plans and Specifications shall govern over the requirements in the FAA Advisory Circular. At all times, the Contractor shall keep the following requirements in mind:

- a. Keep the airport operational for all users.
- b. Minimize delays to aircraft operations.
- c. Maintain safety of aircraft movement and airport operations as a whole.
- d. Minimize delays to construction operations.
- e. Minimize airport operation and construction activity conflicts.

Vehicular access to driveways shall be maintained to the property line except when necessary construction precludes such access. When the Contractor begins excavation of a driveway, safe access shall be provided within 4 hours and not later than the end of the same workday in which excavation began.

Add the following before the last paragraph:

The Contractor shall provide the necessary measures to prevent public access to private properties during removal and replacement of existing barrier structures, such as wood and chain link fences, during non-working hours.

The Contractor shall be responsible to provide at least 48 hours written notice to each affected property before closing or partially closing any driveway or pedestrian access.

Unless the Contractor makes other arrangements satisfactory to the owners, the Contractor shall provide and maintain safe, adequate vehicular access to places of business and public gathering as stated herein below:

- (a) For each establishment (such as, but not limited to, gas stations, markets, and other "drive-in" business) on the corner of an intersection, which has a driveway (or driveways) on each intersecting street, the Contractor shall provide vehicular access to at least one driveway on each intersecting street insofar as the access is affected by the Contractor's operations.
- (b) For each establishment (such as, but not limited to, motels, parking lots and garages) which has a one-way traffic pattern with the appropriate entrance driveway and exit driveway, the Contractor shall provide vehicular access to

the entrance driveway and the exit driveway insofar as the access is affected by the Contractor's operations.

- (c) The Contractor shall provide vehicular access to all schools and parking lots including, but not limited to, apartment building parking lots.
- (d) The Contractor shall provide vehicular access to all establishments requiring such access for receiving or delivering materials or supplies.
- (e) At least three (3) days prior to starting work in any location, the Contractor shall distribute written notices to all homeowners and residents that will be impacted by the work. The City will provide the notice.

Should any change in these requirements be necessitated by extraordinary occurrences or requirements during the execution of the Work, the Contractor shall obtain prior written approval of the Engineer.

Add the following subsections:

7-10.1.1 Traffic Control Plan. The Work Area Traffic Control Handbook "WATCH" manual shall be strictly adhered to, and the Contractor hereby understands and agrees that its failure to provide any facility or device as shown on the handbook, shall constitute a Contract non-compliance.

Full compensation for complying with the submittal requirements, furnishing, placing and removing traffic control shall be on included in related work bid items.

7-10.1.2 Minimum Requirements for Maintaining Traffic Flow. The Contractor shall observe the following minimum requirements:

- a) Unless otherwise shown on the Plans, permitted by this Contract or authorized by the Engineer, all roadways, driveways, travel and turning lanes, sidewalks and access ramps shall remain open at all times.
- b) The Contractor shall provide adequate steel plating to cover open trenches in order to allow traffic flow and not close a street. A minimum lane width of 12 feet shall be provided over the steel plating.
- c) At a minimum, the Contractor shall maintain **one (1) ten (10) foot-wide lane open in each direction between the hours of 7:00 a.m. and 3:30 p.m.** All travel lanes shall be kept open all other times.
- d) Reduction in lane requirements may be afforded only with prior written approval from the Engineer.
- e) Traffic signs, flaggers, warning devices, safety traffic devices and, on select streets, electronic arrow boards for diverting and directing traffic shall be furnished, installed and maintained by the Contractor throughout the project.

- f) The Contractor must provide access through the work zone in non-working hours by means of temporary ramps. Open trenches shall either be covered by steel plates, or ramped with crushed miscellaneous base. No drop-off at either transverse or longitudinal joints shall be allowed at any time. Temporary ramps, including those for driveway access, shall be constructed with either crushed miscellaneous base or temporary asphalt, as appropriate, with a minimum of 1" to 12" slope in both longitudinal and transverse directions.

All costs for the above requirements shall be included in the related work bid items.

7-10.1.3 Temporary Pavement Markings. If permanent pavement markings cannot be restored by the end of the work shift in which they were obliterated, temporary markings shall be provided by the Contractor prior to leaving the Work site on all streets except any street closed to through traffic. These temporary markings shall be as follows:

Temporary lanelines and/or centerlines shall consist of day/night reflectorized raised pavement markers, approved by the Engineer, spaced approximately twenty-four (24) feet apart. A list of approved day/night reflectorized raised pavement markers may be obtained from the CITY.

Where approved by the Engineer, the Contractor may use reflectorized lines approximately twenty-four (24) inches long and four (4) inches wide, spaced approximately twenty-four (24) feet apart.

Right edgelines shall not be simulated with dashes or pavement markers; however, portable delineators, guide markers, etc., may be used by the Contractor where it is considered desirable to enhance the edge of traveled way due to curvilinear alignment, narrowing pavement, etc., and shall be used when directed by the Engineer.

Locations where no-passing zone centerline delineation has been obliterated shall be posted by the Contractor with a sign package consisting of a **W20-1 "ROAD WORK AHEAD"** and **SC13 "DO NOT PASS"**.

All temporary pavement markings and signs shall be maintained, or replaced as necessary by the Contractor, until permanent pavement markings are restored.

All costs for the above requirements shall be included in the related work bid items.

7-10.1.4 Temporary Pavement Markers/Delineation. Temporary pavement delineation shall be furnished, placed, maintained and removed in accordance with the provisions of Section 12-3.01, of the Caltrans Standard Specifications. Nothing in these Special Provisions shall be construed as to reduce the minimum standards specified in the Manual of Traffic Controls published by Caltrans or as relieving the Contractor from responsibility as provided in 7-10 of these Special Provisions.

Whenever the work causes obliteration of pavement markers and/or delineation, the Contractor shall set in place temporary pavement markers/delineation prior to opening the traveled way to traffic. All pavement markers/delineation, including but not limited to lane

lines, centerlines, directional arrows, pavement legends, etc, shall be provided at all times for traveled ways open to traffic.

All work necessary to establish temporary pavement markers/delineation shall be performed by the Contractor. Surfaces on which temporary pavement delineation is to be applied shall be cleaned of all dirt and loose material and shall be dry when the pavement delineation is applied. Temporary pavement markers/delineation shall not be applied over existing pavement delineation or other temporary pavement delineation.

Temporary pavement markers/delineation shall be maintained until replaced with permanent pavement markers/delineation. Temporary pavement delineation shall be removed when 1) it conflicts with the permanent pavement delineation; 2) a new traffic pattern is established or 3) as determined by the Engineer.

Temporary pavement delineation shall consist of temporary reflective raised pavement markers placed on lane lines and centerlines at longitudinal intervals of not more than 24 feet apart. Temporary reflective raised markers shall be the same color as the lane line or centerline the markers replace. Temporary reflective raised pavement markers shall be, at the option of the Contractor, one of the following or approved equal:

Apex Universal Product No. 2SCSM-1W or 2SCSM-2Y markers manufactured by Apex Universal, 11033 Forest Place, Santa Fe Springs, CA 90607, Telephone (562) 944 8878.

Flex-O-Lite Raised Construction Marker (RCM), manufactured by Flex-O-Lite, Lukens Company, P.O. Box 4366, St. Louis, MO 63123-0166, Telephone (800) 325-9525.

Temporary reflective raised pavement markers shall be placed as directed by the Engineer. Temporary reflective raised pavement markers shall be applied to the pavement surface with the adhesive in accordance with the manufacturer's instructions. Epoxy adhesive shall not be used to apply temporary reflective raised pavement markers in areas where the pavement will not be removed.

Temporary lane line or centerline delineation consisting of temporary reflective raised pavement markers placed on longitudinal intervals of not more than twenty-four (24) feet, shall be used on lanes opened to public traffic for a maximum of fourteen (14) days. Prior to the end of the fourteen (14) days the planned permanent pavement delineation, except permanent pavement markers, shall be placed. If the planned permanent pavement delineation, exclusive of permanent pavement markers, is not placed within fourteen (14) days, the Contractor shall provide, at its expense, additional temporary pavement delineation as directed by the Engineer. The additional temporary pavement delineation to be provided shall be equivalent to the pattern specified for the permanent traffic lines as determined by the Engineer.

Full compensation for furnishing, placing, maintaining, and removing the temporary pavement markers/delineation shall be considered as included in the related work bid items.

7-10.1.5 Temporary "No Parking" Signs. The Contractor is responsible to post "Temporary No Parking" signs at least forty-eight (48) hours in advance of the first date of work and the

required enforcement. If work is to begin on either a Monday or Tuesday, the Contractor shall post the signs on a Friday. Each sign must include text indicating the beginning and end dates and the hours in effect. "Tow-Away" and "No Parking" must be shown on each sign face. If it is required to temporarily restrict parking 24 hours/day then "Tow-Away" and "No Parking Anytime" must be shown on each sign face. The signs shall be mounted on either 1" x 2" X 3' high wood stakes, Type II barricades, or 39-inch high delineators. Signs shall be spaced at approximately 100' intervals on the effected side(s) of the street. Signs shall not be posted on trees, traffic signal poles, utility poles, street lights, or any other street furniture.

Signs shall be professionally made of moisture-resistant, heavy duty cardboard or other approved material. All signs shall be maintained by the Contractor and kept free of graffiti. Any sign that becomes illegible or is removed shall be replaced within twenty-four (24) hours. The Contractor shall only be permitted to restrict parking for the minimum time necessary to complete on-going work. The Contractor shall be responsible to remove and repost "Temporary No Parking" signs when work will be delayed for more than five (5) consecutive days, or if the work must go beyond the end date shown on the signs, or otherwise directed by the Engineer.

The Contractor shall obtain approval for the signs and the placement thereof from the Engineer. Immediately after this approval and posting, the Contractor shall notify Torrance Police Department, Traffic Division, at (310) 618-5557 for review and enforcement. The parking restriction cannot be enforced until the signs have been in place 48 hours and the Police notified.

The Contractor shall maintain said signs through the day of work, and shall remove all of said signs on or within one (1) calendar day of the completion of work within the restricted parking area.

Full compensation for furnishing, placing, maintaining and removing temporary signs shall be considered as included in the related work bid items.

7-10.1.6 Holiday Moratorium. No reduction in lane widths on any major street shall be permitted during the CITY's holiday period construction moratorium, which begins on the Monday prior to Thanksgiving and ends on the Friday following New Year's Day. No traffic signal shall be out of operation for any period of time during said moratorium.

7-10.1.7 Trash Pick-Up. Trash pick up days are established and will not be changed. Consult the Engineer regarding trash pick up schedule. The Contractor shall ensure streets and alleys affected by the work are accessible to the CITY's automated trash trucks on designated pick up days. In alleys, Contractor shall be responsible to provide and maintain access to large trash containers during the course of the work.

7-10.1.8 Protection of Permanent Pavement Markings, Manholes, Valves. The Contractor shall cover and protect existing raised pavement markers, thermoplastic legends and markings, valve and manhole covers, utility caps, and similar items from damage and discoloration from the slurry and cape seal applications.

The contractor shall be responsible for replacing or restoring any damaged items.

Full compensation for the items in this subsection shall be considered as included in the appurtenant work.

7-10.3 Street Closures, Detours, Barricades.

Add the following paragraph after the first paragraph:

In addition to the requirements of this subsection, the Contractor shall conform to the requirements for street closures, detours, and barricades as stipulated in the Special Provisions. However, deviations from the requirements stipulated in the Special Provisions may be permitted upon written approval of the Public Works Director when such deviations are in the best interest of the City.

Authorized access to the Airport shall be maintained at all times. Two weeks before any work on any gate the Contractor shall consult the City Airport Manager and Engineer to discuss alternate gate and traffic routing. The contractor shall secure all necessary materials, labor and equipment before working on the gates to avoid unnecessary gate closures.

Replace the second paragraph with the following:

The Contractor shall notify the Public Works Department at (310) 781-6900, at least ten (10) working days in advance of closing or partially closing any street or alley and comply with their requirements. In addition, the Contractor shall notify the Torrance Police Department at (310) 328-3456 and Torrance Fire Department at (310) 781-7040 at least two (2) working days in advance of such closing.

It shall be the Contractor's responsibility to allow passage of the Torrance Transit System coaches through the construction area at all times. The Contractor shall notify the Torrance Transit Department at (310) 618-6266 at least 48 hours prior to construction affecting bus stop zones to allow said Transit System to temporarily abandon and relocate bus stop zones within the construction area.

The Contractor shall immediately notify the above parties upon completion of the construction work and opening or reopening of any street or alley.

Add the following:

The Contractor shall install, maintain, and remove all temporary delineators, barricades, lights, warning signs and other devices necessary to control traffic as specified in the project plans and these specifications. Materials for a temporary facility may be provided from new or used materials. If used materials are provided, they shall be sound, in good condition and otherwise meet the requirements of new materials. All traffic control devices shall be free of graffiti, and the Contractor shall be responsible to immediately clean and/or replace any device to the satisfaction of the Engineer.

Full compensation for furnishing, installing, maintaining and removing the above traffic control devices shall be considered as included in the related work bid items.

Where streets in which improvements are being constructed are specified hereinafter to be closed to through traffic, it shall be understood that such closures shall apply only to the portions of such streets where construction is actually in progress.

Substitute the following for the first sentence of the third paragraph:

The Contractor shall submit to the Public Works Director detailed plans prepared by a Registered Civil Engineer of all temporary bridges proposed for use on this project. This includes bridges which may have been used on previous projects. The Contractor shall allow 15 days for approval by the Engineer. The drawings shall indicate specific locations where the bridge is to be used. Bridges shall not be installed until such time as written approval is obtained from, and the bridge is inspected by, the Public Works Director.

Revise the final sentence of the third paragraph to include:

Except as modified hereinafter or within the Special Provisions.

Add the following paragraph after the third paragraph:

The Contractor shall conform to Section 74.6.8 of the Torrance Municipal Code. In addition, the Contractor shall comply with directions from the Engineer to provide protection at excavations, trenches and/or other potentially hazardous construction areas. The Contractor shall be required to erect temporary railing (Type K) per Caltrans Standard Plan T3, five-foot high chain link fences, or equivalent protection, to completely enclose all open excavations over three feet (3') in depth. Fencing shall be approved by the Engineer, and provide adequate security. Fencing may be removed during working hours to the extent necessary to provide access and working room, in which case the Contractor shall provide equivalent security, to the satisfaction of the Engineer, during said periods. Any excavation not secured to the satisfaction of the Engineer shall be completely backfilled prior to the end of each day's construction activities. The Engineer may require additional security devices, lighting or other protection in addition to said fencing. Full compensation for furnishing, placing and removing temporary protection shall be considered as included in the price for the various items of work.

7-10.3.1 Temporary Steel Plates. When backfilling operations of an excavation in the traveled way, whether transverse or longitudinal cannot be properly complete within a work day, steel plate bridging with a non-skid surface and shoring may be required to preserve unobstructed traffic flow. In such cases, the following conditions shall apply:

1. Steel plate used for bridging shall extend a minimum of 12-inches beyond the edges of the trench.
2. Steel plate bridging shall be installed to operate with minimum noise.
3. The trench shall be adequately shored to support the bridging and traffic loads
4. Temporary paving with cold asphalt concrete shall be used to feather the edges of the plates, if plate installation by Method (2) described below, is used.
5. Bridging shall be secured against displacement by using adjustable cleats, shims, or other devices.

Steel plate bridging and shoring shall be installed using either the following Method (1) or

Method (2):

Method (1) (For speeds more than 45 mph)

The Pavement shall be cold planed to a depth equal to the thickness of the plate and width and length equal to the dimensions of the plate.

Method (2) (For speeds 45 mph or less)

Approach plate(s) and ending plate (if longitudinal placement) shall be attached to the roadway by a minimum of two (2) dowels pre-drilled into the corners of the plate and drilled 2-inches into the pavement. Subsequent plates are butted to each other. Fine grade asphalt concrete shall be compacted to form ramps, maximum slope of 8.5% with a minimum 12- inches taper to cover all edges of the steel plates. When steel plates are removed, the dowel holes in the pavement shall be backfilled with either graded fines of asphalt concrete mix, concrete slurry or an equivalent slurry that is satisfactory to the City and/or Caltrans.

The Contractor shall be responsible for maintenance of the steel plates, shoring and asphalt concrete ramps.

The following table shows the advisory minimal thickness of steel plate bridging required for a given trench width (A-36 grade steel, designed for HS20-44 truck loading).

<u>Trench Width</u>	<u>Minimum Plate Thickness</u>
10"	1/2"
1'-11"	3/4"
2'-7"	7/8"
3'-5"	1"
5'-3"	1 1/4"

For spans greater than the 5'-3" a structural design shall be prepared by a California registered civil engineer.

All steel plates within the right-of-way whether used in or out of the travel way shall be without deformation. Steel plates shall be non-skid. Advanced signs shall be required for steel plates within traveled ways (Type P per the Watch Manual or a Rough Road sign (W33) per Caltrans requirements).

SECTION 9 - MEASUREMENT AND PAYMENT

9-1 MEASUREMENT AND PAYMENT. Add the following sections:

9-1.2.1 Payment for Labor and Materials.

The Contractor shall pay and cause the subcontractors to pay any and all accounts for labor, including Worker's Compensation premiums, State Unemployment and Federal Social Security payments and all other wage and salary deductions required by law. The Contractor also shall pay and cause the subcontractors to pay any and all accounts for services,

equipment and materials used by it and the subcontractors during the performance of work under this contract. All such accounts shall be paid as they become due and payable. If requested by the Engineer, the Contractor shall immediately furnish the City with proof of payment of such accounts.

9-1.2.2 Measurement and Payment

Payment of each item will include full compensation for furnishing all labor, materials, tools, equipment and backup equipment; transportation and technical competence for performing all work necessary to complete each item as indicated on the plans and as specified in these Contract Documents, including but not limited to obtaining all applicable certifications necessary for specialty personnel and major equipment in conformance with Subsection 7-5, and all other applicable permits; securing a storage yard to store all equipment and materials to be used on the job, disposal of waste materials, restoration of the site, etc. The storage yard may also be used as a temporary storage for excavated materials, and traffic control items. No separate payment will be made for mobilization and demobilization. Costs for mobilization/demobilization shall be included in the unit prices bid for each work item.

9-2 LUMP SUM WORK. Replace the second paragraph with the following:

The Contractor shall, within five (5) working days of receipt of a request from the Engineer, submit a complete breakdown of lump sum bid prices showing the value assigned to each part of the work, including an allowance for profit and overhead. In submitting the breakdown, the Contractor certifies that it is not unbalanced and that the value assigned to each part of the work represents its estimate of the actual cost, including profit and overhead, of performing that part of the work. The breakdown shall be sufficiently detailed to permit its use by the Engineer as one of the bases for evaluating requests for payment. No extra costs shall be allowed for providing these breakdowns.

9-3 PAYMENT.

9-3.2 Partial and Final Payment. Replace the third paragraph with the following:

For each progress estimate, 10 percent will be deducted and retained by the CITY, and the remainder less the amount of all previous payments will be paid. In addition, 125% of the amount of outstanding "Stop Notices" shall be withheld.

Add the following:

The Contractor shall submit all requests for payment on a Progress Payment Invoice to be provided by the CITY.

Prior to submittal of said invoice, all items for which payment is requested shall be checked and approved in writing by the Engineer. No payments will be made unless all back-up data is submitted with the payment request and the Progress Payment Invoice is signed by both Contractor and Engineer.

9-3.4 Mobilization. Replace the entire subsection with the following:

Mobilization shall include the provisions of the Construction Schedule, Best Management Practices and Storm Water Pollution Prevention Plan; Sewage Spillage Prevention; Emergency Response Plan; site review; obtaining all permits, insurance, and bonds; moving onto the site all plant and equipment; furnishing and erecting plants, temporary buildings, and other construction facilities, and removal of same at completion of the Work; and other work, all as required for the proper performance and completion of the Work.

Mobilization shall include, but not be limited to, the following items:

- (a) Submittal and modification, as required, of the Construction Schedule and Storm Water Pollution Prevention Plan.
- (b) Moving on to the site of all Contractor's plant and equipment required for the first month's operations.
- (c) Installing temporary construction power and wiring.
- (d) Establishing fire protection system.
- (e) Developing construction water supply.
- (f) Providing on-site sanitary facilities and portable water facilities, as required.
- (g) Arranging for and erection of Contractor's work and storage yard.
- (h) Submittal of all required insurance certificates and bonds, including subcontractors.
- (i) Obtaining all required permits.
- (j) Posting all OSHA required notices and establishment of safety programs.
- (k) Potholing and other research and review as necessary to verify site conditions and utility locations
- (l) Having the Contractor's Superintendent present at the job site full-time.
- (m) Removal, cleanup, and restoration

There shall be no separate payment for mobilization. Payment for such costs shall be considered as included in the other items of work.

9-3.5 Noncompliance with Plans and Specifications. Add the following section:

Failure of the Contractor to comply with any requirement of the Plans and Specifications, and/or to immediately remedy any such noncompliance upon notice from the Engineer, may result in suspension of Contract Progress Payments. Any Progress Payments so suspended

shall remain in suspension until the Contractor's operations and/or submittals are brought into compliance to the satisfaction of the Engineer. No additional compensation shall be allowed as a result of suspension of Progress Payments due to noncompliance with the plans or specifications. The Contractor shall not be permitted to stop work due to said suspension of Progress Payments.

9-4 CLAIMS.

The Contractor shall not be entitled to the payment of any additional compensation for any cause, including any act, or failure to act, by the CITY, or the happening of any event, thing or occurrence, unless the Contractor shall have given the CITY due written notice of potential claim as hereinafter specified.

The written notice of potential claim shall set forth the reasons for which the Contractor believes additional compensation will or may be due, the nature of the costs involved, and, insofar as possible, the amount of the potential claim. Said notice shall be submitted on a form approved by the CITY at least forty-eight (48) hours (two working days) in advance of performing said work, unless the work is of an emergency nature, in which case the Contractor shall notify and obtain approval from the Engineer prior to commencing the work. The Engineer may require the Contractor to delay construction involving the claim, but no other work shall be delayed, and the Contractor shall not be allowed additional costs for any said delay but may be allowed an extension of time if the Engineer agrees that the work delayed is a controlling element of the Construction Schedule. The Contractor shall be required to submit any supporting data (or a detailed written explanation justifying further delay) within five (5) work days of a request from the Engineer and shall be responsible for all costs associated with any delays resulting from late and/or incomplete submittals. By submitting a Bid, the Contractor hereby agrees that this subsection shall supersede 6-6.3 and 6-6.4 of the Standard Specifications.

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

PART 2 - CONSTRUCTION MATERIALS

See Section F – Technical Specifications

PART 3 - CONSTRUCTION METHODS

See Section F – Technical Specifications

ZAMPERINI FIELD SECURITY PROJECT, FEAP 616

SECTION F

TECHNICAL SPECIFICATIONS

**ZAMPERINI FIELD SECURITY PROJECT,
FEAP 616**

**TECHNICAL SPECIFICATIONS
Bid Set**

Prepared For:

**City of Torrance
3301 Airport Drive
Torrance, CA 90505**

Prepared By:

**AECOM
999 W. Town & Country Road
Orange, CA 92868**



October 2013

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PART 2 – TECHNICAL PROVISIONS

CIVIL

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ITEM P-100 MOBILIZATION

DESCRIPTION

100-1 DESCRIPTION OF THE WORK

This item includes: Mobilization; Preparatory work; Laydown/staging area set up and use for operations including, but not limited to, those necessary for the movement of personnel, equipment, supplies and incidentals to and from the Work site; construction of access gates and fencing, obtaining electrical power and water, payment of bonds and insurance for the Work; obtaining all permits; demobilization and site restoration; and for all other work and operations which must be performed and costs that must be incurred incidental to the initiation of actual construction of the Work and for which payment is not otherwise provided for under the Contract.

100-2 CONTRACTOR'S OPERATIONS AND STORAGE AREA

During the course of the Work the Contractor will be afforded the use of the area designated on the drawings as the "Contractor's Storage Area." The area includes an existing trailer office which can be used for the Contractor's Field Office. This space and trailer will be provided without charge to the Contractor for the Contractor's use throughout the contract period. This space may be used by the Contractor for storage of materials, and for parking of employee's personal automobiles.

As a part of the Contractor's Storage Area set-up activities, the Contractor shall investigate the availability of and adequate supply of water, power and communications utilities and make all arrangements, including permits, for the purchase of necessary utilities, at the Contractor's sole expense.

The location shown on the Plans is approximate. The Contractor shall coordinate with the Engineer to determine the precise location and limits of the Area.

The Contractor may install temporary chain link fencing and gates to enclose the Contractor's Storage Area to protect his area as required at his own expense. The fencing and gates shall remain the property of the Contractor and shall be removed at the completion of the Work.

The Contractor shall complete all clean up, restoration and repair, removal of equipment and materials, and removal of all temporary security fencing, gates and traffic control devices within the work site within thirty (30) calendar days after the date of substantial completion of the Work.

METHOD OF MEASUREMENT

100-3 Mobilization, including demobilization and all Work associated therewith, shall be measured for payment by the lump sum as a single complete unit of Work.

BASIS OF PAYMENT

100-4 Payment for "Mobilization" shall be made at the lump sum contract price. Mobilization shall not exceed five percent (5%) of the total price for the Base Bid. The price shall be full compensation for furnishing all materials, labor, equipment and tools necessary to complete mobilization and demobilization.

Payment will be made under:

Item P-100-1 Mobilization (5% max)--per lump sum

END OF ITEM P-100

ITEM P-110 PROJECT REQUIREMENTS

DESCRIPTION

110-1.1 DESCRIPTION OF THE WORK

This project consists of the installation of new security system at Zamperini Field in the City of Torrance which includes but is not limited to the following major elements:

BASE BID – SECURITY CAMERA SYSTEM AND ACCESS CONTROL SYSTEM

1. Installation of security cameras and lighting improvements at Gates A, F, R, O, 23940 and P.
2. Install license plate readers at Gates A, F and R.
3. Installation of UPS for gate operators at Gates A and F
4. Install ingress and egress card readers at Gates A and F, including knox box and maintenance switch keys.
5. Install (4) security cameras for GAC Apron.
6. Install (4) security cameras at East Hangar area.
7. At Door D1; Install (1) security camera, ingress card reader and door locking mechanism with free exit handle.
8. Install computer server for video management system and access control system.
9. Install network video storage system.
10. Install Back-up System for Server.
11. Install (2) computer work stations.
12. Install wireless node network to security cameras, access control system, license plate readers and network storage system and server.
13. Installation of LED security lighting at the East Hangar Area.
14. Remove and replace chain link gates and fencing at Gates O, P, 23940 and I
15. Disable Core Card Reader at Gate Y.

ADDITIVE (1) – REPLACEMENT OF GATES A & F

1. Remove existing ornamental gates including gate operators.
2. Install new ornamental cantilever slide and v-track rolling gates.
3. Install new gate operators.
4. Re-establish access controls to new gate operators.

110-1.2 SUBMITTALS. Prior to beginning work, the Contractor shall submit the following:

- a. Construction Phasing Plan
- b. Construction Security Plan
- c. Access and Traffic Control Plan

110-1.3 COMPLIANCE WITH ADVISORY CIRCULARS

All work shall be in accordance with FAA Advisory Circulars. The Contractor's attention is specifically directed to Advisory Circular 150/5370-2F, Operational Safety on Airports During Construction, current edition, which the Contractor shall adhere to.

110-1.4 PHASES OF WORK

Phases of work shall be as shown on the construction phasing plans or as directed by the engineer.

110-1.5 MAINTAINING AIRPORT SECURITY DURING CONSTRUCTION

Aviation safety and security during construction is a significant concern at airports. Any construction work near and around the airport needs to consider the aircraft operational safety and maintain airport security to minimize any potential safety hazards.

The Contractor shall be responsible to prepare and submit a Construction Security Plan for approval by the Engineer. The Construction Security Plan shall include specifics of how the Contractor will maintain airport perimeter security during construction, proposed haul routes, lay down areas, emergency contact information, methods of construction and mitigation of risks the contractor will utilize on the project to ensure security. The Construction Security Plan shall be submitted and approved by the Engineer prior to beginning any work on the project.

The Contractor shall be responsible to prepare, update, revise and implement all requirements within the Construction Security Plan, including furnishing, erecting, and maintaining all temporary fencing and providing security guards if required to maintain the airports security.

110-1.6 HAUL ROUTE, ACCESS PLAN AND TRAFFIC CONTROL

Haul roads are shown on the Plans. During the project, active aircraft pavements shall be kept clean at all times, and may require immediate sweeping if FOD is created by the contractor operations. Any damage to the pavements caused by the Contractor's operations shall be repaired by the Contractor at his expense.

Access to the airport shall be maintained at all times for airport user's. Work shall be restricted to closure of one airport access gate at any time.

The Contractor shall submit a detailed Access and Traffic Control Plan to demonstrate the methods for providing access for vehicular traffic to the airport. This plan shall be submitted a minimum of 15 calendar days prior to the start of work. This plan will require approval by the Airport prior to being work. Traffic control plans should indicate where and what signs will be installed to communicate if a gate is closed, and alternative routes to access the airport.

The Contractor shall also provide sufficient traffic control measures to protect the airport users, the public and the Contractor's personnel, including barricades, warning signs, traffic control and

markings of hazards. During periods of darkness, barricades, warning signs, and markings shall be suitably illuminated.

110-1.7 PRE-CONSTRUCTION CONFERENCE

Following award, and prior to the start of construction Work, the Contractor shall conduct a Pre-Construction Conference at a time and place designated by the Engineer and have prepared a construction schedule for discussions with expected completion dates. The purpose of the Pre-Construction Conference shall be to discuss various items including operational safety, testing, quality control, security, safety, project scheduling, labor requirements and environmental factors. As a minimum, the following items will be discussed:

- Introduction of Parties Attending
- Award of the Contract
- Construction Phasing Plan
- Maintaining Airport Security During Construction (Construction Security Plan)
- Access & Traffic Control Plan
- Description of the Work
- Quality Assurance Plan
- Submittals/RFI's
- Permits
- Utility Company Input
- Assignment of Superintendent and Emergency Phone Numbers
- Discussion of Construction Schedule (at this meeting the Contractor shall describe the proposed sequence of Work in detail)
- Liquidated Damages
- Certified Payrolls, Progress Payment System, Prevailing Wage Rates
- Lien releases
- Concerns of Users
- Concerns of the Airport/City
- Additional Comments

The Contractor shall be prepared to fully describe the proposed construction organization, operations and schedule at this meeting.

110-1.8 FOD PREVENTION

Aircraft and aircraft engines are subject to Foreign Object Damage (FOD) from debris and waste material lying on and adjacent to airfield pavements. The Contractor shall remove all such materials and trash that may appear on operational aircraft pavements due to the Contractor's operations.

110-1.9 PORTABLE CONSTRUCTION LIGHTING

The Contractor is responsible for providing work area lighting of sufficient quality and quantity to construct the Work to the quality standards required in the Plans and Specifications.

As a minimum the construction lighting shall meet the following requirements:

a. For any Work to be performed during the night time hours the Contractor shall ensure that the work areas are adequately illuminated. A minimum of 10 foot-candles of illumination shall be provided in the work areas using maneuverable light plants with 1000-watt metal halide floodlights, mounted as high as practicality will allow. The Contractor shall determine the number of light plants and their required spacing to achieve the illumination levels specified herein. However, space between light plants shall not be greater than 100 feet.

b. The Contractor shall coordinate with Airport/Engineer to ensure that light placements do not interfere with the visibility of pilots.

c. The Contractor shall not leave equipment on the active airfield areas during non-working hours.

110-1.10 STANDBY EQUIPMENT

It is the contractor's responsibility to provide standby equipment to complete the work in each shift.

110-1.11 SCHEDULING AND DAILY OPERATIONS

All work hours shall be subject to the written approval of the Engineer, Owner and Airport, and shall be in accordance with the approved Work schedule. The Contractor shall also provide daily and weekly Work plans. The Contractor shall have personnel and equipment staged and ready to occupy the work site at the start times listed.

The Contractor shall attend daily briefings and weekly construction meetings with the Engineer. Appropriate staff from the Airport and the Contractor shall attend as required. Topics shall include but not be limited to schedule updates, current issues, quality control, utility issues, submittal status, RFI status, coordination with other contracts, and potential disputes.

110-1.12 PRE-PHASE PLANNING MEETINGS

Prior to the start of Work, and prior to the start of any new phases or sub-phases of Work, the Contractor shall attend a Pre-Phase Planning Meeting. At these meetings the Contractor shall describe in detail the approach to be taken for the subject Work. The Contractor shall include any sketches required to describe the Work approach. The Contractor shall describe in detail the equipment to be used, security requirements, haul routes, traffic control, backup equipment and contingency planning should equipment or material delivery problems occur, etc.

Pre-Phase Planning Meetings will be held for the following phases of work at a minimum:

- Construction at Gate A
- Construction at Gate F
- Construction at Gate R
- Construction at Gates O, P, 23940 and I

- Installation of cameras at GAC apron and East Hangar Area
- Installation of security lighting at East Hangar Area
- Installation of VMS and access control system at the GAC.

MEASUREMENT AND PAYMENT

110-2.1 Unless otherwise noted, payment for conforming to the requirements of Item P-110, except for Paragraph 110-2.2, shall be considered as incidental and included in the contract unit prices for various items of work and no additional measurement and payment will be made.

110-2.2 “Airport Security During Construction and Traffic Control” will not be measured, but shall be paid for as a lump sum. This price shall be full compensation for the preparation, obtaining approval, and amending of the Construction Security Plan, and Access and Traffic Control Plans, including implementation and furnishing all labor, materials, incidentals and equipment, tools including installation, relocation and maintenance of barricades, temporary fences and gates necessary to maintains the airport’s perimeter fencing, and traffic control throughout the duration of the project necessary to complete the work.

Payment will be made under:

Item P-110-1	Airport Security and Traffic Control During Construction --per lump sum
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. END OF ITEM P-110

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ITEM P-640 MISCELLANEOUS SITE IMPROVEMENTS

DESCRIPTION

640-1.1 This item shall consist of miscellaneous site improvements in accordance with these specifications.

MATERIALS AND CONSTRUCTION METHODS

640-2.1 Installation and material of signs shall be performed at the locations shown on the plans and shall conform to Section 56, "Signs" per Caltrans Standard Specifications dated 2010.

640-2.2 Pavement striping shall conform to Section 84-3, "Painted Traffic Stripes and Pavement Markings" per Caltrans Standard Specifications dated 2010. Paint shall be waterborne complying to Federal Specification TT-P-1952E.

640-2.3 Concrete for fence and gate post foundations shall be class 520-C-2500, per Section 201 of the Greenbook dated 2006.

640-2.4 Unless otherwise noted, miscellaneous concrete shall be class 560-C-3250, per Section 201 of the Greenbook dated 2006.

640-2.5 Compacted backfill may be substituted with trench backfill material type 100-E-100 per Section 201 of the Greenbook dated 2006.

640-2.6 Controlled Low Strength Material (CLSM) shall be in accordance with Section 201-6 per the Greenbook dated 2006.

640-2.7 Asphalt Concrete for AC Pavement shall be type C2, PG 64-10 per Section 203 of the Greenbook dated 2006.

640-2.8 Crushed Aggregate Base shall conform to Section 200-2.2 "Crushed Aggregate Base" of the Greenbook dated 2006.

METHOD OF MEASUREMENT

640-3.1 The quantity for "PCC Curb and Gutter" will be measured per linear foot of curb & gutter constructed.

640-3.2 The quantity for "Bollards" will be measured per each.

640-3.3 The quantity for "Pavement Markings" will not be measured, but paid for as a lump sum.

640-3.4 The quantity for "Signage at Vehicle Gate" will be measured per each gate with complete signage installed as shown on plan.

640-3.5 The quantity for “Signage at Door D1” will be measured per each.

640-3.6 The quantity for “Restore AC Pavement” will be measured per square foot of asphalt concrete pavement restored.

640-3.7 The quantity for “Restore Sidewalk / PCC Gutter” will be measured per square foot of sidewalk/ PCC gutter restored.

BASIS OF PAYMENT

640-4.1 Payment for “PCC Curb and Gutter” will be made at the contract unit price per linear foot and shall be full compensation for all labor, materials, equipment, tools, and incidentals necessary to complete the item at the locations shown on the plan. These incidentals shall include but are not limited to demolition and removal of the existing curb and gutter, excavation, backfill, formwork and concrete to construct the item complete in place.

640-4.2 Payment for “Bollards” will be made at the contract unit price per each for this item and shall be full compensation for all labor, materials, equipment, tools, and incidentals necessary to complete the item at the locations shown on the plan. These incidentals shall include but are not limited to excavation, concrete foundation and painting required to construct the item complete in place.

640-4.3 Payment for “Pavement Markings” will be made at the contract unit price per lump sum. This price shall be full compensation for furnishing all material, labor, equipment, tools and incidentals necessary to complete the item.

640-4.4 Payment for “Signage at Vehicle Gate” will be made at the contract unit price per each. The price shall be full compensation for furnishing and installing all signs as shown on plan, and for all labor, materials, equipment, tools, and incidentals necessary to complete this item. These incidentals include, but are not limited to any fastening hardware for installation required to construct the item complete in place.

640-4.5 Payment for “Signage at Door D1” will be made at the contract unit price per each. The price shall be full compensation for furnishing and installing all signs as shown on plan, and for all labor, materials, equipment, tools, and incidentals necessary to complete this item. These incidentals include, but are not limited to any fastening hardware for installation required to construct the item complete in place.

640-4.6 Payment for “Restore AC Pavement” will be made at the contract unit price per square foot and shall be full compensation for all labor, materials, equipment, tools, and incidentals necessary to complete the item at the locations shown on the plan. These incidentals shall include but are not limited to excavation, backfill, crushed aggregate base course and asphalt concrete to construct the item complete in place.

640-4.7 Payment for “Restore Sidewalk / PCC Gutter” will be made at the contract unit price per square foot and shall be full compensation for all labor, materials, equipment, tools, and incidentals necessary to complete the item at the locations shown on the plan. These incidentals

shall include but are not limited to excavation, backfill, crushed aggregate base course and Portland cement concrete to construct the item complete in place.

Payment will be made under:

Item P-640-1	PCC Curb and Gutter--per linear foot
Item P-640-2	Bollards--per each
Item P-640-3	Pavement Markings--per lump sum
Item P-640-4	Signage at Vehicle Gate--per each
Item P-640-5	Signage at Door D1--per each
Item P-640-6	Restore AC Pavement--per square foot
Item P-640-7	Restore Sidewalk / PCC Gutter--per square foot

END OF ITEM P-640

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ITEM F-162 CHAIN-LINK FENCES

DESCRIPTION

162-1.1 This item shall consist of furnishing and erecting a chain-link fence and gates in accordance with these specifications and the details shown on the plans and in conformity with the lines and grades shown on the plans or established by the Engineer.

MATERIALS

162-2.1 FABRIC. The fabric shall be woven with a 9-gauge galvanized steel wire in a 2-inch mesh and shall meet the requirements of ASTM A392, Class 2. The fabric shall be hot-dip galvanized-after-weaving.

162-2.2 BARBED WIRE. Section Not Used

162-2.3 POSTS, RAILS AND BRACES. Line posts, rails, and braces shall conform to the requirements of ASTM F-1043 or ASTM F 1083 as follows:

Galvanized tubular steel pipe shall conform to the requirements of Group 1A, (Schedule 40) coatings conforming to Type A, or Group IC (High Strength Pipe), External coating Type B, and internal coating Type B or D.

Line posts, rails, and braces shall be galvanized steel pipe conforming to the requirements of ASTM F 1083.

Posts, rails, and braces, with the exception of galvanized steel conforming to F 1043 or ASTM F 1083, Group 1A, Type A, or aluminum alloy, shall demonstrate the ability to withstand testing in salt spray in accordance with ASTM B 117 as follows:

External: 1,000 hours with a maximum of 5% red rust
Internal: 650 hours with a maximum of 5% red rust.

The dimensions of the posts, rails, and braces shall be in accordance with Tables I through VI of Fed. Spec. RR-F-191/3.

162-2.4 GATES. Gate frames shall consist of galvanized steel pipe and shall conform to the specifications for the same material under paragraph 162-2.3. The fabric shall be of the same type material as used in the fence.

162-2.5 WIRE TIES AND TENSION WIRES. Wire ties for use in conjunction with a given type of fabric shall be of the same material and coating weight identified with the fabric type. Tension wire shall be 7-gauge marcelled steel wire with the same coating as the fabric type and shall conform to ASTM A 824. All material shall conform to Fed. Spec. RR-F-191/4.

162-2.6 MISCELLANEOUS FITTINGS AND HARDWARE. Miscellaneous steel fittings and hardware for use with zinc-coated steel fabric shall be of commercial grade steel or better quality, wrought or cast as appropriate to the article, and sufficient in strength to provide a balanced design when used in conjunction with fabric posts, and wires of the quality specified herein. All steel fittings and hardware shall be protected with a zinc coating applied in conformance with ASTM A 153.

162-2.7 CONCRETE. Concrete shall be class 520-C-2500, as per Section 201 of the Greenbook, with a minimum 28-day compressive strength of 2500 psi.

162-2.8 MARKING. Each roll of fabric shall carry a tag showing the kind of base metal (steel, aluminum, or aluminum alloy number), kind of coating, the gauge of the wire, the length of fencing in the roll, and the name of the manufacturer. Posts, wire, and other fittings shall be identified as to manufacturer, kind of base metal (steel, aluminum, or aluminum alloy number), and kind of coating.

CONSTRUCTION METHODS

162-3.1 CLEARING FENCE LINE. All trees, brush, stumps, logs, and other debris which would interfere with the proper construction of the fence in the required location shall be removed a minimum width of 2 feet on each side of the fence centerline before starting fencing operations. Trees shall be protected in place, unless noted otherwise on the plans. The new fence shall not be stressed by any adjacent shrubs, trees or vegetation and any necessary trimming shall be done to ensure a free-standing fence and barbed wire. With prior approval by the Engineer, the fence line can be slightly shifted to avoid trees by a distance that does not exceed 12 inches from the current fence location.

162-3.2 INSTALLING FENCE POSTS. All posts shall be set in concrete at the required dimension and depth and at the spacing shown on the plans. The concrete shall be thoroughly compacted around the posts by tamping or vibrating and shall have a smooth finish slightly higher than the ground and sloped to drain away from the posts. All posts shall be set plumb and to the required grade and alignment. No materials shall be installed on the posts, nor shall the posts be disturbed in any manner within 7 days after the individual post footing is completed.

Should rock be encountered at a depth less than the planned footing depth, a hole 2 inches larger than the greatest dimension of the posts shall be drilled to a depth of 12 inches. After the posts are set, the remainder of the drilled hole shall be filled with grout, composed of one part Portland cement and two parts mortar sand. Any remaining space above the rock shall be filled with concrete in the manner described above.

In lieu of drilling, the rock may be excavated to the required footing depth. No extra compensation shall be made for rock excavation.

Where posts are located in existing Portland Cement Concrete or Asphalt Concrete Pavement, holes shall be drilled through the pavement. No extra compensation shall be made for pavement drilling. Concrete foundation for chain link fence shall be constructed as shown on the plans.

162-3.3 **INSTALLING FENCE TOP RAILS.** The top rail shall be continuous and shall pass through the post tops. The coupling used to join the top rail lengths shall allow for expansion.

162-3.4 **INSTALLING FENCE BRACES.** Horizontal brace rails, with diagonal truss rods and turnbuckles, shall be installed at all terminal and gate posts.

162-3.5 **INSTALLING FABRIC.** The wire fabric shall be firmly attached to the posts and braced in the manner shown on the plans. All wire shall be stretched taut and shall be installed to the required elevations. The fence shall generally follow the contour of the ground, with the bottom of the fence fabric no less than 1 inch or more than 2 inches from the ground surface. Grading shall be performed where necessary to provide a neat appearance.

All excavated and removed materials shall be disposed of off-site, not on Airport property. Disposal shall be the responsibility of the Contractor.

162-3.6 **GATES.** Cantilever and rolling chain link gates shall be in accordance with specification F-165 and F-166.

Double swing gate frames shall consist of galvanized steel pipe and shall conform to the specifications for the same material under paragraph 162-2.3. The fabric shall be of the same type material as used in the fence.

162-3.7 **ELECTRICAL GROUNDS.** Electrical grounds shall be constructed at 500-foot intervals. The ground shall be accomplished with a copper clad rod 8 feet long and a minimum of 5/8 inch in diameter driven vertically until the top is 6 inches below the ground surface. A No. 6 solid copper conductor shall be clamped to the rod and to the fence in such a manner that each element of the fence is grounded. Installation of ground rods shall not constitute a pay item and shall be considered incidental to fence construction.

METHOD OF MEASUREMENT

162-4.1 Fences will be measured by the linear foot. Measurement will be along the top of the fence from center to center of end posts, excluding the length occupied by gate openings.

162-4.2 Double swing gate will not be measured, but paid for as a lump sum.

BASIS OF PAYMENT

162-5.1 Payment for "8-foot High Chain Link Fence" will be made at the contract unit price per linear foot, and the price shall be full compensation for furnishing all materials at the locations shown on the plans, including demolition and removal of the existing fence, and for all preparation, including clearing and grubbing, excavation, backfill, concrete foundation, erection, electrical ground rods and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

162-5.2 Payment for “44-Foot Manual Double Swing Gate (O) Chain Link” will be made at the contract unit price per lump sum, and the price shall be full compensation for furnishing all materials at the locations shown on the plans, including demolition and removal of the existing fence, and for all preparation, including clearing and grubbing, excavation, backfill, concrete foundation, erection, electrical ground rods, pad-lock and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item F-162-1	8-Foot High Chain Link Fence -- per linear foot
Item F-162-2	44-Foot Manual Double Swing Gate (O) Chain Link -- per lump sum

MATERIAL REQUIREMENTS

ASTM A 121	Zinc-Coated (Galvanized) Steel Barbed Wire
ASTM A 123	Zinc (Hot Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars, and Strip
ASTM A 153	Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A 392	Zinc-Coated Steel Chain-Link Fence Fabric
ASTM A 446	Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality
ASTM A 491	Aluminum-Coated Steel Chain-Link Fence Fabric
ASTM A 569	Steel, Carbon (0.15 Maximum, Percent), Hot Rolled Sheet and Strip Commercial Quality
ASTM A 570	Hot-Rolled Carbon Steel Sheet and Strip Structural Quality
ASTM A 572	High-Strength Low-Alloy Columbium-Vanadium Steels of Structural Quality
ASTM A 585	Aluminum-Coated Steel Barbed Wire
ASTM A 824	Metallic-Coated Steel Marcellled Tension Wire for Use with Chain Link Fence

ASTM B 117	Standard Test Method of Salt Spray (Fog) Testing
ASTM B 221	Aluminum-Alloy Extruded Bars, Rods, Wire Shapes and Tubes
ASTM F 668	Poly (vinyl Chloride) (PVC)-Coated Steel Chain-Link Fence
ASTM F 1043	Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework
ASTM F 1083	Pipe, Steel, Hot-Dipped Zinc-coated (galvanized) Welded, for Fence Structures
ASTM F 1183	Aluminum Alloy Chain Link Fence Fabric
ASTM F 1234	Protective Coatings on Steel Framework for Fences
ASTM G 23	Operating Light-Exposure apparatus (Carbon-Arc Type) with and without Water for Exposure of Nonmetallic Materials
ASTM G 26	Operating Light-Exposure Apparatus (Xenon-Arc Type) with and without Water for Exposure of Nonmetallic Materials
ASTM G 53	Operating Light- and Water-Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials
Fed. Spec. RR-F-191/3	Fencing, Wire and Post, Metal (Chain-Link Fence Posts, Top Rails and Braces)
Fed. Spec. RR-F-191/4	Fencing, Wire and Post, Metal (Chain-Link Fence Accessories)

END OF ITEM F-162

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ITEM F-164 ORNAMENTAL FENCE

164-1.1 GENERAL DESCRIPTION

The contractor shall provide all labor, materials, and appurtenances necessary for installation of the industrial ornamental steel fence system.

164-1.2 RELATED WORK

Concrete: Greenbook Class 520-C-2500

Earthwork: Greenbook Section 300-2, "Unclassified Excavation"

164-1.3 SYSTEM DESCRIPTION

The Contractor shall supply a total industrial ornamental steel fence system to match existing ornamental fence, 8 foot high, 2 rail, 8 foot panel design or approved equal. The system shall include all components (i.e., pickets, rails, posts, gates and hardware) required.

164-1.4 QUALITY ASSURANCE

The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.

164-1.5 REFERENCES

ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot Dip Process

ASTM A924/A924M - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot Dip Process

ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength and High-Strength Low-Alloy with Improved Formability

ASTM B117 - Practice for Operating Salt Spray (Fog) Apparatus

ASTM D523 - Test Method for Specular Gloss

ASTM D822 - Practice For Conducting Tests On Paint and Related Coatings and Materials Using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus

ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments

ASTM D2244 - Test Method for Calculation of Color Differences From Instrumentally Measured Color Coordinates

ASTM D2794 - Test Method for Resistance of Organic Coatings to The Effects of Rapid Deformation (Impact)

ASTM D3359 - Test Method for Measuring Adhesion by Tape Test

164-1.6 SUBMITTAL

Shop drawing submittal shall be made per Section 2-5.3 prior to installation. Substitutions can be submitted to the Engineer for approval.

164-1.7 PRODUCT HANDLING AND STORAGE

Upon receipt at the job site, all materials shall be checked to ensure that no damage occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism, and theft.

MATERIALS

164-2.1 MANUFACTURER

The industrial ornamental steel fence shall be approved by the Engineer.

164-2.2 MATERIAL

a. Steel material for fence framework (i.e., tubular pickets, rails, and posts), shall be galvanized prior to forming, shall conform to the requirements of ASTM A653/A653M, with a minimum yield strength of 45,000 psi (310 MPa). The steel shall be hot-dip galvanized to meet the requirements of ASTM A653/A653M with a minimum zinc coating weight of 0.90 oz/ft² (276 g/m²), Coating Designation G-90.

b. The manufactured galvanized framework shall be subjected to the thermal stratification coating process (high-temperature, in-line, multi-stage, multi-layer) including, as a minimum, a six-stage pretreatment/wash (with zinc phosphate), an electrostatic spray application of an epoxy base, and a separate electrostatic spray application of a polyester finish. The base coat shall be a zinc-rich thermosetting epoxy powder coating (gray in color) with a minimum thickness of 2 mils (0.0508mm). The topcoat shall be a "no-mar" TGIC polyester powder coat finish with a minimum thickness of 2 mils (0.0508mm). The color shall be black. The stratification-coated framework shall be capable of meeting the performance requirements for each quality characteristic shown in Table 1.

Table 1 – Coating Performance Requirements

Quality Characteristics	ASTM Test Method	Performance Requirements
Adhesion	D3359 – Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance	B117 & D1654	Corrosion Resistance over 3,000 hours (Scribed per D1654; failure mode is 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D822, D2244, D523 (60° Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

c. Material for fence pickets shall be 1" square x 14ga. tubing. The cross-sectional shape of the rails shall conform with outside cross-section dimensions of 1.75" square and a minimum thickness of 14ga. Picket holes shall be spaced 4.98" o.c. Picket retaining rods shall be 0.125" diameter galvanized steel. Posts shall be a minimum of 2-1/2" square x 12ga. High quality PVC grommets shall be supplied to seal all picket-to-rail intersections.

d. Concrete for fence posts shall be class 520-C-2500 as per Section 201 of the Greenbook, with a minimum compressive strength of 2500 psi.

164-2.3 FABRICATION

e. Pickets, rails, and posts shall be pre-cut to specified lengths. Rails or approved equal shall be pre-punched to accept pickets.

f. Grommets shall be inserted into the pre-punched holes in the rails and pickets shall be inserted through the grommets so that pre-drilled picket holes align with the internal upper raceway of the rails or approved equal. (Note: This can best be accomplished by using an alignment template.) Retaining rods shall be inserted into each rail or approved equal so that they pass through the predrilled holes in each picket, thus completing the panel assembly.

g. Completed panels shall be capable of supporting a 600 lb. load (applied at midspan) without permanent deformation. Panels without rings shall be biasable to a 25% change in grade; panels with rings shall be biasable to a 12.5% change in grade.

h. Gates shall be fabricated using ornamental panel material or approved equal and gate ends having the same outside cross-section dimensions. All rail and upright intersections shall be joined by welding. All picket and rail intersections shall also be joined either by welding or by the same retaining rod process used for panel assembly.

CONSTRUCTION METHODS

164-3.1 PREPARATION

All new installation shall be laid out by the contractor in accordance with the construction plans.

164-3.2 INSTALLATION

Fence installation shall be per Specification Item F-162-3.1 and F-162-3.2. Fence posts shall have a depth of 36" and be set in accordance with the spacings shown in Table 2, plus or minus 1/2", depending on the nominal span specified.

Table 2 – Post Spacing Requirements

Span	8' Nominal (92-5/8" Rail)			
	2-1/2"	3"	2-1/2"	3"
Post Size				
Bracket Type	Standard (BB301)		Angle (BB304)	
Post Settings $\pm 1/2"$ O.C	96"	96-1/2"	97-1/2"	98"

Gate posts shall be spaced according to the gate openings specified in the construction plans. Panels shall be attached to posts using mechanically fastened panel brackets supplied by the manufacturer.

164-3.3 CLEANING

The contractor shall clean the jobsite of excess materials.

164-3.4 ELECTRICAL GROUNDS

Electrical ground shall be per Specification Item F-162-3.7.

METHOD OF MEASUREMENT

164-4.1 Ornamental Fence shall be measured by the number of linear feet. Measurement will be made long the top of the fence line from center to center of end posts.

BASIS OF PAYMENT

164-5.1 Ornamental Fence will be made at the contract unit price per linear foot and the price shall be full compensation for furnishing all materials at the locations shown on the plans, including demolition and removal of the existing fence, and for all preparation, including clearing and grubbing, excavation, backfill, concrete foundation, erection, electrical ground rods and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item F-164-1 Ornamental Fence -- per linear foot

END OF ITEM F-170

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ITEM F-165 CANTILEVER SLIDE GATES

165-1.1 GENERAL DESCRIPTION

- a. Internal roller aluminum cantilever slide gates shall be installed at Gates F and I.
- b. Gates installed under this project without a gate operator shall be ready to receive a gate operator under a future project with minimal improvements.

165-1.2 SUBMITTALS

- a. Shop drawing submittals shall be made per Section 2-5.3.
- b. Shop drawings of fences and gates with all dimensions, details, and finishes. Drawings must include post foundations.
- c. Product data: Manufacturer's catalog indicating materials and a letter certifying that all conditions of the specifications have been met.

165-1.3 Certification of Performance Criteria:

- a. Manufacturer of gate system shall provide certification stating the gate system meets or exceeds the requirements of this specification.
 - 1. Gate track system shall be keyed to interlock into gate frame member (providing 200% additional strength when compared to weld only keyless systems). When interlocked with and welded to the "keyed" frame top member, gate track forms a composite structure.
 - 2. Gate shall have a minimum counterbalance length of 50% opening width which provides a 36% increase in lateral resistance (when compared to ASTM minimum of 40% counterbalance). If gate is ever to be automated, counterbalance section shall be filled with fabric or other specified material.
 - 3. To provide superior structural integrity, intermediate vertical members shall be used - with spacing between verticals to be less than 50% of the gate frame height.
 - 4. Entire gate frame (including counterbalance section) shall include 2 adjustable stainless steel cables (minimum 3/16") per bay to allow complete gate frame adjustment (maintaining strongest structural square and level orientation).
 - 5. Gate truck assemblies shall be tested for continuous duty and shall have precision ground and hardened components. Bearings shall be pre-lubricated and contain shock resistant outer races and captured seals.

6. Gate truck assemblies shall be supported by a minimum 5/8" plated steel bolt with self aligning capability, rated to support a 2,000 # reaction load.
7. Hanger brackets shall be hot dipped galvanized steel with a minimum 3/8" thickness that is also gusseted for additional strength.

Gate top track and supporting hangar bracket assemblies shall be certified by a licensed professional engineer to withstand a 2,000 lb. vertical reaction load without exceeding allowable stresses.

b. Acceptable manufacturer of gate system include:

1. Jamieson Fencing
2. Tymetal Corp.
3. Ameristar Fence Products
4. Or approved equal

MATERIALS

165-2.1 CANTILEVER SLIDE GATE MANUFACTURERS:

- a. Products submitted must meet performance criteria as per section 1.3a.
- b. Gate manufacturer shall certify gate is manufactured in compliance with ASTM F 2200, Standard Specification for Automated Vehicular Gate Construction.
- c. Gate manufacturer shall provide independent certification as to the use of a documented Welding Procedure Specification and Procedure Qualification Record to insure conformance to the AWS D1.2 welding code. Upon request, Individual Certificates of Welder Qualification documenting successful completion of the requirements of the AWS D1.2 code shall also be provided. See 1.03 D.3.

165-2.2 GATE DIMENSIONS:

- a. Cantilever Slide Gate dimensions shall be as shown on the detail drawings.

165-2.3 GATE CONSTRUCTION DETAILS:

- a. Gate Frame (Ornamental and Chain Link):
 1. The gate frame shall be fabricated from 6063-T6 aluminum alloy extrusions. The top member shall be a 3" x 5" (76mm x 127mm) aluminum structural channel/tube extrusion weighing not less than 3.0 lb/lf (4.4kg/m). To maintain structural integrity this frame member shall be "keyed" to interlock with the "keyed" track member. If fabricated as a single horizontal piece, the bottom member shall be a 2" x 5" (51mm x 127mm) aluminum structural

tube weighing not less than 2.0 lb/lf (2.9kg/m). If fabricated in two horizontal pieces, the bottom member shall be a 5" (127mm) aluminum structural channel weighing not less than 2.6 lb/lf (3.8kg/m). When the gate frame is manufactured in two horizontal pieces or sections, they shall be spliced in the field (the gate frame shall be fabricated in one or multiple sections depending on size requirements or project constraints).

b. Vertical Members (Chain Link):

1. The vertical members at the ends of the gate frame shall be "P" shaped in cross section with a nominal base dimension of no less than 2" x 2" (51mm x 51mm) and weighing not less than 1.6 lb/lf (2.3kg/m). Major 2" x 2" (51mm x 51mm) vertical members weighing not less than 1.1 lb/lf shall separate each bay and shall be spaced at less than gate height intervals.
2. Intermediate 1" x 2" (25mm x 51mm) vertical members weighing not less than .82 lb/lf shall alternate between 2" x 2" major members.

c. Vertical Members (Ornamental picket):

1. Ornamental Picket (Internal and External): The vertical members at the ends of the opening portion of the frame shall be 2" x 2" (51mm x 51mm) in the cross section weighing not less than 1.1 lb/lf (1.6kg/m). The major vertical members separating each bay shall be 1" x 2" (25mm x 51mm) in cross section weighing not less than .82 lb/lf (1.2kg/m).

d. Gate Track:

1. The gate frame shall have a separate semi-enclosed "keyed" track, extruded from 6005A-T61 or 6105-T5 aluminum alloy, weighing not less than 2.9 lb/lf (4.2kg/m). The track member is to be located on only one side of the top primary. Welds to be placed alternately along the top and side of the track at 9" (229mm) centers with welds being a minimum of 2" (51mm).

e. All welds on the gate frame shall conform to Welding Procedure Specification and Procedure Qualification Record to insure conformance to the AWS D1.2 Structural Welding Code. All individual welders shall be certified to AWS D1.2 welding code.

f. Gate Mounting:

1. The gate frame is to be supported from the track by two (2) swivel type, self-aligning, 4-wheeled, sealed lubricant, ball-bearing truck assemblies.

2. The bottom of each support post shall have a bracket equipped with a pair of 3" (76mm) UHMW guide wheels. Wheel cover protectors shall be included with bottom guides to comply with UL325.
 3. Gap protectors shall be provided and installed, compliant with ASTM F 2200-05.
- g. Diagonal Bracing:
1. Diagonal "X" bracing of 3/16" (5mm) minimum diameter stainless steel aircraft cable shall be installed throughout the entire gate frame.
- h. The gate shall be completed by installation of approved filler as specified.
1. Chain Link: 2" x 2" x 9 gauge aluminized steel chain link fabric per specification F-162 shall extend the entire length of the gate (if operated gate, counterbalance must also have fabric to prevent reach through and comply with ASTM F2200). Fabric shall be attached at each end of the gate frame by standard fence industry tension bars and tied at each 2" x 2" (51mm x 51mm) vertical member with standard fence industry ties. ASTM F2200 requires attachment method that leaves no leading or bottom edge protrusions (cannot exceed 0.5 inch).
 2. Ornamental Picket: Picket sizes shall be 1" x 1" square per specification F-164. Pickets may extend through only the clear opening portion or through the entire length of the gate as required. If a motorized gate operator is to be applied to the gate and the specified picket spacing allows for openings in the gate frame that exceed 2 1/4" (57mm), a secondary gate filler shall be secured at each end of the gate frame and tied at each 1" x 2" (25mm x 51mm) or 2" x 2" (51mm x 51mm) vertical member. The secondary gate filler shall extend to a minimum height of 72" (1.2m) above grade and shall be sized to prevent a 2 1/4" (57mm) diameter sphere from passing through openings anywhere along the length of the gate frame, and in that portion of the adjacent fence that the gate covers in the open position.

165-2.4 POSTS:

- a. A single set of support posts shall be minimum 4" O.D. (102mm) round Schedule 40 or 4" x 4" x 3/16" wall square steel tubing, grade 500. Gate posts shall be galvanized or coated and supported in concrete footings as specified on the Plans.

165-2.5 FINISH:

- a. Gate to be mill finish aluminum for Chain Link Gates or color coated with polyester powder matching the color for Ornamental Fence. If powder coated, the gate (including

track member) and all accessories shall be pretreated chemically by sand blasting or other acceptable method to ensure proper coating adherence.

165-2.6 **WARRANTY:**

a. The truck assembly shall be warranted against manufacturing defects by the manufacturer for a period of (5) five years from date of sale.

CONSTRUCTION METHODS

165-3.1 **POST INSTALLATION**

- a. Install posts per manufacturer's recommendation.
- b. Set posts in concrete. Excavate footing holes having a diameter 4 times the diameter of the post, and 3" deeper than the bottom of the post or otherwise as specified by the Engineer. Crown the finished concrete at the top of the grade point to shed water. Posts shall be embedded 54" for cantilever gates.
- c. Check each post for vertical and top alignment.

165-3.2 **GATE INSTALLATION**

- a. Install gate. Make sure that gate rolls free of binding.
- b. Attach latch and make sure that gate is received by latch in a secure manner.
- c. Gates shall be installed to allow for the future installation of gate operators for automatic opening and closing of gates.

165-3.3 **CLEANING**

- a. Clean up debris and remove from the site.

METHOD OF MEASUREMENT

165-4.1 Cantilever Slide Gates will be measured per each unit installed.

BASIS OF PAYMENT

165-5.1 Payment for "20-foot Cantilever Slide Gate (I) Chain Link" will be made at the contract unit price per each and the price shall be full compensation for furnishing all materials at the locations shown on the plans, including demolition and removal of the existing gates with signs, metal chain with padlock, excavation, backfill, concrete, and for all preparation, erection, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

165-5.2 Payment for “16-foot Cantilever Slide Gate (F) Ornamental” will be made at the contract unit price per each and the price shall be full compensation for furnishing all materials at the locations shown on the plans, including demolition and removal of the existing gates with signs, metal chain with padlock, excavation, backfill, concrete, and for all preparation, erection, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item. Gate operators will be paid separately under Item F-170.

Payment will be made under:

- Item F-165-1 20-foot Cantilever Slide Gate (I) Chain Link--per each
- Item F-165-2 16-foot Cantilever Slide Gate (F) Ornamental--per each

END OF ITEM F-165

ITEM F-166 V-TRACK ROLLING GATES

166-1.1 GENERAL DESCRIPTION

- A. V-Track rolling gates shall be installed at Gates A, P and 23940.
- B. Gates installed under this project without a gate operator shall be ready to receive a gate operator under a future project with minimal improvements.

166-1.2 SUBMITTALS

- A. Shop drawing submittals shall be made per Section 2-5.3.
- B. Shop drawings of fences and gates with all dimensions, details, and finishes. Drawings must include post foundations.
- C. Product data: Manufacturer’s catalog indicating materials and a letter certifying that all conditions of the specifications have been met.
- D. Acceptable manufacturer of gate system include:
 - 1. Jamieson Fencing
 - 2. Tymetal Corp.
 - 3. Ameristar Fence Products
 - 4. Or approved equal

MATERIALS

166-2.1 MANUFACTURER

- A. Gate type shall be V-Track Rolling Gate
- B. All requests for substitution of an approved equal must be made to and approved by the Engineer prior to purchase. Requests for substitution will include the amount of savings to be passed on to the owner.

166-2.2 ALUMINUM V-TRACK ROLLING GATE.

- A. Gate Frame (Ornamental and Chain link):
 - 1. Materials to be in accordance with ASTM F 1184 Type II Class 2.
 - a Grade:
 - b Structural aluminum: 6063-T52 unless otherwise specified
 - c Size/Weight:

Component	Gate Opening > 26'	
	6" V-Groove Wheel (Three Wheel)	
	Tube dimension	Min weight per linear ft (lbs)

Top Primary Members	2"x4"	1.7
Bottom Primary Members	2"x5"	2.02
Primary Vertical Members	2"x4"	1.7
Intermediate Vertical Members	2"x2"	1.12
Tension Bracing	2"x4"	1.7

2. Construction

- a No dimension of left-hand or right hand is necessary in specifying or fabricating this gate.
- b Primary vertical members to be centered at gate opening and equidistant and not to exceed 6' spacing.
- c Intermediate Vertical members are to be equidistant between the primary vertical members.
- d Horizontal tension bracing is provided each end of the panel.
- e Trussing:
 - (i) Each bay shall include four (4) 1/4" thick aluminum gussets welded into each corner of the bay.
 - (ii) 3/16" stainless steel wire rope is cross trussed diagonally between all primary vertical members and attached to the gusset via galvanized 3/8" x 6" turnbuckles between the wire rope and each bottom corner gusset to allow for adjustment.
 - (iii) Wire rope shall be secured to the gusset with a single cable thimble and a crimped cable clamp. The overhang shall be braced exactly as the lead front end of the gate and include fabric filler throughout the overall length of the gate as to adhere to ASTM F-2200-2 and U.L. 325 safety standards for gates.

B. Hardware: All gate hardware; guide assemblies and hangers shall be galvanized after fabrication from malleable iron or pressed steel.

C. Gate Frame Finish:

- 1. Choice of Natural Aluminum for Chain Link Gates or Polymer Power Coated for Ornamental Gates to match fence color as specified and approved by the Engineer.

D. Gate Fabric (Chain Link):

- 1. The chain link fabric filler shall be per specification F-162-2.1.
- 2. The chain link fabric filler shall be stretched along the overall length of the gate including the counter balanced area.
- 3. Assembly:
 - a Attach the fabric to the gate frame by lacing a steel tension bar vertically through the last link of the fabric at both ends of the gate frame.

- b The tension bars are secured to the gate frame by attaching a steel tension bank around frame and through the last link of fabric containing the tension bar.
 - c A tension wire shall be stretched and attached along the top and bottom of the fabric filler and attached to the gate frame with tie wires looped through provided slots in each of the aluminum gussets in the corners of each bay. This ensures that the fabric filler is taut and secure thus adding support to the entire gate frame.
- E. Pickets (Ornamental Fence) shall be per specification F-164.
 - F. Gate posts are 4" O.D. schedule 40 weighing 9.11 lb/ft.
 - 1. Gates > 26' require two double post assembly @ 36" spacing and one latch post.

CONSTRUCTION METHODS

166-3.1 POST INSTALLATION

- A. Install posts per the Plans.
- B. Set posts in concrete. Excavate footing holes having a diameter 4 times the diameter of the post, and 3" deeper than the bottom of the post or otherwise as specified by the Engineer. Crown the finished concrete at the top of the grade point to shed water. Posts shall be embedded 54" for v-track gates.
- C. Check each post for vertical and top alignment.

166-3.2 GATE INSTALLATION

- A. Install gate. Make sure that gate rolls free of binding.
- B. Attach latch and make sure that gate is received by latch in a secure manner.
- C. Gates shall be installed to be capable easily add a gate operator for automated opening and closing as part of any future improvements.

166-3.3 CLEANING

- A. Clean up debris and remove from the site.

METHOD OF MEASUREMENT

- 166-4.1 V-Track rolling gate will be measured per each unit installed.

BASIS OF PAYMENT

- 166-5.1 Payment for "50-foot V-Track Rolling Gate (23940) Chain Link" will be made at the contract unit price per each and the price shall be full compensation for furnishing all materials at the locations shown on the plans including v-track construction, demolition and

removal of the existing gates with signs, metal chain with padlock, excavation, backfill, concrete and for all preparation, erection, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

166-5.2 Payment for “50-foot V-Track Rolling Gate (P) Chain Link” will be made at the contract unit price per each and the price shall be full compensation for furnishing all materials at the locations shown on the plans including v-track construction, demolition and removal of the existing gates with signs, metal chain with padlock, excavation, backfill, concrete and for all preparation, erection, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

166-5.3 Payment for “35-foot V-Track Rolling Gate (A) Ornamental” will be made at the contract unit price per each and the price shall be full compensation for furnishing all materials at the locations shown on the plans including v-track construction including demolition and removal of the existing gates with signs, excavation, backfill, concrete and for all preparation, erection, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item. Gate operators will be paid separately under Item F-170.

Payment will be made under:

- Item F-166-1 50-foot V-Track Rolling Gate (23940) Chain Link--per each
- Item F-166-2 50-foot V-Track Rolling Gate (P) Chain Link--per each
- Item F-166-3 35-foot V-Track Rolling Gate (A) Ornamental--per each

END OF ITEM F-166

ITEM F-170 GATE OPERATORS

170-1.1 GENERAL DESCRIPTION

A. Pre-wired, self-contained, hydraulic gate operators for horizontal cantilever sliding and horizontal rolling, including all selected attachments and accessory equipment.

170-1.2 REFERENCES

- A. Fencing: See Specification Item F-162 and F-164.
- B. Gates: Specification Item F-165 and F-166.
- C. Cast in place concrete: Greenbook Section 201 and 303, 560-C-3250
- D. Electrical service and connections: See Item L-100.
- E. Access control and security: See Division 17.

170-1.3 Submittals

A. Shop drawings: Provide shop drawing submittal per Section 2-5.3. Submit drawings showing connections to adjacent construction, range of travel, and all electrical and mechanical connections to the operator. Drawings shall also show the size and location of the concrete mounting pad. Underground electrical runs shall be shown on shop drawings.

B. Installation instructions: Submit two copies of manufacturer's installation instructions for this specific project.

C. Test Reports:

1. Submit affidavits from the manufacturer demonstrating that the gate mechanism has been tested to 200,000 cycles without breakdown.
2. Each operator shall bear a label indicating that the operator mechanism has been tested for full stress tests of all mechanical components and electrical tests of all overload devices.

170-1.4 QUALITY ASSURANCE

A. Manufacturer: A company specializing in the manufacture of gate operators of the type specified, with a minimum of five years experience.

B. Installer: A minimum of three years experience installing similar equipment.

170-1.5 CODES AND REGULATORY REQUIREMENTS

A. Operators shall be built to UL325 standards and be listed by a NRTL testing laboratory. Complete all electrical work according to local codes and National Electrical code. All fieldwork shall be performed in a neat and professional manner, completed to journeyman standards.

B. The gate operator shall be equipped with multiple external sensors to be capable of reversing the gate in either direction upon sensing an obstruction. See also 170-2.2B.

C. Operators shall have the following capabilities:

1. 3 wire radio receiver
2. Card reader
3. Push button
4. Master/Slave operator
5. 3 loop detector inputs
6. Key switch
7. Alarm output options
8. Serial Port interface

D. Gate operator shall be designed and labeled for UL usage Class III or IV.

170-1.6 PRODUCT DELIVERY AND STORAGE

A. Store products upright in the original shipping containers, covered, ventilated and protected from all weather conditions.

170-1.7 WARRANTY

A. Provide a five-year warranty against all defects in materials or workmanship. Defective materials shall be replaced with comparable materials furnished by the manufacturer, at no cost to the owner. Warranty commences when the system installation is 100% complete and the acceptance cycle is finished.

MATERIALS

170-2.1 GATE OPERATORS

A. Gate Operator shall have sized to open & close the weight of the gate for up to 200,000 cycles without a breakdown. Also, the operator should meet the requirements in 170-1.5C or as approved by the Engineer.

170-2.2 OPERATION

A. Minimum Standard Electrical Components:

1. Gate motor: Shall be as specified in Section 170-2.1 with continuous duty motor, with a service factor of 1.15, or greater or as required by the gate size and weight.

2. All components shall have overload protection.
3. Controls: Controller Board containing:
 - a built in “warn before operate” system;
 - b built in timer to close;
 - c liquid crystal display for reporting of functions;
 - d 19 programmable output relay options or a minimum of 10 pre-defined output relay options;
 - e built-in power surge/lightening strike protection;
 - f RS485 connection of Master/Slave systems.
4. Control circuit: 24VDC.

B. Required external sensors: Contractor shall provide external sensors per the following UL 325 standard requirements for automatic sliding gates:

- One or more non-contact sensors (photoelectric eyes) shall be located where the risk of entrapment or obstruction exists, such as the perimeter reachable by a moving gate.
- One or more contact sensors (edge sensors) shall be located at the leading edge, trailing edge and post mounted both inside and outside of a sliding gate.
- A hardwired contact sensor shall be located and its wiring arranged so that the communication between the sensor and the gate is not subjected to mechanical damage.
- A contact sensor that transmits its signal to the gate operator shall be located such that the signal is not impeded by building structures or other obstructions and shall function under its intended end-use conditions.
- The contact and non-contact sensors must be tested and labeled as “Recognized Components” under the UL 325 standard in order to be deemed acceptable for use in this application.

Contractor shall provide a combination of photo eyes and gate edges such that the gate is capable of reversing in either direction upon sensing an obstruction.

Contractor shall study the entrapment protection schematic and consider his/her specific installation to determine where the greatest risks of entrapment exist. Contractor shall locate edge sensors and the photo-electric sensors accordingly, making certain that a sufficient number of sensors are used so that both directions of gate travel are properly guarded.

C. Control Devices: See Specification 17728 for requirements for proximity card reader, knox box key switch, strobe/opticom, and maintenance key switch.

D. Other Options:

1. Special locks for operator cover.

E. Gate operator shall be mounted on a concrete pad with dimensioning and mounting procedures in accordance with the manufacturer's instructions. Bollards per City of Torrance standard plan T-501 shall be installed for protection.

170-2.3 FACTORY TESTING

A. Fully assemble and test, at the factory, each gate operator to assure smooth operation, sequencing and electrical connection integrity. Apply physical loads to the operator to simulate field conditions. Tests shall simulate physical and electrical loads equal to the fully rated capacity of the operator components.

B. Check all mechanical connections for tightness and alignment. Check all welds for completeness and continuity. Check welded corners and edges to assure they are square and straight.

C. Inspect painted finish for completeness and gloss. Touch up imperfections prior to shipment.

D. Check all hydraulic hoses and electrical wires to assure that chafing cannot occur during shipping or operation.

CONSTRUCTION METHODS

170-3.1 SITE EXAMINATION

A. Locate concrete mounting pad in accordance with approved shop drawings.

B. Make sure that gate is operating smoothly under manual conditions before installation of gate operators. Do not proceed until gate panel is aligned and operates without binding.

170-3.2 INSTALLATION

A. Install gate operator in accordance with the manufacturer's printed instructions, current at the time of installation. Coordinate locations of operators with contract drawings, other trades and shop drawings.

B. Installer shall insure that the electric service is adequate for the gate operator.

170-3.3 FIELD QUALITY CONTROL

A. Test gate operator through ten full cycles and adjust for operation without binding, scraping or uneven motion. Test limit switches for proper "at rest" gate position.

B. All anchor bolts shall be fully concealed in the finished installation.

170-3.4 CONTINUED SERVICE AND DOCUMENTATION

A. The Contractor shall train owner's personnel in the general maintenance of the gate operator and accessories and provide one copy of "operations and maintenance" manual for the owner's use. Manuals will identify parts of the equipment for future procurement.

B. See Specification Division 17 for additional requirements for training and operation and maintenance manuals.

METHOD OF MEASUREMENT

170-4.1 "35-foot Hydraulic Gate Operator with Concrete Foundation Including Loop Detectors and Photo Eye Sensors" will be measured per each unit installed.

170-4.2 "16-foot Hydraulic Gate Operator with Concrete Foundation Including Loop Detectors and Photo Eye Sensors" will be measured per each unit installed.

BASIS OF PAYMENT

170-5.1 Payment for "35-foot Hydraulic Gate Operator with Concrete Foundation Including Loop Detectors and Photo Eye Sensors" will be made at the contract unit price for each gate operator installed, including demolition and removal of the existing gate operator and all associated wiring, RGS conduits, external sensors, loop detectors, concrete foundation, anchors and all incidentals for a complete and operational facility. The price shall be full compensation for furnishing all materials, and for all preparation, erection, and installation of these materials, warranty, and for all labor, equipment, tools, and incidentals necessary to complete the item.

170-5.2 Payment for "16-foot Hydraulic Gate Operator with Concrete Foundation Including Loop Detectors and Photo Eye Sensors" will be made at the contract unit price for each gate operator installed, including demolition and removal of the existing gate operator and all associated wiring, RGS conduits, external sensors, loop detectors, concrete foundation, anchors and all incidentals for a complete and operational facility. The price shall be full compensation for furnishing all materials, and for all preparation, erection, and installation of these materials, warranty, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

- Item F-170-1 35-foot Hydraulic Gate Operator with Concrete Foundation Including Loop Detectors and Photo Eye Sensors (Gate A) -- per each
- Item F-170-2 16-foot Hydraulic Gate Operator with Concrete Foundation

Including Loop Detectors and Photo Eye Sensors (Gate F) --
per each

END OF ITEM F-170

ITEM L-100 GENERAL ELECTRICAL REQUIREMENTS

DESCRIPTION

100-1.1 The Contractor shall provide items, articles, materials, operations and methods required by the Plans and Specifications including labor, equipment, supplies and incidentals necessary for completion of the Work under this Contract.

100-1.2 Apparatus, appliance, material or work not shown on the Plans, but mentioned in the Specifications, or vice versa, or any incidental accessories necessary to make the work complete and ready for operation, even though not specified or shown on the Plans shall be furnished and installed without additional expense to the City.

100-1.3 Should there be any discrepancies or a question of intent, the Contractor shall refer the matter to the Engineer for decision before ordering any equipment, materials or before starting any related work.

100-1.4 The Contractor shall furnish, erect, install, connect, clean, adjust and test all manufactured articles, materials and equipment, and place in service in accordance with the manufacturer's directions and recommendations except as otherwise specified herein.

100-1.5 The Contractor shall submit shop drawings and samples in accordance with the requirements of these Technical Provisions.

100-1.5.1 Submit manufacturer's product data, and specifications, for the lighting fixtures, circuit breakers and handholes. For other bulk items, submit the proposed manufacturer.

100-1.5.2 Submit two complete and legible "as-built" wiring diagrams and single line drawings showing the electrical connections of all equipment.

100-1.5.3 Provide templates for anchor bolts, conduit stub-ups, and other items that require coordination for installation and mounting.

100-1.5.4 Perform a megger on all signal and power cables. Compile the report and submit to Owner's representative for approval.

100-1.6 The Contractor shall furnish airport T-hangar Apron Lighting equipment that conforms to the requirements of cited materials specifications. In addition, where an FAA specification for airport lighting equipment is cited in the Plans or Specifications, the Contractor shall furnish such equipment that is:

a. Produced by the manufacturer qualified (by FAA) to produce such specified and listed equipment.

QUALITY ASSURANCE

100-2.1 Materials and installation shall conform to the applicable Codes and Standards.

100-2.2 After all equipment, devices and raceways are installed, and wires and cables are in place and connected to devices and equipment, the Contractor shall test the system for continuity, short circuit, improper grounds, and other defects. If any defective conditions are present, the Contractor shall make all necessary corrections and retest for compliance.

100-2.3 Each major component of equipment shall have the manufacturer's name, address, model number and rating on the manufacturer's nameplate securely affixed in a conspicuous place. The nameplate of a distributing agent is not acceptable. Code ratings, labels or other data which are die-stamped into the surface of the equipment shall be in an easily visible location.

CODES AND STANDARDS

100-3.1 Materials and installation shall comply with codes, laws and ordinances of Federal, State and local governing bodies having jurisdiction.

100-3.2 In case of differences between building codes, State and Federal laws, local ordinances and/or the Contract Documents, the most stringent shall govern.

100-3.3 All design, equipment and materials specified shall conform to any acts, laws, rules and regulations, most current edition, of the following organizations:

- a. National Electrical Code (ANSI/NFPA70).
- b. National Electrical Safety Code (NESC-ANSI C2).
- c. American National Standards Institute (ANSI).
- d. National Fire Protection Association (NFPA).
- e. Institute of Electrical and Electronics Engineers (IEEE).
- f. Insulated Cable Engineers Association (ICEA).
- g. National Electrical Manufacturers Association (NEMA).
- h. Illuminating Engineering Society (IES).
- i. Underwriters Laboratories Inc. (UL).
- j. Occupational Safety and Health Administration (OSHA).
- k. Federal Aviation Administration (FAA).

100-3.4 Should work be performed which does not comply with the requirements of the applicable building codes, State and Federal laws, local ordinances, industry standards and utility company regulations and/or the Contract Documents, changes for compliance shall be done at no additional cost to the Agency.

100-3.5 The Contractor shall submit to governmental agencies and utility companies, shop drawings which are required by these agencies, for their approval where applicable.

100-3.6 The Contractor shall notify the Engineer of any materials or apparatus believed to be inadequate, unsuitable, in violation of laws, ordinances, rules or regulations of authorities having jurisdiction.

INFORMATION REQUIREMENTS

100-4.1 The Contractor shall submit data to the Engineer prior to purchasing and installation. Submittals shall be in accordance with Section 2 “Scope and Control of Work”, of the General Provisions. The data shall include but shall not be limited to the following:

- a. Catalog cuts and major electrical equipment manufacturers' drawings.
- b. Complete rating data for all equipment.
- c. Instruction books, operation and maintenance manuals with spare parts.

100-4.2 “As Built” record drawings shall be maintained during construction and provided prior to final payment.

PLANS

100-5.1 The Plans are diagrammatic and/or home-run type, which are intended to convey the scope of work and indicate the general arrangement and/or sizes of conduit, equipment, fixtures and other work included in the Contract.

100-5.2 The location of items required by the Plans or Specifications are not definitely fixed by dimensions and are approximate only. The exact locations necessary to secure the best conditions and results shall be determined at the site and shall be in accordance with FAA Guidelines, and are subject to the approval of the Engineer.

100-5.3 Any minor changes in the locations of equipment, fixtures, lighting fixtures conduits, devices, etc., from those locations as shown on the Plans shall be made without extra charge to the Contract. A minor change in location shall be considered to be within 25 feet of the location as may be scaled from the Plans, and as approved by the Engineer.

SHOP DRAWINGS AND SUBMITTALS

100-6.1 The Contractor shall submit shop drawings and submittals in accordance with Section 2 “Scope and Control of Work”, of the General Provisions of these Specifications.

PRODUCT DELIVERY, STORAGE AND HANDLING

100-7.1 Equipment and materials shall be delivered to the Project site and stored in the original containers, suitably sheltered from the elements and mechanical injury, but readily accessible for inspection until installed.

- a. Items subject to moisture damage shall be stored in dry heated spaces.

b. Manufacturer's directions shall be followed in the delivery, handling storage, protection, installation and operation of all equipment and materials.

100-7.2 The Contractor shall cover all fixtures, equipment and apparatus as required protecting them against dirt, water, chemical, solar, or mechanical damage.

100-7.3 Equipment shall be inherently safe and moving parts shall be covered with guards.

INSTRUCTIONS AND ADJUSTMENTS

100-8.1 At the conclusion of the work and before acceptance is made, the Contractor shall demonstrate and explain to the Engineer the function, operation and maintenance of all equipment and systems installed.

100-8.2 The primary adjustments of the system(s) shall be accomplished by the Contractor to the complete satisfaction of the Engineer at the time of completion of the installation.

GUARANTEE

100-9.1 The Contractor shall be responsible for all work in this Specification. The Contractor shall make good, repair, or replace at his own costs and expense as may be necessary, any defect which in the opinion of the Engineer is due to imperfections in material, design or workmanship, if defect shows itself to be defective within one year after acceptance by the Engineer.

100-9.2 The Contractor shall be responsible for protecting all equipment and systems against harmful exposures to, or accumulations of, dust and moisture, flooding, corrosion or other forms of damage, and shall clean and restore damaged equipment, systems and finishes as may be required to place installations in a "Like New" condition before acceptance by the Engineer.

100-9.3 All manufacturers' equipment guarantees or warranties shall be included in the Maintenance Manuals.

MATERIALS AND EQUIPMENT

100-10.1 Materials and equipment shall be new and shall be UL labeled and shall bear the manufacturer's name, model number and other identification markings.

100-10.2 Materials and equipment shall be the standard product of a manufacturer regularly engaged in the production of the required type of material or equipment for at least five years and shall be the manufacturer's latest design with published properties.

100-10.3 Equipment and materials of the same general type shall be of the same manufacturer throughout the Project to provide uniform appearance, operation and maintenance.

100-10.4 Equipment and materials shall be without blemish or defect and shall not be used for temporary light or power purposes, including lamps, without the Engineer's written authorization.

CONSTRUCTION REQUIREMENTS

100-11.1 Minor changes in the locations of switches fixtures and equipment shall be made prior to rough-in at the direction of the Engineer and at no additional cost to the Agency.

100-11.2 The equipment shall be installed with ample space allowed for removal, repair or changes to equipment. Ready accessibility to removable parts of equipment and to wiring shall be provided without moving other equipment which is to be installed or which is in place.

100-11.3 The Contractor shall compare the Plans and Specifications, checking all measurements to determine the intent of the Contract Documents. Any discrepancies shall be brought to the Engineer's attention for interpretation.

100-11.4 The Contractor shall protect the materials and work from damage during installation of the work provided under this Contract.

100-11.5 The Contractor shall protect existing airport lighting systems and provide temporary lighting and power distribution. Any portion of the existing airport lighting systems damaged or disconnected during installation of the new lighting system or equipment shall be repaired and reconnected and must be fully functional prior to sunset each day or during adverse weather conditions, to the satisfaction of the Engineer. This work shall be at no additional cost to the Agency.

100-11.6 All closures must be coordinated and scheduled with the Airport Manager and the Air Traffic Control Tower a minimum of 24 hours in advance.

PROTECTION

100-12.1 The Contractor shall protect conduit and wireway openings against the entrance of foreign matter by means of plugs or caps.

100-12.2 The Contractor shall cover fixtures, materials, equipment and devices including light bases prior to fixture installation furnished or installed under this Contract or otherwise protect against damage, before, during, and after installation.

100-12.3 Fixtures, materials, equipment, or devices damaged prior to final acceptance of the Work shall be restored to their original condition or replaced.

100-12.4 Equipment shall be inherently safe and moving parts shall be covered with guards.

MEASUREMENT AND PAYMENT

100-13.1 No separate measurement will be made to comply with the requirement of this specification. Payment for conformance with the requirements specified herein shall be considered incidental and included in the prices bid for the various items of work.

END OF ITEM L-100

ITEM L-151 T-HANGAR AND GATE AREA LIGHTING

DESCRIPTION

151-1.1 This item shall consist of the furnishing of all labor, equipment and material, and of performing all operations in connection with the installation of new security lighting fixtures at the T-hangar and gate areas. This item shall also include cantilevered supports mounted to roof rafters and siding at the T-hangars, and pole with foundation at gate locations.

151-1.2 All electrical equipment shall be Underwriter's Laboratory (UL) listed and shall be as specified in the drawings. The light fixtures, fittings and all components shall be suitable for outdoor installation and shall be protected from corrosion.

CONSTRUCTION METHODS

151-2.1 GENERAL

a. All work being performed under this Section of these Specifications shall conform to the National Electrical Code.

b. The electrical systems shall be complete with all necessary accessories for the required results with the greatest assurance of protection of life and property.

c. The Plans indicate the extent and general arrangement of the electrical work. If any variance from the Plans is deemed necessary by the Contractor, details of such variances and the reasons thereof shall be submitted in writing as soon as practicable to the Engineer for approval. No such variances shall be made without the prior written approval of the Engineer.

151-2.2 LIGHTING SYSTEM

a. Lighting system. The Contractor shall install new lighting mounted on front roof rafter and sheet steel siding as shown on the plans. The Contractor shall submit shop drawings for the new lighting system to satisfy lighting criteria per the photometric analysis and shall establish a maximum economic installation. Lighting shall be Lithonia D-series size 2 LED W/2 large and medium light engines (2) 530mA drivers, 4000k Led, type T4M optics, 175 W type 3, or approved equal. Fixtures shall be mounted at the highest point available and not less than 15' above ground. The quantity and aiming angles shall be as shown on the drawings.

b. Contractor shall submit detail for fixture wall support steel bracket. All wall connections shall be 100% welded construction. The complete, installed support shall be painted to match the existing steel beam face color.

c. Contractor shall relocate/move existing conduits as necessary to create space for bracket base plate welding and new conduit installation. If adequate space cannot be established, contractor shall inform the site Engineer.

jumpers shall not be less than #6 AWG. Either exothermic or mechanical connections are permitted. Ground Bonding Jumpers cost shall be incidental to Low Voltage Panel Board cost.

150-2.8.1 Type NMC cable. Install as shown on the plans #12 3/C Type NMC cable. Type NMC cable shall be installed outdoors without raceway. Install per all UL and NEC requirements.

150-3 RELATED WORK

150-3.1 Excavation for duct bank and handholes should be at depths per article 300 of the NEC. Backfill shall be compacted at 95% compaction. Any pavement cuts shall be replaced in kind as shown on the plans.

In accordance with the NEC, pull in a 100% sized ground conductor with all power circuits.

150-4 SUBMITTALS

150-4.1 Submit manufacturer's product data, and specifications, for the junction boxes, circuit breakers, handholes and pull boxes. For other bulk items, submit the proposed manufacturer.

150-4.2 Submit two complete and legible "as-built" wiring diagrams and straight line drawings showing the electrical connections of all equipment.

150-4.3 Provide templates for anchor bolts, conduit stub-ups, and other items that require coordination for installation and mounting.

150-4.4 Perform a megger on all signal cables. Compile the report and submit to City's representative for approval.

QUALITY ASSURANCE

150-5.1.1 Contractor shall have at least 5 years of experience in utility service entrance installations and be familiar with utility interface and documentation requirements.

MEASUREMENT AND PAYMENT

150-6.1 Measure and payment for cable or grounding wire installed in trench, duct bank or conduit shall be made by the number of linear feet of cable or grounding wire installed in trenches, duct bank or conduit, including ground rods and grounding connectors, and trench marking tape ready for operation, and accepted as satisfactory. Separate measurement and payment shall be made for each cable or grounding wire installed in trench, duct bank or conduit. The payment for this item does not include additional quantities required for slack.

150-6.2 Measure and payment for underground conduits, duct banks and metallic conduit shall be made by the linear feet of conduits and duct banks installed, including encasement, locator

2. Mounting Provisions: Butt flange for bolted mounting on foundation or breakaway support.
- B. Steel Mast Arms: Single-arm type, continuously welded to pole attachment plate. Material and finish same as pole.
 - C. Brackets for Luminaires: Detachable, cantilever, without underbrace.
 1. Adapter fitting welded to pole and bracket, then bolted together with stainless-steel bolts.
 2. Cross Section: Tapered oval, with straight tubular end section to accommodate luminaire.
 3. Match pole material and finish.
 - D. Pole-Top Tenons: Fabricated to support luminaire or luminaires and brackets indicated, and securely fastened to pole top.
 - E. Grounding and Bonding Lugs: Welded 1/2-inch threaded lug, complying with requirements in NEC for grounding and bonding for electrical systems, listed for attaching grounding and bonding conductors of type and size listed in that Section, and accessible through handhole.
 - F. Cable Support Grip: Wire-mesh type with rotating attachment eye, sized for diameter of cable and rated for a minimum load equal to weight of supported cable times a 5.0 safety factor.
 - G. Prime-Coat Finish: Manufacturer's standard prime-coat finish ready for field painting.
 - H. Galvanized Finish: After fabrication, hot-dip galvanize complying with ASTM A 123/A 123M.
 - I. Factory-Painted Finish: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Color shall be as selected by Architect.

151-2.42 POLE ACCESSORIES

- A. Base Covers: Manufacturers' standard metal units, arranged to cover pole's mounting bolts and nuts. Finish same as pole.

151-2.43 POLE INSTALLATION

A. Align pole foundations and poles for optimum directional alignment of luminaires and their mounting provisions on the pole.

B. Clearances: Maintain the following minimum horizontal distances of poles from surface and underground features, unless otherwise indicated on Drawings:

1. Fire Hydrants and Storm Drainage Piping: 60 inches.
2. Water, Gas, Electric, Communication, and Sewer Lines: 10 feet.
3. Trees: 15 feet.

C. Concrete Pole Foundations: Set anchor bolts according to anchor-bolt templates furnished by pole manufacturer. Concrete materials, installation, and finishing requirements are specified in Greenbook Section 201.

D. Foundation-Mounted Poles: Mount pole with leveling nuts, and tighten top nuts to torque level recommended by pole manufacturer.

1. Use anchor bolts and nuts selected to resist seismic forces defined for the application and approved by manufacturer.
2. Grout void between pole base and foundation. Use nonshrink or expanding concrete grout firmly packed to fill space.
3. Install base covers, unless otherwise indicated.
4. Use a short piece of 1/2-inch-diameter pipe to make a drain hole through grout. Arrange to drain condensation from interior of pole.

E. Embedded Poles with Concrete Backfill: Set poles in augered holes to depth below finished grade indicated on Drawings, but not less than one-sixth of pole height.

1. Make holes 6 inches in diameter larger than pole diameter.
2. Fill augered hole around pole with air-entrained concrete having a minimum compressive strength of 3000 psi at 28 days, and finish in a dome above finished grade.
3. Use a short piece of 1/2-inch-diameter pipe to make a drain hole through concrete dome. Arrange to drain condensation from interior of pole.
4. Cure concrete a minimum of 72 hours before performing work on pole.

F. Poles and Pole Foundations Set in Concrete Paved Areas: Install poles with minimum of 6-inch-wide, unpaved gap between the pole or pole foundation and the edge of adjacent concrete slab. Fill unpaved ring with pea gravel to a level 1 inch below top of concrete slab.

G. Raise and set poles using web fabric slings (not chain or cable).

H. Install on concrete base with top 30 inches above finished grade or surface at bollard location. Cast conduit into base, and shape base to match shape of bollard base. Finish by troweling and rubbing smooth.

151-2.44 GROUNDING

- A. Ground metal poles and support structures according to the NEC.
1. Install grounding electrode for each pole, unless otherwise indicated.
 2. Install grounding conductor pigtail in the base for connecting luminaire to grounding system.

MEASUREMENT AND PAYMENT

151-3.1 Measurement and payment for “Security Camera / ALPR Pole with Foundation” will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials equipment, tools, and for all labor including necessary to complete the item to be fully operational including excavation, backfill, concrete, steel reinforcement, steel pole and appurtenances.

151-3.2 Measurement and payment for “20’ Pole with Mast Arm and Foundation will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials equipment, tools, and for all labor including necessary to complete the item to be fully operational including excavation, backfill, concrete, steel reinforcement, steel pole and appurtenances.

151-3.3 Measurement and payment for “Lighting Fixture, LED 175W with Installation” will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials equipment, tools, and for all labor including necessary to complete the item to be fully operational including appurtenances.

151-3.4 Measurement and payment for “Lighting Fixture, LED (Twin 175W) 350W with Installation” will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials equipment, tools, and for all labor including necessary to complete the item to be fully operational including appurtenances.

Payment will be made under:

- | | |
|--------------|--|
| Item L-151-1 | Security Camera / ALPR Pole with Foundation --per each |
| Item L-151-2 | 20’ Pole with Mast Arm and Foundation--per each |
| Item L-151-3 | Lighting Fixture, LED 175W with Installation--per each |

Item L-151-4 Lighting Fixture, LED (Twin 175W) 350W with Installation--per
each

END OF ITEM L-151

ITEM L-152 UNINTERRUPTIBLE POWER SUPPLY

SCOPE

152-1.1 Contractor shall furnish and install 3kVA uninterruptible power supplies (UPSs) with minimum 26 AH of battery capacity at 120 volts each. The batteries and UPS shall be enclosed in a NEMA 3R enclosure.

DESCRIPTION

152-2.1 Install UPS installation at Slide Gate relocations at Gates A and F. Install 1 module for each existing gate motor of both gates such that each gate operator has its own dedicated backup power. In addition to gate motors, the UPS shall also provide uninterrupted power to the access control equipment and existing gate arms.. UPS shall have an integral voltage sensor such that each unit will transfer to the on position upon loss of normal service.

152-2.2 UPS shall meet the following requirements:

- a. UPS; 2100W/3000VA, 120V, sine wave, crest factor up to 5:1.
- b. UPS: Input voltage-240V, 60 Hz; output connections; 3 position terminal blocks to accommodate equipment support as shown on the plans; voltage adjustment 92-147V, output 86-154V
- c. UPS; RS-232 port, audible alarms, 880 Joules surge protection
- d. Batteries; As recommended to accommodate 26 AH minimum.
- e. The batteries and UPS shall be enclosed in a NEMA 3R enclosure.

152-3 RELATED WORK

152-3.1 Excavation for duct bank and handholes should be at depths per article 300 of the NEC. Backfill shall be compacted at 95% compaction. Any pavement cuts shall be replaced in kind as shown on the plans.

Field splicing of power or signal conductors is prohibited.

152-3.2 Ground UPS installations per manufacturer's instructions.

152-4 SUBMITTALS

152-4.1 Submit manufacturer's product data, and specifications, for the UPS module, batteries, and enclosure cabinet. For other bulk items, submit the proposed manufacturer.

152-4.2 Submit two complete and legible "as-built" wiring diagrams and single line drawings showing the electrical connections of all equipment.

152-4.3 Provide templates for anchor bolts, conduit stub-ups, and other items that require coordination for installation and mounting.

152-4.4 Perform a megger on all signal cables. Compile the report and submit to Owner's representative for approval.

152-5 QUALITY ASSURANCE

152-5.1 Contractor shall have at least 5 years of experience in utility service entrance installations and be familiar with utility interface and documentation requirements.

MEASUREMENT AND PAYMENT

152-6.1 Measurement and payment for "Gate Operator/Access Control, Uninterruptable Power System with Enclosure and Foundation" will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials equipment, tools, and for all labor including necessary to complete the item to be fully operational including excavation, backfill, concrete, steel reinforcement, anchors, outdoor enclosure and appurtenances.

Payment shall be made under:

Item L-152-1 Gate Operator/Access Control, Uninterruptable Power System with Enclosure and Foundation --per each

END OF ITEM L-152

DIVISION 17 SECURITY SYSTEMS

SECTION 17050

GENERAL REQUIREMENTS

PART 1 – GENERAL

- A. The Division 17 specifications follow the Construction Standards Institute (CSI) format. The use of this format shall not be interpreted or construed to indicate a conflict with the format used in other parts of the Contract Documents.

1.02 SUMMARY

A. Part 1 Includes:

1. Summary.
2. Related Documents.
3. References.
4. Definitions.
5. Drawing Interpretation.
6. System Description and General Responsibilities.
7. Coordination with Other Trades.
8. Quality Assurance.
9. Submittals.
10. Delivery, Storage, and Handling.
11. Sequencing and Scheduling.
12. Warranty.
13. Extra Materials.

B. Part 2 Includes:

1. Product Options and Substitutions.
2. Materials and Equipment.
3. Fabrication.
4. Source Quality Control.
5. Wires and Cables.
6. Connectors.
7. Firestopping/Sealant Materials.
8. Power Supplies.

C. Part 3 Includes:

1. Examination.
2. Installation.
3. Field Quality Control.
4. Cleaning.
5. Training.
6. Pay Requests

1.03 RELATED DOCUMENTS

- A. Drawings, Greenbook General Provisions, and Section E Special Provisions of the Contract apply to this Section.
- B. Related Sections:
 - 1. 17110 – Raceways and Boxes
 - 2. 17160 – Cabinets, Enclosures and Racks
 - 3. 17728 – Access Control System
 - 4. 17782 – Security Camera System
 - 5. 17892 – Wireless Network System
 - 6. Item L-100 General Electrical Requirements.

1.04 REFERENCES

- A. Codes compliance - Comply with the current edition of the following codes as applicable:
 - 1. California Electrical Code (NFPA 70) CEC
 - 2. National Fire Alarm Codes (NFPA 72) NFAC – 1999 Edition
 - 3. California Building Code CBC
 - 4. All State codes and ordinances
- B. Standards Compliance - Comply with the following codes as applicable:
 - 1. American National Standards Institute ANSI
 - 2. American Society for Testing and Materials ASTM
 - 3. Electronics Industry Association EIA
 - 4. Electrical Testing Laboratories ETL
 - 5. Factory Mutual FM
 - 6. Federal Aviation Agency FAA
 - 7. Federal Communications Commission FCC
 - 8. Institute of Elect. and Electronics Engineers IEEE
 - 9. National Electrical Contractors Association NECA
 - 10. National Electrical Manufacturers Association NEMA
 - 11. National Fire Protection Association NFPA
 - 12. Occupational Safety Health Act OSHA
 - 13. Underwriter's Laboratories UL

1.05 DEFINITIONS

- A. By Others or By Other Trades: Shall mean by persons or parties other than the Division 17 Contractor. In this context the words "by others or by other trades" shall not be interpreted to mean "not in contract".
- B. Certified: Equipment is "certified" if: Equipment has been tested and found by a nationally recognized testing laboratory to meet nationally recognized standards and found to be safe for use in a specified manner; production is periodically inspected by a nationally recognized testing laboratory; and it bears a label, tag, or other record of certification.

- C. Concealed: Embedded in masonry or other construction installed behind wall furring with double partitions or hung ceilings, in crawl spaces, in shafts.
- D. Conveniently Accessible: Capable of being reached without climbing or crawling under or over obstacles, and with adequate working clearance both front and back.
- E. Damage: Visible or invisible damage that negatively affects performance or appearance and creates defective materials or workmanship.
- F. Defective Materials or Workmanship: Operational failures, performance below required minimums, evidence that the system will not be reasonably maintainable, errors in documentation, abnormal operations, unsafe conditions, or similar unsatisfactory performance.
- G. Contractor: Company holding the contract or agreement with the CITY or its representative. The Contractor may when permitted sub-contract Work described in this Section to which the term contractor may apply.
- H. Exposed: Not concealed.
- I. Failure: Any deviation from intended system operation and performance, as determined by the Contract Documents and subsequent submittals and the CITY's Representative.
- J. Furnish: Purchase and deliver to the Project site complete with every necessary appurtenance, support and accessory required for operation.
- K. GAC: General Aviation Center.
- L. Install: Unload at the delivery point at the site and perform every operation necessary to establish secure mounting and correct operation at the proper location in the Project.
- M. Labeled: Equipment is "labeled" if: It embodies a valid label, symbol, or other identifying maker of a nationally recognized testing laboratory such as Underwriters' Laboratories, Inc.; the laboratory makes periodic inspections of the production of such equipment; and the labeling indicates compliance with nationally recognized standards or tests to determine safe use in a specified manner.
- N. Listed: Equipment is "listed" if mentioned in a list which is published by a nationally recognized laboratory which makes periodic inspection of the production of such equipment or states that such equipment meets nationally recognized standards or has been tested and found safe for use in a specified manner.
- O. Nationally Recognized Testing Laboratory: A testing laboratory which is approved, in accordance with OSHA regulations, by the Secretary of Labor.
- P. Open: Not in conduit.
- Q. Provide: Furnish and install, completely ready for use, including all accessories required for operation.

1.06 DRAWING INTERPRETATION

- A. The Drawings are diagrammatic and indicate the general arrangement of systems and equipment unless indicated otherwise by dimensions or detail drawings. The Drawings utilize riser, block, installation and schematic diagrams and symbols to outline the Work to be provided. These drawings do not have any dimensional significance nor do they delineate every item required for the intended Work. No interpretation shall be made from the limitations of symbols and diagrams that any elements necessary for complete Work are excluded.
- B. The Work shall be provided in accordance with the intent expressed on the Drawings and Specifications, and in conformance with the actual building architectural and structural conditions. When in conflict, field conditions take precedence over the Drawings.
- C. The meaning of abbreviations shall be the same whether in lower case letters or without periods.
- D. The use of words in the singular shall not be considered as singular where other indications denote that more than one item is referred to.
- E. Details that appear on the Drawings which are specific with regard to the dimensioning and positioning of the Work, are intended only for the purpose of establishing general feasibility. They do not obviate field coordination for the Work.

1.07 SYSTEM DESCRIPTION AND GENERAL RESPONSIBILITIES

- A. Provide all parts and equipment for a complete and operational systems for the Work of this Section as described herein and shown on the drawings.
- B. Furnish and install all trenching and backfill, duct banks, conduits, raceways, sleeves, boxes, gutters, shelves, enclosures, shelf and enclosure supports, backboards, pull ropes (in unused or spare conduits) required to make all systems fully operational, including components not shown on the Drawings, but necessary to fully operational systems.
- C. Furnish, install, terminate, test, dress, and identify all wire and cable required to make systems fully operational, including all wire and cabling not shown on the Drawings, but necessary to fully operational systems.
- D. Recognize that the Work entails a considerable amount of custom integration between individual systems, as well as the design and implementation of many system and component interfaces. Take full responsibility for the performance of the total integrated system, including integration between systems and various interfaces, in order to achieve the specified operational features and system performance requirements.
- E. Recognize that the Work entails a considerable amount of custom-written and custom-tailored software, both high-level language applications and hardware-specific drivers. Take full responsibility for the performance of the total software suite, including the software embedded in manufactured equipment, in order to achieve the specified operational features and system performance requirements.

- F. It is the sole responsibility of the Contractor to ensure that all equipment supplied under this Specification is 100% compatible with the existing systems and wiring installed in the facility. The Contractor shall install, configure and program the systems described in this Specification to ensure that the new systems and the existing systems operate as one seamless entity.
- G. Prior to submitting a bid, the Contractor shall perform a site survey of all related existing systems and submit any potential problems of the design documents that may increase the installation cost of the project. Prior to the preparation of submittals, the Contractor shall coordinate closely with the CITY including system maintenance personnel.
- H. Extensive interface to the existing on-line facility security and communication systems is required as part of this Work. All connections to the existing systems shall be thoroughly detailed in submittals and approved prior to commencing any work.
- I. If it is necessary to temporarily remove or disconnect any part of the existing systems or equipment for the purposes of interfacing and connecting new equipment, the Contractor shall reinstall and make fully operational all equipment and devices removed or disconnected. Any and all system cutovers and interruptions must be pre-approved and carefully coordinated with CITY and Facility.
- J. Fully test the systems, demonstrate their satisfactory operation, and train maintenance and operating personnel, as specified in this Section and the Sections governed by this Section.

1.08 COORDINATION WITH OTHER TRADES

- A. Coordinate installation of lighting and ventilation in all equipment rooms and control stations to avoid any possible interference and to enhance system function.
- B. Coordinate with the Work of the Electrical specifications and Drawings for the required electrical and mechanical control interfaces at the control panels and annunciators.
- C. If applicable, provide coordination drawings of security device plate mounting templates and internal frame conduits to the hollow metal frame manufacturer/supplier to facilitate frame preparation for electronic devices. Rework all frames for which device mounting has not been coordinated at Contractor's expenses.
- D. If applicable, obtain product data and wiring schematic information from the Door and Gate Contractors/manufacturers for all approved locking and door monitoring hardware. Coordinate with the Contractors to properly wire, terminate and test all electrically controlled and monitored door/gate hardware.
- E. Coordinate with the CITY and all other trades as required to ensure that the entire Work of this Project will be carried out in an orderly, complete, and coordinated fashion.
- F. Coordinate with the CITY all Internet Protocol addressing for devices provided by this Division.

1.09 QUALITY ASSURANCE

A. California State Contractor's License C-10 (high voltage) and/or C-7 (low voltage) will be required to perform this Work.

B. Division 17 Key Project Personnel:

1. Qualifications of all key project personnel including, but not limited to, project manager, project engineer, and lead technician shall be reviewed and approved by the CITY's Representative. If the CITY's Representative is not satisfied with the qualifications of proposed personnel, resubmit another candidate with acceptable qualifications for approval by the CITY's Representative. The accepted Project Manager/Project Engineer shall represent the Contractor in all project matters and shall be responsible for technical and administrative work including, but not limited to, the following:

- a. Preparation of all project RFIs, RFCs, and correspondence.
- b. Preparation and signature of all engineering documents and submittals.
- c. Supervision of shop fabrication and field installation work.
- d. Representation at all project construction and coordination meetings.
- e. Construction progress scheduling and reporting.
- f. Preparation and negotiation of change proposals.
- g. Conduct of demonstration and on-site performance/acceptance testing.

2. Key personnel has NICET certification for video security systems or certification from Milestone Systems.

3. Firm is licensed vendor or installer of Milestone Systems.

4. Firm is licensed installer and servicer for AMAG Technology.

C. Regulatory Requirements and Standards:

1. References to the California Electrical Code (CEC) and National Fire Alarm Code (NFAC) are a minimum installation requirement standard. Drawings and Specifications shall govern in those instances where requirements are greater than those specified in the CEC and NFAC.

2. Obtain and pay for all permits and inspections required by all legal authorities and agencies having jurisdiction for the Work. The certificates of all such permits and inspections shall be delivered to the CITY.

D. Field Samples:

1. Wires and Cables: Submit a one (1) foot sample length of each wire and cable type to be used with the cable identification clearly shown.

2. Submit all required samples along with the product data submittal for review and approval prior to installation.

3. If all wire samples can not be submitted at the same time, submit samples with a complete list of all cables to be used noting samples which have been submitted. Update the list with each subsequent sample submittal.

1.10 SUBMITTALS

A. Submit under provisions of Greenbook 2-5.3, Submittals.

B. Product Data:

1. Product data is required for all materials and equipment. Include complete bill of materials for each section with the product data submittal.
2. Cross-reference submitted items to the Specifications using their related Section and paragraph number.
3. Submit complete product data for the all system components in a single, bound submittal of one or more volumes. Provide a table of contents and labeled divider tabs for each section. Partial submittals for individual Sections will be returned without review.
4. Include descriptive literature, catalog cuts, illustrations, schematics, technical data sheets, and test data necessary for the CITY's Representative to ascertain that proposed equipment and materials comply with specification requirements. Include manufacturer's name, model, catalog or part numbers. Catalog cuts shall be legible and shall clearly identify equipment being submitted.
5. Include required calculations, I/O points lists, system zone schedules, and other tabular data as necessary to clarify system sizing and configuration. Do not, however, consider such submittals as a substitute for complete shop drawings.
6. Disclosure of Product Deviations: Specifically identify and tabulate any and all deviations from the contract documents including all system functions and features. Reference the corresponding specification sections and paragraph/article numbers. All variances and deviations will be reviewed for acceptance or rejection. It will be the Contractor's sole responsibilities to comply with all other contract requirements not revealed in the disclosure of product deviations.

C. Shop Drawings:

1. Shop drawings are required for all systems and component assemblies.
2. AutoCAD ".dwg" files of the Contract Drawings will be made available upon request. These files may be used as a first step in the preparation of shop drawings. Do not consider the drawing plots from such files as a substitute for the Shop Drawings that are to be prepared by the contractor.
3. Shop drawings will not be accepted or considered unless they are submitted as a complete package for each individual section. Partial submittals covering less than a whole system or with incomplete interfaces to other systems will be rejected.
4. Standard manufacture's drawings may not be used as shop drawings unless specifically modified for use on this project.
5. Each drawing requires a unique drawing number and revision level.
6. At a minimum, include the following shop drawings:
 - a. Floor Plans: Scaled drawings showing equipment and device locations in plan view. Include wire and cable types and quantities, raceway sizing and routing. Routing information shall indicate where rated assemblies are penetrated. Separate into as many plan series as needed to prevent overlapping information. These drawings shall be fully coordinated with other trades prior to submittal. Show relationship to adjacent surrounding structure.
 - b. Equipment and Control Room Plans and Elevations: Scaled, dimensioned drawings showing security equipment layouts in security equipment rooms, electrical/ security closets, and control rooms. Include electrical J-boxes and receptacles, power, conduit sizing and routing, metal gutters, wiring ducts, cable trays, and supports. Indicate all other non-security cabinets, enclosures, and equipment within the room.

- c. Cabinet, Enclosure, and Rack Elevations: Scaled, dimensioned drawings for each system equipment cabinet, enclosure, and rack showing component and equipment mounting, wire and cable routing and separation, connector and terminal block locations and labeling, and all necessary fabrication details.
 - d. System Block Diagrams: Single line block diagrams showing the general relationship between system components and the interconnection between systems. Use these Drawings as a reference for the Single line diagrams and point-to-point diagrams by cross-referencing the shop drawing number of those diagrams on these Drawings.
 - e. Single Line Diagrams: Interconnection diagrams for the riser and trunk wiring between equipment cabinets, enclosures racks and major components. Use the same equipment designations as the floor plans and block diagrams.
 - f. Point-to-point diagrams: Drawings which show the wiring of each component or device of each individual system. Include details of power supply, grounding, shielding, shield grounding, surge protection, fusing, connector pin-outs, terminal assignments, and similar wiring and connection details. Use the same component and device designations as the floor plans and other shop drawings.
 - g. Schematic Diagrams: Drawings which show the component wiring of a system to include but not limited to resistors, diodes, transistors, relays, etc. Required for all custom systems and modified commercial products.
 - h. Device Installation Diagrams: Details which show the installation and wiring termination of each field device in each individual system.
 - i. All other shop drawings necessary to install, fabricate, locate, identify, test, service, and repair the systems provided.
7. Shop drawing approved by the CITY's Representative OR by the Consultant Engineer is not a release from Contract requirements as defined by the Drawings, Specifications, and governing codes and regulations.

D. Samples:

1. Devices/Equipment: Submit sample assemblies of each of the following devices or equipment along with the product data submittal for review and approval by the CITY's Representative:
 - a. Substituted products if requested by CITY.
 - b. Custom component, board, equipment or assembly.
2. Disposition: Submitted samples become property of the CITY and will not be returned.
3. Approval of any custom or modified assemblies shall be required. Submit technical information with samples.

E. Test Procedures:

1. Initial Performance Testing: Prepare test procedures, forms and checklists for point-by-point testing. Include a listing for each individual system, each control station and control panel, each equipment room, and each major system component. At a minimum, forms shall include columns for operational/non-operational status, remarks, workmanship and date corrected. Submit a sample format for Approval by the CITY's Representative a minimum of 20 days prior to testing.

2. Performance Testing: Provide test forms which are identical to or similar to the accepted Initial Performance Testing forms. Obtain Approval from the CITY's Representative for any changes in test procedure or forms.
3. Continuous Operational/Functional Testing: Submit a detailed test procedure for the continuous functional testing described generally in this Section. Submit for Approval by the CITY's Representative a minimum of 15 days prior to testing.

F. Test Results:

1. Initial Performance Testing: Submit completed test results for point-by-point testing to the CITY's Representative five days prior to scheduled Performance Testing.
2. Performance Testing: Submit completed test results prior to or with the request to begin the Continuous Operational Test.
3. Continuous Operational Test: Submit completed test results prior to or with the request for Substantial Completion.

G. Record (As-Built) Documents:

1. Maintain a record set of as built drawings on the job and as construction and installation progress, show the actual installed location of all items, material, and equipment.
2. Accurately record actual routing of all conduits (i.e. sizes and types).
3. The As-Built drawings shall be available to the CITY's Representative for review and will be required for evaluation of progress payments.
4. Submit As-Built Shop Drawings created from the approved shop drawings and updated from the site As-Built drawing set and any other drawings required to depict the As-Built condition of the installed work.

H. Operational Manuals:

1. Submit the required quantity of identical manuals, which shall contain the Theory of Operation, start up, shut down and emergency procedures and the manufacturer's operating instructions.
2. Subdivide the manual by section with tab dividers. Provide a table of contents which identifies each section and the contents therein.

I. Maintenance Manuals:

1. Submit a complete set of maintenance documents as described in this Section. For documents of a size greater than 11 x 17 inches, prints and sepia mylar shall be furnished.
2. Manuals shall include the following as a minimum requirement:
 - a. Technical system description.
 - b. System schematics.
 - c. Detailed wiring diagrams to identify cabling, termination and routing.
 - d. Panel assembly drawings to identify location of components, terminal strips and equipment as required to correlate with system drawings.
 - e. Descriptions and drawings as required to maintain equipment from the board to the component level.
 - f. Description of software and user programmable functions. Procedures for user programmable functions shall be included.
 - g. A complete printout of each unique system program.

3. For systems where the program resides on a disk or other similar storage medium, furnish a copy of the disk, or similar medium, to the CITY's Representative.
4. Where multiple systems are combined into a single integrated system, documentation shall include a description of the integrated system and the details of the interfaces between systems.
5. Provide a list of current telephone numbers and addresses of all material vendors and equipment manufacturers who have supplied components in this Project. Include separate service telephone list and purchasing telephone list cross-referencing with each component.

1.11 DELIVERY, STORAGE AND HANDLING

- A. Protect all materials and equipment from damage during storage at the site and throughout the construction period. Protect equipment and materials during shipment and storage against physical damage, dirt, dust, moisture, cold, rain, and any foreign substances that may damage the equipment.
- B. Prevent damage from rain, dirt, sun and ground water by storing the equipment on elevated supports and covering them on all sides with securely fastened protective rigid or flexible waterproof coverings.
- C. Protect conduit by storing it on elevated supports and capping the ends with suitable closure material to prevent dirt accumulation.
- D. Protect all fabricated and/or installed materials and equipment against dust, dirt, moisture, physical damage, metal debris and any foreign substances that may damage the equipment.
- E. Protect painted surfaces with removable heavy Kraft paper, sheet vinyl or equal, installed at the factory and removed prior to final inspection.
- F. Replace equipment determined by the CITY's Representative to be damaged. Repaint and finish damaged paint on equipment and materials with the same quality of paint and workmanship used by manufacturer so that repaired areas are not obvious.

1.12 SEQUENCING AND SCHEDULING

- A. General Requirements:
 1. Do not begin the project without the CITY's acceptance of proposed key project personnel for the Division 17 Work.
 2. If applicable, coordinate installation of lighting and ventilation in all equipment rooms and control stations to avoid any possible interference and to enhance system function.
 3. Prepare, review, and coordinate with the CITY's Representative the approved construction (CPM) work schedule. Schedule work in areas and at times that will not interfere with scheduled activities as defined by the CITY's Representative.
 4. Do not procure any equipment without accepted product data submittals. Do not perform any field installation without accepted shop drawings. Do not begin any extensive software development or programming without accepted system and panel operational narratives, the required CITY's coordination, and user's requirements.

5. Pre-assemble control electronics, control panels, racks, and cabinets off-site as most practical.
6. Install system control equipment, control panels, cabinets, racks, and consoles only after major construction in the area in which they are to be installed has been completed and areas have been cleaned, painted, and sealed.
7. After systems installation and prior to point-by-point performance testing, thoroughly pre-test all devices and device wiring for proper performance. Then thoroughly pre-test each system function in each state or condition under every operating mode.

1.13 WARRANTY

- A. The Contractor is to provide a warranty of the Work provided under this contract (including, but not limited to, software, hardware, and peripheral equipment) as a system, including interfaces to work by others for one year from the date of Acceptance of the Work. Divisions of work among various suppliers, vendors, installers, subcontractors, and other parties will not be recognized or accepted.
- B. Guarantee to repair and replace defective materials or workmanship during the warranty period including labor and materials.
- C. An emergency maintenance (Warranty) request shall be defined as a system or portion of a system failure that affects building safety, security and operation of critical components. Failure of a single component i.e., smoke detector, intercom station, camera or monitor is not considered an emergency maintenance request.
- D. Respond within four hours to an emergency maintenance request. Provide a twenty-four hour telephone contact number (24 hours per day, 365 days per year). Service response time is defined as the period between the placing of a service request and the arrival of a qualified technician on-site.
- E. Maintain a sufficient parts inventory at the project during the warranty period to meet the guaranteed system repair times.
- F. Repair and make operational any defective materials or workmanship resulting from an emergency maintenance request within an 8-hour period from the time of the initial arrival of service personnel at the site. Correct non-emergency defective materials or workmanship within four (4) calendar days of receiving notice of the defect.
- G. Where the equipment manufacturer's warranty covers a longer time period than that required by these Specifications, the manufacturer's warranty shall govern.

1.14 EXTRA MATERIALS

- A. Prior to Acceptance of the Work, deliver to the CITY all spare parts and extra materials required in each Section. All spare parts and extra materials shall be brand new in their original shipping boxes or packages and shall have one year material warranty remaining at the time of delivery. Extra materials shall be available to the Contractor to use as immediate replacements during the warranty period. All extra materials used for the warranty requirements shall be replaced by the Contractor.

1. None.

B. Special Tools:

1. Provide three of each type of security screw bits used.
2. Provide minimum of one of any specialty tools used.

PART 2 - PRODUCTS

2.01 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Comply with the General and Supplementary Conditions and Division 1 Specifications.
- B. The products named in this section and the sections governed by this section establish minimum qualities that substitutions must meet to be considered acceptable. The specified products have also been used in preparing the drawings and specifications, and therefore establish the basis for equipment sizing, wire and cable design, power consumption, and other design parameters.
- C. Substitution requests, if permitted, will be considered only if submitted in strict accordance with the followings:
1. Cross-reference submitted items to the Specifications using their related Section and paragraph number.
 2. Submit complete product data, descriptive literature, catalog cuts, illustrations, schematics, technical data sheets, and test data necessary for the CITY's Representative to ascertain that proposed equipment and materials comply with specification requirements. Include manufacturer's name, model, catalog or part numbers. Catalog cuts shall be legible and shall clearly identify equipment being submitted.
 3. Disclosure of Product Deviations: Specifically identify and tabulate any and all deviations from the contract documents including all system functions and features. Reference the corresponding specification sections and paragraph/article numbers. All variances and deviations will be reviewed for acceptance or rejection. It will be the Contractor's sole responsibilities to comply with all other contract requirements not revealed in the disclosure of product deviations.
- D. The Contractor shall take full responsibility for all design, coordination, and cost associated with substitutions including, but not limited to:
1. Its integration into the total system including physical mounting space, electrical interconnection, signal wiring, power, quality, electromagnetic interference, communication protocols, and similar design considerations.
 2. Any additional materials, equipment, components, accessories, items required for equivalent system operation and performance.
 3. Any necessary changes to branch power circuits, circuit protective devices, and the Work of other trades.
 4. Any modifications to wire, cable, and raceway design.

2.02 MATERIALS AND EQUIPMENT

- A. All equipment and materials required for installation under these Specifications shall be new and without blemish or defect.
- B. Materials and equipment furnished shall be of current production by manufacturers regularly engaged in the manufacturing of such items, for which replacement parts are available.
- C. All material and equipment shall be listed, labeled, or certified by Underwriters' Laboratories, Inc., where such standards have been established. Equipment and material which are not covered by UL Standard will be accepted provided equipment and material is listed, labeled, certified or otherwise determined to meet safety requirements of a nationally recognized testing laboratory. Equipment of a class which no nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe will be considered, if inspected or tested in accordance with national industrial standards such as NEMA or ANSI.
- D. All parts of a system shall be the product of one manufacturer. When more than one unit of the same class of equipment or material is required, such units shall be the products of a single manufacturer. Constituent parts which are similar shall be the product of a single manufacturer.
- E. All components of an assembled unit need not be products of the same manufacturer, however, all components must be acceptable to the CITY's Representative. Components shall be compatible with each other and with the total assembly for the intended service.

2.03 FABRICATION

- A. Fabricate enclosures to easily accommodate interconnecting cables entering from above or below through the use of auxiliary gutters, cable trays, and conduits. Protect all metal cabinet edges where conductors cross and conduit ends with protective covering or bushing.
- B. Group wires and cables by types, boards and modules, and maintain National Electrical Code clearances throughout the installation, including Class 1, Class 2, communications, and branch circuit power separations. Maintain sufficient and proper separation between microphone-level audio, line-level audio, high-level audio, and video cables.
- C. Uniformly organize equipment and cable routing throughout all enclosures, racks, and cabinets. Provide wiring ducts, wireways, wire posts, D rings, wire saddles to route and secure factory and field wiring. Provide routing for all wiring from point of entry to point of termination to maintain required separation, access to all components, and general organization to the wiring. Neatly dress, route and secure wiring.
- D. Mechanically fasten cabinet raceways and cable clamps to enclosure rear panels, rack members, console members, or to other system components. The use of adhesive fasteners (without mechanical fastener) is not permitted. Furnish and install cable support posts where necessary to properly support cables.
- E. No splices are permitted in cabinet raceways. Exception: Splice to cable shield when within two inches of cable termination is permitted.

- F. Furnish and install metal grounding type outlet strips in each equipment cabinet, enclosure, and rack. Leave a minimum of two unused receptacles at each location for future expansion. Neatly shorten and dress power cords from individual equipment to the outlet strips.
- G. Provide protection from accidental contact of all terminals or exposed conductors over 25 volts within enclosures that contain Class 2 wiring. Use non-conductive barriers, heat shrink or other acceptable methods. Tape of any kind is not permitted.
- H. Provide an isolated ground bus within each equipment cabinet, enclosure, and rack for single point termination of audio and data shields and grounds.

2.04 SOURCE QUALITY CONTROL

A. Shop Inspections:

1. The CITY's Representative shall have the right at all times to inspect or otherwise evaluate the Work performed or being performed and shall have access to the premises in which the Work is being performed.
2. The CITY's Representative may verify the inspections or re-inspect any item. The CITY reserves the right to reject materials and workmanship found unacceptable during inspections.

2.05 WIRES AND CABLES

A. Listings and Markings: UL listed and marked for flame resistance as follows:

1. General purpose: CEC Type CM
2. Riser: CEC Type CMR
3. Plenum: CEC Type CMP

B. Communication and Control Cables:

1. Conductors: Stranded bare copper, size as indicated.
2. Insulation level: 300 VRMS.
3. Temperature level: 75° C.
4. Paired cables shall be twisted.
5. Shield (where indicated): 100% coverage aluminum polyester foil with drain wire.

C. Copper CCTV Cables (for camera runs less than 300 feet):

1. Category 6 Unshielded Twisted Pair cables, quantity and size as indicated.

D. Optical Fiber Camera Cables (for camera runs greater than 300 feet):

1. Multimode optical fiber, quantity and size as indicated

E. Optical Fiber Backbone (switch) cables, quantity and size as indicated.

1. Singlemode optical fiber

2.06 DATA CABLING

- A. Must be 4-Pair UTP (Unshielded Twisted Pair) Category 6 medium to high-grade data cable.
- B. Must have performance characteristics better than "minimum compliant" Category 6 cable.
- C. Must be name brand cable such as Berk-Tek, AMP, TE, ADC, Panduit, Superior-Essex, Etc. No "off-shore cable" will be accepted.
- D. Must have manufacturer name and part number imprinted on cable sheath. Cables without a manufactures name will be rejected.
- E. Must be UL Listed. Must have UL symbol and listing number visible on cable.
- F. Must be ETL verified and have the ETL verification label on the cable sheath and/or on the box or reel.
- G. Must comply with applicable standards requirements outlined in the NFPA 70 2011 edition (NEC) section 800 and elsewhere.
- H. Must be plenum-rated (CMP) type cable. Riser-rated cable (CMR) is not acceptable in ceiling spaces. Riser-rated CMR-type cable is acceptable only when installed entirely in a solid type metal conduit such as EMT, IMC, RMC, Etc... Flexible metal conduit does not meet this requirement nor does Innerduct, plenum or otherwise.
- I. Must be consistent in color, model and manufacturer per project and preferably match existing cable.
- J. Must be terminated using the 568-B wiring configuration at jack, patch panel and any consolidation point.
- K. Must be continuous its entire length between patch panel and jack. Use of consolidation points must be approved prior to installing. Only one consolidation point should used and be within 25' of either the jack or patch panel.
- L. Must be terminated on a jack at the camera end and patch panel at the IDF end
- M. Must be terminated directly on jacks and patch panels. Field terminated RJ45 connectors directly on installed cabling are not acceptable at either end. Exceptions to this must be preapproved. RJ45 plugs must match cable rating. (Cat 5E, Cat 6, Etc.)
- N. Vendor must certify the Permanent Link with a recently calibrated cable tester such as the Wire Scope or Fluke DTX 1800. Tests should be extended tests and hard-copy test results should be provided to the City.
- O. Cable and installation must meet the current TIA-568-C.0, C.1, C.2 wiring standards and installation practices outlined.
- P. Cable and installation must meet the current TIA-569-C and previous standards and requirements for pathways and spaces.
- Q. Cable must be labeled at jack and patch panel ends per City of Torrance numbering plan.

2.07 Patch Cables

- 1. Must match installed cabling type in regard to performance. (Category 6, Category 6A).
- 2. Must be high quality, stranded wire and booted.
- 3. Must be UL listed and show the UL symbol and listing on the cable jacket.
- 4. Must be ETL verified and show the ETL verification symbol on the cable jacket.
- 5. Must not be too short to where proper routing is not possible or be too long where excess length has to be coiled up or stored in wire management panel(s).

2.08 General Installation of Data Cables:

1. Common cable pathways must be installed to support cabling wherever practical or necessary.
2. Proper supports should be installed in a professional and workmanlike manner.
3. Installation of supports and cable must meet all applicable building codes and electrical code requirements.
4. Cable must not be supported from any wire or other type of support structure that has been installed to support any other building device, utility, system or structure. New wires should be installed using proper methods and devices.
5. Existing telephone and data cabling support structures and pathways may be used to support new cabling.
6. Distance between supports may not exceed five (5) feet and should be inconsistent in distance whenever possible. Having supports exactly the same distance from each other for a long run is undesirable but acceptable.
7. Nothing may be attached to ceiling wires that support T-bar ceilings, lighting fixtures, conduits, pipes, speakers, ducts, grids, Etc...
8. Cable pathway supports should be specifically designed for the purpose of supporting high speed data cabling. Nails, drive rings, wires, Etc should not be used to directly support the cabling.
9. Zip ties should not be used anywhere on the data cabling. Only Velcro-type materials should be used for bundling cable or patch cords.
10. Penetrations in walls or ceilings must typically be sleeved. Sleeves must meet minimum fire standards where they are installed in fire walls or fire barriers. Acceptable products are EZ path and Redi-Sleeve products.
11. Any penetrations in fire walls or barriers must be properly installed and restore the wall or barrier back to its original fire rating. Any penetrations in fire-rated walls or barriers must be brought to the City's attention prior to installing sleeve or fire-rated assembly.

2.09 Conduits and Pull Boxes

General Description:

All telecommunication cabling must be installed in a protective conduit, whenever possible. The conduit type and size will vary depending on the application. The following applications apply: telephones and payphones, local area networks (incl. wireless access points), fire/burglar alarm systems (incl. smoke detectors), video cameras, paging speakers, security access systems, information and vending kiosks, and HVAC/building control systems.

Conduit – Inside workstation

1. Conduit must be EMT or aluminum or steel flexible conduit (FMC)
2. Conduit must not be no smaller than 3/4" trade size
3. Conduit must have a pull string installed
4. Conduit must be installed using standards, practices and requirements as outlined in the latest version of the NFPA 70 Electrical code and the corresponding Electrical code handbook
5. Conduits may be stubbed above wall into ceiling space if ceiling space is accessible. If space is not accessible, conduit should run to an accessible location or "home-run" to the nearest telephone closet/IDF or appropriate location for connection
6. Each work station location/outlet preferably must have its own conduit for communications
7. Workstation locations/outlets may be looped before going home or stubbing into ceiling space however, no more than two outlets may be looped together

8. Workstation locations must have conduit(s) terminated into a double-gang (4S) box at the work station at same height to match other surrounding boxes and outlets. Box must have a double-gang plaster ring installed to accept a double-gang plate.

Conduit – Inside feeder

1. Telecommunication Rooms (TRs) must be tied together with conduits so they can be interconnected.
2. Conduits through ceiling spaces must be EMT or IMC/RMC only. No flex.
3. Conduit must not be smaller than 2" trade size.
4. TR's must have two conduits between each other if the conduit is only 2". If the conduit is 3" or 4", one conduit is acceptable.

Conduit – Underground

1. Underground conduits and ducts must be installed per the Bell Operating company standards and practices.
2. Conduit placement and final design must be coordinated with ATT/Verizon and their requirements must be adopted.
3. All underground conduits must be plastic (PVC) or HDPE type.
4. PVC must be schedule 80, especially if it is not in a slurry encasement.
5. All conduit fittings must match pipe type and Schedule.
6. All underground conduit must have a minimum of 24" of cover – with 36" cover and slurry preferred.
7. If slurry is used, it must uniformly and completely encase the conduit (no less than 3" encasement preferred).
8. Slurry may need to be dyed red. Check with City before pouring.
9. When encasement is used, proper dobies designed for the purpose of supporting must be used. Bricks, blocks, rocks, etc. are not acceptable.
10. Underground conduits must be mandrel tested after installation.
11. Proper sweeps must be used. No 90 degree elbows shall be used
12. Conduits must enter pullboxes properly and through proper penetrations. Penetrations should be drilled or cored and chipped out.
13. Conduit to pullbox space must be sealed using acceptable sealant or mortar.
14. Conduit running underground and then going above ground should convert to metal conduit above ground. IMC or RMC is acceptable for this.

Vaults and Pullboxes (referred to as pullboxes)

1. Pullboxes must be placed wherever appropriate or required.
2. Conduit runs more than 300' or with more than three (3) 90 degree sweeps shall have a pullbox installed.
3. Pullboxes installed must be sized appropriately for their use. The City will determine (or the ATT requirements) will specify what type and size of pullboxes should be installed and where.
4. Pullboxes must be self-draining, have racking installed, have a ground rod placed in one of the four corners, be flush with the finished grade after the lid or cover is installed, and have a means to secure the lid or cover with bolts.
5. Pullboxes where any vehicles may drive over them must be traffic-rated.

2.10 CONNECTORS

A. Terminal Blocks:

1. Type: DIN-rail-mounted, modular, screw terminals.

2. Provide fused terminals where required or indicated.
3. Accepted Manufacturers: Entelec, Phoenix Contact, Weidmueller, or approved equal.

B. Data Connectors:

1. Category 6 compliant RJ-45 Connectors.

2.11 FIRESTOPPING/SEALANT MATERIALS

- A. Firestop and seal all penetrations of fire walls with minimum three hour sealant or Fire Stop Putty(FSP). This includes but is not limited to all raceway, conductor, sleeve and cable tray penetrations where penetrating device does not completely seal the hole.
- B. Accepted Products: International Protective Coatings Corp. FlameSafe® FSP 1100, Nelson FSP, Domtar Fire-Halt® or approved equal from other manufacturers.

2.12 POWER SUPPLIES

A. Uninterruptible Power Supplies (UPS):

1. Provide solid state inverter/charger and static bypass switch with less than 1/4 cycle, static transfer time, and frequency stability of 60 Hz + 1 Hz, voltage regulation of +8%, total harmonic distortion less than 5% and minimum output capacity and voltage as indicated in the drawings. Provide sealed lead/acid type batteries.
2. Size the security equipment UPS with sufficient capacity to support and maintain all added security equipment and devices for a minimum of 15 minutes after the loss of power.
3. Submit UPS power calculations indicating power consumption by each major equipment component.
4. Acceptable products: APC, or approved equal from other manufacturers.

B. 12VDC/24VDC Power Supplies:

1. Output is be regulated to within plus or minus 1 percent.
2. Size as required for each location with a capacity of 150 percent of the intended maximum load.
3. Class 2 power supplies shall be power limited to 100 watts with over-voltage and short circuit protection.
4. Acceptable products: Altronix, or approved equal from other manufacturers.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Carefully inspect the installed Work by other trades and verify that all such Work is complete to the point where installation of the Work of this division may properly commence.

- B. In the event of discrepancy, immediately notify the CITY's Representative. Do not proceed with installation in areas of discrepancy until such discrepancies have been fully resolved.
- C. Install all equipment in accordance with all pertinent codes and regulations, the accepted design, and the referenced standards.

3.02 INSTALLATION

A. Equipment Identification:

1. Install a nameplate on each individual equipment rack, enclosure, boxes, cabinet, and significant equipment item.
2. Use identifiers and abbreviations defined in the Drawings whenever possible. Use plan designation for labeling, unless indicated otherwise.
3. Nameplates shall be laminated black phonemic resin with a white core and engraved lettering, a minimum of 1/4" high. Use fasteners to install nameplates. Do not fasten with adhesives.
4. Engrave using upper case letters of uniform height; centered on device, cover plate, or enclosure; with all characters made clearly and distinctly.
5. All equipment shall have the manufacturer's name, address, model number and rating on a name plate securely affixed in a conspicuous place. All equipment shall bear labels attesting to Underwriters Laboratories approval where subject to Underwriters Laboratories label service.
6. Identify all field terminals and relays with device identification. Lettering shall be 3/16" high minimum.

B. Equipment Installation:

1. Install all equipment in accordance with the manufacturer's recommendations, and accepted shop drawings.
2. Install all equipment in compliance with CEC requirements, NECA's "Standard of Installation", and recognized industry practices.
3. If requested, submit structural and seismic mounting load calculations demonstrating adequate support and bracing for seismic zone 4.
4. Do not attach electrical materials to roof decking, removable or knockout panels, or temporary walls and partitions unless indicated otherwise. Use hangers and other supports to support the equipment and materials, intended for this purpose.
5. Locate equipment as close as practical to the locations shown on the Drawings.
6. Maintain minimum 3-foot working clearances on each side of equipment or equipment racks where access is required to inspect, service or adjust.
7. Check equipment against available mounting space indicated on the drawings. Coordinate location of equipment with existing devices to minimize interference. Bring all conflicts or clearance problems to the attention of the CITY's Representative during the preparation of shop drawings.
8. Where the CITY's Representative determines that equipment installation is not conveniently accessible for operation and maintenance, remove and reinstall equipment in a conveniently accessible manner at no extra cost.

C. Wire And Cable Installation:

1. Install cable types as follows:
 - a. In conduit: CEC Type CM.
 - b. Open risers: CEC Type CMR.
 - c. Other open runs: CEC Type CMP.
2. Route from source to termination in a uniform manner through raceways, cabinets, and equipment housings without breaking the insulation or deforming the cables. "Flying splices", meaning splices in wire bundles, raceways, or pull boxes are specifically prohibited. Splice only at junction box locations shown on the Drawings.
3. Obtain CITY's pre-approval for all exposed cable runs.
4. Maintain separation between Class 1, Class 2, communications, and branch circuit power wire and cable in accordance with the CEC. Do not route microphone-level audio, line-level audio, or high-level audio in the same conduit or cable group.
5. Do not exceed the following cable pulling tensions:
 - a. 24 AWG conductors: 4 lbs. per conductor.
 - b. 22 AWG conductors: 7 lbs. per conductor.
 - c. 20 AWG conductors: 12 lbs. per conductor.
 - d. 18 AWG conductors: 19 lbs. per conductor.
 - e. 16 AWG conductors: 30 lbs. per conductor.
 - f. 14 AWG conductors: 48 lbs. per conductor.
6. Use a scale to measure tensions for typical cable pulls. If tensions are exceeded even momentarily or if cables are damaged, remove the cables. Install new cables either using an acceptable anti-friction agent or adding pull boxes to the run.
7. Install edge protection materials ("cat track") on the edges of holes, lips of ducts of any other point where wires or cables cross sharp metallic edges.

D. Wire Termination, Dressing, and Identification:

1. Terminate or join all wires and cables with specified terminal blocks or connectors submitted and accepted for the specific termination. Acceptable termination and junction methods include:
 - a. Equipment or device terminal blocks (provided with equipment or device): Direct connection with stripped conductors.
 - b. Equipment or device screw terminals (provided with equipment or device): Two-crimp, spade lug on stripped conductors.
 - c. Device lead wires (provided with device): Two-crimp, insulated wire nut over conductors.
 - d. Equipment or device connector (provided with equipment or device): Provide mating connector.
 - e. Junctions and/or splices where indicated: Provide terminal blocks for control and communication cables and specified connector types for others.
2. Use the specific cable stripper for each cable and wire type. Use a 3-step-cut coax cable stripper on coaxial cables, a jacket stripper on jacketed cables, and the proper size stripper for individual conductors. Do not strip with a knife, scissors or other improper tool.
3. Use the proper crimping tool for each cable / connector combination. For example, crimp coaxial cables using a full-cycle ratchet crimp tool with the specific size

hexagonal steel die for the cable type. Crimp D-subminiature connectors using a specific D-sub crimp tool, and so on.

4. For multi-pin connectors use the appropriate pin insertion and extraction tool.
5. Dress wires and cables to provide a neat and orderly appearance within all enclosures, equipment racks, cabinets, consoles by routing in snap-cover, plastic wiring duct or other acceptable method. In locations where wiring duct is not feasible, organize by cable clamping, dressing and tie-wrapping.
6. Relieve strain on all loose wire bundles using tie-wrap supports fastened with machine screws or bolts. Do not use self-adhesive type supports.
7. Neatly form cable ends and apply shrinkable tubing to shielded cables or where necessary to secure the insulation against fraying or raveling.
8. Individually identify all conductors with a unique number located within 1-1/2-inch from its termination at both ends. Impress the number on a fixed length of white shrinkable tubing with a heat impression stamping machine, or other acceptable method.
9. Cross reference the interconnection diagrams of the record drawings with the installed cable identification numbers.

E. Grounding and Shielding:

1. Install a 1/0 AWG, THWN, stranded copper bonding jumper from each ground bus to the existing single-point ground bus in the security equipment room. Do not loop or series each ground bus.
2. Use the signal grounding system as the system signal reference voltage by connecting the isolated secondary common of each low-voltage power supply and equipment item to the system at only one point. Also use the system as the shield ground by connecting the source side of all shields to the system at only one point. Ground all other equipment per manufacturer's recommendation.
3. Other than its single connection to site ground, isolate this signal grounding system from all other metallic objects. Maintain complete isolation from the safety grounding system which shall be used to ground all equipment cabinets, enclosures, racks, conduits, equipment chassis, and other metallic objects from hazardous line voltages. If 60 Hz hum is found in the system, add circuits or transformers within equipment to provide positive isolation between signal and safety/chassis ground, thereby eliminating all ground loops.

F. Surge Suppression:

1. All electrical circuits supplying power to the System shall be protected against line voltage transients. Furnish and install line voltage surge protectors in all circuits. This includes circuits supplied from an uninterruptible power supply (UPS), unless the UPS already has surge protectors with the specified performance included in its input circuits.

3.03 FIELD QUALITY CONTROL

A. Initial Performance Testing:

1. Initial Performance Testing is to be conducted by the Contractor.
2. Point-by-point testing shall include the sequential operation of each system and control function in each of its operating modes. All tests are to be conducted and recorded per the accepted procedure and test forms.

3. Notify the CITY's Representative five days in advance that this activity will be occurring.

B. Performance Testing:

1. Performance Testing is to be conducted by the Contractor and witnessed by the CITY's Representative.
2. Schedule point-by-point performance testing only after Initial Testing has been satisfactorily completed and all necessary corrections have been made. Provide the CITY's Representative with a minimum of 5 working days notice with a request to schedule Performance Testing. Submit Initial Performance Test records prior to the scheduled Performance Test. Failure to submit test results as specified shall be cause to re-schedule testing.
3. Point-by-point testing shall include the sequential operation of each function in each of its operating modes, in addition to completion of all required performance testing and measurement.
4. Conduct point-by-point testing in the presence of CITY's Representative. Record test results on the accepted test checklist which shall include a list of all personnel witnessing the tests. If test results are not in compliance with requirements, make necessary changes or adjustments at no additional cost, and arrange for another test. This process shall continue until the systems are acceptable to the CITY's Representative.
5. Performance Testing will also include inspections for contract document compliance, codes and standards compliance, and workmanship.

C. Continuous Operational Test:

1. After completion and CITY Representative's approval of the Performance Testing and Training, conduct a 14-day operational test in order to demonstrate continuous system performance. The systems will not be accepted until they operate for 14 continuous days without a system failure. Restart the test period from the beginning after every confirmed system failure.
2. The CITY will provide staff to man and operate all control points during continuous operational testing. The CITY's test personnel will simulate staff movement, generate alarms, and otherwise randomly operate as many functions as practical on a nearly continuous, 8-hour-shift basis. Provide jumpers and simulation programs to test alarms and other conditions that cannot be readily performed by test personnel. The test staff will record all suspected problems and provide these reports to the test committee.
3. The CITY's Representative will make the final determination for all disputed problems.
4. System failure is defined as any portion of the system that fails to operate as intended and can not be corrected within 24 hours of the failure. Individual device failure such as a single camera or a single intercom station will not be a cause for system failure.

3.04 CLEANING

- A. Coordinate with the General Provision Work.
- B. Protect equipment during installation against entry of foreign matter on the inside. Vacuum clean all equipment both inside and outside before testing, operating and painting. Clean electrical connections with a suitable solvent prior to assembly.

- C. Remove from the premises and dispose of all packing material and debris on a daily basis.
- D. Upon completion of the Work, remove excess debris, materials, equipment, apparatus, tools and the like and leave the premises clean, neat and orderly.
- E. Thoroughly polish all bright metal or plated Work and remove any pasted labels, dirt or stains from the equipment.

3.05 TRAINING

- A. Provide on-site, project-specific training sessions for system operations, maintenance, and programming with designated total hours as follows for all systems provided under this section:

1. Operational, IP Cameras.....	4 hours
2. Operational, Access Control.....	4 hours
3. Maintenance, General.....	4 hours
4. Maintenance, License Plate Readers.....	2 hours
5. Programming	4 hours
6. Programming, Wireless Node Network.....	2 hours

- B. All classroom training is to occur at a location provided by the CITY.

- C. Operational Training:

- 1. IP Camera – Train Airport Operational Staff and Police Staff in system operation, real time viewing, playback, search and retrieval of archived data and transfer of video to a portable media such as DVD RW. Include basic maintenance and care of equipment.
- 2. Access Control – Train Airport Operational Staff in system operation, monitoring, alarm response, remote gate operations, data entry for card access, removal or denial of cards, and making photo ID badges.
- 3. Provide a combination of classroom sessions supported by audio/visual aids, and field sessions with personnel participating in hands-on operation of the systems.

- D. Maintenance Training:

- 1. Train CITY’s personnel in the basic user level maintenance and trouble shooting of the Systems. Structure training to identify the equipment and systems that can be serviced or reset by the on duty building engineer, how to identify systems that have failed or not working, and emergency shut down procedures.
- 2. Train CITY’s personnel on the management of Automatic License Plate Readers.
- 3. Provide a combination of classroom sessions supported by audio/visual aids, and field sessions with personnel participating in hands-on preventative, corrective maintenance and reactive maintenance.

- E. Programming Training:

1. Train CITY's personnel in the site-specific programming and software trouble shooting of the Systems. Training will also include user programmable features that may be used for this system such as motion detection, frame rate, video masking, and other related features.
 2. Train CITY's personnel on the programming and management Wireless Node Network including user programmable features.
 3. Provide a combination of classroom sessions supported by audio/visual aids, and field sessions with personnel participating in hands-on for programming changes, software uploading/downloading, trouble shooting, etc.
- F. Submit an estimated training schedule 15 days prior to training for approval by the CITY's Representative. Estimate classroom and hands-on hours required for all three types of training (operational, maintenance, and programming). Include a syllabus for each class session.
- G. All training materials including Operational and Maintenance (O&M) Manuals shall be reviewed and approved prior to conducting the specific training.

3.06 MEASUREMENT AND PAYMENT

- A. Measurement and payment for "Staff Training – VMS, APLR, Wireless Node & Access Control" will be made at the contract unit price per lump sum and the price shall be full compensation for furnishing all materials, equipment, tools and for all labor including preparation time for development of the training classes, manuals, diagrams and actual training time necessary to complete the item.
- B. Measurement and payment for "Miscellaneous Security/IT Equipment" will be made at the contract unit price per lump sum and the price shall be full compensation for furnishing all materials, equipment, tools and for all labor including installation and troubleshooting necessary to complete the item to be fully operational.

Payment will be made under:

Item 17050-1	Staff Training – VMS, APLR, Wireless Node & Access Control -- per lump sum
Item 17050-2	Miscellaneous Security/IT Equipment—per lump sum

END OF SECTION

SECTION 17160

CABINETS, ENCLOSURES, AND RACKS

PART 1 - GENERAL

1.01 SUMMARY:

A. Section Includes:

1. Free-standing Equipment Cabinets, Enclosures or Racks.
2. Wall-mounted Equipment Cabinets or Enclosures.
3. Wall-mounted Equipment Racks.

B. Related Sections:

1. 17050 - General Requirements.
2. 17110 – Raceways and Boxes
3. 17728 – Access Control System
4. 17782 – Security Camera System
5. 17892 – Wireless Network System.

1.02 REFERENCES:

A. CODES AND STANDARDS

1. ANSI/EIA RS-310-C Rack mounting standards.
2. NEMA 250 Enclosures for Electrical Equipment, 1000 Volts Max.
3. CEC California Electrical Code.
4. UL 50 Cabinets and Boxes.

1.03 SUBMITTALS:

A. Conform to the requirements of Section 17050, General Requirements.

B. Product Data: Submit manufacturer's technical data for all items to be used including specifications, installation instructions, and general recommendations.

1.04 SITE CONDITIONS:

A. Enclosures shown on the Drawings are in approximate locations. Actual location within the same room may depend on site conditions. Adjust in field and obtain approval for final enclosure locations prior to installation.

1.05 DESCRIPTION

A. Provide cabinets of the same type and quality of the existing type used for similar equipment. Match existing keying of similar cabinets.

PART 2 - PRODUCTS

2.01 GENERAL:

- A. Types: Provide NEMA Type 4X cabinets and enclosures for outdoor applications. Provide NEMA Type 12 cabinets and enclosures for indoor applications.
- B. Materials: Provide cabinets and enclosures as follows:
 - 1. Provide electrical cabinets and enclosures that are UL listed and labeled, and constructed in conformance with UL 50 "Cabinets and Boxes."
 - 2. In normally dry interior locations, provide sheet steel with corrosion resistant fasteners.
 - 3. Outdoors and in damp interior locations, provide galvanized sheet steel with stainless steel fasteners.
 - 4. At constantly wet locations or corrosive atmospheres, provide stainless sheet steel with stainless steel fasteners
- C. Rail Mounts: Full enclosure length rack angles shall be installed and have ANSI/EIA RS-310-C mounting standards with 10-32 tapped mounting holes in each enclosure.
- D. Shelf: Provide a shelf or other suitable mounting plate for all non rack mountable equipment.
- E. Painting: In addition to galvanizing or priming coat, all inside and outside surfaces of trim and doors shall be given a factory finish coat of gray paint.
- F. Grounding: Provide cabinets and enclosures with provision for cabinet grounding without penetrating exterior wall of the enclosure.

2.02 FREE-STANDING EQUIPMENT CABINETS, ENCLOSURES OR RACKS

- A. Not Used.

2.03 WALL-MOUNTED EQUIPMENT CABINETS OR ENCLOSURES:

- A. Server, data storage system and associated equipment will be installed in City provided rack. Contractor shall provide rails, shelf and all other hardware needed for mounting equipment in the rack.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Mounting: Mount cabinets at a uniform height. Mount cabinets with fronts straight and plumb. Install in accordance with manufacturer's instructions and ANSI/EIA 310 in locations shown on Contract drawings; arrange for adequate ventilation and access.
- B. Bracing: Brace or anchor all free-standing/wall-mounted cabinets using Uni-strut or other approved method to building structure.

- C. Flush Cabinets: Set flush cabinets in finished spaces flush with adjacent walls. Mount cabinets with fronts straight and plumb.
- D. Painting: Touch up all welds, scrapes and other mars in the enclosure finish with a rust inhibiting paint.
- E. Front Access: Locate with minimum of 36 inches clear space in front of each cabinet or rack.
- F. Other Access: Provide minimum 36 inches clear space to each side of enclosure which requires access for inspection or service.
- G. Integrate racks/enclosures with systems served.
- H. Ground and Bound Racks/Enclosures in Accordance with the Specifications and TIA/EIA 607.

3.02 CLEANING AND ADJUSTING

- A. Clean installed items using methods and materials recommended by manufacturer.
- B. Adjust racks/enclosures to be flush and level.

4.01 MEASUREMENT AND PAYMENT

A. Measurement and payment for "Outdoor Security Cabinet with Foundation" will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials equipment, tools, and for all labor including necessary to complete the item to be fully operational including excavation, backfill, concrete, steel reinforcement and appurtenances.

Payment will be made under:

17160-1 Outdoor Security Cabinet with Foundation—per each

END OF SECTION

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SECTION 17728

ACCESS CONTROL SYSTEM

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Computer Workstation
2. Door Control Modules
3. Proximity Card Readers
4. Proximity Cards
5. Photo Badge Software
6. Photo Badge Printer
7. System Printer
8. Power Supplies
9. Safety Vehicle Loop Detector
10. Safety Photo Eye Gate Sensor
11. Fire/Police/Maintenance Gate Access

B. Related Sections

1. Section 17050, General Requirements.
2. Section 17160, Cabinets, Enclosures, and Racks.
3. Section 17782, Security Camera System.
4. Section 17892, Wireless Network System.

1.2 REFERENCES

- A. Comply with Section 17050 General Requirements.

1.3 SYSTEM DESCRIPTION

- A. The access control system at the airport will be compatible with the City's existing system and the police department's crime laboratory such that existing proximity cards can be used to access all three facilities and new cards will not be issued. City employees who need access to the airport can have their existing cards individually enrolled and programmed at the airport to provide access.
- B. Access control will be compatible with City's existing AMAG Technology System's Symmetry Professional Security Management Software version 6.2 (Build 10111). The AMAG software will track the issued cards and record each entry into the airport. The software will be installed on a virtual server. The physical server will be installed in the IT equipment room within the GAC.

- C. Access control system will assign different level of clearances to particular cards, and track whom the card belongs to, which gates were entered and what time the card was used. It will also have the capability to activate or deactivate card from the main control point. The server will be accessed by multiple password-protected levels for programming authority.
- D. When the card is read by the card reader, an outdoor database unit (installed locally to gate) will wirelessly transmit the read to the server to automatically record the name, date, time, gate number and other preconfigured information regarding the cardholder. The new access control terminals/computers will be provided at the Administration Office and Duty Officer's room which will be capable of retrieving any corresponding activity, keep track of visitor activity and staff entering/exiting the facility. The system will also monitor which gates are open and will alert staff if gates are open for an excessive (user programmable) period of time.
- E. The terminal/workstation will be provided at the Administration Office which includes the software and ID printing equipment capable of creating photo-ID badges. Blank photo-ID badges will be provided as part of this project. Coordination will be made to provide the proper graphic appearance of the ID cards.
- F. There will be no connectivity between the existing access control system at the City police department crime lab and the new system at the Airport. The main function of the Airport system is to issue cards to airport users and tracking of tenants. However, it is anticipated that City employees can have their existing access cards enrolled into the airport access control system, so that one card can be used at the City, police department and airport.
- G. Provide enclosures, wiring, raceway, terminations, racks, mounts and all other equipment required for a complete operational system.
- H. Protect in place existing Fire Department Strobe Switch Detector as shown on the Plans.
- I. Remove and relocate existing Police/Fire Department Knox Box key switches and Maintenance key switches from existing card reader pedestals to new card reader pedestals.
- J. User Programming Functions: The system operation shall be completely programmable by the CITY. Programming shall be possible from the Access Control Server or a stand-alone computer with the proper access codes.
- K. Provide new vehicle detector safety loops and photo sensors at vehicle gates.
- L. The existing gate arms at Gates A and F shall be integrated and connected to the access control system.

1.4 SUBMITTALS:

- A. Comply with Section 17050, General Requirements
- B. Submit system equipment and components listed in Section 2.1B.

- C. Submit a detailed Operational Narrative Description of the complete access control system with detailed description of all system components and how the components will be integrated together.

1.5 QUALITY ASSURANCE

- A. Comply with Section 17050, General Requirements.
- B. NEC Compliance: Comply with applicable codes.

1.6 PROJECT CONDITIONS

- A. Comply with Section 17050, General Requirements.

1.7 SEQUENCING AND SCHEDULING

- A. Comply with Section 17050, General Requirements.

1.8 EXTRA MATERIALS

- A. Comply with the requirements of Section 17050, General Requirements.
- B. Provide the following spare parts:
 - 1. Not Used

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

- A. The products named in this section establish qualities that substitutions must meet to be considered acceptable. Provide access control system equipment and components including, but not limited to, the following or approved equal from other manufacturers where noted. Products listed identify the minimum acceptable quality and features:

B. Products

- | | | |
|-----|---|----------------------------|
| 1. | Access Control System Software..... | AMAG Symmetry Professional |
| 2. | Access Control Module..... | Symmetry Multinode M2150 |
| 3. | Computer Workstation with UPS..... | Submit |
| 4. | Mechanical Locking System at Door D1 with free exit handle..... | Submit |
| 5. | Proximity Card Reader..... | HID ProxPro II |
| 6. | Long Range Proximity Card Reader..... | HID 5375 MaxiProx |
| 7. | Proximity/Smart Cards..... | HID ISO Prox II |
| 8. | Photo Badge Camera..... | 1.3 Megapixel (min) Submit |
| 9. | Photo Badge Printer..... | Fargo DTC1000 |
| 10. | Photo Badge Software (Ability to store database on virtual server)..... | Submit |
| 11. | System Printer..... | Submit |
| 12. | Power Supplies..... | Submit, See Section 17050 |
| 13. | Safety Vehicle Loop Detector..... | Submit |
| 14. | Safety Photo Eye Gate Sensor..... | Submit |

2.2 ACCESS CONTROL SYSTEM SOFTWARE

A. SYSTEM REQUIREMENTS

1. Network Computer Server
 - a. See Specification 17782 for physical server requirements. Access control system will be installed on a virtual server running AMAG Symmetry Security Management Software through VMware.
 - b. Virtualization software shall be VMware vSphere 5 Enterprise Plus with three (3) years maintenance.
 - c. Database for Photo ID badges shall be installed on the virtual server in the GAC IT/equipment room.
2. Badging Station and Workstation Requirements (Administration Office and Duty Officer's Room)
 - a. Intel i7 Processor, 2.66 GHz minimum
 - b. Mini Tower, 16X DVD RW
 - c. 4GB RAM (min)
 - d. 250 GB hard disk (min)
 - e. 4 USB ver 2.0 (min)
 - f. 2 USB ver 3.0 (min)
 - g. 23" IPS monitor 1920x1080 with anti-glare
 - h. 1 Ethernet Port 10/100/1000 Mbps
 - i. Keyboard and Mouse
 - j. Uninterruptable Power Supply 1,000VA (min)
 - k. Operating system (the following are acceptable):
 - 1) Windows 7 Pro/Ultimate SP1 32bit/64bit
 - l. 3 Year Warranty

2.3 SYSTEM PRINTER

A. SYSTEM REQUIREMENTS

1. Monochrome Laser, Single Function printer
2. Ethernet Port

3. Two (2) toner cartridges

2.4 PROXIMITY CARD PRINTER

A. SYSTEM REQUIREMENTS

1. Single Sided printing
2. Proximity card encoder
3. Ethernet Port
4. Two (2) color ribbons
5. One (1) cleaning kit

2.5 ACCESS CONTROL MODULE

A. General Specifications

1. Support a local database of 20,000 card holders with expansion capabilities up to 1,000,000 card holders.
2. The SMS intelligent database controller shall support a minimum of 12,000 offline transactions. The option to provide for at least 65,000 transaction storage at the panel must be available.
3. The SMS hardware shall be comprised of modular components that connect over standard interfaces to one another. There shall be database storage and processing module (DBU), and once data has been downloaded to the DBU it shall locally make access control decisions. Access granted or denied decisions shall be made in under 0.5 seconds.
4. The DBU shall store firmware in non-volatile flash memory to allow for convenient updates through the head-end software application. The DBU shall store the cardholder and configuration database information in battery-backed memory so that loss of primary power will not cause the loss of the database.
5. The SMS hardware shall be capable of expansion via 2-, 4-, and 8- door controllers (DC). Door controllers shall support one or more input/output module expansion cards that requires no additional addressing and provides 8 monitored input points or 8 auxiliary output points.
6. The DBU shall support configurations that include: 16 card readers, 96 monitored input points, or 96 auxiliary output points.
7. Support DHCP and Static IP addresses
8. Provides encrypted communication There shall be an intelligent controller option to provide control of 8 readers/doors from a single circuit board

(communications, memory, CPU, and reader/door functions integrated) with an available 8-reader/door add-on to provide a 16-door controller from two circuit boards. The 8-door controller shall provide an integrated on-board RS-232 interface, and shall have provisions for modular expandable memory.

9. System must support the installation of readers at any distance from 3 feet to 3000 feet from the reader interface board. Systems that do not support this requirement, or that require additional, separately mounted components to achieve the requirement shall not be acceptable. This requirement does not apply to biometric reader devices or Wiegand readers.
10. Access control module shall control and integrate all features on the gates including but not limited to:
 - a. Gate motors
 - b. Ingress and egress card readers
 - c. Pavement loop detectors (safety and free egress)
 - d. Photo eyes
 - e. Strobe switch detector
 - f. Knox Box key switch
 - g. Maintenance key switch
 - h. "Anti-piggyback" gate arm

2.6 PROXIMITY CARD READER

A. Features:

1. Proximity Card Readers – Wall, Single-Gang Box,
2. Provide surface mounting style 125 KHz proximity card readers suitable for Wall, US European or Asian Single-Gang Box, Post, or window mullion mounting behind glass using an optional mounting bracket, and for mounting configurations as shown on the project plans.
3. The reader shall be capable of reading access control data in standard Wiegand formats up to 84 bits in length from any HID Proximity card or equivalent, outputting the data in one of the following configurations:
 - a. The card reader shall output credential data in compliance with the SIA AC-01 Wiegand standard, compatible with all standard access control systems.

- b. The card reader shall output credential data using a Clock and Data interface, and be compatible with systems requiring a magnetic stripe reader.
4. The reader shall be capable of outputting a periodic reader supervision message at a configurable time interval, enabling the host system to signal an alarm condition based on the absence of this message.
5. The Proximity card reader shall provide the ability to change operational features in the field through the use of a factory-programmed command card.
6. The reader shall have a configurable hold input, which when asserted shall either buffer a single card read or disable the reader, until the line is released. This input may be used for special applications or with loop detectors.
7. The reader shall require that a card, once read, must be removed from the RF field for one second before it will be read again, to prevent multiple reads from a single card presentation and anti-passback errors.
8. Typical proximity card read range shall be up to 9" using HID Proxcard II card.
9. Proximity card readers shall meet the following environmental specifications:
 - a. Operating temperature: -22 to 150 degrees F (-30 to 65 degrees C)
 - b. Operating humidity: 0% to 95% relative humidity non-condensing
 - c. Weatherized design suitable to withstand harsh environments The reader shall be of potted, polycarbonate material, sealed to a NEMA rating of 4X (IP55).
10. Warranty of Proximity card readers shall be lifetime against defects in materials and workmanship.

2.7 LONG RANGE PROXIMITY CARD READER

A. Features:

1. Provide surface mounting style 125 KHz proximity card readers suitable for Post or Wall mounting, for parking applications, and for mounting configurations as shown on the project plans.
2. The reader shall be capable of reading access control data in standard Wiegand formats up to 84 bits in length from any HID Proximity card or equivalent, outputting the data in one of the following configurations:
 - a. The card reader shall output credential data in a Serial protocol interface, transmitting that data in Hex format, compatible with a host device using an RS-232, RS-422, OR RS-485 serial port.

- b. The card reader shall output credential data in compliance with the SIA AC-01 Wiegand standard, compatible with all standard access control systems.
 - c. The card reader shall output credential data using a Clock and Data interface, and be compatible with systems requiring a magnetic stripe reader.
 3. The reader shall be capable of outputting a periodic reader supervision message at a configurable time interval (via the Wiegand or Clock and Data interface) enabling the host system to signal an alarm condition based on the absence of this message.
 4. The Proximity card reader shall provide the ability to change operational features in the field through the use of a factory-programmed command card or internal DIP switches.
 5. The reader shall have a configurable hold input, which when asserted shall either buffer a single card read or disable the reader, until the line is released. This input may be used for special applications or with loop detectors.
 6. The reader shall have a 4-stage auto-tuning circuit allowing the read range to be maintained within 4 inches of metal.
 7. The reader shall contain an integral tamper switch to provide tamper protection when connected to an external alarm system.
 8. The reader shall require that a card, once read, must be removed from the RF field for one second before it will be read again, to prevent multiple reads from a single card presentation and anti-passback errors.
 9. Typical proximity card read range shall be 18" to 24" using HID Proxcard II card.
 10. Proximity card readers shall meet the following environmental specifications:
 - a. Operating temperature: -22 to 150 degrees F (-30 to 65 degrees C)
 - b. Operating humidity: 5% to 95% relative humidity non-condensing
 - c. Weatherized design suitable to withstand harsh environments The reader shall be of polycarbonate material, and sealed with an O-Ring gasket and waterproof cable fitting to a NEMA rating of 3S (IP54).
 11. Knox Box and Maintenance Key:
 - a. The ingress card reader shall include a Police and Fire Department Knox Box key switch (serialized medco lock and key) with a color blue tag on the card reader housing visible by emergency personnel.
 - b. The ingress and egress card reader shall include a maintenance key switch (cylinder type lock).

12. The existing gate arm at Gate A and F shall be connected to access control system to prevent "piggy-backing" of multiple vehicles into the airport.

2.8 PROXIMITY CARD

- A. 26 bit, Format H10301, 1386 LGGMV type
- B. Provide 400 proximity cards, with either lanyard or belt clip.
- C. The graphics and information printed on the cards will be coordinated with the City.
- D. Meets ISO standards for thickness for use with direct image and thermal transfer printers.
- E. Contractor shall ensure that airport's proximity cards are compatible with the City's and Police Department's existing access control system. The City's system has Facility Code 100 and Police Department's Crime Lab has Facility Code 70.
- F. The purchase of proximity cards should be coordinated with the City to ensure that new cards do not duplicate numbering of existing cards.

2.9 SAFETY PHOTO EYE SENSOR

- A. 90 feet (30 meters) sensing distance for protecting large openings or wide roadways.
- B. Weather-proof to IP-66 standards for indoor and outdoor use.
- C. Mounts flat or at a 90-degree angle to the wall with no need for extra brackets.
- D. Adjustable lens angle.
- E. Transmitter power can be adjusted to match local environment.
- F. Internal terminal block for easy wiring.
- G. Mounting screws included.
- H. Technology: Through-beam photoelectric sensor
- I. Response time: 100ms
- J. Tx power adjust: Low vs. high
- K. Sensing angle adjust: Horizontal +/-5°, vertical +/-5°
- L. Operating temp.: -13°~140°F (-25°~60°C)

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with Section 17050, General Requirements.
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Access Control System

- B. Comply with manufacturer's recommendations, procedures and standards for the assembly and operation of the Access Control System.
- C. Locate and ground all surge protection devices so as to prevent the introduction of surges and spikes into devices, equipment cabinets, cable trays or wiring bundles.

3.2 PROGRAMMING

- A. Coordinate with and obtain approval from CITY for all final operational sequences and monitoring configurations. Make all necessary hardware, software and programming changes and adjustments to meet all requirements and operational intent at no additional cost to the CITY.
- B. Program a minimum of five test cards with different access levels for use in system testing. CITY is responsible for entering the final database information (key cards and users).

3.3 SEQUENCE OF OPERATIONS

- A. Alarms: Two types of alarm signals shall be generated, Door Open Too Long (DOTL) and Door Activity (DA). A DOTL alarm shall cause a signal to be sent to the IP camera system to display the related camera and sound a momentary tone at the display screen. A DA alarm shall cause a signal to display the related camera for a programmable time period initially set for 5 seconds.
- B. Pedestrian Door Operation (Door D1) - Card Reader Landside, Free Egress Exit Airside.
 - 1. A valid card read shall allow access through the door for a programmable time initially set for four seconds and then relock. A Door Activity alarm shall be sent to the IP Camera system
 - 2. A Door Open Too Long alarm shall be generated if the door is unsecured for a programmable time period initially set for 60 seconds.
 - 3. When the door closes the lock shall automatically relock.
 - 4. Locks shall unlock and remain unlocked when the unlock input signal is active.
 - 5. The Airside of the door shall provide free egress through a manual door handle.
- C. Vehicle Gate Operation (Gate A and F) – Card Reader Landside and Airside, Loop Detector Exit Airside.
 - 1. A valid card read shall send a momentarily open signal to the gate operator. The gate operator shall close the gate and anti-tailgate arm when the loop detector closes or times out. A Door Activity alarm shall be sent to the IP Camera system.
 - 2. A Door Open Too Long alarm shall be generated if the gate is unsecured for a programmable time period initially set for 60 seconds.

3. The exit gate shall open via the Airside vehicle exit loop connected directly to the gate operator or a valid card read from the egress card reader.
4. Safety loops or beams shall open the gate when activated and only when the gate is closing.
5. The electric safety photo sensor signal shall reverse a closing gate via direct wiring to the gate operator.

3.4 FIELD QUALITY CONTROL

- A. After installation of the Access Control System, and prior to performance testing, functionally test all locks, DPS, panels, and other hardware interconnections, and all interfaces to other systems.
- B. Performance Testing
 1. Comply with Section 17050, General Requirements for:
 - a. Initial Performance Testing.
 - b. Performance Testing.
 - c. Continuous Operational Test.

3.5 TRAINING

- A. Provide training in accordance with Section 17050, General Requirements.

3.6 MEASUREMENT AND PAYMENT

- A. Measurement and payment for "Long Range Proximity Card Reader on Pedestal with Foundation" will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor including excavation, backfill and concrete necessary to complete the item to be fully operational.
- B. Measurement and payment for "Proximity Card Reader at Door D1" will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor necessary to complete the item to be fully operational.
- C. Measurement and payment for "Free-Exit Handle at Door D1" will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor necessary to complete the item to be fully operational.
- D. Measurement and payment for "Knox Box on Ingress Card Reader" will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor necessary to complete the item to be fully operational.

- E. Measurement and payment for “Maintenance Key on Ingress and Egress Card Reader” will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor necessary to complete the item to be fully operational.
- F. Measurement and payment for “Access Control Module” will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor necessary to complete the item to be fully operational.
- G. Measurement and payment for “Access Control System Software and License” will be made at the contract unit price per lump sum and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor including software installation, troubleshooting, purchasing of software and licenses necessary to complete the item to be fully operational.
- H. Measurement and payment for “Proximity Cards with Lanyard or Clip” will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor including coordination with the City on card numbering and interoperability between the City Yard and Police Department access control system as necessary to complete the item to be fully operational.
- I. Measurement and payment for “Computer Workstation with UPS” will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor, computer setup, configuration, and interface with server necessary to complete the item to be fully operational.
- J. Measurement and payment for “Photo ID Camera with Tripod” will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor to complete the item to be fully operational.
- K. Measurement and payment for “System Printer” will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor to complete the item to be fully operational.
- L. Measurement and payment for “Proximity Card Printer/Encoder, Single Sided with Photo ID Software” will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials, equipment, tools, Photo ID software and for all labor to complete the item to be fully operational.
- M. Measurement and payment for “Disable Core Carder Reader at Gate Y” will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials, equipment, tools and for all labor to complete the item.

Payment will be made under:

17728-1 Long Range Proximity Card Reader on Pedestal with
Foundation—per each

- 17728-2 Proximity Card Reader at Door D1—per each
- 17728-3 Free-Exit Handle at Door D1
- 17728-4 Knox Box on Ingress Card Reader—per each
- 17728-5 Maintenance Key on Ingress and Egress Card Reader—per each
- 17728-6 Access Control Module—per each
- 17728-7 Access Control System Software and License—per lump sum
- 17728-8 Proximity Cards with Lanyard or Clip—per each
- 17728-9 Computer Workstation with UPS—per each
- 17728-10 Photo ID Camera with Tripod—per each
- 17728-11 System Printer—per each
- 17728-12 Proximity Card Printer/Encoder, Single Sided with Photo ID Software—per each
- 17728-13 Disable Core Carder Reader at Gate Y—per each

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SECTION 17782

SECURITY CAMERA SYSTEM

PART 1 GENERAL

1.1 SUMMARY:

A. Section Includes:

1. Cameras and Enclosures.
2. Network Server.
3. Network Server Adapter.
4. Network Storage Devices.
5. Remote Network Switch.

B. Related Sections:

1. Section 17050, General Requirements.
2. Section 17160, Cabinets, Enclosures, and Racks.
3. Section 17728, Access Control System.
4. Section 17892, Wireless Network System.

1.2 REFERENCES:

- A. ANSI/EIA-170, Electrical Performance Standards - Monochrome Television Studio Facilities A("RS-170"): Standards for picture quality.
- B. ANSI/EIA-330, Electrical Performance Standards For Closed Circuit Television Camera 525/60 Interlaced 2:1 ("RS-330"): Standards for Picture quality.

1.3 SYSTEM DESCRIPTION:

A. General Video Surveillance:

1. Indoor and Outdoor Cameras: General video surveillance and recording will be provided in areas including East End Hangar, Tie Down Apron, and Madison Taxi Lane. Provide pre-programmed video sequencing and manual selecting of cameras per City requirements. Cameras with location title and date stamp will be sequentially displayed on their designated sections of monitors in GAC Duty-Officer's Room, Administration Front Desk and Torrance Police Department.

B. Vehicle License Plate Cameras:

1. ALPRs (automatic license plate readers) shall have OCR capability built-in and software to convert license plates to text base information and store vehicle and License plate images. ALPR shall be mounted on a pole as shown on the Plans.
2. After the ALPR captures and translates a license plate, the text information and photo is relayed to the local wireless node at each gate and transmitted to the GAC at the airport. The information will then be sent through to the Police Department via the City's wireless network. It is not anticipated that the GAC will record or track the license plate information. It will be sent to the Police Department, and it will be the responsibility of the police department to utilize the data. The interface with the police department's license plate server and database and is not included in the scope of this project, and will be performed by the City if this function is desired

C. Indoor (Fixed) Camera and Housing: These cameras will provide general video surveillance around the entrance door at the airport. The cameras will provide high resolution color video during the day and high resolution back and white video under low-light conditions. The cameras will be installed indoors with a dome housing.

D. Outdoor (Pan Tilt Zoom) Camera: These cameras will provide general video surveillance around the entrance gates, apron area and hangar areas around the airport. The cameras will provide high resolution color video during the day and high resolution back and white video under low-light conditions. The cameras will be installed in outdoor environmentally-resistant security dome housing. These cameras will include features to pan, tilt and zoom.

E. Network Recording Storage System and Server

1. The City currently uses Milestone System XProtect Corporate (4.1a build 60995) for their camera surveillance system, and this project will provide the same system at the airport to ensure compatibility and reduce IT support and maintenance issues. The Milestone System software provides a central video management interface that allows multiple recording to be managed as one uniform system.
2. The Milestone System will be installed on a new rack mounted server in the IT equipment room located at the GAC within an existing rack. Video data will be recorded on a hard disk drive storage system located with the server, and the video data can be viewed from computers within the GAC, and computers at the Police Department using the Milestone System software via the City's wireless network.
3. Cameras will be monitored both at the GAC and at the Public Safety Communications Center (PSCC) located in the Torrance Police Department building.

4. Users at the GAC, existing networked computers in the Duty Officer Room and Administration Office shall be able to access live and archived videos, with viewing rights dependent on the level of access granted to the user. All recording will be automatically-performed through a digital video recording system and archived at the security equipment room in the GAC. No new equipment shall be required at the PSCC. The police department will utilize existing monitors and computer to access the video data from the airport.
5. Users at PSCC shall be able to log-in to the XProtect VMS and view camera feeds through the City's wireless network system, and remotely manage archived video recorded on the system in the GAC. The camera feeds will not be continuously streamed, but will be on-demand when a user log-in and requests the camera feeds to minimize the use of the wireless network bandwidth.
6. During the time between 12:00 am to 7:00 am, the City's network performs back-up of the servers which utilizes most of the wireless bandwidth. To ensure that the camera video will still be viewable from the PSCC, a "Class of Service" will be setup by the City's IT staff to give priority to the video data.

1.4 SUBMITTALS:

- A. Comply with Section 17050, General Requirements.
- B. Contractor shall submit a detailed Operational Narrative Description of the entire system. Narrative shall include as a minimum the following:
 1. Detailed description of all system components
 2. Detailed description of how system components will be integrated together
 3. Detailed description of how this system will be integrated with the existing City systems including all required cabling, hardware and communications devices, network switching requirements and protocols and addressing schema.
- C. Manufacturer data sheet and specifications for:
 1. Indoor fixed security camera, housings and mounting hardware.
 2. Outdoor PTZ security camera, housings and mounting hardware.
 3. Network computer server including all necessary software.
 4. System equipment and components listed in Section 2.1A.

5. Calculation of required size of storage for Network Video Storage System, and number of required HDD to achieve simultaneous recording from all cameras.

D. Proof of Concept APLR Test Plan.

1.5 QUALITY ASSURANCE:

- A. Comply with Section 17050, General Requirements.
- B. NEC Compliance: Comply with Article 725 (Class 2 Power-limited Circuits).

1.6 EXTRA MATERIALS:

A. Deliver the following spare parts to the City:

1. Not Used.

PART 2 PRODUCTS

2.1 SYSTEM EQUIPMENT AND COMPONENTS:

A. The materials listed below establish the minimum quality and standards that are to be met. Subject to compliance with requirements, provide equipment and components including, but not limited to, the following or approved equal from other manufacturers:

- | | | |
|-----|------------------------------------|---------------------------------------|
| 1. | Indoor (Fixed) Dome IP-Camera | Submit |
| 2. | Outdoor (PTZ) Fixed Dome IP-Camera | Submit |
| 3. | License Plate Camera | Spikelet P-392, PIPS Technology |
| 4. | Network Server | Submit, Dell server |
| 5. | Network Video Storage | Submit, Dell Storage |
| 6. | Network Server Adapter | Cisco WS-C2960S-24PS-L |
| 7. | IT Storage Switch | Dell PowerConnect 6224 – 24 Ports |
| 8. | Rack Mount Monitor and Keyboard | Submit |
| 9. | KVM switch | Avocent AutoView 3200 |
| 10. | Video Management Software | XProtect Corporate, Milestone Systems |
| 11. | External Back-up System | See Section 2.7 |
| 12. | Remote Network Switch (At Gates) | Submit Cisco Brand |

2.2 AUTOMATIC LICENSE PLATE READER:

A. ALPR's shall to be model SPIKELET P-392 by PIPS Technology:

1. Each ALPR shall include 4GB internal memory or secured digital memory that will store the license plate information locally during a wireless outage. Upon wireless communication restoration, cameras shall then transmit the recorded information back to the network video storage.
2. ALPR shall be mounted on a pole as shown on the Plans.
3. ALPR shall include mounting brackets and terminal box and shall be mounted according to manufacturer's recommendations. Contractor shall provide a proof of concept test of the APLR for approval and acceptance by the City before proceeding with the final installation. Submit a APLR proof of concept test plan for approval.
4. The Contractor shall coordinate with the City to provide the data link to the Police Departments operation center. The City will provide the interface with the Police Department's license plate database system.

2.3 INDOOR (FIXED) DOME IP-CAMERAS:

A. Imaging

1. Recording at 1,280 x 960 minimum resolution at 30 frames per second.
2. Focal Length: Coordinate, select, and obtain approval of proper lens size at each camera location to provide desired coverage
3. Zoom: +/- 30x Optical
4. Sensitivity 0.5 lux (Color), 0.04 lux (Black/White)
5. Compression: H.264,/MPEG 4
6. Pan/Tilt: 360 degrees continuous, 92 degree tilt
7. Additional Features:
 - a. Motion detection
 - b. Pre-alarm and post-alarm.
 - c. Camera Edge Storage compatible with VMS.
8. IP 66 environmental and vandal resistant security dome housings on fixed mounts. Small dome housings shall be tinted as to conceal

direction of cameras. Provide all necessary heaters, blowers and weatherproof accessories.

9. Edge storage with 32GB of internal memory or SDHC Class 10 memory to allow cameras to continue recording in the event that the airport's wireless network is not functioning. When the wireless system is restored, the cameras will have the ability to transmit the locally stored video information to the network storage server to final storage.
10. Open Network Video Interface Forum (ONVIF) compatible.

B. Data Transmission

1. TFTP and HTTP Image Transmission Protocols
2. 100Base-T Ethernet Network Interface

C. Electrical

1. Opto-coupled alarm input, Opto-coupled alarm and flash sync output
2. Power over Ethernet (PoE)

D. Environmental

1. Operating Temperature -40°F to +122°F
2. Humidity 0% to 90% (non condensing)

E. Acceptable Products

1. Panasonic
2. Sony
3. Axis

2.4 OUTDOOR (PAN-TILT-ZOOM) DOME IP-CAMERAS:

A. Imaging

1. Recording at 1,280, x 960 minimum resolution at 30 frames per second.
2. Focal Length: Coordinate, select, and obtain approval of proper lens size at each camera location to provide desired coverage
3. Sensitivity 1.0 lux (Color), 0.08 lux (Black/White)
4. Compression: H.264,/MPEG 4
5. Additional Features:

- a. Motion detection
 - b. Pre-alarm and post-alarm.
6. Camera Edge Storage compatible with VMS.
 7. Vandal resistant security dome housings on fixed mounts. Small dome housings shall be tinted as to conceal direction of cameras. Provide all necessary heaters, blowers and weatherproof accessories.
 8. Edge storage with 32GB of internal memory or SDHC Class 10 memory to allow cameras to continue recording in the event that the airport's wireless network is not functioning. When the wireless system is restored, the cameras will have the ability to transmit the locally stored video information to the network storage server to final storage.
 9. Open Network Video Interface Forum (ONVIF) compatible.

B. Data Transmission

1. TFTP and HTTP Image Transmission Protocols
2. 100Base-T Ethernet Network Interface

C. Electrical

1. Opto-coupled alarm input, Opto-coupled alarm and flash sync output
2. Power over Ethernet (PoE)

D. Environmental

1. Operating Temperature -40°F to +122°F
2. Humidity 0% to 90% (non condensing)

E. Acceptable Products

1. Panasonic
2. Sony
3. Axis

2.5 SYSTEM SERVER

A. Network Server

1. Dell type server, 1U rack mount.
2. Intel Xeon Processor, 2.80GHz minimum, 8M Cache

3. 8GB RAM
 4. Windows Server Software Standard Edition
 5. VMware vSphere 5 Enterprise Plus with three (3) years maintenance.
 6. Two (2) 500 GB 7200K RPM SATA hard drive (RAID 1)
 7. DVD-ROM drive
 8. Redundant Power Supply
 9. Sliding Ready Rails with Cable Management Arm
 10. Five (5) years ProSupport 4HR 7x24 Onsite: Non Mission Critical
 11. Appropriate power cables to plug into PDU
- B. Network Server shall have adequate speed and amount of RAM (more than 8GB if recommended by Milestone representative) capable of running all the required software for the server including, video management system, access control system, and software required by the City for general server management and backup.
- C. Server shall be capable to processing up to (15) security cameras at 1,280x960 resolution at 30 fps plus an additional (5) cameras in the future with no bottlenecking in performance.
- D. Server Network Adapter capable of receiving and sending data for the security camera system at the airport with no bottlenecking in recording performance including access of live and archived video streams from GAC or Police Department simultaneously.
- E. Provide KVM switch and rack mounted 21 inch LCD monitor and keyboard on a 1U slide tray at the Video Rack for the server.
- F. Five (5) year warranty for the network server.
- G. Server shall be connected and configured with the existing UPS with the IT equipment room.
- H. All new equipment must fit within the available existing floor mounted rack space in the Administration – Security Closet (aka GAC equipment room).

2.6 SERVER NETWORK ADAPTOR

- A. Server network adaptor shall be type Cisco WS-C2960S-24PS-L.
- B. Redundant power supply and any required accessory kits or cables.
- C. Five (5) year extended warranty.

2.7 IT STORAGE SWITCH

- A. IT storage switch shall be type Dell PowerConnect 6224 – 24 ports.
- B. Redundant power supply and any required accessory kits or cables.
- C. three (3) year extended warranty.

2.8 NETWORK VIDEO STORAGE

- A. The Contractor shall provide a Dell type storage system using a NAS configuration, 2U rack mount.
- B. Video storage in RAID 5 configuration with capacity for thirteen (13) months of storage with image resolution at 4CIF at 5 frames per second for (15) security cameras recording 8 hours per day at medium image quality.
- C. Rated high reliability hard disk drives with adequate number of HDD capable of allowing simultaneous recording of (15) security cameras at 1,280x960 resolution at 30 fps with no bottlenecking in performance including access of archived video from the GAC or Police Department
- D. RAID units shall be designed with hot-swappable disk drives and dual-redundant power supplies.
- E. Five (5) year warranty for the storage system.
- F. Network storage system shall be connected and configured with the existing UPS with the IT equipment room.
- G. All new equipment must fit within the available existing floor mounted rack space in the Administration – Security Closet (aka GAC equipment room).

2.9 BACK-UP OF VMS AND ACCESS CONTROL

- A. The VMS and AMAG (ACS) shall be backed up using a USB interface connected to the physical server.
 - 1. For the VMS server will use Windows Backup.
 - 2. For the AMAG will use VEEAM
- B. One-dual port USB 3.0 interface card.
- C. Two 4TB USB 3.0 external drives,
- D. Two (one per CPU) VEEAM Backup & Replication v6.5 Enterprise Edition for VMware License.

2.10 VIDEO MANAGEMENT SYSTEM

A. VIDEO MOTION AND TAMPER DETECTION

1. The video management system shall provide a video motion detection function that detects movement in the camera's field of view to trigger an alarm indication. The field of view of each camera shall be configurable to provide video motion detection. Each video display shall be segmented into sensor fields and each sensor may be individually activated or deactivated to sense motion. The number of sensors that a moving object must cover to generate an alarm shall be selectable in order to prevent objects that are too small from triggering an alarm.
2. The video management system shall provide a function that detects the tampering of the connected fixed cameras and their respective video cables. Repositioning or removing the camera, or, manipulating the camera mount shall create an alarm. The tamper function shall be independent from the video motion detection operation. A percentage of sensor fields may be defined that must simultaneously register a change before an alarm is generated. The sensitivity of the tamper detection shall be adjustable for the ambient conditions to which the camera is subjected using an algorithm that reacts to differences between a reference frame and the current video image. The unit may be configured to create an alarm if the picture is too bright or too dark. Also, an alarm may be generated if the tampering is associated with electrical noise interference near the camera. To avoid false alarms caused by short-term changes in the field of view, the encoder shall provide a delayed alarm trigger where an alarm is triggered only after a set time interval in seconds has elapsed and only if the triggering condition still exists.

B. INTELLIGENT VIDEO MOTION DETECTION

1. The manufacturer shall offer an optional intelligent video motion detector (IVMD) for indoor or outdoor use. The intelligent motion detector shall use a software algorithm to detect movement of objects within the field of view of a video camera and, in turn, generate an alarm event. The detector shall use advanced video content analysis to reliably detect moving objects while suppressing unwanted alarms from spurious sources in the field of view. The unit shall adapt automatically to changing environmental conditions and is non-sensitive to influences such as rain and tree movement.
2. Configuration Manager shall be provided as part of the product to allow setup of the sensitive areas that will detect and analyze motion. Objects shall be filtered according to their properties, and only objects that match all filter criteria shall trigger an alarm. A graphical display shall indicate the sensitive areas of the image, the minimum object size, and the motion direction that will trigger an alarm. Once movement has been

detected, the object shall be outlined and tracked on the monitor display screen.

C. OPERATIONAL REQUIREMENTS

1. Users at the GAC, using network computer terminals in the Duty Officer Room and Administration Office shall be able to access live and archived videos with viewing rights dependent on the level of access granted to the user.
2. The police department communications center shall be will be able to access live and archived videos with viewing rights dependent on the level of access granted to the user.
 - a. System Workstations provided with the VMS software shall be capable receiving live images from the specified camera, controlling P/T/Z cameras, and replaying stored video sequences from the VMS local RAM memory or network video storage server.

D. ALARM REQUIREMENTS

1. An alarm input shall be available for each video input of the specified in the VMS. The alarm inputs shall accept external alarm devices such as door contacts or sensors. An alarm device shall be able to trigger the VMS and automatically establish a connection with a predefined IP address of a remote station.
2. The VMS shall provide a relay output for each video input to allow activation of external devices such as lights or sirens. Relay outputs may be configured to either remain in the activated state or to return to the idle state after a predetermined time has expired. Relays may also be triggered manually.
3. The VMS shall provide video loss detection that triggers an alarm upon the interruption of any of the video signals.
4. The VMS shall provide an alarm signal in the event of tampering with the connected cameras.
5. For remote sites that do not have a video receiver (decoder) an e-mail message with JPEG images attached may be sent as an alarm notification. A 31 character text message may be displayed on an alarm. Images may also be watermarked on an alarm. Alarm e-mail messages may be sent in either of the following ways:
 - a. Standard e-mail with JPEG image attachment.

- b. E-mail in SMS (Short Message Service) format to an e-mail to SMS gateway with no attachment. This method allows an alarm to be sent by cell phone.
6. The encoder shall provide a delayed alarm triggering function that triggers an alarm only after a set time interval in seconds has elapsed and only if the triggering condition still exists. This function avoids false alarms triggered by short-term changes.
7. Each camera input shall have a unique, programmable identification label that may be displayed at the receiver location in the event of an alarm.

E. Alarm Recording

1. The VMS shall be capable of recording both pre-alarm and post alarm video.
2. An Event Recording mode shall start recording only via an alarm condition from a VMS. Alarms from the VMS may be generated by external alarm contact inputs, motion detection, video loss, or low video contrast of the input camera video. The requirements are to record 3 minutes before and 3 minutes after the detection of motion.

2.11 REMOTE NETWORK SWITCH

A. Features and Specifications:

1. If security cameras will be powered through PoE, the switch shall be capable of standard IEEE 802.3af or IEEE802.3at, or provide separate PoE injector as required.
2. Switch shall have a minimum of 4 ports 10/100/1000 Mbps.
3. Switch shall be Cisco brand and submitted to the Engineer for approval by the City's IT staff.

B. Acceptable Products

1. Cisco

2.12 SOURCE QUALITY CONTROL:

- A. Comply with Section 17050, General Requirements.

PART 3 EXECUTION

3.1 INSTALLATION:

- A. Comply with Section 17050, General Requirements.

- B. Comply with manufacturer's recommendations, procedures, and standards for the assembly and operation of the system.
- C. Use screw type terminals and crimped lugs for camera power cable terminations.
- D. Locate and ground all surge protection devices so as to prevent the introduction of surges and spikes into devices, equipment cabinets, cable trays or wiring bundles.
- E. Use wiring management to route neatly loose cables.
- F. Do not drill, attach, or deform counter/desk tops without prior coordination and approval from the City.
- G. Mount individual components to removable rear panels in wall-mounted cabinets using DIN rails, snap track or stand off-mounted PC boards, or properly sized mounting hardware.
- H. Fuses: Provide over-current protection for control relay outputs and associated wiring.
- I. Power Distribution:
 - 1. Hardwire each system power supply circuit to a line voltage transient voltage surge suppresser at its point of supply.
 - 2. Coordinate with the electrical contractor for power capacities and circuit assignments in the electrical panel schedules and drawings for the security power supplying the IP Camera system equipment. Notify the City if additional power or circuits may be required.

3.2 COORDINATION:

- A. Coordinate with and obtain City's approval for the following items or tasks. Make all necessary modifications and changes from the design documents at no additional cost to the City:
 - 1. Camera housing types and dome finishes (clear, tinted, etc).
 - 2. Exact mounting locations of all cameras and camera field of view at all locations.
 - 3. Exact location and configuration of network storage devices and server configuration.
 - 4. Camera numbers, titles, sequencing, event alarming, and controls.
 - 5. All digital recording parameters, features, and functions.

3.3 PROGRAMMING:

- A. Prior to system programming, meet with the City to determine all programming requirements. Program requirements shall include, but not be limited to: Determining camera views, screen configuration, camera titles, video motion detection, sequencing and controls.
- B. Prepare and submit an operational sequence narrative including all programming functions and features for City's approval. A copy of the manufacturer's product programming manual will not be acceptable.
- C. Program system as approved. Meet with the City and review the entire system operation and all recording functions. Make all program adjustments as requested at no additional cost to the City.

3.4 SEQUENCE OF OPERATIONS

- A. General: There shall be three modes of operation, a normal, manual, and alarm mode. Within the alarm mode there are two types of alarms that may be received from the access control system. These alarms include a Door Open Too Long (DOTL) or a Door Activity (DA) alarm.

B. Communication Center Sequence:

- 1. Normal mode:
 - a. Sequence through all cameras with a dwell time set to 3 seconds.
- 2. Alarm mode:
 - a. DA Alarm:
 - 1) Display the corresponding camera for the indicated alarms sequentially as they are received by the access control system for a dwell time of 6 seconds. Display, alphanumerically, on the monitor, the location of the camera.
 - 2) For simultaneous DA alarms reduce the dwell time to 2 seconds. Display, alphanumerically, on the monitor, the location of the camera.
 - 3) Return to Normal mode once alarm dwell time has ended.
 - b. DOTL Alarm:
 - 1) Display the corresponding camera for the indicated alarms sequentially as they are received by the access control system for a dwell time of 5 seconds. Display,

alphanumerically, on the monitor, the location of the camera as well as the corresponding alarm type. A DOTL alarm shall have priority over a DA alarm.

- 2) For simultaneous DOTL alarms reduce the dwell time to 2 seconds. Display, alphanumerically, on the monitor, the location of the camera as well as the corresponding alarm type.
- 3) Return to Normal mode once alarm dwell time has ended.

3. Manual Mode

- a. Manual mode shall have priority over all other modes.

C. General Aviation Center (GAC) Operations Sequence:

1. Normal mode:

- a. Continually display 16 camera windows on computer workstation monitor.

2. Alarm mode:

a. DA Alarm

- 1) Display, on full screen alphanumerically, on the monitor, the location of the camera for a dwell time of 6 seconds.
- 2) Return to Normal mode once alarm dwell time has ended.

b. DOTL Alarm

- 1) Display, on full screen, the corresponding camera for the indicated alarm for a dwell time of 10 seconds. Display, alphanumerically, on the monitor, the location of the camera as well as the corresponding alarm type.
- 2) For simultaneous DOTL alarms, display on the monitor only the corresponding cameras for a dwell time of 2 seconds. Display, alphanumerically, on the monitor, the location of the camera as well as the corresponding alarm type.
- 3) Return to Normal mode once alarm dwell time has ended.

c. Manual Mode

- 1) Display, on screen, cameras as selected by the keyboard.

d. PTZ Auto Homing

- 1) Auto home and zoom on gate when related alarm is received.

3.5 FIELD QUALITY CONTROL:

A. After installation of the video surveillance system, and prior to performance testing, functionally test all cameras, video equipment, and other hardware interconnections. In addition, conduct the following adjustments and measurements:

1. Field-of-View Testing: After camera and lens installation, and with IP camera consoles installed, demonstrate the field-of-view of each camera/lens combination to the City. Adjust lens type and/or adjust camera positioning as needed to obtain the City's desired field-of-view at no additional cost.
2. Network Performance: Test performance of network reliability and speed using full camera resolution at maximum frames per second from all security cameras and access of live and archive video streams from the GAC and police department.
3. Server Performance: Run all required services programs & evaluation of the CPU utilization including processing of full camera resolution at maximum frames per second from all security cameras and access of live and archive video streams from the GAC and police department.
4. Back-up Data Performance: Test acceptable of external back-up system.

B. Performance Testing

1. Comply with Section 17050, General Requirements for:
 - a. Initial Performance Testing.
 - b. Performance Testing.
 - 1) Demonstrate proper view, adjustment, switching, sequencing, alarming, auto-positioning, recording, and system performance for all camera locations with all required sequences of operation under all operating modes. Where required, demonstrate proper interface with all other security electronic systems.
 - c. Continuous Operational Test.

3.6 TRAINING:

A. Provide training in accordance with Section 17050.

3.7 MEASUREMENT AND PAYMENT:

- A. Measurement and payment for "Outdoor PTZ Security Camera in Vandal Resistant Housing" will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor including necessary to complete the item to be fully operational.
- B. Measurement and payment for "Indoor Fixed Security Camera in Vandal Resistant Housing" will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor necessary to complete the item to be fully operational.
- C. Measurement and payment for "Video Management System Software and Camera License" will be made at the contract unit price per lump sum and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor including software installation, troubleshooting, purchasing of software license necessary to complete the item to be fully operational.
- D. Measurement and payment for "Remote Network Switch – 4 Port" will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor necessary to complete the item to be fully operational.
- E. Measurement and payment for "Automatic License Plate Reader Camera Including Bracket and Termination Box" will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor necessary to complete the item to be fully operational.
- F. Measurement and payment for "1U Server Including Software" will be made at the contract unit price per lump sum and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor including software installation, setup for local and remote log-in to view video information, troubleshooting, purchasing of software and licenses necessary to complete the item to be fully operational.
- G. Measurement and payment for "Server Network Adapter – 24 Port" will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor necessary to complete the item to be fully operational.
- H. Measurement and payment for "IT Storage Switch – 24 Port" will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor necessary to complete the item to be fully operational.
- I. Measurement and payment for "2U Video Storage System" will be made at the contract unit price per lump sum and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor including software installation,

setup for local and remote log-in to view video information, troubleshooting, purchasing of software and licenses necessary to complete the item to be fully operational.

- J. Measurement and payment for "1U Rack mount Monitor and Keyboard" will be made at the contract unit price per lump sum and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor necessary to complete the item to be fully operational.
- K. Measurement and payment for "KVM Switch" will be made at the contract unit price per lump sum and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor necessary to complete the item to be fully operational.
- L. Measurement and payment for "External Back-up System" will be made at the contract unit price per lump sum and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor including software installation, computer setup, configuration, and interface with server, troubleshooting, purchasing of software and licenses necessary to complete the item to be fully operational.

Payment will be made under:

17782-1	Outdoor PTZ Security Camera in Vandal Resistant Housing—per each
17782-2	Indoor Fixed Security Camera in Vandal Resistant Housing—per each
17782-3	Video Management System Software and Camera License—per lump sum
17782-4	Remote Network Switch – 4 Port—per each
17782-5	Automatic License Plate Reader Camera Including Bracket and Termination Box—per each
17782-6	1U Server Including Software—per lump sum
17782-7	Server Network Adapter – 24 Port —per each
17782-8	IT Storage Switch – 24 Port —per each
17782-9	2U Video Storage System—per lump sum
17782-10	1U Rackmount Monitor and Keyboard—per lump sum
17782-11	KVM Switch—per each
17782-12	External Back-up System—per lump sum

END OF SECTION

SECTION 17892

WIRELESS NETWORK SYSTEM

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Indoor Mesh Nodes
2. Outdoor Mesh Nodes
3. Mesh Management Software
4. High Gain Antennas
5. Switches
6. Connection to other Networks

B. Related Sections

1. Section 17050 General Requirements
2. Section 17160 Cabinets, Enclosures and Racks
3. Section 17728 Access Control System
4. Section 17782 Security Camera System

1.2 SYSTEM DESCRIPTION

- A. For each security camera, automatic license plate reader and access card reader provide off the shelf a commercial shared self-forming wireless mesh network that provides broadband video and data communications on a licensed public safety frequency spectrum. The system is to provide wireless communication throughout the site to all Nodes as specified and shown on the drawings.
- B. The outdoor wireless node shall be enclosed in a weather tight NEMA 4X enclosure.
- C. The wireless nodes will be capability of transmitting the full resolution and maximum frames per second (i.e. 1,280x960 at 30 fps with H.264 compression) of the security camera, including PTZ controls, the data from the access control system and automatic license plate reader and redundancy needed for mesh nodes systems.

1.3 REGULATORY REQUIREMENTS

- A. FCC Part 15

1.4 SUBMITTALS:

- A. Comply with Section 17050, General Requirements.
- B. Submit detailed System Design Report that includes as a minimum:
 - 1. Scaled site plan with location of all wireless nodes shown
 - 2. Proposed wireless link frequencies, communications speeds, protocols and primary and secondary network connection details
 - 3. Wireless node mounting details

1.5 QUALITY ASSURANCE

- A. Comply with Section 17050, General Requirements.
- B. NEC Compliance: Comply with Article 725 (Class 2 Power-limited Circuits).

1.6 EXTRA MATERIALS

- A. Deliver the following spare parts to the CITY:
 - 1. Not used.

PART 2 PRODUCTS

2.1 SYSTEM EQUIPMENT AND COMPONENTS

- A. The materials listed below establish the minimum quality and standards that are to be met. Subject to compliance with requirements, provide equipment and components including, but not limited to, the following or approved equal from other manufacturers:
 - 1. Outdoor Mesh Node.....Firetide Hotport 7020-FIPS
 - 2. Mesh Management SoftwareFiretide HotView Pro
 - 3. Omni Directional AntennaFiretide band specific
 - 4. Directional AntennaFiretide band specific

2.2 OUTDOOR MESH NODE

- A. The outdoor mesh Node shall be enclosed in a weather tight cast aluminum NEMA-4X enclosure with weatherproof power and Ethernet connectors with removable sunshield and bracket for wall or pole mounting. Minimal operational temperatures shall be -22 C to +55 C.
- B. The Node shall have six dualband 2.4 GHz and 5GHz, 3dBi omni directional antennas.
- C. The Node shall have three GigE10/100/1000 Mbps Ethernet ports that are IEEE 802.3u compliant with CSMA/CD 10/100/1000 autosense.

- D. The Node shall be Power over Ethernet (PoE) capable and PoE device loadable.
- E. The Node shall be capable of operating on the 4.9 and 5 GHz band.
- F. The Node shall have WPA/WPA2 encryption, 128 bit/ 256 bit end to end AES encryption key capability and FIPS 140-2.
- G. The Node shall upon power up automatically discover, communicate and incorporate other Nodes to provide multiple, redundant communication paths to maximize signal and minimize data hopping (repeated signals) between Nodes. Manually programmed Node data paths shall override automatic paths.

2.3 MESH MANAGEMENT SOFTWARE

- A. Provide network management software for mesh configuration as provided by the manufacturer of the equipment provided.

2.4 ANTENNAS

- A. Provide antennas compatible with the frequency bands used.
- B. Provide omni or directional antennas as required for system performance with no less than 30 dB signal loss.

2.5 SOURCE QUALITY CONTROL

- A. Comply with Section 17050, General Requirements.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Comply with Section 17050, General Requirements.
- B. Comply with manufacturer's recommendations, procedures, and standards for the assembly and operation of the system.
- C. Comply with all applicable codes.
- D. Comply with grounding wireless specifications.

3.2 RF SURVEY

- A. Contractor shall perform spectrum analysis at each proposed wireless node location and submit results of frequencies discovered to assist CITY in selection of preferred band.

3.3 COORDINATION

- A. Coordinate with and obtain CITY's approval for the following items or tasks. Make all necessary modifications and changes from the design documents at no additional cost to the City of Torrance to incorporate the following interfaces:
 - 1. General Aviation Center (GAC) LAN: Coordinate with the City the requirements for interfacing and connecting to the GAC LAN for interface with the Network Video Storage System.
 - 2. Torrance Police Data Link: Coordinate with the City and Torrance Police Department the requirements for interfacing and connecting to the data link between the Torrance Police communication center and the GAC.

The data link is to be provided by the City or City to provide the communication path for the display and control of the IP camera system.

3. Torrance Police Communication Center LAN: Coordinate with the CITY and Torrance Police Department for the requirements for interfacing and connecting to the Torrance Police communication center LAN for interface with the Network Video Storage System and IP camera system.
- 4.
- B. If required, prepare all section of the FCC license application related to the work of this contract and turn over to the City. Provide any additional information or action requested by the City or FCC to complete the FCC application process.

- 1.

3.4 PROGRAMMING

- A. Prior to system programming, meet with the City to determine all programming requirements. Program requirements shall include, but not be limited to: Encryption preference, operational band preference, network interfacing requirements for system connections, IP addressing, router programming, and information exchange requirements.
- B. Program system to minimize data hopping between Nodes with preset primary and backup Node paths.
- C. Program system as required and approved. Meet with and review the entire system operation and all recording functions with the City of Torrance. Made all program adjustments as requested at no additional cost to the City.

3.5 FIELD QUALITY CONTROL

- A. Performance Testing
 1. Comply with Section 17050, General Requirements for:
 - a. Initial Performance Testing.
 - b. Performance Testing.
 - c. Continuous Operational Test.

3.6 TRAINING

- A. Provide training in accordance with Section 17050

3.7 MEASUREMENT AND PAYMENT

A. Measurement and payment for "Outdoor Wireless Mesh Node" will be made at the contract unit price per each and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor including necessary to complete the item to be fully operational.

B. Measurement and payment for “Wireless Node Management Software” will be made at the contract unit price per lump sum and the price shall be full compensation for furnishing and installing all materials, equipment, tools, and for all labor including software installation, troubleshooting, purchasing of software license necessary to complete the item to be fully operational.

C. Measurement and payment for “Additional Wireless Mesh Node” shall be at the cost of labor and materials associated for additional wireless node equipment based on the RF Survey to provide a reliable wireless signal to the GAC building. Payment shall not exceed the amount of the allowance in this Bid Item. Any and all unused portions of the allowance will not be paid to the Contractor.

Payment will be made under:

- 17892-1 Outdoor Wireless Mesh Node—per each
- 17892-2 Wireless Node Management Software-per lump sum
- 17892-3 Additional Wireless Mesh Node-per allowance

END OF SECTION

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APPENDICES

APPENDIX I

CITY OF TORRANCE PERMIT AND BUSINESS LICENSE



City of Torrance, Community Development Department

Permit Application Form

3031 TORRANCE BLVD. • TORRANCE, CA 90503

OWNER/APPLICANT INFORMATION

Name: _____

Address: _____

City/State: _____

Zip: _____

Phone: _____

Evacuation permits will not be issued without USA I.D. number.

Underground Service Alert

Call 1-800/227-2600

USA I.D. #: _____

CONTRACTOR INFORMATION ON FILE

State License #: _____

Class: _____ Exp. Date: _____

City Business #: _____

Workers Comp. #: _____

Exp. Date: _____

JOB LOCATION/ADDRESS

(or closest street address)

Please list cross streets: _____

DESCRIPTION OF WORK

Lin/Ft Trench _____

Width of Trench _____

Lin/Ft Curb & Gutter _____

Lin/Ft Bore _____

Sewer Connection _____

Number of Curb Drains _____

Sq/Ft Asphalt _____

Sq/Ft Concrete _____

Sq/Ft Dirt _____

Work Order Number *(for utility companies)*: _____

Applicant or Authorized Signature: _____

For further permit information, please call 310/618-5898 or Fax 310/618-2846.

Please call the Business License Office at 310-618-5923 for fee amounts. Payment must be submitted with your application.



City of Torrance, Revenue Division
Business License Application

3031 Torrance Boulevard, Torrance, California 90503 • 310/618-5828

FOR OFFICIAL USE ONLY

1. LICENSE NO. _____
 2. CATEGORY NO. _____
 HEALTH PERMIT _____ S.I.C. CODE _____

PART I. APPLICANT TO ANSWER ALL QUESTIONS IN THIS SECTION (print or type)

3. BUSINESS NAME OR DBA _____ 4. CORPORATE NAME (IF DIFFERENT FROM ABOVE) _____

5. BUSINESS ADDRESS _____ SUITE # _____ CITY _____ STATE _____ ZIP _____

6. MAILING ADDRESS _____ SUITE # _____ CITY _____ STATE _____ ZIP _____

7. NATURE OF BUSINESS (state type of business being conducted at this location) _____ 8. NO. OF PERSONS WORKING AT LOCATION _____ 9. BUSINESS PHONE _____

10. NAME OF PERSON MAKING APPLICATION (must be an owner, partner or corporate officer) _____ 11. TITLE _____ 12. HOME PHONE _____

13. RESIDENCE ADDRESS _____ CITY _____ STATE _____ ZIP _____ 14. DRIVER'S LICENSE NO. _____ 15. STATE SALES TAX NO. _____

16. STATE CONTRACTOR'S LICENSE NO. _____ 17. SQUARE FOOTAGE _____ 18. SOCIAL SECURITY NO. _____ 19. FED. ID# _____ 20. STATE ID# _____

21. OWNERSHIP INFORMATION

PARTNERSHIP CORPORATION SOLE OWNERSHIP

NAMES OF OWNER, PARTNERS, OR PRINCIPAL OFFICERS _____ TITLE _____ HOME ADDRESS _____ HOME PHONE _____

I declare that I am the owner, partner, corporate officer or person with the power of attorney, and I understand if all the information provided above is not the true the business license being applied for may be revoked as outlined in section 31.9.10 of the Torrance Municipal Code.

I am duly authorized to make this application. All of the information provided in this application is true and correct. The business will not provide any service, good or product which is illegal under Federal, State, or Local Laws. I declare under penalty of perjury that the foregoing is true and correct.

SIGNATURE _____ DATE _____

PART II. FOR OFFICIAL USE ONLY

BASIC FEE _____ APPLICATION SENT FOR ZONING? YES NO _____ PROCESSING FEE _____ FIRE INSP. FEE _____ OTHER _____

PER PERSON FEE _____ OTHER (cont'd) _____

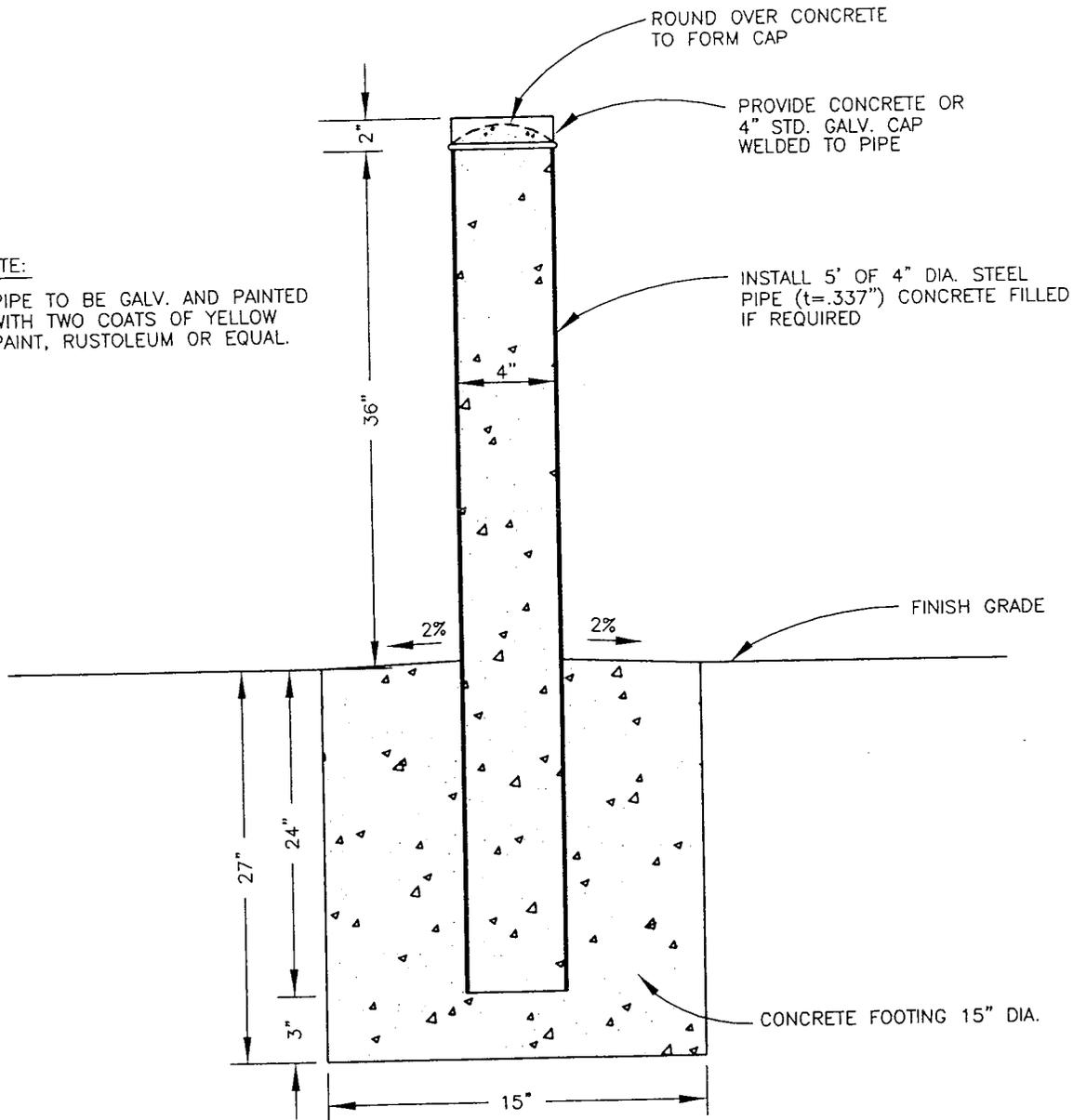
PENALTY FEE _____ HOLD _____ ENT. FEE _____ DANCE/PIANO FEE _____

RECEIVED BY _____ DATE _____ CHECK NO. _____ BANK NO. _____ CASH _____ TOTAL AMOUNT \$ _____

APPENDIX II
CITY OF TORRANCE STANDARD DRAWINGS

NOTE:

PIPE TO BE GALV. AND PAINTED WITH TWO COATS OF YELLOW PAINT, RUSTOLEUM OR EQUAL.



**PERMANENT BARRIER POST
(BOLLARD)**

NOT TO SCALE

CITY OF TORRANCE - ENGINEERING DEPARTMENT

DATE ISSUED

16 NOV 1998

PERMANENT BARRIER POST

RICHARD W. BURTT
ENGINEERING DIRECTOR
R.C.E. NO. 32862

STANDARD NO.

T501-1

SHEET 1 OF 1

DV/JT/T501-1

APPENDIX III

CONSTRUCTION AND DEMOLITION DEBRIS RECYCLING SUMMARY

CONSTRUCTION AND DEMOLITION DEBRIS RECYCLING SUMMARY

Project Type: Roadway and/or Bridge/Structure Water/Sewer
 Traffic Signal/Street Lighting Other _____

Project Name: _____ Date: _____

City Contract No. _____

Project Location: _____

Thomas Guide Page/Grid No(s): _____

Contractor Name: _____

Contractor Address: _____

Contractor License #: _____

Project Duration: From: _____ To: _____

Demolition and Recycling Cost: \$ _____

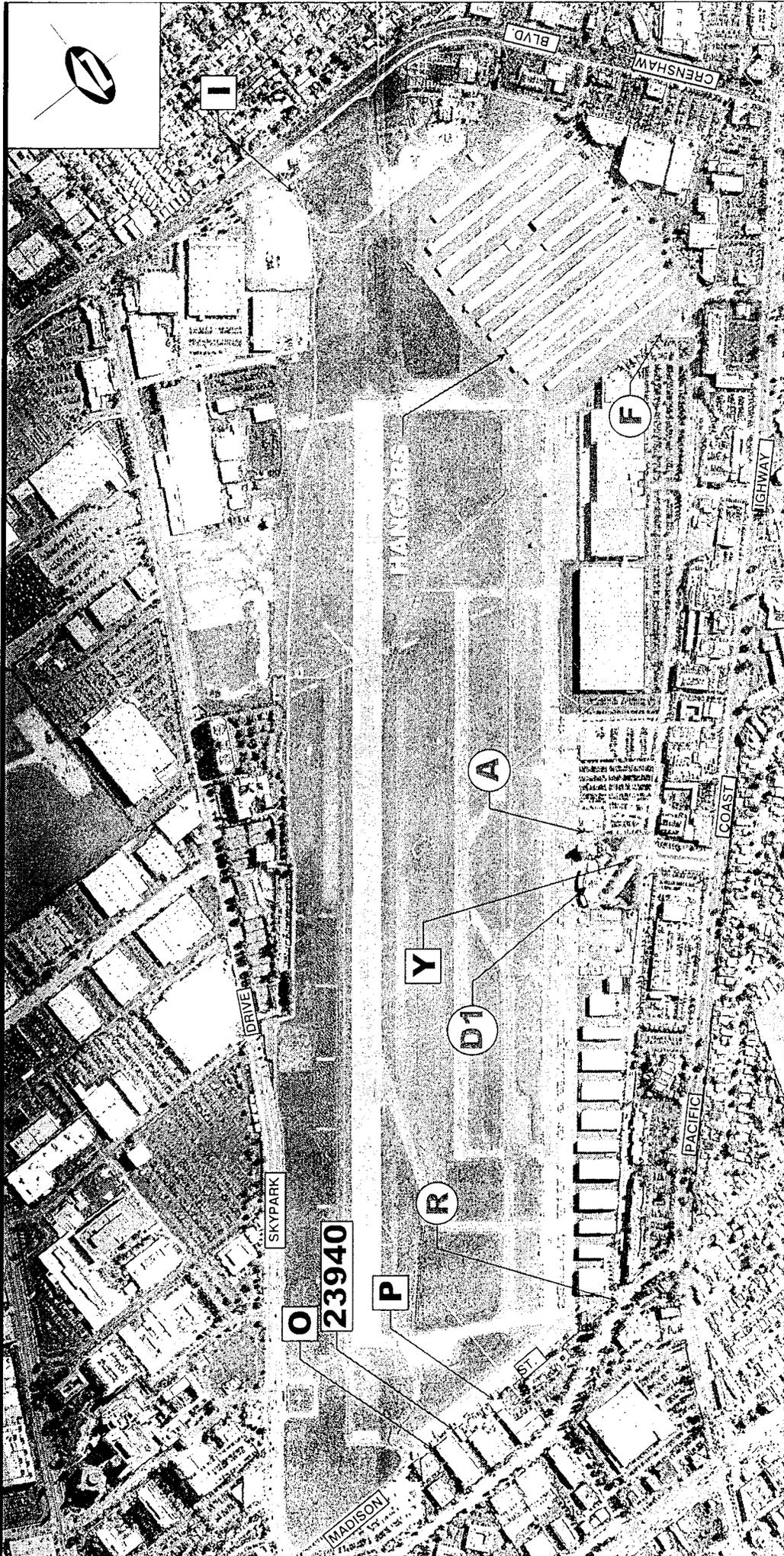
Type(s) of Debris Generated	Total Quantity Generated (tons, c.y. or units)	Reuse /Recycling		Disposal	
		Total Quantity (tons, c.y. or units)	Name of Reuse/Recycling Facility/Site	Total Quantity (tons, c.y. or units)	Name of Disposal Facility
Asphalt					
Brick					
Concrete					
Green Waste					
Metal (ferrous)					
Metal (non-ferrous)					
Mixed Debris					
Rock					
Soil					
Wood Waste					
Other:					
Total					

Notes:

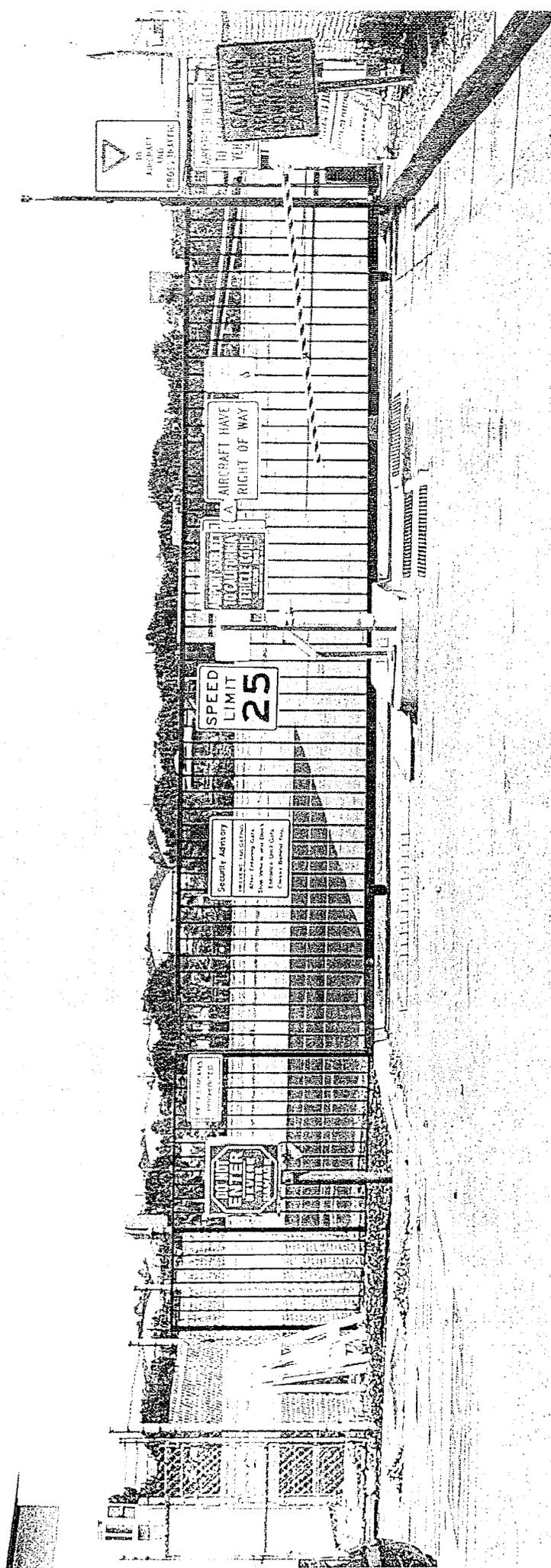
- Other debris types may include, but are not limited to, Ash, Cardboard, Carpeting, Glass, Gravel, Land Clearing Debris, Non-friable Asbestos, Paper, Plastic, Porcelain, Roofing Material, Sand, and Tires. Attach additional sheets if necessary.
- If the debris is taken to a transfer station solely for the purpose of reuse/recycling, then list the transfer station as the reuse/recycling facility/site.
- If the debris is taken to a transfer station solely for the purpose of transfer to a disposal facility, then list the transfer station as the disposal facility.

Prepared by _____ Signature _____ Phone #: _____

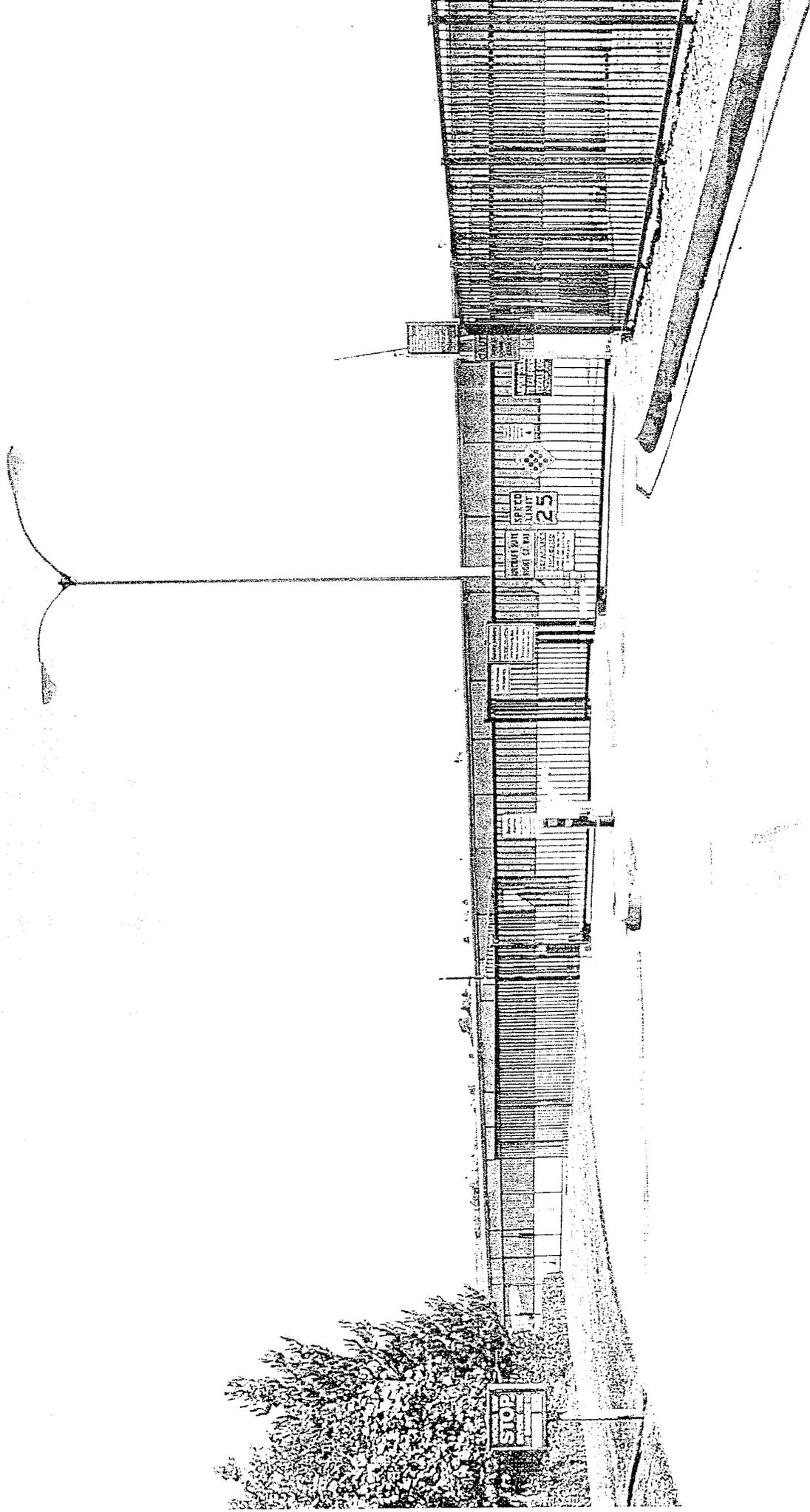
APPENDIX IV
PROJECT PHOTOS



GATE LOCATIONS

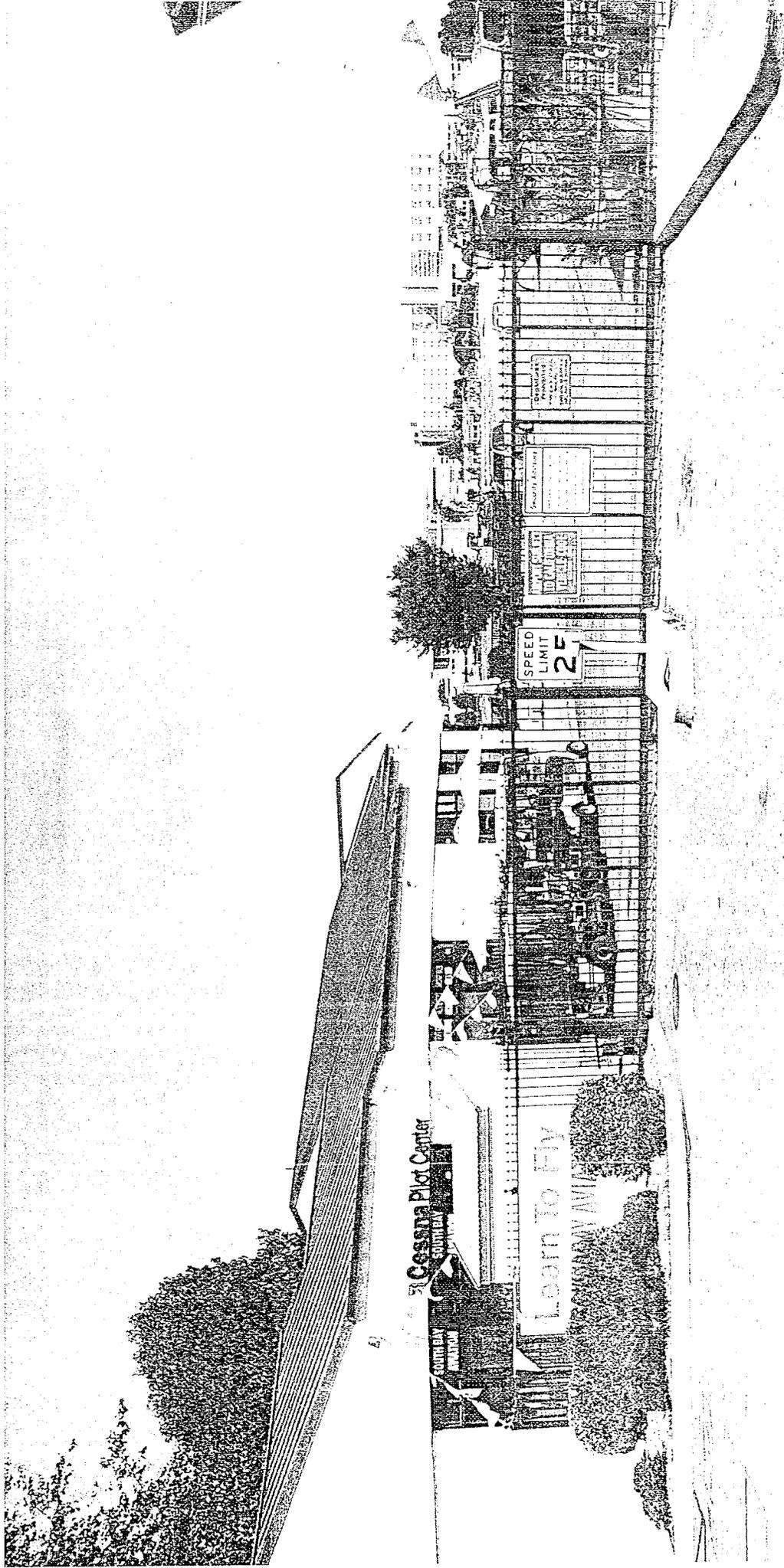


Gate A

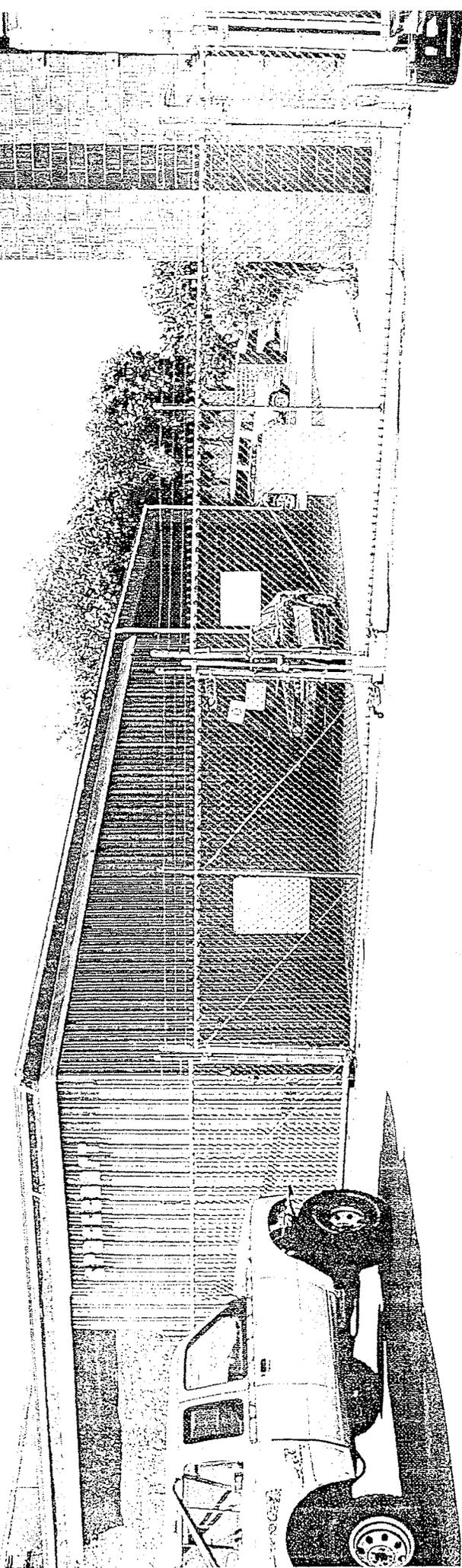


Gate F

OUT 1 2019

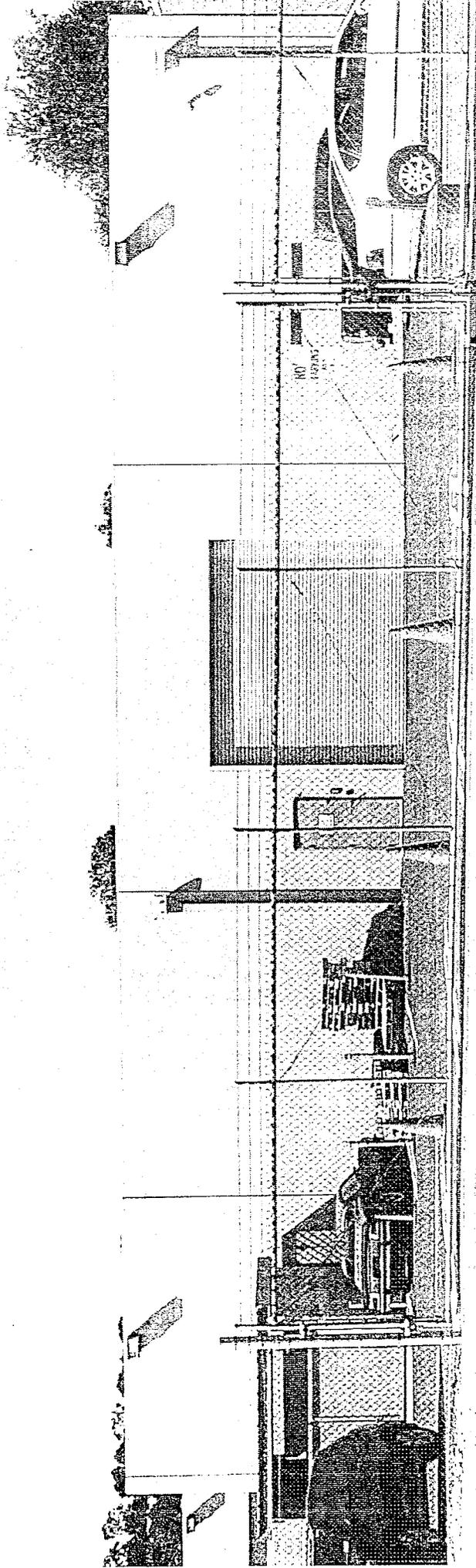


Gate R

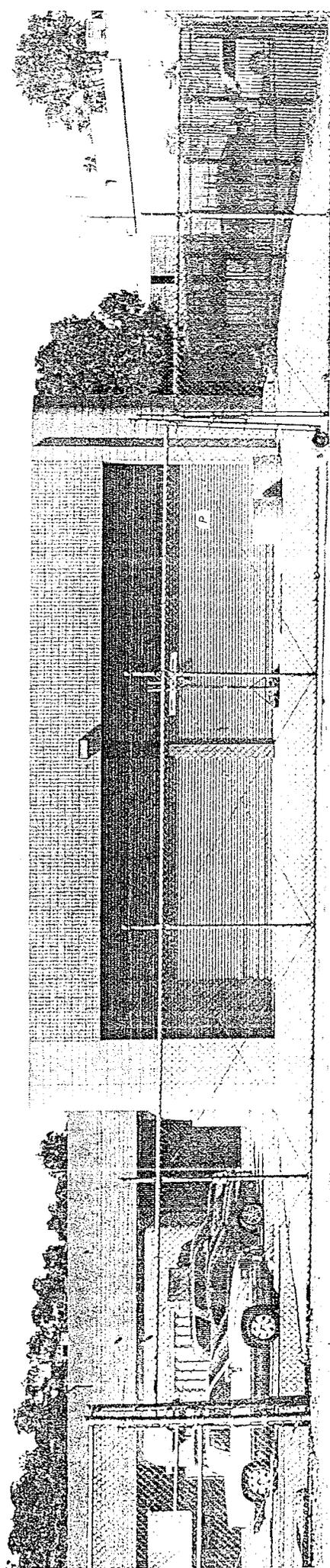


Gate 0

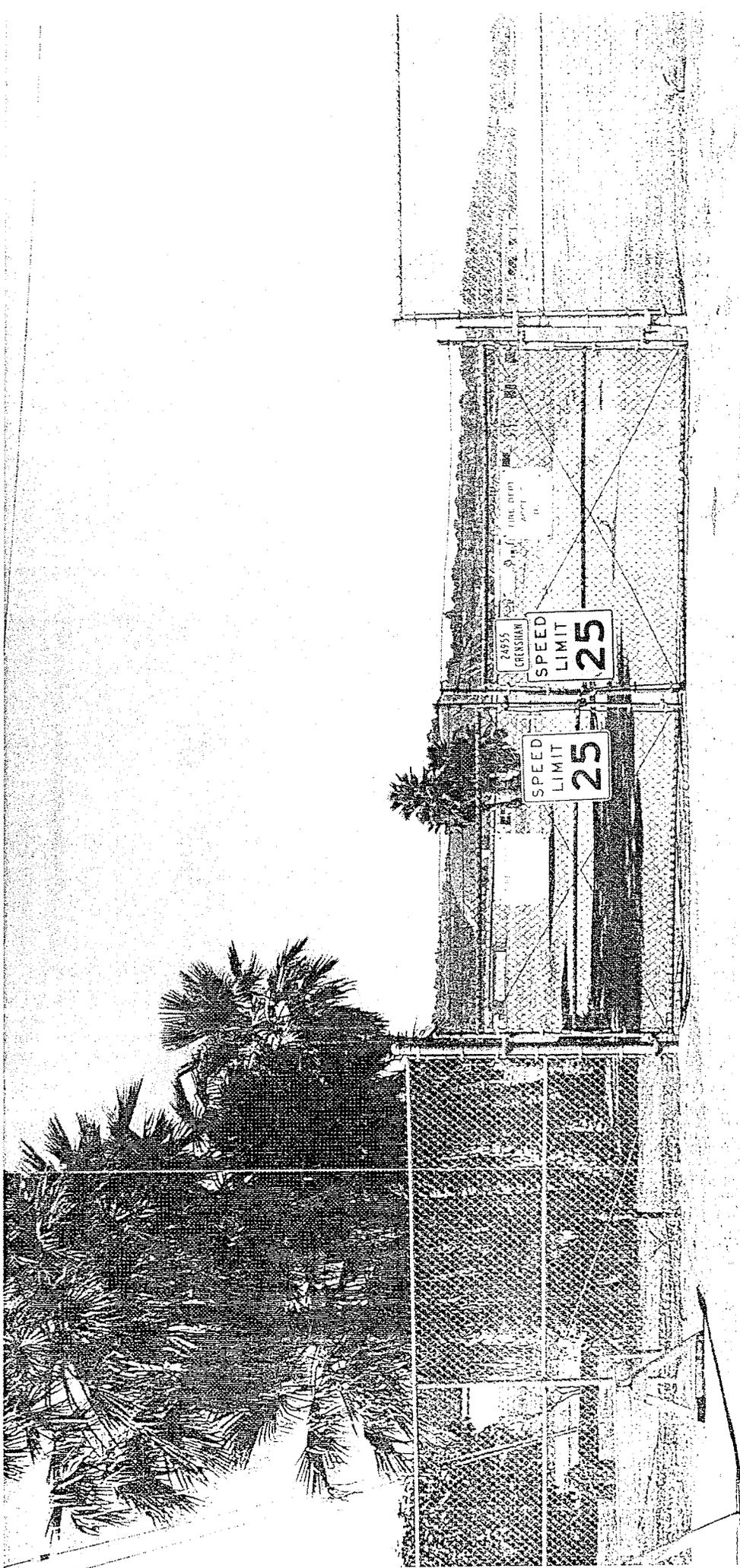
OCT 1 2013



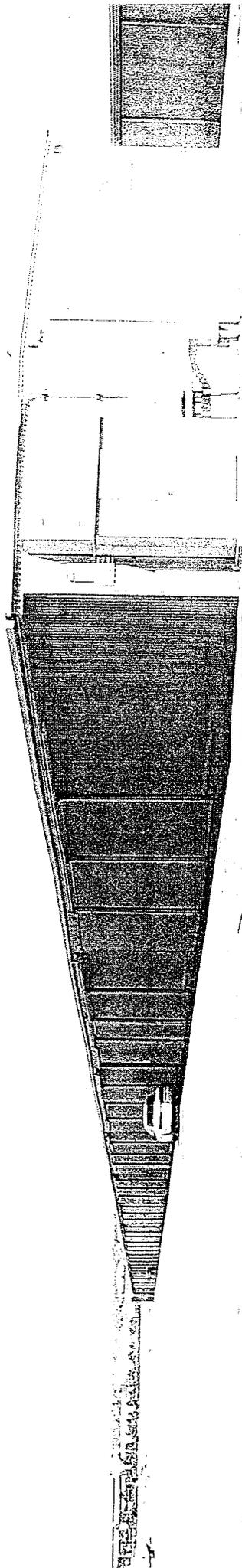
Gate 23940



Gate P



Gate 1



Hangar (typical)

001 1 2013