CITY OF SANTA ANA

BUILDING PERMIT WORKSHEET

PLEASE PRINT 3/4 1/14/09:forms/Bldg.App.Worksheet

PROJECT ADDRESS: 601 S. Santa Fe	SUITE:	SAPIN # 10173326
USE OF BUILDING: RESIDENTIAL COMMERCIAL (INDUSTRIAL) OTHER		2010-935-16 MASTER ID#

NATURE OF WORK: NEW (ADD) ALTER/T.I. DEMO REROOF REPAIR SIGN MISC

NEW/ADDITION/ALTERATION:

1ST FL..	SF	BASEMENT: YES/NO	SF	NO. OF STORIES:	
2ND FL..	SF	PATIO/ENCL. PATIO:	SF	BLDG. HEIGHT:	
TOTAL OF OTHER FLS:	SF	RES. REMODEL:	SF	PROPOSED USE:	
GARAGE/CARPORT:	SF	ALTER/T.I.:	SF		

JOB DESCRIPTION (non-residential projects see reverse side of this application) : wireless telecom facility by MetroPCS/Towers Co.

Monopine 65' top of tree

BUILDING OWNER'S NAME: Harold S. Findley			PHONE NO: 714.538.4818
ADDRESS:	CITY:	STATE:	ZIP:
TENANT'S NAME (Comm/Ind): MetroPCS			PHONE NO: 714.730.3163
CONTRACTOR'S NAME: TBD	STATE CONTR. #:	LICENSE CLASS:	PHONE NO:
ADDRESS:	CITY:	STATE:	ZIP:
WORKERS COMP. POLICY#: / EXP. DATE:	INSURANCE COMPANY:	SANTA ANA BUS. LIC. #:	
ARCHITECT/ENGINEER: DCI Pacific	STATE LICENSE #: C-18015 11/31/11	PHONE NO: 949.475.1000	
ADDRESS: 2400 Dupont Dr.	CITY: Irvine	STATE: CA	ZIP: 92862
CONTACT NAME: Jane Narine		**PHONE NO:** 714.231.2892	
E-MAIL ADDRESS: jane.narine@verizon.net		**FAX NO:**	

OFFICE USE ONLY: (ACC OR SPC (CIRCLE ONE) 5 HRS PER JK. BLDG. FEE $ _____

OCC. GROUP: _____ RECEIPT #: 582117 P/C FEE PD $ 207.25

TYPE OF CONSTR: _____ VALUATION: $ 140,000 SUBMITTAL DATE: 9/29/11

FIRE SPKR: YES / NO A/C: YES / NO FLOOD ZONE: X PROCESSED JG

RES. DEV. FEE: YES / NO **PRIOR DWELLING UNIT:** YES / NO COMMENTS: _____

PLANNING OK TO CHECK & DATE _____ BLDG. DEPT. APPROVAL & DATE _____

PLNG CONDITIONS: _____

PLEASE CHECK ALL THAT APPLY TO YOUR PROJECT

JOB DESCRIPTION CHECKLIST:

- ☐ Additional square footage
- ☐ Awnings
- ☐ Canopy
- ☐ Ceiling work
- ☐ Change of occupancy (use)
- ☐ Disabled accessible (H/C) restrooms
- ☐ Dust collector
- ☐ Elevator shaft
- ☐ Exterior doors or windows
- ☐ Equipment pads
- ☐ Interior demo
- ☐ Kitchen equipment
- ☐ Partition walls
- ☐ Rated corridors
- ☐ Rated shafts
- ☐ Roof mounted equipment
- ☐ Security bars
- ☐ Screening for equipment
- ☐ Skylights
- ☐ Stairs
- ☐ Storefront/facade improvements
- ☐ Storage racks or shelving over 5'-9"
- ☐ Walk-in coolers

ITEMS REQUIRING SEPARATE BUILDING PERMIT APPLICATIONS:

- ☐ Block wall
- ☐ Card readers
- ☐ Complete demo
- ☐ Fence
- ☐ Fire signaling system
- ☐ Fire sprinklers
- ☐ Flagpole
- ☐ Lawn sprinkler system
- ☐ Light Standards
- ☐ Parking lot repaving
- ☐ Parking lot restriping
- ☐ Pedestrian protection
- ☐ Pool/Spa
- ☐ Signs
- ☐ Spray booth
- ☐ Temporary power pole
- ☐ Trash enclosure

FEE CHECKLIST WORKSHEET

Received by: _____ SAPIN #: 10173326

FEE TYPE	REQUIRED	
	Yes	No
Plan Check Fee	☑	☐
Disability Fee	☐	☐
SMIP Fee	☑	☐
Res. Dev. Fee	☐	☐
Fire Facility Fee	☐	☐
School Distr. Fee	☐	☐
Microfilm	☐	☐
FCWP Surcharge	☐	☐

CALCULATION AREA

COST/SQ FT X TOTAL SQ FT = VALUATION

Contract

Counter computations/valuation $ 140,000

Plan checker computation/final valuation $_____

F05 1-10-03

Add when VF enters MID

CITY OF SANTA ANA

BUILDING PERMIT WORKSHEET

10174348

PLEASE PRINT

1/14/09:forms/Bldg.App.Worksheet

PROJECT ADDRESS: 601 S Santa	SUITE:	SAPIN # ~~10174348~~
USE OF BUILDING: RESIDENTIAL COMMERCIAL INDUSTRIAL OTHER		MASTER ID#

NATURE OF WORK: NEW ADD ALTER/T.I. DEMO REROOF REPAIR SIGN MISC

NEW/ADDITION/ALTERATION:

1ST FL..	_____ SF	BASEMENT: YES/NO	_____ SF	NO. OF STORIES:	_____
2ND FL..	_____ SF	PATIO/ENCL. PATIO:	_____ SF	BLDG. HEIGHT:	_____
TOTAL OF OTHER FLS:	_____ SF	RES. REMODEL:	_____ SF	PROPOSED USE:	_____
GARAGE/CARPORT:	_____ SF	ALTER/T.I.:	_____ SF		

JOB DESCRIPTION (non-residential projects see reverse side of this application) : _____

Relocate trash enclosure

BUILDING OWNER'S NAME:		PHONE NO:	
ADDRESS:	CITY:	STATE:	ZIP:
TENANT'S NAME (Comm/Ind):		PHONE NO:	
CONTRACTOR'S NAME:	STATE CONTR. #:	LICENSE CLASS:	PHONE NO:
ADDRESS:	CITY:	STATE:	ZIP:
WORKERS' COMP. POLICY#: / EXP. DATE:		INSURANCE COMPANY:	SANTA ANA BUS. LIC. #:
ARCHITECT/ENGINEER:	STATE LICENSE #:	PHONE NO:	
ADDRESS:	CITY:	STATE:	ZIP:
CONTACT NAME:		**PHONE NO:**	
E-MAIL ADDRESS:		**FAX NO:**	

OFFICE USE ONLY: ACC OR SPC (CIRCLE ONE) _____ HRS PER _____ BLDG. FEE $ _____

OCC. GROUP: _____ RECEIPT #: _____ P/C FEE PD $ _____

TYPE OF CONSTR: _____ VALUATION: $ _____ SUBMITTAL DATE: _____

FIRE SPKR: YES / NO A/C: YES / NO FLOOD ZONE: _____ PROCESSED _____

RES. DEV. FEE: YES / NO **PRIOR DWELLING UNIT:** YES / NO COMMENTS: _____

PLANNING OK TO CHECK & DATE _____ BLDG. DEPT. APPROVAL & DATE _____

PLNG CONDITIONS: _____

PLEASE CHECK ALL THAT APPLY TO YOUR PROJECT

JOB DESCRIPTION CHECKLIST:

- ☐ Additional square footage
- ☐ Awnings
- ☐ Canopy
- ☐ Ceiling work
- ☐ Change of occupancy (use)
- ☐ Disabled accessible (H/C) restrooms
- ☐ Dust collector
- ☐ Elevator shaft
- ☐ Exterior doors or windows
- ☐ Equipment pads
- ☐ Interior demo
- ☐ Kitchen equipment
- ☐ Partition walls
- ☐ Rated corridors
- ☐ Rated shafts
- ☐ Roof mounted equipment
- ☐ Security bars
- ☐ Screening for equipment
- ☐ Skylights
- ☐ Stairs
- ☐ Storefront/facade improvements
- ☐ Storage racks or shelving over 5'-9"
- ☐ Walk-in coolers

ITEMS REQUIRING SEPARATE BUILDING PERMIT APPLICATIONS:

- ☐ Block wall
- ☐ Card readers
- ☐ Complete demo
- ☐ Fence
- ☐ Fire signaling system
- ☐ Fire sprinklers
- ☐ Flagpole
- ☐ Lawn sprinkler system
- ☐ Light Standards
- ☐ Parking lot repaving
- ☐ Parking lot restriping
- ☐ Pedestrian protection
- ☐ Pool/Spa
- ☐ Signs
- ☐ Spray booth
- ☐ Temporary power pole
- ☐ Trash enclosure

Planning and Building Agency
Planning Division
20 Civic Center Plaza
P.O. Box 1988 (M-20)
Santa Ana, CA 92702
(714) 647-5804
www.santa-ana.org

Sapin Dev Rev
Application Data Sheet

Master I.D.: 2012-101480

Project Address: 601 S Santa Fe St

Application Number: NONR-2012-79-NEW

Application Date: 02/08/2012

Planner/Project Manager: Fregoso, Vince

Determination: Approved

Application Description: Relocate existing trash enclosure to accommodate new cell facility (approved per CUP 2011-14).

Dev Rev Project Conditions:

Planning and Building Agency
Planning Division
20 Civic Center Plaza
P.O. Box 1988 (M-20)
Santa Ana, CA 92702
(714) 647-5804
www.santa-ana.org

Sapin Dev Rev
Application Data Sheet

Master I.D.: 2010-93516

Project Address: ~~601 S~~ Santa Fe St
601 3/4 S Santa Fe WCC02

Application Number: NONR-2011-541-NEW

Application Date: 09/29/2011

Planner/Project Manager: Fregoso, Vince

Determination: Staff Review

Application Description: New cell tower

Dev Rev Project Conditions:

OK to plan check 9/29/11 Vince Fregoso. Approval pending review of plans for compliance with CUP 11-14.

CITY OF SANTA ANA
PLAN CHECK - CHECKLIST

JOB ADDRESS: 601 3/4 S Santa Fe St WCC02

TRACKING #: 10173326 DATE: 9-29-11

FOR PLANCHECK STATUS CALL (714) 647-5800

PLEASE INITIAL EACH ITEM BELOW

1. I agree to pay a plancheck fee established for this project with the understanding that this payment is not a guarantee that a permit will be issued and that this fee is not refundable once a plancheck has commenced.

2. I understand that I may request an "Accelerated Plancheck" at an additional cost to me. This plancheck will be performed by an in-house plan checker with the intention of reducing plancheck time for the Building & Safety Division.

3. I understand that the project valuation (from which plancheck and permit fees are calculated) will be reviewed during the plancheck process and that said valuation shall be adjusted up or down in accordance with established fee computation regulations.

4. I understand that I shall submit **separate plans, applications and plancheck fees** for the following when plan check is required:

   a. Electrical Plans - 2 complete sets
   b. Plumbing Plans - 3 complete sets
   c. Mechanical Plans - 2 complete sets
   d. Grading Plans - 3 complete sets

5. I understand that I shall visit the Public Works Department to verify whether a field inspection of the property is required. I understand that prior to the issuance of the Building permit I am required to obtain Public Works Agency approval if my project valuation exceeds $30,000 or has added plumbing fixtures, or added bedrooms, or exceeds 500 sq.ft.

AGREED TO BY APPLICANT OR AGENT

Applicant's Signature Jane Morine

Print Name Jane Morine Address 5942 Midir

Telephone Number 714.231.2892 Fax _____

FOR OFFICE USE ONLY: "Checklist of items discussed" APPROVALS & FEES REQUIRED: Y/N

1. ✓ Planning Department
2. ✓ Public Works Agency
3. ✓ Fire Departmemt
4. ✓ Police Department
5. ___ School District
6. ___ Health Department
7. ___ Title 24 (Energy)
8. ___ Title 24 (Disabled Access)
9. ___ Roof Mounted Equip.
10. ___ List of Subcontr.
11. ✓ Bldg. Pmt. Info.
12. ___ Summary of Appr. Req.
13. ✓ FY Information
14. ___ Constr. Act. Req.
15. ___ Res. Dev. Fees
16. ✓ SMIP
17. ✓ Microfilming
18. ✓ Const. Debris Recyc.
19. ___ FCWP Surcharge
20. ✓ LOA/Owner-Builder Ver.

PERMIT TECHNICIAN _____

Form 58: 3-26-04

Planning & Building Agency
Building Safety Division
20 Civic Center Plaza
P.O. Box 1988 (M-19)
Santa Ana, CA 92702
(714) 647-5800
www.santa-ana.org

TENANT IMPROVEMENT PLAN CHECK COMMENTS

PLAN CHECK NO: 10173326

PROJECT ADDRESS: 601 3/4 S Santa Fe St Unit# WCC02

PLAN CHECK ENGINEER: Kwak, Jason **TEL: 714** 647-5866

FAX: 714 647-5897

TYPE OF CONSTRUCTION: N/A

OCCUPANCY CLASSIFICATION(S): U

PLAN CHECK DATES:

APPLICATION 9/29/2011

INITIAL REVIEW 12/8/2011

EXPIRATION 3/27/2012

RECHECKS: 1.

2.

3.

REMARKS/RECHECK ITEMS:

PROJECT APPLICANT CONTACT PERSON: Jane Norine

TEL: (714)231-2892

FAX: (714)846-5159

EMAIL: jane.norine@verizon.net

VALUATION: $140,000.00

FLOOD ZONE: X-0602320276J

APPLICABLE CODE: 2010 CALIFORNIA BUILDING CODE (CBC) WITH CITY OF SANTA ANA AMENDMENTS

1. All items noted on this plan check report must be addressed. If you feel that an item is not applicable to your project, note "N/A" and discuss the reason with the plan checker.

2. Please indicate the sheet number and detail to the right of each correction, or note the number on the plans where the correction is made. Resubmit marked original, calculations and this correction sheet. A separate sheet for response may be used.

3. Resubmit 3 corrected sets of plans.

4. Meetings between the project applicant/designer and the plan reviewer shall be by appointment only. Please call (714) 647-5866 for an appointment.

5. The drawings/information submitted for Building Safety Division review is incomplete. The applicant shall, prior to resubmitting, complete all construction documents to show compliance with the 2010 California Building Standards Code with local amendments.

    a. Foundation plan and calculations are missing. Provide pile/pier foundation plans wet stamped and signed by both engineer of record and geotechnical engineer.

6. This review does not include mechanical, plumbing, fire sprinkler system, or electrical work. Separate plans, applications, fees, plan checks, and permits are required for mechanical, plumbing, fire sprinkler systems, and electrical work. Call 647-5800 for information.

7. **The applicant shall obtain clearances/approvals for the following prior to building permit issuance:**

    - Planning Division approval on the corrected/final set of drawings (647-5804.) Previously approved plans should be submitted to expedite the process.
    - Fire Department approval on the corrected/final sets of drawings (647-5839 or 647-5700)
    - Police Department approval on the corrected/final set of drawings (647-5840)
    - Public Works Agency approval (647-5039)
    - Proof of Worker's Compensation Insurance shall be required at the time of permit issuance

8. Update architectural plans to callout current code requirements for 2010 CBC.

9. Sheet MP-2 is missing

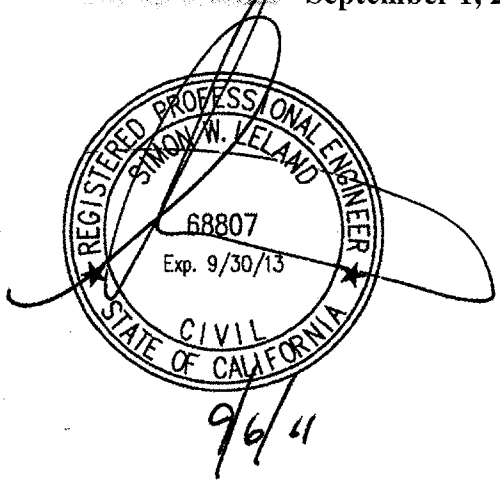
10. Sheet MP-1 is missing in some sets.

11. Please update index to match plans, including MP sheets and foundation plan.

Structural Calculations
65-Ft. Pine Tree Monopole

For TowerCo
Site Location: 601 South Santa Fe Santa Ana, CA
Site Name: Bluebird Towing: CA2944
Designed According to: ANSI/TIA-222-G-2
Meets the Requirements of: 2010 California Building Code

Calculations Prepared by:
DaVinci Engineering, Inc.
Job # 6111225-115
September 1, 2011



9/6/11

CITY SET

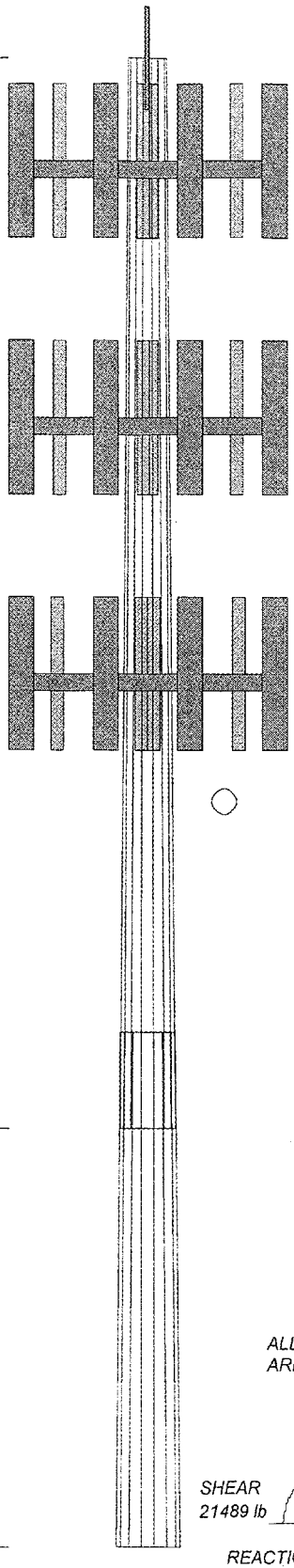
Cell Trees, Inc. Job# 11-123

Table of Contents

DaVinci Engineering, Inc.
P.O. Box 1966
Santa Maria, CA 93456
(805) 922-5221
www.davinci-engineering.com

Cell Trees, Inc.
5401 S. Canada Place
Tucson, AZ 85706
(520) 663-1330
www.celltreesinc.com

10173326



Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	41.75	18	0.1875	3.75	18.0000	26.9080	A572-65	1882.6
2	20.00	18	0.2188		25.7329	30.0000		1306.4
								3189.0

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Generic Lightning Rod 4' copper	59	(4) 72" x 12" x 6" Panel	45
4-ft Branches	56.29	6-ft Branches	43.29
(4) HBX-3319DS-VTM Panel Antenna	55	(4) 60" x 12" x 7" Panel	35
(4) HBX-3319DS-VTM Panel Antenna	55	(4) 60" x 12" x 7" Panel	35
Std. 4-ft T-Arm Mount	55	(4) 60" x 12" x 7" Panel	35
(4) HBX-3319DS-VTM Panel Antenna	55	Std. 8-ft T-Arm Mount	35
(4) 72" x 12" x 6" Panel	45	8-ft Branches	31.91
(4) 72" x 12" x 6" Panel	45	10-ft Branches	16.19
Std. 8-ft T-Arm Mount	45		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Orange County, California.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 85 mph basic wind in accordance with the TIA-222-G Standard.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
8. Welds are fabricated with ER-70S-6 electrodes.
9. TOWER RATING: 95.5%

ALL REACTIONS ARE FACTORED

AXIAL 15404 lb

SHEAR 21489 lb

MOMENT 808 kip-ft

REACTIONS - 85 mph WIND

DaVinci Engineering, Inc.
PO Box 1966
Santa Maria, CA 93456
Phone: (805) 922-5221
FAX: (805) 880-0402

Job:	*1511225-115*
Project:	*65-Ft Pine Tree Monopole*
Client: TowerCo; Bluebird Towing	Drawn by: SWL / App'd:
Code: TIA-222-G	Date: 09/01/11 / Scale: NTS
Path: R:\Engineering Documents\RISA TOWER Files\Cell Trees 225\2011\111225-115.eri	Dwg No. E-1

Tower Input Data

This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Orange County, California.
Basic wind speed of 85 mph. Structure Class II. Exposure Category C. Topographic Category 1. Crest Height 0.00 ft.
Deflections calculated using a wind speed of 60 mph.
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section. Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	59.00-17.25	41.75	3.75	18	18.0000	26.9080	0.1875	0.7500	A572-65 (65 ksi)
L2	17.25-1.00	20.00		18	25.7329	30.0000	0.2188	0.8750	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	18.2777	10.6007	424.9328	6.3234	9.1440	46.4712	850.4248	5.3013	2.8380	15.136
	27.3231	15.9020	1434.4301	9.4858	13.6693	104.9384	2870.7476	7.9525	4.4058	23.498
L2	26.9423	17.7148	1456.9168	9.0575	13.0723	111.4507	2915.7506	8.8591	4.1440	18.944
	30.4628	20.6775	2316.9742	10.5723	15.2400	152.0324	4636.9972	10.3407	4.8950	22.377

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
7/8"	C	No	Inside Pole	55.00 - 2.00	12	No Ice	0.00	0.33
7/8"	C	No	Inside Pole	45.00 - 2.00	12	No Ice	0.00	0.33
7/8"	C	No	Inside Pole	35.00 - 2.00	12	No Ice	0.00	0.33

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 59.00-17.25	37.36	1.029	18	79.326	A	0.000	79.326	79.326	100.00	0.000	0.000
					B	0.000	79.326		100.00	0.000	0.000
					C	0.000	79.326		100.00	0.000	0.000
L2 17.25-1.00	8.96	0.85	15	38.868	A	0.000	38.868	38.868	100.00	0.000	0.000
					B	0.000	38.868		100.00	0.000	0.000
					C	0.000	38.868		100.00	0.000	0.000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight lb
Generic Lightning Rod 4' copper	C	None		0.0000	59.00	No Ice	0.25	0.50	75.00
(4) HBX-3319DS-VTM Panel Antenna	A	From Face	2.25	0.0000	55.00	No Ice	6.09	4.49	49.08
(4) HBX-3319DS-VTM Panel Antenna	B	From Face	2.25	0.0000	55.00	No Ice	6.09	4.49	49.08
(4) HBX-3319DS-VTM Panel Antenna	C	From Face	2.25	0.0000	55.00	No Ice	6.09	4.49	49.08
Std. 4-ft T-Arm Mount ***	C	None		0.0000	55.00	No Ice	6.47	6.47	415.00
(4) 72" x 12" x 6" Panel	A	From Face	2.25	0.0000	45.00	No Ice	8.40	4.70	45.00
(4) 72" x 12" x 6" Panel	B	From Face	2.25	0.0000	45.00	No Ice	8.40	4.70	45.00
(4) 72" x 12" x 6" Panel	C	From Face	2.25	0.0000	45.00	No Ice	8.40	4.70	45.00
Std. 8-ft T-Arm Mount ***	C	None		0.0000	45.00	No Ice	8.37	8.37	825.00
4-ft Branches	C	None		0.0000	56.29	No Ice	37.46	0.00	480.00
6-ft Branches	C	None		0.0000	43.29	No Ice	108.05	0.00	1470.00
8-ft Branches	C	None		0.0000	31.91	No Ice	221.70	0.00	2898.00
10-ft Branches ***	C	None		0.0000	16.19	No Ice	45.99	0.00	540.00
(4) 60" x 12" x 7" Panel	A	From Face	2.25	0.0000	35.00	No Ice	7.00	4.24	40.00
(4) 60" x 12" x 7" Panel	B	From Face	2.25	0.0000	35.00	No Ice	7.00	4.24	40.00
(4) 60" x 12" x 7" Panel	C	From Face	2.25	0.0000	35.00	No Ice	7.00	4.24	40.00
Std. 8-ft T-Arm Mount	C	None		0.0000	35.00	No Ice	8.37	8.37	825.00

Discrete Appurtenance Pressures - No Ice $G_H = 1.100$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft²	C_AA_C Side ft²
Generic Lightning Rod 4' copper	0.0000	75.00	0.00	0.00	59.00	1.133	20	0.25	0.50
HBX-3319DS-VTM Panel Antenna	300.0000	196.32	-2.63	-1.52	55.00	1.116	20	24.38	17.98
HBX-3319DS-VTM Panel Antenna	60.0000	196.32	2.63	-1.52	55.00	1.116	20	24.38	17.98
HBX-3319DS-VTM Panel Antenna	180.0000	196.32	0.00	3.04	55.00	1.116	20	24.38	17.98
Std. 4-ft T-Arm Mount	0.0000	415.00	0.00	0.00	55.00	1.116	20	6.47	6.47
72" x 12" x 6" Panel	300.0000	180.00	-2.71	-1.56	45.00	1.070	19	33.60	18.80
72" x 12" x 6" Panel	60.0000	180.00	2.71	-1.56	45.00	1.070	19	33.60	18.80
72" x 12" x 6" Panel	180.0000	180.00	0.00	3.12	45.00	1.070	19	33.60	18.80
Std. 8-ft T-Arm Mount	0.0000	825.00	0.00	0.00	45.00	1.070	19	8.37	8.37
4-ft Branches	0.0000	480.00	0.00	0.00	56.29	1.121	20	37.46	0.00
6-ft Branches	0.0000	1470.00	0.00	0.00	43.29	1.061	19	108.05	0.00
8-ft Branches	0.0000	2898.00	0.00	0.00	31.91	0.995	17	221.70	0.00
10-ft Branches	0.0000	540.00	0.00	0.00	16.19	0.863	15	45.99	0.00
60" x 12" x 7" Panel	300.0000	160.00	-2.78	-1.61	35.00	1.015	18	28.00	16.94
60" x 12" x 7" Panel	60.0000	160.00	2.78	-1.61	35.00	1.015	18	28.00	16.94
60" x 12" x 7" Panel	180.0000	160.00	0.00	3.21	35.00	1.015	18	28.00	16.94
Std. 8-ft T-Arm Mount	0.0000	825.00	0.00	0.00	35.00	1.015	18	8.37	8.37
	Sum:	9136.96							

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 90 deg - No Ice
5	0.9 Dead+1.6 Wind 90 deg - No Ice
6	1.2 Dead+1.6 Wind 180 deg - No Ice
7	0.9 Dead+1.6 Wind 180 deg - No Ice
8	Dead+Wind 0 deg - Service
9	Dead+Wind 90 deg - Service
10	Dead+Wind 180 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	59 - 17.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-12099.63	-387.79	0.00
			Max. Mx	4	-12099.63	-387.79	0.00
			Max. My	2	-12099.63	0.00	387.79
			Max. Vy	4	19813.84	-387.79	0.00
			Max. Vx	2	-19813.84	0.00	387.79
L2	17.25 - 1	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-15385.20	-807.77	0.00
			Max. Mx	4	-15385.20	-807.77	0.00
			Max. My	2	-15385.20	0.00	807.77
			Max. Vy	4	21502.26	-807.77	0.00
			Max. Vx	2	-21502.26	0.00	807.77

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	2	15404.13	0.00	21488.70
	Max. H_x	10	12836.78	0.00	-5987.27
	Max. H_z	3	11553.10	0.00	21488.78
	Max. M_x	2	807.77	0.00	21488.70
	Max. M_z	4	807.77	-21488.70	0.00
	Max. Torsion	1	0.00	0.00	0.00
	Min. Vert	5	11553.10	-21488.78	0.00
	Min. H_x	5	11553.10	-21488.78	0.00
	Min. H_z	7	11553.10	0.00	-21488.78
	Min. M_x	6	-807.77	0.00	-21488.70
	Min. M_z	1	0.00	0.00	0.00
	Min. Torsion	5	0.00	-21488.78	0.00

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	12836.78	0.00	0.00	0.00	0.00	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	15404.13	0.00	-21488.70	-807.77	0.00	0.00
0.9 Dead+1.6 Wind 0 deg - No Ice	11553.10	0.00	-21488.78	-804.07	0.00	0.00
1.2 Dead+1.6 Wind 90 deg - No Ice	15404.13	21488.70	0.00	0.00	-807.77	0.00
0.9 Dead+1.6 Wind 90 deg - No Ice	11553.10	21488.78	0.00	0.00	-804.07	0.00
1.2 Dead+1.6 Wind 180 deg - No Ice	15404.13	0.00	21488.70	807.77	0.00	0.00
0.9 Dead+1.6 Wind 180 deg - No Ice	11553.10	0.00	21488.78	804.07	0.00	0.00
Dead+Wind 0 deg - Service	12836.78	0.00	-5987.27	-224.48	0.00	0.00
Dead+Wind 90 deg - Service	12836.78	5987.27	0.00	0.00	-224.48	0.00
Dead+Wind 180 deg - Service	12836.78	0.00	5987.27	224.48	0.00	0.00

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-12836.78	0.00	0.00	12836.78	0.00	0.000%
2	0.00	-15404.14	-21488.97	0.00	15404.13	21488.70	0.001%
3	0.00	-11553.10	-21488.97	0.00	11553.10	21488.78	0.001%
4	21488.97	-15404.14	0.00	-21488.70	15404.13	0.00	0.001%
5	21488.97	-11553.10	0.00	-21488.78	11553.10	0.00	0.001%
6	0.00	-15404.14	21488.97	0.00	15404.13	-21488.70	0.001%
7	0.00	-11553.10	21488.97	0.00	11553.10	-21488.78	0.001%
8	0.00	-12836.78	-5987.64	0.00	12836.78	5987.27	0.003%
9	5987.64	-12836.78	0.00	-5987.27	12836.78	0.00	0.003%
10	0.00	-12836.78	5987.64	0.00	12836.78	-5987.27	0.003%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	9	0.00000001	0.00004723
3	Yes	9	0.00000001	0.00003839
4	Yes	9	0.00000001	0.00004723
5	Yes	9	0.00000001	0.00003839
6	Yes	9	0.00000001	0.00004723
7	Yes	9	0.00000001	0.00003839
8	Yes	8	0.00000001	0.00010890
9	Yes	8	0.00000001	0.00010890
10	Yes	8	0.00000001	0.00010890

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	59 - 17.25	6.795	8	0.8185	0.0000
L2	21 - 1	1.076	8	0.4602	0.0000

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	59 - 17.25	24.462	2	2.9478	0.0000
L2	21 - 1	3.872	2	1.6567	0.0000

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	59 - 17.25 (1)	TP26.908x18x0.1875	41.75	58.00	75.6	15.4259	-12099.60	1036340.00	0.012
L2	17.25 - 1 (2)	TP30x25.7329x0.2188	20.00	58.00	65.8	20.6775	-15385.20	1397240.00	0.011

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	59 - 17.25 (1)	TP26.908x18x0.1875	387.79	552.72	0.702	0.00	552.72	0.000
L2	17.25 - 1 (2)	TP30x25.7329x0.2188	807.77	856.11	0.944	0.00	856.11	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	59 - 17.25 (1)	TP26.908x18x0.1875	19813.80	518170.00	0.038	0.00	1106.79	0.000
L2	17.25 - 1 (2)	TP30x25.7329x0.2188	21502.30	698621.00	0.031	0.00	1714.31	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	59 - 17.25 (1)	0.012	0.702	0.000	0.038	0.000	0.715	1.000	4.8.2 ✓
L2	17.25 - 1 (2)	0.011	0.944	0.000	0.031	0.000	0.955	1.000	4.8.2 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	59 - 17.25	Pole	TP26.908x18x0.1875	1	-12099.60	1036340.00	71.5	Pass
L2	17.25 - 1	Pole	TP30x25.7329x0.2188	2	-15385.20	1397240.00	95.5	Pass
							Summary	
						Pole (L2)	95.5	Pass
						RATING =	**95.5**	**Pass**

DaVinci Engineering, Inc.	Job	6111225-115	Page	6 of 8
P.O. Box 1966 Santa Maria, CA 93456 Phone: (805) 922-5221 Fax: (805) 880-0402	Project	65-Ft. Pine Tree Monopole	Date	9/1/2011
	Client	TowerCo: Bluebird Towing	Designed by	Simon W. Leland, P.E.

Monopole Anchor Rod and Base Plate Calculation

ANSI/ TIA-222-G-2

Factored Base Reactions:		Pole Shape:	Anchor Rods:	Base Plate:
Moment:	845 ft-kips	18-Sided Tapered Polygon	(5) 2.25 in. #18J A615 GR. 75	1.75 in. x 43 in. ROUND
Shear:	24 kips	Pole Dia. (D_f):	Anchor Rods Evenly Spaced	fy = 60 ksi
Axial:	17 kips	30.00 in	On a 37 in Bolt Circle	ID = 24 in

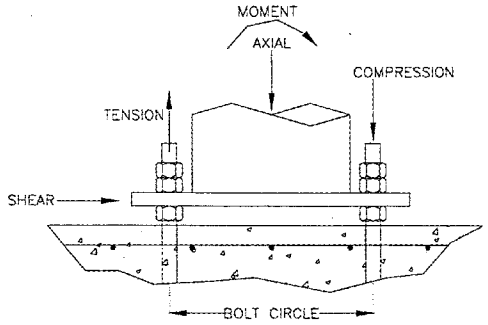
Anchor Rod Calculation According to TIA-222-G section 4.9.9

ϕ =	0.80	TIA 4.9.9	
I_{bolts} =	856	in^2	Moment of Inertia
P_u =	219	kips	Tension Force
V_u =	4.8	kips	Shear Force
R_{nt} =	325	kips	Nominal Tensile Strength
η =	0.50	for detail type (d)	

The following Interaction Equation Shall Be Satisfied:

$$\left(\frac{P_u + \frac{V_u}{\eta}}{\phi R_{nt}}\right) \leq 1.0$$

$$0.9 \leq 1$$



Base Plate Calculation According to TIA-222-G

ϕ =	0.90	TIA 4.7	
M_{PL} =	779.3	in-kip	Plate Moment
L =	18.85	in	Section Length
Z =	14.43		Plastic Section Modulus
M_p =	865.9	in-kip	Plastic Moment
ϕM_n =	779.3	in-kip	Factored Resistance

Calculated Moment vs Factored Resistance

779 in-kip $\leq$ 779 in-kip

Base Weld Calculation According to AISC (LRFD)

ϕ =	0.75	
ϕ Rn=	18.66	kips/ in
Rw=	14.35	kips/ in

$$Rn := \sqrt{\left(\frac{Moment}{\frac{\pi \cdot Pole\_Diameter^2}{4}}\right)^2 + \left(\frac{Shear}{\pi \cdot Pole\_Diameter}\right)^2}$$

Anchor Rods Are Adequate	88.1%
Base Plate Is Adequate	100.0%
Base Weld Is Adequate	76.9%

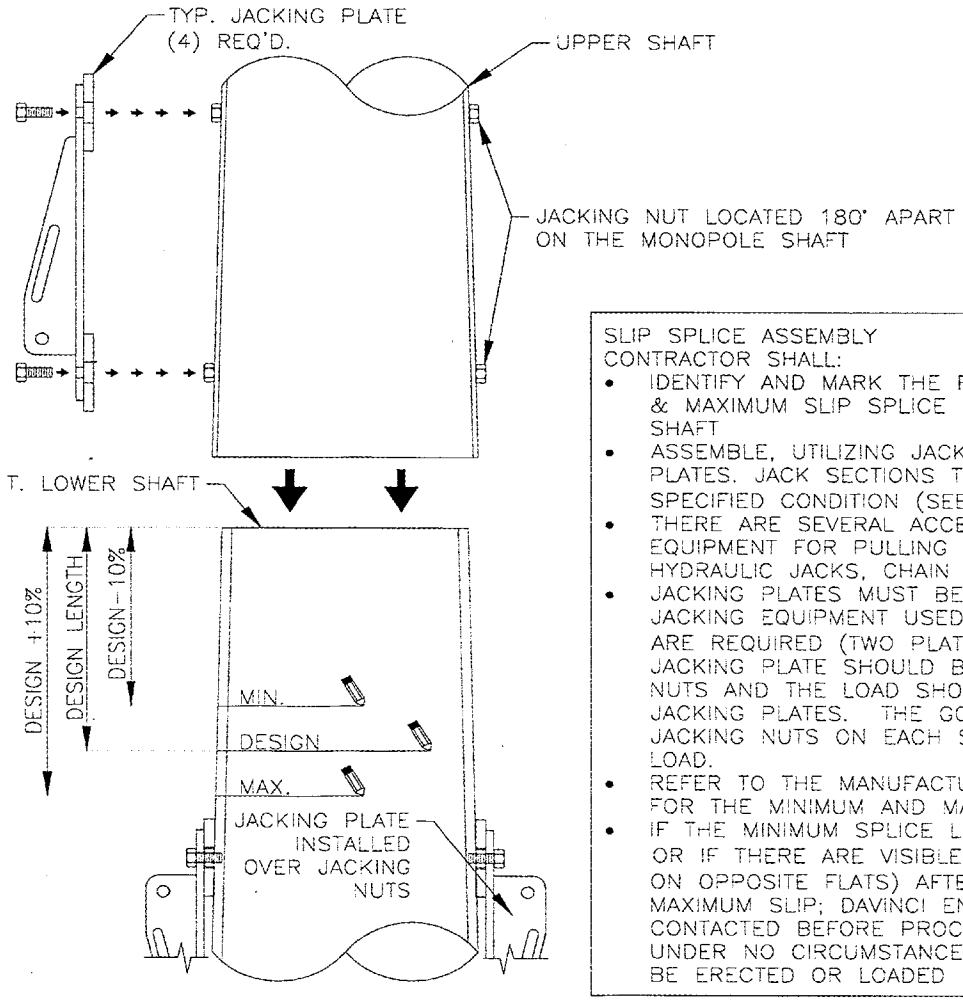
DaVinci Engineering, Inc.
P.O. Box 1966
Santa Maria, CA 93456
Phone: (805) 922-5221
Fax: (805) 880-0402

Job	6111225-115	Page	7 of 8
Project	65-Ft. Pine Tree Monopole	Date	9/1/2011
Client	TowerCo: Bluebird Towing	Designed by	Simon W. Leland, P.E.

Monopole Slip Splice Information:

In Accordance with: Section 4.9.7.1 & 13.3.5 of the ANSI/ TIA-222-G-2

The monopole sections are tapered and have a male/female slip splice that is held together with gravity loads and friction from mechanical jacking forces. The splice connection has been designed in accordance with section 4.9.7.1 & 13.3.5 of the TIA/EIA-222-G Structural Specifications for Antenna Supporting Structures and Antennas. There is no welding or bolting required at this connection. This splice connection is the industry standard for both the telecommunication and transmission tower industries.



SLIP SPLICE ASSEMBLY
CONTRACTOR SHALL:

- IDENTIFY AND MARK THE REQUIRED MINIMUM, DESIGN & MAXIMUM SLIP SPLICE DISTANCE ON THE POLE SHAFT
- ASSEMBLE, UTILIZING JACKING NUTS AND JACKING PLATES. JACK SECTIONS TOGETHER TO MANUFACTURER SPECIFIED CONDITION (SEE ERECTION DRAWINGS)
- THERE ARE SEVERAL ACCEPTABLE TYPES OF EQUIPMENT FOR PULLING THE SECTIONS TOGETHER: HYDRAULIC JACKS, CHAIN HOIST OR TURNBUCKLES.
- JACKING PLATES MUST BE USED REGARDLESS OF THE JACKING EQUIPMENT USED. FOUR JACKING PLATES ARE REQUIRED (TWO PLATE PER SECTION). THE JACKING PLATE SHOULD BE BOLTED TO BOTH JACKING NUTS AND THE LOAD SHOULD BE APPLIED TO THE JACKING PLATES. THE GOAL IS TO INSURE THAT BOTH JACKING NUTS ON EACH SECTION CARRY THE JACKING LOAD.
- REFER TO THE MANUFACTURERS ERECTION DRAWINGS FOR THE MINIMUM AND MAXIMUM JACKING FORCES.
- IF THE MINIMUM SPLICE LENGTH CANNOT BE ACHIEVED, OR IF THERE ARE VISIBLE GAPS (IN EXCESS OF 1/4" ON OPPOSITE FLATS) AFTER THE SECTIONS PASS MAXIMUM SLIP; DAVINCI ENGINEERING SHALL BE CONTACTED BEFORE PROCEEDING WITH THE ERECTION. UNDER NO CIRCUMSTANCE SHOULD THE STRUCTURE BE ERECTED OR LOADED IF THESE CONDITIONS EXIST.

DaVinci Engineering, Inc.
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Santa Maria, CA 93456
Phone: (805) 922-5221
Fax: (805) 880-0402

Job	6111225-115	Page	8 of 8
Project	65-Ft. Pine Tree Monopole	Date	9/1/2011
Client	TowerCo: Bluebird Towing	Designed by	Simon W. Leland, P.E.

Seismic Analysis per:

2010 California Building Code

Reference

Occupancy Category — CBC 2010 Table 1604.5

I

Importance Factor — ASCE 7-05 Table 11.5-1

I = 1

Site Classification — CBC 2010 Table 1613.5.2 & Geotechnical Report

Seismic Design Category E

Site Class D

Site Coefficients — CBC 2010 Section 1613.5.3

S_S 1.392 Mapped Spectral Accelerations for short periods

S_1 0.500 Mapped Spectral Accelerations for a 1 sec period

Design Spectral Response Acceleration Parameters — CBC 2010 Section 1613.5.4

S_{DS} 0.928 5% damped Spectral Accl. for short periods — CBC 2010 Eq: 16-38

S_{D1} 0.500 5% damped Spectral Accl for a 1 sec. period — CBC 2010 Eq: 16-39

Equivalent Lateral Force Procedure — ASCE 7-05 Section 12.8

C_t = 0.02 Period Parameters — ASCE 7-05 Table 12.8-2

X= 0.75 Period Parameters — ASCE 7-05 Table 12.8-2

h_n = 59-ft Height of Structure

$T = C_t h_n^X$ = 0.426 Fundamental Period — ASCE 7-05 Eq: 12.8-7

R = 1.5 Response Modification Factor — ASCE 7-05 Tabel 12.2-1

$C_s = S_{DS}/[R/I]$ = 0.62 Seismic Response Coefficient — ASCE 7-05 Eq: 12.8-2/ 12.8-3

W 15.4 kips Total Axial Weight of Pole

$V = C_S W$ = 9.5 kips Max. Equivalent Seismic Base Shear — ASCE 7-05 Eq: 12.8-1

9.5 kips < 24 kips

Seismic < Wind Load from Design

Design Vertical Acceleration — ASCE 7-05 Eq: 12.14-6

Ev = 2.86 kips (maximum vertical seismic force @ base is less than forces from wind loading)

The maximum creditable seismic shear is less than the calculated wind shear

TowerCo

vertical solutions

December 20, 2011

Ms. Susan Hart
TowerCo, LLC
5000 Valleystone Drive
Cary, NC 27519
(919) 653-5734

Vertical Solutions, Inc.
PO Box 579
Holly Springs, NC 27540
(888) 321-6167
operations@verticalsolutions-inc.com

Subject	**Foundation Design Calculations**
TowerCo Designation	**Number: CA2944** **Site Name: Bluebird Towing**
Engineering Firm Designation	**Vertical Solutions Project: 111256, Revision 0**
Site Data	**601 S. Santa Fe, Santa Ana, Orange County, CA 92701** **Latitude: N33° 44' 26.1"±, Longitude: W117° 51' 10.1"±** **Elevation: 116-ft±; Topography: Category 1;** **Exposure Category: "C"; Structure Classification II; Site Class "D"** **59-ft Self-Supporting Pole Structure (Monopine)**

Dear Ms. Hart,

To your request, we present our Drilled Shaft foundation design calculations per ANSI/TIA-222-G-2-2009 *Structural Standard for Antenna Supporting Structures and Antennas – Addendum 2* and the *2010 California Building Code.*

We trust you find our work satisfactory. Please do not hesitate to call should you have any questions.

Sincerely,

Matthew E. Reeves, E.I.
Structural Engineer in Training

REGISTERED PROFESSIONAL ENGINEER
MICHAEL L. LASSITER
C 63329
EXP. 06/30/2012
CIVIL
STATE OF CALIFORNIA

Michael L. Lassiter, S.E., P.E., C.W.I.
Structural Engineer, Civil Engineer, Certified Weld Inspector
& President
CA PE License No.: C 63329

Enclosures:

- Foundation Design Calculations

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City of Santa Ana

DEC 20 2011

Foundation Design Calculations

2002 Production Drive, Apex, NC 27539 Ph: (888) 321-6167 Fax: (919) 321-1768 operations@verticalsolutions-inc.com

vertical solutions

VSi Job #: 111256
Date: 12/20/11
Engineer: MER

Foundation Design / LPILE Input

BC =	37	in			
D_{req} =	4.88	ft	(assuming #9 vert & #5 ties)		
f'_c =	3000	psi			
L =	19.5	ft	=	234	in
D =	5	ft	=	60	in
I =	636172.5	in^4			
A =	2827.4	in^2			
E =	3122018.6	psi			
n_{req} =	15	#9 bars			
Vert. Size =	#9				
n_{bar} =	15				
dia_{bar} =	1.13	in			
A_{bar} =	1.00	in^2			
A_{steel} =	15.00	in^2			
ρ =	0.0053		> 0.005	OK	
Tie Size =	#6				
dia_{bar} =	0.75	in			
Cover =	3.0	in	(to edge of tie)		
Clr. cover =	4.31	in	(to center of vert)		
L_{vert} =	19.0	ft			
L_{tie} =	15.941	ft	15 ft -	11.29	in (assuming #9 vert & #5 ties)
V =	14.2	cubic yd			

vertical solutions

VSi Job #: 111256
Date: 12/20/11
Engineer: MER

Design Wind Speed

V_{design} =	85	mph
$V_{service}$ =	60	mph
ratio =	0.50	

Factored Reactions

M =	808	kip-ft
V =	21.5	kip
P =	15.4	kip

Unfactored Reactions

M =	505	kip-ft
V =	13.4	kip
P =	12.8	kip

Unfactored Service Reactions

M =	252	kip-ft
V =	6.7	kip
P =	12.8	kip

LPILE RESULTS

- Design

M_n =	22484.79	kip-in
ϕM_n =	1686	kip-ft
M_{max} =	7011691	lb-in
M_u =	935	kip-ft
r_M =	55%	
Δ =	1.3603	
Δ_{All} =	1.5	
r_Δ =	91%	
ϕV_n =	268	kip
V_{max} =	87401.18	lb
V_u =	140	kip
r_V =	52%	

- Service

Δ =	0.672508	
Δ_{All} =	0.75	
r_Δ =	90%	

CAISSON Version 4.91 10:37:19 AM Friday, September 16, 2011
Vertical Solutions Inc.

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*****************************************************************************
*                                                                           *
*  PIER FOUNDATIONS ANALYSIS AND DESIGN - (C) 1995,2002 POWER LINE SYSTEMS, INC.*
*                                                                           *
*****************************************************************************
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*** ANALYSIS IDENTIFICATION : CA2944
NOTES :

*** PIER PROPERTIES CONCRETE STRENGTH (ksi) = 3.00 STEEL STRENGTH (ksi) = 60.00

DIAMETER (ft) = 5.000 DISTANCE FROM TOP OF PIER TO GROUND LEVEL (ft) = 0.50

*** SOIL PROPERTIES

LAYER	TYPE	THICKNESS (ft)	DEPTH AT TOP OF LAYER (ft)	DENSITY (pcf)	CU (psf)	KP	PHI (degrees)
1	S	3.00	0.00	0.0		1.000	-0.00
2	S	3.50	3.00	120.0		2.882	29.00
3	S	7.00	6.50	120.0		3.255	32.00
4	C	4.50	13.50	115.0	200.0		
5	S	4.50	18.00	120.0		3.255	32.00
6	C	2.50	22.50	115.0	200.0		
7	C	17.00	25.00	115.0	200.0		

*** DESIGN (FACTORED) LOADS AT TOP OF PIER MOMENT (ft-k) = 808.0 VERTICAL (k) = 15.4 SHEAR (k) = 21.5
ADDITIONAL SAFETY FACTOR AGAINST SOIL FAILURE = 1.33

*** CALCULATED PIER LENGTH (ft) = 19.500

*** CHECK OF SOILS PROPERTIES AND ULTIMATE RESISTING FORCES ALONG PIER

TYPE	TOP OF LAYER BELOW TOP OF PIER (ft)	THICKNESS (ft)	DENSITY (pcf)	CU (psf)	KP	FORCE (k)	ARM (ft)
S	0.50	3.00	0.0		1.000	0.00	2.50
S	3.50	3.50	120.0		2.882	31.78	5.83
S	7.00	5.57	120.0		3.255	205.03	10.20
S	12.57	1.43	120.0		3.255	-82.07	13.30
C	14.00	4.50	115.0	200.0		-36.00	16.25
S	18.50	1.00	120.0		3.255	-89.72	19.01

*** SHEAR AND MOMENTS ALONG PIER

DISTANCE BELOW TOP OF PIER (ft)	WITH THE ADDITIONAL SAFETY FACTOR SHEAR (k)	WITH THE ADDITIONAL SAFETY FACTOR MOMENT (ft-k)	WITHOUT ADDITIONAL SAFETY FACTOR SHEAR (k)	WITHOUT ADDITIONAL SAFETY FACTOR MOMENT (ft-k)
0.00	29.0	1106.1	21.8	831.6
1.95	29.0	1162.7	21.8	874.2
3.90	28.6	1219.2	21.5	916.7
5.85	14.7	1264.6	11.0	950.8
7.80	-21.0	1262.9	-15.8	949.5
9.75	-81.3	1166.7	-61.1	877.2
11.70	-163.9	931.3	-123.2	700.2
13.65	-146.9	577.8	-110.4	434.4
15.60	-112.9	339.2	-84.9	255.0
17.55	-97.3	134.2	-73.2	100.9
19.50	-0.0	-0.0	-0.0	-0.0

*** TOTAL REINFORCEMENT PCT = 0.30 REINFORCEMENT AREA (in^2) = 8.48
*** USABLE AXIAL CAP. (k) = 15.4 USABLE MOMENT CAP. (ft-k) = 956.7

*** US Standard Re-Bars (Select one of the following):

43	BARS #4	(AREA = 0.20 in^2	DIA = 0.500 in)	AT SPACING (in) =	3.65
28	BARS #5	(AREA = 0.31 in^2	DIA = 0.625 in)	AT SPACING (in) =	5.61
20	BARS #6	(AREA = 0.44 in^2	DIA = 0.750 in)	AT SPACING (in) =	7.85
15	BARS #7	(AREA = 0.60 in^2	DIA = 0.875 in)	AT SPACING (in) =	10.47
11	BARS #8	(AREA = 0.79 in^2	DIA = 1.000 in)	AT SPACING (in) =	14.28
9	BARS #9	(AREA = 1.00 in^2	DIA = 1.128 in)	AT SPACING (in) =	17.45
7	BARS #10	(AREA = 1.27 in^2	DIA = 1.270 in)	AT SPACING (in) =	22.44
6	BARS #11	(AREA = 1.56 in^2	DIA = 1.410 in)	AT SPACING (in) =	26.18
4	BARS #14	(AREA = 2.25 in^2	DIA = 1.693 in)	AT SPACING (in) =	39.27

*** WEIGHT OF CAISSON (kips) = 57.432
*** PRESSURE UNDER CAISSON DUE TO INPUT DESIGN AXIAL LOAD (psf) = 784.3

LPILE Plus for Windows, Version 5.0 (5.0.39)

Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method

This program is licensed to:

MER
Vertical Solutions

Path to file locations: L:\2011\1256_Bluebird Towing_CA\Task 1\Models\LPile\
Name of input data file: CA2944 - Design.lpd
Name of output file: CA2944 - Design.lpo
Name of plot output file: CA2944 - Design.lpp
Name of runtime file: CA2944 - Design.lpr

Time and Date of Analysis

Date: December 20, 2011 Time: 12:57:43

Problem Title

CA2944 - Design

Program Options

Units Used in Computations - US Customary Units: Inches, Pounds

Basic Program Options:

Analysis Type 3:
- Computation of Nonlinear Bending Stiffness and Ultimate Bending Moment Capacity with Pile Response Computed Using Nonlinear EI

Computation Options:
- Only internally-generated p-y curves used in analysis
- Analysis does not use p-y multipliers (individual pile or shaft action only)
- Analysis assumes no shear resistance at pile tip
- Analysis for fixed-length pile or shaft only
- No computation of foundation stiffness matrix elements
- Output pile response for full length of pile
- Analysis assumes no soil movements acting on pile
- No additional p-y curves to be computed at user-specified depths

Solution Control Parameters:
- Number of pile increments = 100
- Maximum number of iterations allowed = 100
- Deflection tolerance for convergence = 1.0000E-05 in
- Maximum allowable deflection = 1.0000E+02 in

Printing Options:
- Values of pile-head deflection, bending moment, shear force, and soil reaction are printed for full length of pile.
- Printing Increment (spacing of output points) = 1

Pile Structural Properties and Geometry

Pile Length = 234.00 in

Depth of ground surface below top of pile = 6.00 in

Slope angle of ground surface = .00 deg.

Structural properties of pile defined using 2 points

Point	Depth X in	Pile Diameter in	Moment of Inertia in**4	Pile Area Sq.in	Modulus of Elasticity lbs/Sq.in
1	0.0000	60.00000000	636172.5000	2827.4000	3122019.
2	234.0000	60.00000000	636172.5000	2827.4000	3122019.

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness that the above values of moment of inertia and modulus of are not used for any computations other than total stress due to combined axial loading and bending.

Soil and Rock Layering Information

The soil profile is modelled using 7 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 6.000 in
Distance from top of pile to bottom of layer = 42.000 in
p-y subgrade modulus k for top of soil layer = 20.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 20.000 lbs/in**3

Layer 2 is silt with cohesion and friction
Distance from top of pile to top of layer = 42.000 in
Distance from top of pile to bottom of layer = 84.000 in
p-y subgrade modulus k for top of soil layer = 30.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 30.000 lbs/in**3

Layer 3 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 84.000 in
Distance from top of pile to bottom of layer = 168.000 in
p-y subgrade modulus k for top of soil layer = 25.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 25.000 lbs/in**3

Layer 4 is silt with cohesion and friction
Distance from top of pile to top of layer = 168.000 in
Distance from top of pile to bottom of layer = 222.000 in
p-y subgrade modulus k for top of soil layer = 100.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 100.000 lbs/in**3

Layer 5 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 222.000 in
Distance from top of pile to bottom of layer = 276.000 in
p-y subgrade modulus k for top of soil layer = 90.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 90.000 lbs/in**3

Layer 6 is silt with cohesion and friction
Distance from top of pile to top of layer = 276.000 in
Distance from top of pile to bottom of layer = 306.000 in
p-y subgrade modulus k for top of soil layer = 100.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 100.000 lbs/in**3

Layer 7 is silt with cohesion and friction
Distance from top of pile to top of layer = 306.000 in
Distance from top of pile to bottom of layer = 522.000 in
p-y subgrade modulus k for top of soil layer = 100.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 100.000 lbs/in**3

(Depth of lowest layer extends 288.00 in below pile tip)

Effective Unit Weight of Soil vs. Depth

Effective unit weight of soil with depth defined using 14 points

Point	Depth X	Eff. Unit Weight

No.	in	lbs/in**3
1	6.00	.00001
2	42.00	.00001
3	42.00	.06655
4	84.00	.06655
5	84.00	.06944
6	168.00	.06944
7	168.00	.06655
8	222.00	.06655
9	222.00	.06944
10	276.00	.06944
11	276.00	.06655
12	306.00	.06655
13	306.00	.03044
14	522.00	.03044

**** WARNING - POSSIBLE INPUT DATA ERROR ****

Values entered for effective unit weights of soil were outside
the limits of 0.011574 pci (20 pcf) or 0.0810019 pci (140 pcf)
This data may be erroneous. Please check your data.

Shear Strength of Soils

Shear strength parameters with depth defined using 14 points

Point No.	Depth X in	Cohesion c lbs/in**2	Angle of Friction Deg.	E50 or k_rm	RQD %
1	6.000	.00000	20.00	------	------
2	42.000	.00000	20.00	------	------
3	42.000	.34722	29.00	.02000	.0
4	84.000	.34722	29.00	.02000	.0
5	84.000	.00000	32.00	------	------
6	168.000	.00000	32.00	------	------
7	168.000	1.38889	25.00	.01000	.0
8	222.000	1.38889	25.00	.01000	.0
9	222.000	.00000	32.00	------	------
10	276.000	.00000	32.00	------	------
11	276.000	1.38889	25.00	.01000	.0
12	306.000	1.38889	25.00	.01000	.0
13	306.000	1.38889	25.00	.01000	.0
14	522.000	1.38889	25.00	.01000	.0

Notes:

(1) Cohesion = uniaxial compressive strength for rock materials.
(2) Values of E50 are reported for clay strata.
(3) Default values will be generated for E50 when input values are 0.
(4) RQD and k_rm are reported only for weak rock strata.

Loading Type

Static loading criteria was used for computation of p-y curves.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head = 13438.000 lbs
Bending moment at pile head = 6060000.000 in-lbs

Axial load at pile head = 12833.000 lbs

Non-zero moment at pile head for this load case indicates the pile-head may rotate under the applied pile-head loading, but is not a free-head (zero moment) condition.

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

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Number of sections = 1

Pile Section No. 1

The sectional shape is a circular drilled shaft (bored pile).

Outside Diameter = 60.0000 in

Material Properties:

Compressive Strength of Concrete	=	3.000 kip/in**2
Yield Stress of Reinforcement	=	60. kip/in**2
Modulus of Elasticity of Reinforcement	=	29000. kip/in**2
Number of Reinforcing Bars	=	15
Area of Single Bar	=	1.00000 in**2
Number of Rows of Reinforcing Bars	=	15
Area of Steel	=	15.000 in**2
Area of Shaft	=	2827.433 in**2
Percentage of Steel Reinforcement	=	.531 percent
Cover Thickness (edge to bar center)	=	4.310 in

Unfactored Axial Squash Load Capacity = 8071.71 kip

Distribution and Area of Steel Reinforcement

Row Number	Area of Reinforcement in**2	Distance to Centroidal Axis in
1	1.000	25.549
2	1.000	24.433
3	1.000	22.248
4	1.000	19.091
5	1.000	15.100
6	1.000	10.449
7	1.000	5.341
8	1.000	0.000
9	1.000	-5.341
10	1.000	-10.449
11	1.000	-15.100
12	1.000	-19.091
13	1.000	-22.248
14	1.000	-24.433
15	1.000	-25.549

Axial Thrust Force = .00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches	Max. Concrete Stress psi	Max. Steel Stress psi
1784806.	2.141767E+12	8.333333E-07	.00002508	30.10054171	77.09504867	619.87039
3552041.	2.131225E+12	.00000167	.00005017	30.10033429	153.00566	1239.73075
5301705.	2.120682E+12	.00000250	.00007525	30.10012329	227.73187	1859.58083
7033798.	2.110139E+12	.00000333	.00010033	30.09991229	301.27372	2479.42071
8748320.	2.099597E+12	.00000417	.00012542	30.09969771	373.63123	3099.24996
8748320.	1.749664E+12	.00000500	.00006587	13.17327797	195.66182	6144.51848
8748320.	1.499712E+12	.00000583	.00007689	13.18105280	227.64922	7167.28965
8748320.	1.312248E+12	.00000667	.00008793	13.18886340	259.45721	8189.67813
8748320.	1.166443E+12	.00000750	.00009898	13.19670975	291.08525	9211.68131
8748320.	1.049798E+12	.00000833	.00011004	13.20458472	322.53261	10233.29834
8748320.	9.543622E+11	.00000917	.00012111	13.21249902	353.79894	11254.52428
8748320.	8.748320E+11	.00001000	.00013220	13.22044551	384.88350	12275.35837
8748320.	8.075373E+11	.00001083	.00014331	13.22842419	415.78567	13295.79827

8748320.	7.498560E+11	.00001167	.00015443	13.23644221	446.50508	14315.83922
8748320.	6.998656E+11	.00001250	.00016556	13.24449241	477.04088	15335.48097
8748320.	6.561240E+11	.00001333	.00017670	13.25257838	507.39258	16354.71979
8748320.	6.175285E+11	.00001417	.00018786	13.26070368	537.55970	17373.55163
8748320.	5.832214E+11	.00001500	.00019903	13.26886117	567.54135	18391.97675
8748320.	5.525255E+11	.00001583	.00021022	13.27705801	597.33716	19409.98952
8748320.	5.248992E+11	.00001667	.00022142	13.28529060	626.94636	20427.58883
8748320.	4.999040E+11	.00001750	.00023264	13.29355896	656.36828	21444.77208
8748320.	4.771811E+11	.00001833	.00024387	13.30187023	685.60263	22461.53288
8748320.	4.564341E+11	.00001917	.00025511	13.31021369	714.64821	23477.87407
8748320.	4.374160E+11	.00002000	.00026637	13.31860006	743.50490	24493.78711
8748320.	4.199194E+11	.00002083	.00027765	13.32702219	772.17165	25509.27320
8748320.	4.037686E+11	.00002167	.00028894	13.33548367	800.64797	26524.32750
8748320.	3.888142E+11	.00002250	.00030024	13.34398448	828.93315	27538.94716
8748320.	3.749280E+11	.00002333	.00031156	13.35252464	857.02652	28553.12933
8748320.	3.619995E+11	.00002417	.00032289	13.36110771	884.92757	29566.86865
8748320.	3.499328E+11	.00002500	.00033424	13.36973011	912.63537	30580.16460
8748320.	3.386447E+11	.00002583	.00034561	13.37839186	940.14921	31593.01433
8766802.	3.287551E+11	.00002667	.00035699	13.38709652	967.46857	32605.41222
9036124.	3.285863E+11	.00002750	.00036839	13.39584410	994.59272	33617.35515
9305144.	3.284169E+11	.00002833	.00037980	13.40463102	1021.52068	34628.84297
9573864.	3.282468E+11	.00002917	.00039123	13.41346085	1048.25192	35639.86978
9842283.	3.280761E+11	.00003000	.00040267	13.42233717	1074.78594	36650.42938
10110394.	3.279047E+11	.00003083	.00041413	13.43125284	1101.12146	37660.52477
10378201.	3.277327E+11	.00003167	.00042561	13.44021499	1127.25820	38670.14655
10645698.	3.275599E+11	.00003250	.00043710	13.44922006	1153.19512	39679.29470
11179761.	3.272125E+11	.00003417	.00046014	13.46736610	1204.46679	41696.15063
11712564.	3.268623E+11	.00003583	.00048324	13.48569095	1254.92993	43711.06662
12244099.	3.265093E+11	.00003750	.00050641	13.50420535	1304.57869	45724.00508
12774344.	3.261535E+11	.00003917	.00052965	13.52290928	1353.40625	47734.93853
13303287.	3.257948E+11	.00004083	.00055296	13.54180992	1401.40617	49743.83101
13830908.	3.254331E+11	.00004250	.00057634	13.56090724	1448.57126	51750.65400
14357187.	3.250684E+11	.00004417	.00059979	13.58020484	1494.89446	53755.37441
14882109.	3.247006E+11	.00004583	.00062332	13.59970987	1540.36882	55757.95367
15405661.	3.243297E+11	.00004750	.00064692	13.61942947	1584.98724	57758.35188
15927816.	3.239556E+11	.00004917	.00067060	13.63936365	1628.74175	59756.53790
16368322.	3.219998E+11	.00005083	.00069313	13.63535821	1669.35316	60000.00000
16720019.	3.184766E+11	.00005250	.00071435	13.60661566	1706.67449	60000.00000
17040729.	3.145981E+11	.00005417	.00073512	13.57136786	1742.39363	60000.00000
17313213.	3.100874E+11	.00005583	.00075514	13.52487981	1776.04767	60000.00000
17584975.	3.058257E+11	.00005750	.00077521	13.48188579	1809.06350	60000.00000
17811452.	3.010386E+11	.00005917	.00079450	13.42824161	1840.07500	60000.00000
18013650.	2.961148E+11	.00006083	.00081340	13.37102830	1869.77969	60000.00000
18215262.	2.914442E+11	.00006250	.00083234	13.31748068	1898.91067	60000.00000
18416297.	2.870072E+11	.00006417	.00085132	13.26732695	1927.46528	60000.00000
18586721.	2.823299E+11	.00006583	.00086971	13.21077526	1954.48446	60000.00000
18730105.	2.774830E+11	.00006750	.00088758	13.14930260	1980.12929	60000.00000
18873020.	2.728629E+11	.00006917	.00090548	13.09127033	2005.25784	60000.00000
19015462.	2.684536E+11	.00007083	.00092341	13.03643882	2029.86714	60000.00000
19187096.	2.646496E+11	.00007250	.00094250	13.00000012	2055.50482	60000.00000
19309996.	2.603595E+11	.00007417	.00096346	12.99051583	2083.02860	60000.00000
19434448.	2.562784E+11	.00007583	.00098074	12.93278396	2104.92187	60000.00000
19529433.	2.519927E+11	.00007750	.00099724	12.86755621	2125.29610	60000.00000
19624064.	2.478829E+11	.00007917	.00101376	12.80543983	2145.22926	60000.00000
19718346.	2.439383E+11	.00008083	.00103032	12.74624884	2164.71935	60000.00000
19812273.	2.401488E+11	.00008250	.00104691	12.68980801	2183.76387	60000.00000
19905842.	2.365051E+11	.00008417	.00106353	12.63595641	2202.36034	60000.00000
19999053.	2.329987E+11	.00008583	.00108017	12.58454740	2220.50642	60000.00000
20091910.	2.296218E+11	.00008750	.00109685	12.53544867	2238.20004	60000.00000
20184392.	2.263670E+11	.00008917	.00111356	12.48852432	2255.43773	60000.00000
20268219.	2.231364E+11	.00009083	.00113001	12.44053066	2271.92166	60000.00000
20327932.	2.197614E+11	.00009250	.00114568	12.38573492	2287.13361	60000.00000
20387359.	2.165029E+11	.00009417	.00116137	12.33315647	2301.94338	60000.00000
20446494.	2.133547E+11	.00009583	.00117709	12.28268087	2316.34881	60000.00000
20505333.	2.103111E+11	.00009750	.00119283	12.23420084	2330.34768	60000.00000
20563887.	2.073669E+11	.00009917	.00120861	12.18762338	2343.93837	60000.00000
20680083.	2.017569E+11	.00010250	.00124023	12.09979355	2369.88480	60000.00000
20795078.	1.964889E+11	.00010583	.00127196	12.01852977	2394.17114	60000.00000
21046479.	1.927922E+11	.00010917	.00131000	12.00000107	2421.20212	60000.00000
21046479.	1.870798E+11	.00011250	.00134242	11.93265975	2442.05241	60000.00000
21124774.	1.823721E+11	.00011583	.00137249	11.84884250	2459.67089	60000.00000
21189623.	1.778150E+11	.00011917	.00140147	11.76061571	2475.13677	60000.00000
21253576.	1.734986E+11	.00012250	.00143055	11.67798579	2489.19889	60000.00000
21316630.	1.694037E+11	.00012583	.00145973	11.60052359	2501.84252	60000.00000
21378758.	1.655130E+11	.00012917	.00148901	11.52783573	2513.05203	60000.00000
21439959.	1.618110E+11	.00013250	.00151839	11.45957887	2522.81199	60000.00000
21500208.	1.582837E+11	.00013583	.00154788	11.39543474	2531.10611	60000.00000
21559509.	1.549186E+11	.00013917	.00157747	11.33512795	2537.91820	60000.00000
21617829.	1.517041E+11	.00014250	.00160717	11.27839386	2543.23102	60000.00000

21675159.	1.486297E+11	.00014583	.00163698	11.22500360	2547.02731	60000.00000
21731496.	1.456860E+11	.00014917	.00166690	11.17474973	2549.28924	60000.00000
21786726.	1.428638E+11	.00015250	.00169693	11.12743199	2549.76691	60000.00000
21817931.	1.400081E+11	.00015583	.00172540	11.07207477	2545.06631	60000.00000
21846186.	1.372535E+11	.00015917	.00175377	11.01843059	2540.38262	60000.00000
21846186.	1.344381E+11	.00016250	.00178750	10.99999845	2544.44172	60000.00000
21899145.	1.320551E+11	.00016583	.00182417	10.99999845	2548.12282	60000.00000
21947952.	1.297416E+11	.00016917	.00185331	10.95554531	2549.61920	60000.00000
21972352.	1.273760E+11	.00017250	.00188087	10.90357125	2549.51561	60000.00000
21996021.	1.250959E+11	.00017583	.00190861	10.85467994	2545.52537	60000.00000
22019454.	1.228993E+11	.00017917	.00193645	10.80807388	2541.52048	60000.00000
22042652.	1.207817E+11	.00018250	.00196436	10.76363862	2537.96701	60000.00000
22065607.	1.187387E+11	.00018583	.00199237	10.72126329	2541.84640	60000.00000
22088308.	1.167664E+11	.00018917	.00202046	10.68084419	2544.98549	60000.00000
22110751.	1.148610E+11	.00019250	.00204864	10.64228833	2547.37435	60000.00000
22132943.	1.130193E+11	.00019583	.00207691	10.60551345	2549.00281	60000.00000
22154875.	1.112379E+11	.00019917	.00210528	10.57043731	2549.86024	60000.00000
22176335.	1.095128E+11	.00020250	.00213379	10.53725302	2548.56356	60000.00000
22197302.	1.078411E+11	.00020583	.00216247	10.50590336	2544.99613	60000.00000
22218098.	1.062220E+11	.00020917	.00219120	10.47587335	2541.41694	60000.00000
22238741.	1.046529E+11	.00021250	.00222001	10.44711292	2537.82555	60000.00000
22259207.	1.031315E+11	.00021583	.00224889	10.41956127	2534.59080	60000.00000
22279505.	1.016555E+11	.00021917	.00227784	10.39317191	2538.53127	60000.00000
22299632.	1.002231E+11	.00022250	.00230686	10.36789834	2541.90376	60000.00000
22316197.	9.881711E+10	.00022583	.00233540	10.34125865	2544.62176	60000.00000
22324211.	9.741474E+10	.00022917	.00236264	10.30970514	2546.63839	60000.00000
22332102.	9.605205E+10	.00023250	.00238994	10.27931035	2548.18831	60000.00000
22347545.	9.343921E+10	.00023917	.00244472	10.22182882	2549.86658	60000.00000
22362068.	9.096435E+10	.00024583	.00249992	10.16915023	2546.46645	60000.00000
22376053.	8.861803E+10	.00025250	.00255538	10.12032688	2540.83009	60000.00000
22389786.	8.639146E+10	.00025917	.00261101	10.07462204	2535.16614	60000.00000
22403275.	8.427564E+10	.00026583	.00266679	10.03181756	2529.47385	60000.00000
22403275.	8.221385E+10	.00027250	.00272500	9.99999940	2535.85585	60000.00000
22403275.	8.025054E+10	.00027917	.00279167	9.99999940	2543.14889	60000.00000
22403275.	7.837880E+10	.00028583	.00285833	9.99999940	2547.82718	60000.00000
22412622.	7.662435E+10	.00029250	.00292500	9.99999940	2549.89073	60000.00000
22482544.	7.515057E+10	.00029917	.00298769	9.98670280	2546.12631	60000.00000
22492628.	7.354538E+10	.00030583	.00304287	9.94944155	2541.70917	60000.00000
22502610.	7.200835E+10	.00031250	.00309815	9.91409361	2537.27429	60000.00000
22512501.	7.053525E+10	.00031917	.00315354	9.88055170	2532.82098	60000.00000
22522301.	6.912215E+10	.00032583	.00320904	9.84871209	2528.34882	60000.00000
22532012.	6.776545E+10	.00033250	.00326465	9.81848180	2523.85727	60000.00000
22541612.	6.646176E+10	.00033917	.00332036	9.78976429	2523.71519	60000.00000
22551119.	6.520806E+10	.00034583	.00337619	9.76248801	2529.48615	60000.00000
22560520.	6.400147E+10	.00035250	.00343214	9.73657429	2534.57132	60000.00000
22569822.	6.283941E+10	.00035917	.00348821	9.71195877	2538.95845	60000.00000
22579018.	6.171941E+10	.00036583	.00354440	9.68857706	2542.63426	60000.00000
22588100.	6.063919E+10	.00037250	.00360072	9.66636837	2545.58500	60000.00000
22597073.	5.959668E+10	.00037917	.00365717	9.64528263	2547.79672	60000.00000
22605923.	5.858987E+10	.00038583	.00371375	9.62526619	2549.25456	60000.00000
22612932.	5.761256E+10	.00039250	.00376958	9.60401595	2549.92936	60000.00000
22613048.	5.665064E+10	.00039917	.00382223	9.57551658	2548.69220	60000.00000

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 = [redacted]

Computed Values of Load Distribution and Deflection
for Lateral Loading for Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Specified shear force at pile head = 13438.000 lbs
Specified moment at pile head = 6060000.000 in-lbs
Specified axial load at pile head = 12833.000 lbs

Non-zero moment for this load case indicates the pile-head may rotate under
the applied pile-head loading, but is not a free-head (zero moment)condition.

Depth X in	Deflect. y in	Moment M lbs-in	Shear V lbs	Slope S Rad.	Total Stress lbs/in**2	Flx. Rig. EI lbs-in**2	Soil Res. p lbs/in	Es*h F/L
0.000	1.360	6.06E+06	13438.	-.007463	290.310	2.12E+12	0.000	0.000
2.340	1.343	6.09E+06	13438.	-.007456	291.804	2.12E+12	0.000	0.000
4.680	1.325	6.12E+06	13438.	-.007450	293.297	2.12E+12	0.000	0.000
7.020	1.308	6.16E+06	13438.	-.007443	294.791	2.11E+12	-.001272	.002276

9.360	1.291	6.19E+06	13438.	-.007436	296.284	2.11E+12	-.004205	.007625
11.700	1.273	6.22E+06	13438.	-.007429	297.777	2.11E+12	-.007156	.013152
14.040	1.256	6.25E+06	13438.	-.007422	299.271	2.11E+12	-.010119	.018856
16.380	1.238	6.28E+06	13438.	-.007415	300.764	2.11E+12	-.013090	.024734
18.720	1.221	6.31E+06	13438.	-.007408	302.257	2.11E+12	-.016065	.030787
21.060	1.204	6.35E+06	13438.	-.007401	303.751	2.11E+12	-.019039	.037011
23.400	1.186	6.38E+06	13438.	-.007394	305.244	2.11E+12	-.022008	.043407
25.740	1.169	6.41E+06	13438.	-.007387	306.737	2.11E+12	-.024967	.049971
28.080	1.152	6.44E+06	13438.	-.007380	308.231	2.11E+12	-.027912	.056704
30.420	1.135	6.47E+06	13438.	-.007373	309.724	2.11E+12	-.030839	.063602
32.760	1.117	6.50E+06	13438.	-.007366	311.217	2.11E+12	-.033742	.070665
35.100	1.100	6.54E+06	13437.	-.007359	312.710	2.11E+12	-.036619	.077890
37.440	1.083	6.57E+06	13437.	-.007351	314.203	2.11E+12	-.039482	.085314
39.780	1.066	6.60E+06	13437.	-.007344	315.697	2.11E+12	-.042326	.092935
42.120	1.049	6.63E+06	13432.	-.007337	317.190	2.11E+12	-4.269	9.527
44.460	1.031	6.66E+06	13338.	-.007329	318.682	2.11E+12	-76.602	173.795
46.800	1.014	6.69E+06	13123.	-.007322	320.154	2.11E+12	-107.199	247.327
49.140	.997108	6.72E+06	12854.	-.007314	321.599	2.11E+12	-122.224	286.833
51.480	.980001	6.75E+06	12546.	-.007307	323.012	2.11E+12	-141.574	338.043
53.820	.962911	6.78E+06	12187.	-.007300	324.388	2.11E+12	-164.780	400.437
56.160	.945839	6.81E+06	11770.	-.007292	325.722	2.11E+12	-191.459	473.669
58.500	.928785	6.84E+06	11287.	-.007284	327.006	2.11E+12	-221.296	557.537
60.840	.911748	6.86E+06	10731.	-.007277	328.234	2.11E+12	-254.031	651.971
63.180	.894729	6.89E+06	10095.	-.007269	329.395	2.11E+12	-289.451	757.007
65.520	.877728	6.91E+06	9373.645	-.007262	330.482	2.11E+12	-327.380	872.787
67.860	.860745	6.93E+06	8560.435	-.007254	331.485	2.11E+12	-367.672	999.544
70.200	.843780	6.95E+06	7650.316	-.007246	332.392	2.11E+12	-410.207	1137.602
72.540	.826833	6.97E+06	6638.139	-.007238	333.194	2.11E+12	-454.901	1287.406
74.880	.809904	6.98E+06	5518.898	-.007231	333.878	2.11E+12	-501.714	1449.569
77.220	.792993	7.00E+06	4287.729	-.007223	334.432	2.11E+12	-550.567	1624.638
79.560	.776100	7.00E+06	2939.902	-.007215	334.844	2.11E+12	-601.422	1813.334
81.900	.759226	7.01E+06	1470.754	-.007207	335.101	2.11E+12	-654.259	2016.485
84.240	.742369	7.01E+06	9.277	-.007200	335.189	2.11E+12	-594.867	1875.063
86.580	.725531	7.01E+06	-1444.501	-.007192	335.124	2.11E+12	-647.678	2088.907
88.920	.708711	7.01E+06	-3022.306	-.007184	334.891	2.11E+12	-700.873	2314.119
91.260	.691909	7.00E+06	-4724.802	-.007176	334.477	2.11E+12	-754.252	2550.840
93.600	.675126	6.98E+06	-6552.197	-.007169	333.868	2.11E+12	-807.623	2799.239
95.940	.658360	6.97E+06	-8472.001	-.007161	333.051	2.11E+12	-833.235	2961.556
98.280	.641613	6.94E+06	-10441.	-.007153	332.019	2.11E+12	-849.574	3098.446
100.620	.624883	6.92E+06	-12446.	-.007145	330.767	2.11E+12	-863.978	3235.336
102.960	.608172	6.89E+06	-14482.	-.007138	329.292	2.11E+12	-876.450	3372.226
105.300	.591478	6.85E+06	-16545.	-.007130	327.591	2.11E+12	-886.994	3509.116
107.640	.574802	6.81E+06	-18631.	-.007123	325.661	2.11E+12	-895.612	3646.006
109.980	.558144	6.76E+06	-20734.	-.007115	323.500	2.11E+12	-902.308	3782.896
112.320	.541504	6.71E+06	-22851.	-.007108	321.105	2.11E+12	-907.085	3919.786
114.660	.524880	6.66E+06	-24977.	-.007100	318.477	2.11E+12	-909.944	4056.676
117.000	.508274	6.60E+06	-27108.	-.007093	315.613	2.11E+12	-910.890	4193.566
119.340	.491686	6.53E+06	-29238.	-.007086	312.514	2.11E+12	-909.924	4330.456
121.680	.475114	6.46E+06	-31364.	-.007078	309.180	2.11E+12	-907.050	4467.346
124.020	.458558	6.38E+06	-33481.	-.007071	305.612	2.11E+12	-902.270	4604.236
126.360	.442020	6.30E+06	-35584.	-.007064	301.811	2.11E+12	-895.586	4741.126
128.700	.425497	6.22E+06	-37670.	-.007057	297.779	2.11E+12	-887.001	4878.016
131.040	.408991	6.13E+06	-39733.	-.007051	293.518	2.11E+12	-876.518	5014.906
133.380	.392501	6.03E+06	-41770.	-.007044	289.030	2.12E+12	-864.139	5151.796
135.720	.376026	5.93E+06	-43775.	-.007037	284.319	2.12E+12	-849.865	5288.686
138.060	.359567	5.83E+06	-45745.	-.007031	279.389	2.12E+12	-833.699	5425.576
140.400	.343122	5.72E+06	-47675.	-.007024	274.244	2.12E+12	-815.644	5562.466
142.740	.326693	5.61E+06	-49560.	-.007018	268.887	2.12E+12	-795.700	5699.356
145.080	.310278	5.49E+06	-51396.	-.007012	263.326	2.12E+12	-773.871	5836.246
147.420	.293877	5.37E+06	-53180.	-.007006	257.564	2.12E+12	-750.157	5973.136
149.760	.277490	5.24E+06	-54905.	-.007000	251.609	2.12E+12	-724.560	6110.026
152.100	.261117	5.11E+06	-56568.	-.006994	245.467	2.12E+12	-697.082	6246.916
154.440	.244756	4.97E+06	-58165.	-.006989	239.145	2.12E+12	-667.725	6383.806
156.780	.228409	4.84E+06	-59691.	-.006983	232.650	2.12E+12	-636.489	6520.696
159.120	.212074	4.70E+06	-61142.	-.006978	225.991	2.12E+12	-603.376	6657.586
161.460	.195751	4.55E+06	-62513.	-.006973	219.176	2.12E+12	-568.387	6794.476
163.800	.179440	4.40E+06	-63800.	-.006968	212.214	2.13E+12	-531.523	6931.366
166.140	.163140	4.25E+06	-64998.	-.006963	205.116	2.13E+12	-492.784	7068.256
168.480	.146851	4.10E+06	-67642.	-.006959	197.889	2.13E+12	-1767.085	28158.
170.820	.130573	3.94E+06	-71584.	-.006954	190.207	2.13E+12	-1601.760	28705.
173.160	.114305	3.77E+06	-75130.	-.006950	182.111	2.13E+12	-1428.943	29253.
175.500	.098046	3.59E+06	-78262.	-.006946	173.646	2.13E+12	-1248.636	29800.
177.840	.081797	3.40E+06	-80964.	-.006942	164.859	2.13E+12	-1060.840	30348.
180.180	.065557	3.21E+06	-83218.	-.006939	155.797	2.13E+12	-865.554	30895.
182.520	.049324	3.01E+06	-85006.	-.006935	146.512	2.13E+12	-662.779	31443.
184.860	.033100	2.81E+06	-86311.	-.006932	137.056	2.13E+12	-452.512	31991.
187.200	.016882	2.61E+06	-87115.	-.006929	127.484	2.14E+12	-234.753	32538.
189.540	.000672	2.40E+06	-87401.	-.006926	117.850	2.14E+12	-9.498	33086.
191.880	-.015533	2.20E+06	-87151.	-.006924	108.214	2.14E+12	223.254	33633.

194.220	-.031732	2.00E+06	-86348.	-.006921	98.636	2.14E+12	463.508	34181.
196.560	-.047925	1.79E+06	-84973.	-.006919	89.177	2.14E+12	711.268	34728.
198.900	-.064114	1.60E+06	-83010.	-.006918	79.902	2.14E+12	966.536	35276.
201.240	-.080300	1.41E+06	-80441.	-.006916	70.877	2.14E+12	1229.319	35823.
203.580	-.096481	1.22E+06	-77248.	-.006914	62.169	2.14E+12	1499.621	36371.
205.920	-.112659	1.05E+06	-73414.	-.006913	53.848	2.14E+12	1777.446	36919.
208.260	-.128835	8.79E+05	-68921.	-.006912	45.987	2.14E+12	2062.800	37466.
210.600	-.145009	7.24E+05	-63751.	-.006911	38.658	2.14E+12	2355.687	38014.
212.940	-.161180	5.81E+05	-57887.	-.006911	31.937	2.14E+12	2656.114	38561.
215.280	-.177350	4.53E+05	-51312.	-.006910	25.902	2.14E+12	2964.083	39109.
217.620	-.193519	3.41E+05	-44007.	-.006910	20.632	2.14E+12	3279.601	39656.
219.960	-.209687	2.47E+05	-35954.	-.006909	16.209	2.14E+12	3602.671	40204.
222.300	-.225855	1.73E+05	-29052.	-.006909	12.717	2.14E+12	2296.749	23796.
224.640	-.242022	1.12E+05	-23588.	-.006909	9.817	2.14E+12	2373.536	22949.
226.980	-.258188	63441.	-17946.	-.006909	7.530	2.14E+12	2448.395	22190.
229.320	-.274355	28358.	-12131.	-.006909	5.876	2.14E+12	2521.408	21505.
231.660	-.290521	7080.840	-6148.039	-.006909	4.873	2.14E+12	2592.632	20882.
234.000	-.306688	0.000	0.000	-.006909	4.539	2.14E+12	2662.102	10156.

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness that the above values of total stress due to combined axial stress and bending may not be representative of actual conditions.

Output Verification:

Computed forces and moments are within specified convergence limits.

Output Summary for Load Case No. 1:

Pile-head deflection	=	1.36025875 in
Computed slope at pile head	=	-.00746313
Maximum bending moment	=	7011691. lbs-in
Maximum shear force	=	-87401.17849 lbs
Depth of maximum bending moment	=	84.24000000 in
Depth of maximum shear force	=	189.54000 in
Number of iterations	=	12
Number of zero deflection points	=	1

Summary of Pile Response(s)

Definition of Symbols for Pile-Head Loading Conditions:

Type 1 = Shear and Moment, y = pile-head displacment in
Type 2 = Shear and Slope, M = Pile-head Moment lbs-in
Type 3 = Shear and Rot. Stiffness, V = Pile-head Shear Force lbs
Type 4 = Deflection and Moment, S = Pile-head Slope, radians
Type 5 = Deflection and Slope, R = Rot. Stiffness of Pile-head in-lbs/rad

Load Type	Pile-Head Condition 1	Pile-Head Condition 2	Axial Load lbs	Pile-Head Deflection in	Maximum Moment in-lbs	Maximum Shear lbs
1	V= 13438.	M= 6.06E+06	12833.0000	[redacted]	[redacted]	

The analysis ended normally.

LPILE Plus for Windows, Version 5.0 (5.0.39)

Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method

This program is licensed to:

MER
Vertical Solutions

Path to file locations: L:\2011\1256_Bluebird Towing_CA\Task 1\Models\LPile\
Name of input data file: CA2944 - Service.lpd
Name of output file: CA2944 - Service.lpo
Name of plot output file: CA2944 - Service.lpp
Name of runtime file: CA2944 - Service.lpr

Time and Date of Analysis

Date: December 20, 2011 Time: 13:00:15

Problem Title

CA2944 - Service

Program Options

Units Used in Computations - US Customary Units: Inches, Pounds

Basic Program Options:

Analysis Type 3:
- Computation of Nonlinear Bending Stiffness and Ultimate Bending Moment Capacity with Pile Response Computed Using Nonlinear EI

Computation Options:
- Only internally-generated p-y curves used in analysis
- Analysis does not use p-y multipliers (individual pile or shaft action only)
- Analysis assumes no shear resistance at pile tip
- Analysis for fixed-length pile or shaft only
- No computation of foundation stiffness matrix elements
- Output pile response for full length of pile
- Analysis assumes no soil movements acting on pile
- No additional p-y curves to be computed at user-specified depths

Solution Control Parameters:
- Number of pile increments = 100
- Maximum number of iterations allowed = 100
- Deflection tolerance for convergence = 1.0000E-05 in
- Maximum allowable deflection = 1.0000E+02 in

Printing Options:
- Values of pile-head deflection, bending moment, shear force, and soil reaction are printed for full length of pile.
- Printing Increment (spacing of output points) = 1

Pile Structural Properties and Geometry

Pile Length = 234.00 in

Depth of ground surface below top of pile = 6.00 in

Slope angle of ground surface = .00 deg.

Structural properties of pile defined using 2 points

Point	Depth X in	Pile Diameter in	Moment of Inertia in**4	Pile Area Sq.in	Modulus of Elasticity lbs/Sq.in
1	0.0000	60.00000000	636172.5000	2827.4000	3122019.
2	234.0000	60.00000000	636172.5000	2827.4000	3122019.

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness that the above values of moment of inertia and modulus of are not used for any computations other than total stress due to combined axial loading and bending.

Soil and Rock Layering Information

The soil profile is modelled using 7 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 6.000 in
Distance from top of pile to bottom of layer = 42.000 in
p-y subgrade modulus k for top of soil layer = 20.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 20.000 lbs/in**3

Layer 2 is silt with cohesion and friction
Distance from top of pile to top of layer = 42.000 in
Distance from top of pile to bottom of layer = 84.000 in
p-y subgrade modulus k for top of soil layer = 30.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 30.000 lbs/in**3

Layer 3 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 84.000 in
Distance from top of pile to bottom of layer = 168.000 in
p-y subgrade modulus k for top of soil layer = 25.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 25.000 lbs/in**3

Layer 4 is silt with cohesion and friction
Distance from top of pile to top of layer = 168.000 in
Distance from top of pile to bottom of layer = 222.000 in
p-y subgrade modulus k for top of soil layer = 100.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 100.000 lbs/in**3

Layer 5 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 222.000 in
Distance from top of pile to bottom of layer = 276.000 in
p-y subgrade modulus k for top of soil layer = 90.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 90.000 lbs/in**3

Layer 6 is silt with cohesion and friction
Distance from top of pile to top of layer = 276.000 in
Distance from top of pile to bottom of layer = 306.000 in
p-y subgrade modulus k for top of soil layer = 100.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 100.000 lbs/in**3

Layer 7 is silt with cohesion and friction
Distance from top of pile to top of layer = 306.000 in
Distance from top of pile to bottom of layer = 522.000 in
p-y subgrade modulus k for top of soil layer = 100.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 100.000 lbs/in**3

(Depth of lowest layer extends 288.00 in below pile tip)

Effective Unit Weight of Soil vs. Depth

Effective unit weight of soil with depth defined using 14 points

Point	Depth X	Eff. Unit Weight

No.	in	lbs/in**3
1	6.00	.00001
2	42.00	.00001
3	42.00	.06655
4	84.00	.06655
5	84.00	.06944
6	168.00	.06944
7	168.00	.06655
8	222.00	.06655
9	222.00	.06944
10	276.00	.06944
11	276.00	.06655
12	306.00	.06655
13	306.00	.03044
14	522.00	.03044

**** WARNING - POSSIBLE INPUT DATA ERROR ****

Values entered for effective unit weights of soil were outside
the limits of 0.011574 pci (20 pcf) or 0.0810019 pci (140 pcf)
This data may be erroneous. Please check your data.

Shear Strength of Soils

Shear strength parameters with depth defined using 14 points

Point No.	Depth X in	Cohesion c lbs/in**2	Angle of Friction Deg.	E50 or k_rm	RQD %
1	6.000	.00000	20.00	------	------
2	42.000	.00000	20.00	------	------
3	42.000	.34722	29.00	.02000	.0
4	84.000	.34722	29.00	.02000	.0
5	84.000	.00000	32.00	------	------
6	168.000	.00000	32.00	------	------
7	168.000	1.38889	25.00	.01000	.0
8	222.000	1.38889	25.00	.01000	.0
9	222.000	.00000	32.00	------	------
10	276.000	.00000	32.00	------	------
11	276.000	1.38889	25.00	.01000	.0
12	306.000	1.38889	25.00	.01000	.0
13	306.000	1.38889	25.00	.01000	.0
14	522.000	1.38889	25.00	.01000	.0

Notes:

(1) Cohesion = uniaxial compressive strength for rock materials.
(2) Values of E50 are reported for clay strata.
(3) Default values will be generated for E50 when input values are 0.
(4) RQD and k_rm are reported only for weak rock strata.

Loading Type

Cyclic loading criteria was used for computation of p-y curves.

Number of cycles of loading = 100.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)

Shear force at pile head = 6696.000 lbs
Bending moment at pile head = 3019516.000 in-lbs
Axial load at pile head = 12833.000 lbs

Non-zero moment at pile head for this load case indicates the pile-head may rotate under the applied pile-head loading, but is not a free-head (zero moment) condition.

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

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Number of sections = 1

Pile Section No. 1

The sectional shape is a circular drilled shaft (bored pile).

Outside Diameter = 60.0000 in

Material Properties:

Compressive Strength of Concrete	=	3.000 kip/in**2
Yield Stress of Reinforcement	=	60. kip/in**2
Modulus of Elasticity of Reinforcement	=	29000. kip/in**2
Number of Reinforcing Bars	=	15
Area of Single Bar	=	1.00000 in**2
Number of Rows of Reinforcing Bars	=	15
Area of Steel	=	15.000 in**2
Area of Shaft	=	2827.433 in**2
Percentage of Steel Reinforcement	=	.531 percent
Cover Thickness (edge to bar center)	=	4.310 in

Unfactored Axial Squash Load Capacity = 8071.71 kip

Distribution and Area of Steel Reinforcement

Row Number	Area of Reinforcement in**2	Distance to Centroidal Axis in
1	1.000	25.549
2	1.000	24.433
3	1.000	22.248
4	1.000	19.091
5	1.000	15.100
6	1.000	10.449
7	1.000	5.341
8	1.000	0.000
9	1.000	-5.341
10	1.000	-10.449
11	1.000	-15.100
12	1.000	-19.091
13	1.000	-22.248
14	1.000	-24.433
15	1.000	-25.549

Axial Thrust Force = .00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches	Max. Concrete Stress psi	Max. Steel Stress psi
1784806.	2.141767E+12	8.333333E-07	.00002508	30.10054171	77.09504867	619.87039
3552041.	2.131225E+12	.00000167	.00005017	30.10033429	153.00566	1239.73075
5301705.	2.120682E+12	.00000250	.00007525	30.10012329	227.73187	1859.58083
7033798.	2.110139E+12	.00000333	.00010033	30.09991229	301.27372	2479.42071
8748320.	2.099597E+12	.00000417	.00012542	30.09969771	373.63123	3099.24996
8748320.	1.749664E+12	.00000500	.00006587	13.17327797	195.66182	6144.51848
8748320.	1.499712E+12	.00000583	.00007689	13.18105280	227.64922	7167.28965
8748320.	1.312248E+12	.00000667	.00008793	13.18886340	259.45721	8189.67813
8748320.	1.166443E+12	.00000750	.00009898	13.19670975	291.08525	9211.68131
8748320.	1.049798E+12	.00000833	.00011004	13.20458472	322.53261	10233.29834
8748320.	9.543622E+11	.00000917	.00012111	13.21249902	353.79894	11254.52428

8748320.	8.748320E+11	.00001000	.00013220	13.22044551	384.88350	12275.35837
8748320.	8.075373E+11	.00001083	.00014331	13.22842419	415.78567	13295.79827
8748320.	7.498560E+11	.00001167	.00015443	13.23644221	446.50508	14315.83922
8748320.	6.998656E+11	.00001250	.00016556	13.24449241	477.04088	15335.48097
8748320.	6.561240E+11	.00001333	.00017670	13.25257838	507.39258	16354.71979
8748320.	6.175285E+11	.00001417	.00018786	13.26070368	537.55970	17373.55163
8748320.	5.832214E+11	.00001500	.00019903	13.26886117	567.54135	18391.97675
8748320.	5.525255E+11	.00001583	.00021022	13.27705801	597.33716	19409.98952
8748320.	5.248992E+11	.00001667	.00022142	13.28529060	626.94636	20427.58883
8748320.	4.999040E+11	.00001750	.00023264	13.29355896	656.36828	21444.77208
8748320.	4.771811E+11	.00001833	.00024387	13.30187023	685.60263	22461.53288
8748320.	4.564341E+11	.00001917	.00025511	13.31021369	714.64821	23477.87407
8748320.	4.374160E+11	.00002000	.00026637	13.31860006	743.50490	24493.78711
8748320.	4.199194E+11	.00002083	.00027765	13.32702219	772.17165	25509.27320
8748320.	4.037686E+11	.00002167	.00028894	13.33548367	800.64797	26524.32750
8748320.	3.888142E+11	.00002250	.00030024	13.34398448	828.93315	27538.94716
8748320.	3.749280E+11	.00002333	.00031156	13.35252464	857.02652	28553.12933
8748320.	3.619995E+11	.00002417	.00032289	13.36110771	884.92757	29566.86865
8748320.	3.499328E+11	.00002500	.00033424	13.36973011	912.63537	30580.16460
8748320.	3.386447E+11	.00002583	.00034561	13.37839186	940.14921	31593.01433
8766802.	3.287551E+11	.00002667	.00035699	13.38709652	967.46857	32605.41222
9036124.	3.285863E+11	.00002750	.00036839	13.39584410	994.59272	33617.35515
9305144.	3.284169E+11	.00002833	.00037980	13.40463102	1021.52068	34628.84297
9573864.	3.282468E+11	.00002917	.00039123	13.41346085	1048.25192	35639.86978
9842283.	3.280761E+11	.00003000	.00040267	13.42233717	1074.78594	36650.42938
10110394.	3.279047E+11	.00003083	.00041413	13.43125284	1101.12146	37660.52477
10378201.	3.277327E+11	.00003167	.00042561	13.44021499	1127.25820	38670.14655
10645698.	3.275599E+11	.00003250	.00043710	13.44922006	1153.19512	39679.29470
11179761.	3.272125E+11	.00003417	.00046014	13.46736610	1204.46679	41696.15063
11712564.	3.268623E+11	.00003583	.00048324	13.48569095	1254.92993	43711.06662
12244099.	3.265093E+11	.00003750	.00050641	13.50420535	1304.57869	45724.00508
12774344.	3.261535E+11	.00003917	.00052965	13.52290928	1353.40625	47734.93853
13303287.	3.257948E+11	.00004083	.00055296	13.54180992	1401.40617	49743.83101
13830908.	3.254331E+11	.00004250	.00057634	13.56090724	1448.57126	51750.65400
14357187.	3.250684E+11	.00004417	.00059979	13.58020484	1494.89446	53755.37441
14882109.	3.247006E+11	.00004583	.00062332	13.59970987	1540.36882	55757.95367
15405661.	3.243297E+11	.00004750	.00064692	13.61942947	1584.98724	57758.35188
15927816.	3.239556E+11	.00004917	.00067060	13.63936365	1628.74175	59756.53790
16368322.	3.219998E+11	.00005083	.00069313	13.63535821	1669.35316	60000.00000
16720019.	3.184766E+11	.00005250	.00071435	13.60661566	1706.67449	60000.00000
17040729.	3.145981E+11	.00005417	.00073512	13.57136786	1742.39363	60000.00000
17313213.	3.100874E+11	.00005583	.00075514	13.52487981	1776.04767	60000.00000
17584975.	3.058257E+11	.00005750	.00077521	13.48188579	1809.06350	60000.00000
17811452.	3.010386E+11	.00005917	.00079450	13.42824161	1840.07500	60000.00000
18013650.	2.961148E+11	.00006083	.00081340	13.37102830	1869.77969	60000.00000
18215262.	2.914442E+11	.00006250	.00083234	13.31748068	1898.91067	60000.00000
18416297.	2.870072E+11	.00006417	.00085132	13.26732695	1927.46528	60000.00000
18586721.	2.823299E+11	.00006583	.00086971	13.21077526	1954.48446	60000.00000
18730105.	2.774830E+11	.00006750	.00088758	13.14930260	1980.12929	60000.00000
18873020.	2.728629E+11	.00006917	.00090548	13.09127033	2005.25784	60000.00000
19015462.	2.684536E+11	.00007083	.00092341	13.03643882	2029.86714	60000.00000
19187096.	2.646496E+11	.00007250	.00094250	13.00000012	2055.50482	60000.00000
19309996.	2.603595E+11	.00007417	.00096346	12.99051583	2083.02860	60000.00000
19434448.	2.562784E+11	.00007583	.00098074	12.93278396	2104.92187	60000.00000
19529433.	2.519927E+11	.00007750	.00099724	12.86755621	2125.29610	60000.00000
19624064.	2.478829E+11	.00007917	.00101376	12.80543983	2145.22926	60000.00000
19718346.	2.439383E+11	.00008083	.00103032	12.74624884	2164.71935	60000.00000
19812273.	2.401488E+11	.00008250	.00104691	12.68980801	2183.76387	60000.00000
19905842.	2.365051E+11	.00008417	.00106353	12.63595641	2202.36034	60000.00000
19999053.	2.329987E+11	.00008583	.00108017	12.58454740	2220.50642	60000.00000
20091910.	2.296218E+11	.00008750	.00109685	12.53544867	2238.20004	60000.00000
20184392.	2.263670E+11	.00008917	.00111356	12.48852432	2255.43773	60000.00000
20268219.	2.231364E+11	.00009083	.00113001	12.44053066	2271.92166	60000.00000
20327932.	2.197614E+11	.00009250	.00114568	12.38573492	2287.13361	60000.00000
20387359.	2.165029E+11	.00009417	.00116137	12.33315647	2301.94338	60000.00000
20446494.	2.133547E+11	.00009583	.00117709	12.28268087	2316.34881	60000.00000
20505333.	2.103111E+11	.00009750	.00119283	12.23420084	2330.34768	60000.00000
20563887.	2.073669E+11	.00009917	.00120861	12.18762338	2343.93837	60000.00000
20680083.	2.017569E+11	.00010250	.00124023	12.09979355	2369.88480	60000.00000
20795078.	1.964889E+11	.00010583	.00127196	12.01852977	2394.17114	60000.00000
21046479.	1.927922E+11	.00010917	.00131000	12.00000107	2421.20212	60000.00000
21046479.	1.870798E+11	.00011250	.00134242	11.93265975	2442.05241	60000.00000
21124774.	1.823721E+11	.00011583	.00137249	11.84884250	2459.67089	60000.00000
21189623.	1.778150E+11	.00011917	.00140147	11.76061571	2475.13677	60000.00000
21253576.	1.734986E+11	.00012250	.00143055	11.67798579	2489.19889	60000.00000
21316630.	1.694037E+11	.00012583	.00145973	11.60052359	2501.84252	60000.00000
21378758.	1.655130E+11	.00012917	.00148901	11.52783573	2513.05203	60000.00000
21439959.	1.618110E+11	.00013250	.00151839	11.45957887	2522.81199	60000.00000
21500208.	1.582837E+11	.00013583	.00154788	11.39543474	2531.10611	60000.00000

21559509.	1.549186E+11	.00013917	.00157747	11.33512795	2537.91820	60000.00000
21617829.	1.517041E+11	.00014250	.00160717	11.27839386	2543.23102	60000.00000
21675159.	1.486297E+11	.00014583	.00163698	11.22500360	2547.02731	60000.00000
21731496.	1.456860E+11	.00014917	.00166690	11.17474973	2549.28924	60000.00000
21786726.	1.428638E+11	.00015250	.00169693	11.12743199	2549.76691	60000.00000
21817931.	1.400081E+11	.00015583	.00172540	11.07207477	2545.06631	60000.00000
21846186.	1.372535E+11	.00015917	.00175377	11.01843059	2540.38262	60000.00000
21846186.	1.344381E+11	.00016250	.00178750	10.99999845	2544.44172	60000.00000
21899145.	1.320551E+11	.00016583	.00182417	10.99999845	2548.12282	60000.00000
21947952.	1.297416E+11	.00016917	.00185331	10.95554531	2549.61920	60000.00000
21972352.	1.273760E+11	.00017250	.00188087	10.90357125	2549.51561	60000.00000
21996021.	1.250959E+11	.00017583	.00190861	10.85467994	2545.52537	60000.00000
22019454.	1.228993E+11	.00017917	.00193645	10.80807388	2541.52048	60000.00000
22042652.	1.207817E+11	.00018250	.00196436	10.76363862	2537.96701	60000.00000
22065607.	1.187387E+11	.00018583	.00199237	10.72126329	2541.84640	60000.00000
22088308.	1.167664E+11	.00018917	.00202046	10.68084419	2544.98549	60000.00000
22110751.	1.148610E+11	.00019250	.00204864	10.64228833	2547.37435	60000.00000
22132943.	1.130193E+11	.00019583	.00207691	10.60551345	2549.00281	60000.00000
22154875.	1.112379E+11	.00019917	.00210528	10.57043731	2549.86024	60000.00000
22176335.	1.095128E+11	.00020250	.00213379	10.53725302	2548.56356	60000.00000
22197302.	1.078411E+11	.00020583	.00216247	10.50590336	2544.99613	60000.00000
22218098.	1.062220E+11	.00020917	.00219120	10.47587335	2541.41694	60000.00000
22238741.	1.046529E+11	.00021250	.00222001	10.44711292	2537.82555	60000.00000
22259207.	1.031315E+11	.00021583	.00224889	10.41956127	2534.59080	60000.00000
22279505.	1.016555E+11	.00021917	.00227784	10.39317191	2538.53127	60000.00000
22299632.	1.002231E+11	.00022250	.00230686	10.36789834	2541.90376	60000.00000
22316197.	9.881711E+10	.00022583	.00233540	10.34125865	2544.62176	60000.00000
22324211.	9.741474E+10	.00022917	.00236264	10.30970514	2546.63839	60000.00000
22332102.	9.605205E+10	.00023250	.00238994	10.27931035	2548.18831	60000.00000
22347545.	9.343921E+10	.00023917	.00244472	10.22182882	2549.86658	60000.00000
22362068.	9.096435E+10	.00024583	.00249992	10.16915023	2546.46645	60000.00000
22376053.	8.861803E+10	.00025250	.00255538	10.12032688	2540.83009	60000.00000
22389786.	8.639146E+10	.00025917	.00261101	10.07462204	2535.16614	60000.00000
22403275.	8.427564E+10	.00026583	.00266679	10.03181756	2529.47385	60000.00000
22403275.	8.221385E+10	.00027250	.00272500	9.99999940	2535.85585	60000.00000
22403275.	8.025054E+10	.00027917	.00279167	9.99999940	2543.14889	60000.00000
22403275.	7.837880E+10	.00028583	.00285833	9.99999940	2547.82718	60000.00000
22412622.	7.662435E+10	.00029250	.00292500	9.99999940	2549.89073	60000.00000
22482544.	7.515057E+10	.00029917	.00298769	9.98670280	2546.12631	60000.00000
22492628.	7.354538E+10	.00030583	.00304287	9.94944155	2541.70917	60000.00000
22502610.	7.200835E+10	.00031250	.00309815	9.91409361	2537.27429	60000.00000
22512501.	7.053525E+10	.00031917	.00315354	9.88055170	2532.82098	60000.00000
22522301.	6.912215E+10	.00032583	.00320904	9.84871209	2528.34882	60000.00000
22532012.	6.776545E+10	.00033250	.00326465	9.81848180	2523.85727	60000.00000
22541612.	6.646176E+10	.00033917	.00332036	9.78976429	2523.71519	60000.00000
22551119.	6.520806E+10	.00034583	.00337619	9.76248801	2529.48615	60000.00000
22560520.	6.400147E+10	.00035250	.00343214	9.73657429	2534.57132	60000.00000
22569822.	6.283941E+10	.00035917	.00348821	9.71195877	2538.95845	60000.00000
22579018.	6.171941E+10	.00036583	.00354440	9.68857706	2542.63426	60000.00000
22588100.	6.063919E+10	.00037250	.00360072	9.66636837	2545.58500	60000.00000
22597073.	5.959668E+10	.00037917	.00365717	9.64528263	2547.79672	60000.00000
22605923.	5.858987E+10	.00038583	.00371375	9.62526619	2549.25456	60000.00000
22612932.	5.761256E+10	.00039250	.00376958	9.60401595	2549.92936	60000.00000
22613048.	5.665064E+10	.00039917	.00382223	9.57551658	2548.69220	60000.00000

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 = 22484.79387 in-kip

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Computed Values of Load Distribution and Deflection
for Lateral Loading for Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Specified shear force at pile head = 6696.000 lbs
Specified moment at pile head = 3019516.000 in-lbs
Specified axial load at pile head = 12833.000 lbs

Non-zero moment for this load case indicates the pile-head may rotate under
the applied pile-head loading, but is not a free-head (zero moment)condition.

Depth X in	Deflect. y in	Moment M lbs-in	Shear V lbs	Slope S Rad.	Total Stress lbs/in**2	Flx. Rig. EI lbs-in**2	Soil Res. p lbs/in	Es*h F/L
0.000	.672508	3.02E+06	6696.000	-.003668	146.930	2.13E+12	0.000	0.000
2.340	.663929	3.04E+06	6696.001	-.003665	147.674	2.13E+12	0.000	0.000

4.680	.655357	3.05E+06	6696.000	-.003661	148.418	2.13E+12	0.000	0.000
7.020	.646794	3.07E+06	6696.000	-.003658	149.162	2.13E+12	-.000257	.000931
9.360	.638239	3.08E+06	6695.998	-.003654	149.906	2.13E+12	-.000888	.003254
11.700	.629691	3.10E+06	6695.995	-.003651	150.651	2.13E+12	-.001575	.005853
14.040	.621152	3.11E+06	6695.991	-.003648	151.395	2.13E+12	-.002321	.008745
16.380	.612620	3.13E+06	6695.985	-.003644	152.139	2.13E+12	-.003128	.011949
18.720	.604097	3.15E+06	6695.976	-.003641	152.883	2.13E+12	-.003998	.015486
21.060	.595581	3.16E+06	6695.966	-.003637	153.627	2.13E+12	-.004932	.019377
23.400	.587074	3.18E+06	6695.953	-.003634	154.371	2.13E+12	-.005932	.023644
25.740	.578575	3.19E+06	6695.938	-.003630	155.115	2.13E+12	-.007000	.028310
28.080	.570084	3.21E+06	6695.920	-.003627	155.859	2.13E+12	-.008137	.033400
30.420	.561601	3.22E+06	6695.900	-.003623	156.603	2.13E+12	-.009346	.038942
32.760	.553127	3.24E+06	6695.876	-.003620	157.347	2.13E+12	-.010628	.044962
35.100	.544661	3.26E+06	6695.850	-.003616	158.091	2.13E+12	-.011985	.051491
37.440	.536203	3.27E+06	6695.820	-.003613	158.835	2.13E+12	-.013320	.058130
39.780	.527753	3.29E+06	6695.788	-.003609	159.579	2.13E+12	-.014648	.064946
42.120	.519312	3.30E+06	6693.481	-.003605	160.323	2.13E+12	-1.957	8.819
44.460	.510880	3.32E+06	6646.978	-.003602	161.066	2.13E+12	-37.789	173.087
46.800	.502456	3.33E+06	6518.011	-.003598	161.800	2.13E+12	-72.438	337.355
49.140	.494041	3.35E+06	6309.347	-.003594	162.515	2.13E+12	-105.907	501.623
51.480	.485634	3.36E+06	6023.747	-.003591	163.202	2.13E+12	-138.196	665.891
53.820	.477236	3.38E+06	5663.966	-.003587	163.854	2.13E+12	-169.308	830.159
56.160	.468847	3.39E+06	5232.759	-.003583	164.463	2.13E+12	-199.245	994.427
58.500	.460466	3.40E+06	4732.872	-.003580	165.019	2.13E+12	-228.008	1158.695
60.840	.452094	3.41E+06	4167.051	-.003576	165.517	2.13E+12	-255.600	1322.963
63.180	.443731	3.42E+06	3538.035	-.003572	165.949	2.13E+12	-282.021	1487.231
65.520	.435376	3.43E+06	2848.558	-.003568	166.308	2.13E+12	-307.275	1651.499
67.860	.427031	3.44E+06	2101.352	-.003565	166.588	2.13E+12	-331.362	1815.767
70.200	.418694	3.44E+06	1299.144	-.003561	166.782	2.13E+12	-354.286	1980.035
72.540	.410366	3.44E+06	444.655	-.003557	166.885	2.13E+12	-376.047	2144.303
74.880	.402047	3.44E+06	-459.396	-.003553	166.890	2.13E+12	-396.647	2308.571
77.220	.393737	3.44E+06	-1410.297	-.003549	166.793	2.13E+12	-416.089	2472.839
79.560	.385435	3.44E+06	-2405.338	-.003546	166.589	2.13E+12	-434.374	2637.107
81.900	.377143	3.43E+06	-3441.814	-.003542	166.273	2.13E+12	-451.503	2801.375
84.240	.368859	3.42E+06	-4127.006	-.003538	165.840	2.13E+12	-134.131	850.914
86.580	.360584	3.41E+06	-4466.129	-.003534	165.372	2.13E+12	-155.717	1010.522
88.920	.352318	3.40E+06	-4855.233	-.003531	164.864	2.13E+12	-176.850	1174.590
91.260	.344060	3.39E+06	-5295.322	-.003527	164.310	2.13E+12	-199.294	1355.428
93.600	.335812	3.38E+06	-5789.463	-.003523	163.705	2.13E+12	-223.048	1554.244
95.940	.327571	3.36E+06	-6340.716	-.003520	163.043	2.13E+12	-248.109	1772.358
98.280	.319340	3.35E+06	-6952.133	-.003516	162.316	2.13E+12	-274.470	2011.207
100.620	.311117	3.33E+06	-7626.748	-.003512	161.518	2.13E+12	-302.125	2272.364
102.960	.302903	3.31E+06	-8367.578	-.003509	160.643	2.13E+12	-331.064	2557.550
105.300	.294697	3.29E+06	-9176.714	-.003505	159.682	2.13E+12	-360.505	2862.540
107.640	.286500	3.27E+06	-10028.	-.003501	158.627	2.13E+12	-367.237	2999.430
109.980	.278311	3.24E+06	-10894.	-.003498	157.478	2.13E+12	-373.022	3136.320
112.320	.270130	3.22E+06	-11773.	-.003494	156.233	2.13E+12	-377.860	3273.210
114.660	.261958	3.19E+06	-12662.	-.003491	154.890	2.13E+12	-381.753	3410.100
117.000	.253793	3.16E+06	-13558.	-.003487	153.448	2.13E+12	-384.702	3546.990
119.340	.245637	3.13E+06	-14461.	-.003484	151.908	2.13E+12	-386.709	3683.880
121.680	.237489	3.09E+06	-15367.	-.003480	150.267	2.13E+12	-387.774	3820.770
124.020	.229349	3.05E+06	-16275.	-.003477	148.526	2.13E+12	-387.900	3957.660
126.360	.221217	3.01E+06	-17181.	-.003474	146.685	2.13E+12	-387.087	4094.550
128.700	.213092	2.97E+06	-18085.	-.003470	144.744	2.13E+12	-385.336	4231.440
131.040	.204975	2.93E+06	-18984.	-.003467	142.704	2.13E+12	-382.649	4368.330
133.380	.196866	2.88E+06	-19875.	-.003464	140.564	2.13E+12	-379.027	4505.220
135.720	.188764	2.84E+06	-20756.	-.003461	138.327	2.13E+12	-374.471	4642.110
138.060	.180669	2.79E+06	-21626.	-.003458	135.993	2.13E+12	-368.982	4779.000
140.400	.172581	2.74E+06	-22482.	-.003455	133.564	2.13E+12	-362.560	4915.890
142.740	.164501	2.68E+06	-23322.	-.003452	131.041	2.13E+12	-355.208	5052.780
145.080	.156427	2.63E+06	-24143.	-.003449	128.427	2.13E+12	-346.925	5189.670
147.420	.148360	2.57E+06	-24944.	-.003446	125.723	2.14E+12	-337.713	5326.560
149.760	.140300	2.51E+06	-25723.	-.003443	122.932	2.14E+12	-327.573	5463.450
152.100	.132246	2.45E+06	-26476.	-.003441	120.056	2.14E+12	-316.505	5600.340
154.440	.124198	2.39E+06	-27203.	-.003438	117.098	2.14E+12	-304.510	5737.230
156.780	.116157	2.32E+06	-27900.	-.003435	114.062	2.14E+12	-291.589	5874.120
159.120	.108121	2.26E+06	-28566.	-.003433	110.950	2.14E+12	-277.743	6011.010
161.460	.100091	2.19E+06	-29199.	-.003430	107.767	2.14E+12	-262.971	6147.900
163.800	.092067	2.12E+06	-29796.	-.003428	104.516	2.14E+12	-247.275	6284.790
166.140	.084048	2.05E+06	-30355.	-.003426	101.201	2.14E+12	-230.655	6421.680
168.480	.076035	1.98E+06	-31530.	-.003423	97.826	2.14E+12	-773.465	23804.
170.820	.068026	1.90E+06	-33263.	-.003421	94.252	2.14E+12	-707.917	24351.
173.160	.060023	1.82E+06	-34839.	-.003419	90.495	2.14E+12	-638.673	24899.
175.500	.052024	1.74E+06	-36248.	-.003417	86.573	2.14E+12	-565.734	25446.
177.840	.044030	1.65E+06	-37482.	-.003416	82.505	2.14E+12	-489.102	25994.
180.180	.036039	1.56E+06	-38533.	-.003414	78.311	2.14E+12	-408.775	26541.
182.520	.028053	1.47E+06	-39391.	-.003412	74.011	2.14E+12	-324.756	27089.
184.860	.020071	1.38E+06	-40048.	-.003411	69.627	2.14E+12	-237.043	27637.
187.200	.012092	1.29E+06	-40496.	-.003409	65.182	2.14E+12	-145.637	28184.

189.540	.004116	1.19E+06	-40725.	-.003408	60.699	2.14E+12	-50.538	28732.
191.880	-.003857	1.10E+06	-40728.	-.003407	56.204	2.14E+12	48.257	29279.
194.220	-.011826	1.00E+06	-40495.	-.003405	51.721	2.14E+12	150.746	29827.
196.560	-.019794	9.06E+05	-40018.	-.003404	47.276	2.14E+12	256.933	30374.
198.900	-.027759	8.13E+05	-39288.	-.003403	42.898	2.14E+12	366.817	30922.
201.240	-.035722	7.23E+05	-38297.	-.003403	38.615	2.14E+12	480.401	31469.
203.580	-.043683	6.34E+05	-37036.	-.003402	34.456	2.14E+12	597.686	32017.
205.920	-.051642	5.49E+05	-35496.	-.003401	30.451	2.14E+12	718.675	32565.
208.260	-.059600	4.69E+05	-33668.	-.003401	26.632	2.14E+12	843.368	33112.
210.600	-.067557	3.92E+05	-31544.	-.003400	23.030	2.14E+12	971.769	33660.
212.940	-.075513	3.21E+05	-29116.	-.003400	19.680	2.14E+12	1103.879	34207.
215.280	-.083467	2.56E+05	-26374.	-.003399	16.614	2.14E+12	1239.700	34755.
217.620	-.091422	1.98E+05	-23310.	-.003399	13.869	2.14E+12	1379.234	35302.
219.960	-.099376	1.47E+05	-19915.	-.003399	11.480	2.14E+12	1522.483	35850.
222.300	-.107329	1.05E+05	-16787.	-.003399	9.483	2.14E+12	1150.848	25091.
224.640	-.115282	68826.	-13966.	-.003399	7.784	2.14E+12	1260.405	25584.
226.980	-.123235	39699.	-10884.	-.003399	6.411	2.14E+12	1373.310	26077.
229.320	-.131188	18091.	-7534.818	-.003399	5.392	2.14E+12	1489.563	26569.
231.660	-.139141	4640.136	-3909.304	-.003399	4.758	2.14E+12	1609.166	27062.
234.000	-.147094	0.000	0.000	-.003399	4.539	2.14E+12	1732.119	13777.

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness that the above values of total stress due to combined axial stress and bending may not be representative of actual conditions.

Output Verification:

Computed forces and moments are within specified convergence limits.

Output Summary for Load Case No. 1:

Pile-head deflection	=	.67250753 in
Computed slope at pile head	=	-.00366786
Maximum bending moment	=	3442786. lbs-in
Maximum shear force	=	-40728.10252 lbs
Depth of maximum bending moment	=	74.88000000 in
Depth of maximum shear force	=	191.88000 in
Number of iterations	=	7
Number of zero deflection points	=	1

Summary of Pile Response(s)

Definition of Symbols for Pile-Head Loading Conditions:

Type 1 = Shear and Moment, y = pile-head displacment in
Type 2 = Shear and Slope, M = Pile-head Moment lbs-in
Type 3 = Shear and Rot. Stiffness, V = Pile-head Shear Force lbs
Type 4 = Deflection and Moment, S = Pile-head Slope, radians
Type 5 = Deflection and Slope, R = Rot. Stiffness of Pile-head in-lbs/rad

Load Type	Pile-Head Condition 1	Pile-Head Condition 2	Axial Load lbs	Pile-Head Deflection in	Maximum Moment in-lbs	Maximum Shear lbs
1	V= 6696.000	M= 3.02E+06	12833.0000	[redacted]	3442786.	-40728.1025

The analysis ended normally.

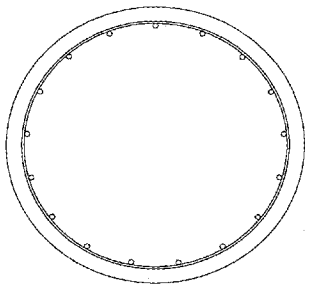
vertical solutions

Mn.xls

VSi Job: 111256
Engineer: MER
Date: 12/20/11

Inputs:

M_u	935 k-ft
ϕ	0.9
D	60 in
c	**14.97** in
f'_c	3 ksi
β_1	0.85
a	12.72 in
ε_{cu}	0.003 in/in
ε_y	0.002 in/in
fy	60 ksi
Bar Size	#9
A_s	1 in^2
n	15



Compute flexural resistance of round concrete cross section by strain compatibility method

Output: ymax 25.69

Bar #	y_{NA} (in)	y (in)	ε	f_s (ksi)	F_s (kip)	M_s (k-ft)	phi (rad)
1	25.69	4.3	0.002	60.0	60.0	128.4	0.0
2	23.47	6.5	0.002	49.0	49.0	95.9	0.4
3	17.19	12.8	0.000	12.5	12.5	17.9	0.8
4	7.94	22.1	-0.001	-41.2	-41.2	-27.3	1.3
5	-2.69	32.7	-0.004	-60.0	-60.0	13.4	1.7
6	-12.84	42.8	-0.006	-60.0	-60.0	64.2	2.1
7	-20.78	50.8	-0.007	-61.1	-61.1	105.7	2.5
8	-25.13	55.1	-0.008	-61.6	-61.6	129.1	2.9
9	-25.13	55.1	-0.008	-61.6	-61.6	129.1	3.4
10	-20.78	50.8	-0.007	-61.1	-61.1	105.7	3.8
11	-12.84	42.8	-0.006	-60.0	-60.0	64.2	4.2
12	-2.69	32.7	-0.004	-60.0	-60.0	13.4	4.6
13	7.94	22.1	-0.001	-41.2	-41.2	-27.3	5.0
14	17.19	12.8	0.000	12.5	12.5	17.9	5.4
15	23.47	6.5	0.002	49.0	49.0	95.9	5.9
					-384.8	926.4	

alpha	0.957 rad
b	24.52 in
ybar	5.19 in

Ac	150.9 in^2
Cc	384.8 kip
$\Sigma F_s+\Sigma C_c$	0.0 kip
y_c	22.5 in
M_c	720.6 k-ft
$\Sigma M_s+\Sigma M_c$	1647 k-ft
M_n	1647 k-ft

w = 16 in

A_{coduit} = 203.55 in^2

Pure Flexure

ϕM_n	**1482 k-ft**
M_u	**935 k-ft**
ratio	**0.63**

result	ok

Combined Flexure and Axial Load, simplified (straight-line interpolation)

Pu	**15.4 k**
ϕP_n	**4740 k**
ϕM_n	**1478 k-ft**
ratio	**0.63**

VSi Job No.: 111256
Date: 12/20/2011
Calculated by: MER

SEISMIC TRANSVERSE REINFORCMENT, CBC 2010, IBC 2009, ACI 318-08
Seismic Design Categories D through F

Input:

$SDC := "D"$ = seismic design category (C, D, E, F)

$SiteClass := "D"$ = site class (A, B, C, D, E, F)

$D := 5 \cdot ft$ = diameter of drilled shaft

$f'_c := 4000 \cdot psi$ = concrete strength

$d_{long} := 1.128 \cdot in$ = diameter of longitudinal (vertical) bars

$n_{long} := 21$ = number of longitudinal (vertical) bars

$f_{yt} := 60 \cdot ksi$ = yield strength of rebar

$ties := "\#6"$ = transverse reinforcement

$A_{ties} := 0.44 \cdot in^2$ = area of transverse reinforcement

$s_{ties} := 6.0 \cdot in$ = spacing of transverse reinforcement

$n_{ties} := 2.0$ = number of transverse reinforcement bars per spacing

$cover := 4.1875 \cdot in$ = cover to longitudinal reinforcement bars

$h_x := 7.657 \cdot in$ = horizontal distance between longitudinal reinforcement bars

Output: Minimum longitudinal reinforcement - CBC 2010 - 1810.3.9.4.2

$$A_s := n_{long} \cdot \left(\frac{\pi \cdot d_{long}^2}{4} \right) \qquad A_s = 21.0 \cdot in^2$$

$$A_c := \frac{\pi \cdot D^2}{4} \qquad A_c = 2827 \cdot in^2$$

$$\rho_{sL} := \frac{A_s}{A_c} \qquad \rho_{sL} = 0.007$$

$$r_{\rho L} := \begin{cases} "OK" & \text{if } \rho_{sL} \geq 0.005 \\ "NG" & \text{otherwise} \end{cases} \qquad r_{\rho L} = "OK"$$

Output: Minimum number longitudinal reinforcement - CBC 2010 - 1810.3.9.4.2

$$r_n := \begin{cases} "OK" & \text{if } n_{long} \geq 4 \\ "NG" & \text{otherwise} \end{cases} \qquad r_n = "OK"$$

Output: Minimum diameter of closed ties - CBC 2010 - 1810.3.9.4.2

$$ties_{REQ} := \begin{cases} "\#3" & \text{if } D \leq 20 \cdot in \\ "\#4" & \text{otherwise} \end{cases} \qquad ties_{REQ} = "\#4"$$

Output: Max spacing of closed ties for required length

$$L := \begin{cases} 7 \cdot D & \text{if SiteClass} = \text{"E"} \\ 7 \cdot D & \text{if SiteClass} = \text{"F"} \\ 3 \cdot D & \text{otherwise} \end{cases}$$

CBC 2010 - 1810.3.9.4.2.1& 1810.3.9.4.2.2

$L = 15.0 \cdot ft$

$$\rho_s := 0.12 \cdot \left(\frac{f'_c}{f_{yt}} \right)$$

ACI 318 Eq. 21-3

$\rho_s = 0.008$

$$\rho_{sTreq} := \begin{cases} \rho_s & \text{if SiteClass} = \text{"E"} \\ \rho_s & \text{if SiteClass} = \text{"F"} \\ \frac{\rho_s}{2} & \text{otherwise} \end{cases}$$

CBC 2010 - 1810.3.9.4.2.1& 1810.3.9.4.2.2

$\rho_{sTreq} = 0.004$

$$s_{transReq} := \left[\begin{array}{c} 0.25 \cdot D \\ 6 \cdot d_{long} \\ \left[4 + \left(\frac{14 - \frac{h_x}{in}}{3} \right) \right] \cdot in \end{array} \right]$$

ACI 318 - 21.6.4.3

$4 < s_o < 6$

$$s_{transReq} = \begin{pmatrix} 15.00 \\ 6.72 \\ 6.11 \end{pmatrix} \cdot in$$

$$\rho_{sT} := \frac{A_{ties} \cdot (2 \cdot n_{ties})}{D \cdot s_{ties}}$$

$\rho_{sT} = 0.005$

$$r_{\rho sT} := \frac{\rho_{sTreq}}{\rho_{sT}}$$

$r_{\rho sT} = 0.82$

$$result_{\rho sT} := \begin{cases} \text{"OK"} & \text{if } \rho_{sT} \geq \rho_{sTreq} \\ \text{"NG"} & \text{otherwise} \end{cases}$$

$result_{\rho sT} = \text{"OK"}$

Output: Max spacing of closed ties after a length of 3 times shaft diameter

$$s_{tiesREQ} := \begin{pmatrix} 12 \cdot d_{long} \\ 0.5 \cdot D \\ 12 \cdot in \end{pmatrix}$$

CBC 2010 - 1810.3.9.4.2

$$s_{tiesREQ} = \begin{pmatrix} 13.5 \\ 30.0 \\ 12.0 \end{pmatrix} \cdot in$$

$s_{maxTies} := \min(s_{tiesREQ})$

$s_{maxTies} = 12.0 \cdot in$

GEOTECHNICAL ENGINEERING REPORT
PREPARED FOR

TowerCo

TowerCo
5000 Valleystone Dr.
Cary, North Carolina 27519

PROJECT

Bluebird Towing
CA2944
601 South Santa Fe, Santa Ana, CA

Under Contract with:

earthTouch inc
www.earthtouchinc.com

EarthTouch, Inc.
3135 North Fairfield Road, Suite D
Layton, Utah 84041

Prepared By:

Earth Systems Southwest

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File No.: 50322-01
Doc. No.: 11-09-700

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September 2, 2011

File No.: 50322-01
Doc. No.: 11-09-700

EarthTouch, Inc.
10757 Edgewood Court
Rancho Cucamonga, California 91730

Attention: Mr. Heinz Lumpp

Project: **Proposed Telecommunications Tower**
CA2944-Bluebird Towing
601 South Santa Fe Street
Santa Ana, Orange County, California

Subject: **GEOTECHNICAL ENGINEERING REPORT**

Earth Systems presents this Geotechnical Engineering Report for the proposed telecommunications tower to be constructed at 601 South Santa Fe Street in Santa Ana, Orange County, California. This report presents our findings and recommendations for foundation design, incorporating the information supplied to our office. The site is suitable for the proposed development provided the recommendations in this report are followed in design and construction. This report should stand as a whole, and no part of the report should be excerpted or used to the exclusion of any other part.

This report completes our scope of services in accordance with our proposal dated August 10, 2011 and authorized August 11, 2011. Other services that may be required, such as plan reviews and grading observation are additional services and will be billed according to our Fee Schedule in effect at the time services are provided. Unless requested in writing, the client is responsible for distributing this report to the appropriate governing agency or other members of the design team.

We appreciate the opportunity to provide our professional services. Please contact our office if there are any questions or comments concerning this report or its recommendations.

Respectfully submitted,
EARTH SYSTEMS SOUTHWEST

Lutz Kunze, PE C-25801, GE 493
Associate Geotechnical Engineer

SER/lk/mr

Distribution: 4/TowerCo., PDF/EarthTouch, 2/BD File, 1/RC File

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EXECUTIVE SUMMARY

Earth Systems Southwest has prepared this executive summary solely to provide a general overview of the report. The report itself should be relied upon for information about the findings, conclusions, recommendations, and other concerns.

Earth Systems Southwest conducted geotechnical engineering exploration for a communication facility for EarthTouch, Inc. The site of the proposed communication tower is located at 601 South Santa Fe Street in Santa Ana, Orange County, California at approximately latitude 33.7406° North and longitude 117.8528° West. The proposed development will consist of the installation of a 60 foot TowerCo Monopine tower. The existing equipment shelter located west of the proposed tower will be utilized.

Artificial fill and native alluvium underlie the site. Groundwater was not encountered in the depth explored (50 feet), but historically, groundwater is estimated to be about 40 feet deep. Soils materials exhibit a low potential for corrosion to concrete and mild corrosion potential to buried metal. Surficial soils exhibit "low" expansion potentials.

We consider the most significant geologic hazard to the project to be the potential for moderate to severe seismic shaking that is likely to occur during the design life of the proposed structure. The project site is located within the influence of several fault systems that are considered to be active or potentially active that characterizes the Los Angeles Basin of Southern California. Structures should be designed in accordance with the values and parameters given within the 2010 California Building Code [CBC] and ASCE 7-05. The seismic design parameters are presented in the following table and within the report.

SUMMARY OF RECOMMENDATIONS

Design Item	Recommended Parameter	Reference Section No.
Drilled Pier		
Tower Foundation	Drilled pier	5.3
Bearing Materials	Native soil and fill	3.1
Allowable Passive Pressure	250 psf per foot	5.4
Active Pressure	35 pcf	5.4
At-rest Pressure	55 pcf	5.4
Allowable Coefficient of Friction	0.35	5.4
Soil Expansion Potential	Low	3.1
Geologic and Seismic Hazards		
Liquefaction Potential	Low	3.4.2
Significant Faults and Magnitude	Whittier Fault, M7.1	3.4.1
Fault Type and Distance	A: 19.1 km	3.4.1
Seismic Design Category	D	5.6
Site Class	D	5.6
Maximum Considered Earthquake [MCE]		
Short Period Spectral Response, S_s	1.409 g	5.6
Second Spectral Response, S_1	0.501 g	5.6
Site Coefficient, F_a	1.00	5.6
Site Coefficient, F_v	1.50	5.6
Existing Site Conditions		
Existing Fill	≈ 1.0 foot	
Groundwater Depth	Historic ≈ 40 feet	3.2
Near-Surface Corrosivity	Low sulfates Low chlorides Medium resistivity	5. 5
Estimated Cut and Fill	< 1 foot	5.1

The recommendations contained within this report are subject to the limitations presented in Section 6 of this report. We recommend that all individuals using this report read the limitations.

GEOTECHNICAL ENGINEERING REPORT
PROPOSED TELECOMMUNICATIONS TOWER
CA2944-BLUEBIRD TOWING
601 SOUTH SANTA FE STREET
SANTA ANA, ORANGE COUNTY, CALIFORNIA

Section 1
INTRODUCTION

1.1 Project Description

This geotechnical engineering report has been prepared for the proposed communications facility to be constructed at 601 South Santa Fe Street in Santa Ana, Orange County, California. The proposed new development will include the installation of a new 60-foot Monopine tower supported by a caisson foundation. The existing equipment shelter west of the proposed tower will be utilized. Design loads or tower reactions were not defined at the time this report was prepared. Minimal site grading is anticipated for accommodation of the planned facility. Our understanding of the project is based on the following document:

1. Royal Street Communications California, LLC, Dagerman LA2823A, plans prepared by DCI Pacific and dated August 1, 2011.

1.2 Site Description

An existing telecommunications facility is located at the rear of a commercial property with a one-story masonry block building fronting on South Santa Fe Street in Santa Ana, Orange County, California. The approximate coordinates of the site are 33.7406° North and 117.8528° West. The site location is shown on Figure 1 in Appendix A.

Topographically, the site is generally flat and level. A paved driveway is located along the eastern edge of the property leading to the back lot. The site elevation is approximately 222 feet above mean sea level. Drainage is by sheet flow to the south.

Existing improvements include an existing monopalm tower and an equipment compound. Palm trees border the property along the back.

The history of past use and development of the property was not investigated as part of our scope of services. Underground utilities may also exist near and within the development areas. These utility lines include, but are not limited to, domestic water, electric, sewer, telephone, cables and irrigation lines.

1.3 Previous Report

A report for the existing development was made available and reviewed as part of this exploration.

Geotechnical Investigation for Sprint Monopalm and Equipment Slab, Bluebird Towing Site-OG60XC671D, 601 South Santa Fe Street, Santa Ana, California prepared by Toro International, 6 Indigo, Irvine, CA 92618 and dated July 21, 2004.

1.4 Purpose and Scope of Services

The purpose for our services was to evaluate the site soil conditions and provide professional opinions and recommendations regarding the proposed development of the site. The scope of services included:

- A general reconnaissance of the site.
- Shallow subsurface exploration by drilling one exploratory boring to a depth of approximately 50 feet.
- Laboratory testing of selected soil samples obtained from the exploratory boring.
- A review of selected published technical literature pertaining to the site.
- An engineering analysis and evaluation of the acquired data from the exploration and testing programs.
- A summary of our findings and recommendations in this written report.

This report contains the following:

- Discussions on subsurface soil and groundwater conditions.
- Discussions on regional and local geologic conditions.
- Discussions on geologic and seismic hazards.
- Graphic and tabulated results of laboratory tests and field studies.
- Recommendations regarding:
  - Site development and grading criteria.
  - Excavation conditions and buried utility installations.
  - Structure foundation type and design.
  - Allowable foundation bearing capacity and expected total and differential settlements.
  - Potential corrosivity of site soils to concrete and steel reinforcement.
  - Seismic design parameters.

Not Contained in This Report: Although available through Earth Systems Southwest, the current scope of our services does not include:

- A corrosive study to determine cathodic protection of concrete or buried pipes.
- A field resistivity study for use in grounding design.
- An environmental assessment.
- An investigation for the presence or absence of wetlands, hazardous or toxic materials in the soil, surface water, groundwater, or air on, below, or adjacent to the subject property.

Section 2
METHODS OF EXPLORATION AND TESTING

2.1 Field Exploration

An exploratory boring was drilled to a depth of 51.5 feet below the existing ground surface to observe the soil profile and obtain samples for laboratory testing. The boring was advanced on August 19, 2011 using 8-inch outside diameter hollow-stem augers, powered by a Mobile B61 truck-mounted drilling rig. The boring location is shown on the Boring Location Map, Figure 2, in Appendix A. The location shown is approximate, established by pacing and sighting from existing buildings and structures.

Soil samples were obtained within the test boring using a Standard Penetration (SPT) sampler (ASTM D 1586) and a Modified California (MC) ring sampler (ASTM D 3550 with shoe similar to ASTM D 1586). The SPT sampler has a 2-inch outside diameter and a 1.38-inch inside diameter. The MC sampler has a 3-inch outside diameter and a 2.37-inch inside diameter. The samples were obtained by driving the sampler with a 140-pound automatic hammer, dropping 30 inches in general accordance with ASTM D 1586. Recovered soil samples were sealed in containers and returned to the laboratory. Bulk samples were also obtained from auger cuttings, representing a mixture of soils encountered at the depths noted.

The final log of the boring represents our interpretation of the contents of the field log and the results of laboratory testing performed on the samples obtained during the subsurface exploration. The final log is included in Appendix A of this report. The stratification lines represent the approximate boundaries between soil types although the transitions may be gradational.

2.2 Laboratory Testing

Samples were reviewed along with field log to select those that would be analyzed further. Those selected for laboratory testing include soils that would be exposed and used during grading and those deemed to be within the influence of the proposed structure. Test results are presented in graphic and tabular form in Appendix B of this report. The tests were conducted in general accordance with the procedures of the American Society for Testing and Materials [ASTM] or other standardized methods as referenced below. Our testing program consisted of the following:

- In-situ Moisture Content and Unit Dry Weight for the ring samples.
- Particle Size Analysis to classify and evaluate soil composition. The gradation characteristics of selected samples were made by sieve analysis procedures.
- Direct Shear to evaluate the relative frictional strength of the soils. Specimens were placed in contact with water before testing and were then sheared under normal loads ranging from 0.5 to 2.0 kips per square foot.
- Chemical Analyses (Soluble Sulfates and Chlorides, pH, and Electrical Resistivity) to evaluate the potential adverse effects of the soil on concrete and steel.

Section 3
DISCUSSION

3.1 Soil Conditions

The field exploration indicates that shallow site soils within the upper approximately 50 feet consist of younger alluvial and flood plain deposits associated with deposition by the Santa Ana River. Shallow soils consisted of a thin cover of artificial fill over native interbedded sandy silts, silty sands, silty clay and sandy to clayey gravels (ML, SP, SM, CL, and GP and GC soil types per the Unified Soil Classification System). Six inches of asphalt concrete and aggregate base cover the site.

The boring log provided in Appendix A includes a more detailed description of the soils encountered. The near surface soils are visually classified to be in the "low" expansion range. The shallow soils tested exhibit low concentrations of sulfate and chloride, respectively. The soils also exhibit medium resistivity suggesting a mild potential for metal loss from electrochemical processes.

3.2 Groundwater

Free groundwater was not visually encountered in the boring during exploration to 50 feet below the ground surface. However, laboratory testing suggests that saturated to nearly saturated soils are present below 25 feet. Groundwater levels have historically been approximately 40 feet below the ground surface (bgs) based on data provided by the California Geologic Survey (Plate 1.2, Seismic Hazard Zone Report, Tustin Quadrangle, 1998). Shallower high moisture conditions probably reflect perched conditions within the interbedded clay beds.

3.3 Geologic Setting

Regional Geology: The project site is located in the north-central portion of the landward Peninsular Ranges geomorphic province of California. The Peninsular Ranges are characterized as a series of northwest-southeast trending mountain ranges and intervening valleys generally bounded by major faults of the San Andreas rift zone. Regional features of the Peninsular Ranges include the Santa Ana Mountains, San Joaquin Hills, and Los Angeles Basin.

Local Geology: The project site is located within the central-block of the Los Angeles Basin, which includes the Orange County Coastal Plain, and the broad area of coalesced Holocene alluvial fans and flood plains composing the Tustin Plain. The Tustin Plain is the broad, nearly level valley situated between the Santa Ana Mountains to the northeast and the San Joaquin Hills to the south and southwest. The project site is located east of the Santa Ana River.

Quaternary younger alluvium and flood plain deposits underlie the project area consisting of interbedded and poorly consolidated sand, silt, clay, and gravel. No faults have been mapped within the project limits. Significant faults within approximately 25 miles of the site include the San Joaquin Hills, Anaheim, Yorba Linda, Newport Inglewood, Puente Hills, Whittier, and Elsinore faults. Refer to Table 1 in Appendix A for a more detailed list of proximal faults. The closest active or potentially active fault zone is the San Joaquin Hills fault zone located about 3.5 miles from the site.

3.4 Geologic Hazards

Geologic hazards that may affect the region include seismic hazards (ground shaking, surface fault rupture, soil liquefaction, and other secondary earthquake-related hazards), flooding, ground subsidence, and erosion. A discussion follows on the specific hazards to this site.

Seismic Sources: Several active faults or seismic zones lie within 34 miles (55 kilometers) of the project site as shown on Table 1 in Appendix A. The Mean Magnitude Earthquake listed is from published geologic information available for each fault (Cao et al., CGS, 2008).

The primary seismic hazard to the project site is strong ground shaking from earthquakes along local or regional fault zones including the Whittier-Elsinore fault system and the Newport-Inglewood fault zone. Several blind thrusts within the Los Angeles Basin including the Puente Hills and San Joaquin Hills blind thrust also pose a hazard. Significant ground shaking could also result from earthquakes along faults within the frontal fault system at the base of the San Gabriel Mountains, earthquakes along the San Jacinto and San Andreas fault zones, and from earthquakes from other faults located within the Los Angeles basin.

Surface Fault Rupture: The project site does not lie within a currently delineated State of California, *Alquist-Priolo* Earthquake Fault Zone (Hart, 1997). Well-delineated fault lines cross through this region as shown on California Geological Survey (CGS) maps (Jennings, 1994); however, no active faults are mapped in the immediate vicinity of the site. Therefore, active fault rupture is unlikely to occur at the project site. While fault rupture would most likely occur along previously established fault traces, future fault rupture could occur at other locations.

Historic Seismicity: The site is located in seismically active southern California where large numbers of earthquakes are recorded each year. An historical search for regional earthquakes indicates approximately 34 earthquakes of magnitude 5.5 or greater have occurred within 65 miles of the site since 1800. Many of these earthquakes originated on the nearby Sierra Madre, Elsinore, San Jacinto, Newport-Inglewood, and San Andreas faults. The 1933 Long Beach earthquake is estimated to have had an epicenter approximately 9 miles from the project.

Seismic Risk and Site Acceleration: While accurate earthquake predictions are not possible, various agencies have conducted statistical risk analyses. In 2008, the California Geological Survey (CGS) and the United States Geological Survey (USGS) completed the latest generation of probabilistic seismic hazard maps. We have used these maps in our evaluation of the seismic risk at the site. The Working Group of California Earthquake Probabilities (WGCEP, 2007) estimated a 59% conditional probability that a magnitude 6.7 or greater earthquake may occur between 2008 to 2038 along the southern California segment of the San Andreas fault, a 31% probability along the San Jacinto fault and an 11% probability along the Elsinore fault.

The potential intensity of ground motion may be estimated by the horizontal peak ground acceleration (PGA), measured in "g" forces. Ground motions are dependent primarily on the earthquake magnitude and distance to the seismogenic (rupture) zone. Accelerations are also dependent upon attenuation by rock and soil deposits, direction of rupture, and type of fault. For these reasons, ground motions may vary considerably in the same general area. This variability can be expressed statistically by a standard deviation about a mean relationship. Important factors influencing the structural performance are the duration and frequency of strong ground motion, local subsurface conditions, soil-structure interaction, and structural details.

The following table provides the probabilistic estimate of the PGA taken from the 2002 CGS/USGS seismic hazard maps/data.

Estimate of PGA from 2002 CGS/USGS/Probabilistic Seismic Hazard Maps/Data

Risk	Equivalent Return Period (years)	PGA (g) [1]
10% exceedance in 50 years	475	≈ 0.38 g

Notes:
1 Based on an alluvial site and Site Class D

2010 CBC Seismic Coefficients: The California Building Code (CBC) seismic design parameters criteria are based on a Design Earthquake that has an earthquake ground motion $^2/_3$ of the lesser of 2% probability of occurrence in 50 years or 150% of mean deterministic limit. The PGA estimate given above is provided for information on the seismic risk inherent in the CBC design. The seismic and site coefficients given in Chapter 16 of the 2007 California Building Code are provided in Section 5.7 of this report.

Tsunamis and Seiches: The site is far inland, so the hazard from tsunamis is non-existent. At the present time, no water storage reservoirs are located in the immediate vicinity of the site. Therefore, hazards from seiches are considered negligible at this time.

Soil Liquefaction: Liquefaction is the loss of soil strength from sudden shock (usually earthquake shaking), causing the soil to become a fluid mass. In general, for the effects of liquefaction to be manifested at the surface, groundwater levels must be within 50 feet of the ground surface and the soils within the saturated zone must also be susceptible to liquefaction. The potential for liquefaction to occur at this site is considered low because the depth of groundwater beneath the site currently exceeds 50 feet and underlying soils are not considered liquefiable. No free groundwater was encountered in our exploratory boring. However, the historic high groundwater depth is estimated to be approximately 40 feet. The project is located inside the margin of a currently designated liquefaction hazards area as shown on the California Geologic Survey Seismic Hazards Zones, Tustin Quadrangle, dated 1998.

Ground Subsidence: The potential for seismically induced ground subsidence is considered to be negligible at the site. Dry sands tend to settle and densify when subjected to strong earthquake shaking. The amount of subsidence is dependent on relative density of the soil, ground motion, and earthquake duration. Uncompacted fill areas may be susceptible to seismically induced settlement. Based on Tokimatsu and Seed methodology, we estimate that about 0.1 inches of total ground subsidence may occur in the upper 50 feet of soils for the Design Earthquake ground motion.

Slope Instability: The site is flat. Therefore, potential hazards from slope instability, landslides, or debris flows are considered negligible.

Flooding: The project site may be in an area where sheet flooding and erosion could occur. If significant changes are proposed for the site, appropriate project design, construction, and maintenance can minimize the site sheet flooding potential.

Seismic Hazard Zones: The project site is not currently zoned by the California Geologic Survey for active faults or seismic induced landsliding, but is within a designated liquefaction zone.

Section 4
CONCLUSIONS

The following is a summary of our conclusions and professional opinions based on the data obtained from a review of selected technical literature and the site evaluation.

General:

- From a geotechnical perspective, the site is suitable for the proposed development, provided the recommendations in this report are followed in the design and construction of this project.

Geotechnical Constraints and Mitigation:

- The primary geologic hazard is severe ground shaking from earthquakes originating on regional faults. A major earthquake originating on the local segments of the Whittier, Elsinore, or Newport-Inglewood fault zones could be the critical seismic events that may affect the site within the design life of the proposed development. Engineered design and earthquake-resistant construction increase safety and allow development of seismic areas.
- The underlying geologic condition for seismic design is Site Class D. The site is about 19.1 km from a Type A seismic source (Whittier fault) as defined by the California Geological Survey. A qualified professional should design any permanent structure constructed on the site. The *minimum* seismic design should comply with the 2010 edition of the California Building Code.
- Other geologic hazards, including fault rupture, liquefaction, subsidence, seismically induced flooding, and landslides, are considered low or negligible on this site.
- Shallow soils exhibit "low to medium" expansion potentials and have low sulfate and chloride contents, with low potentials for corrosion to concrete.
- Shallow soils exhibit medium resistivity and are estimated to have mild corrosive properties to buried metal.

Section 5
RECOMMENDATIONS

SITE DEVELOPMENT AND GRADING

5.1 Site Development - Grading

A representative of Earth Systems Southwest (ESSW) should observe site clearing, grading, and the bottom of excavations before placing fill.

Clearing and Grubbing: Little site grading is anticipated. Pavements, foundations, non-engineered fill, construction debris, trash, and abandoned underground utilities should be removed from the proposed tower foundation.

Site Preparation (Equipment Shelter): The existing equipment shelter will be utilized for the new tower; therefore no site preparation is anticipated.

Tower Foundation: It is our understanding that the proposed tower is going to be supported on a drilled cast-in-place pier. Therefore, no site preparation for the tower should be required other than removal of existing AC pavement.

Subgrade Preparation: In areas to receive fill, pavements, or hardscape, the subgrade should be scarified; moisture conditioned, and compacted to at least 90% relative compaction (ASTM D 1557) for a depth of 1-foot below finished subgrade. Compaction should be verified by testing.

Engineered Fill Soils: On-site soil is suitable for use as engineered fill provided it is free of significant organic or deleterious matter. The on-site soil should be placed in maximum 8-inch lifts (loose) and compacted to at least 90% relative compaction (ASTM D 1557) near its optimum moisture content. Compaction should be verified by testing. Rocks larger than 3 inches in greatest dimension should be removed from fill or backfill material.

Imported fill soils (if needed) should be non-expansive, granular soils meeting the USCS classifications of SM, SP-SM, or SW-SM with a maximum rock size of 3 inches and 5 to 35% passing the No. 200 sieve. The geotechnical engineer should evaluate the import fill soils before hauling to the site. However, because of the potential variations within the borrow source, import soil will not be prequalified by ESSW. The imported fill should be placed in lifts no greater than 8 inches in loose thickness and compacted to at least 90% relative compaction (ASTM D 1557) near optimum moisture content.

Site Drainage: Positive drainage should be maintained away from the structures (5% for 5 feet minimum) to prevent ponding and subsequent saturation of the foundation soils or slab subgrade. Gutters and downspouts should be considered as a means to convey water away from foundations if adequate drainage is not provided. Drainage should be maintained for paved areas. Water should not pond on or near paved areas.

5.2 Excavations and Utility Trenches

Excavations should be made in accordance with CalOSHA requirements. Using the Cal/OSHA standards and general soil information obtained from the field exploration, classification of the near surface on-site soils will likely be characterized as Type C. Actual classification of site specific soil type per Cal/OSHA specifications as they pertain to trench safety should be based

on real-time observations and determinations of exposed soils by the Competent Person during grading and trenching operations.

Our site exploration and knowledge of the general area indicates there is a potential for caving of site excavations (utilities, footings, etc.). Excavations within sandy soil should be kept moist, but not saturated, to reduce the potential of caving or sloughing. Where excavations over 4 feet deep are planned, lateral bracing or appropriate cut slopes of 1.5:1 (horizontal: vertical) should be provided. No surcharge loads from stockpiled soils or construction materials should be allowed within a horizontal distance measured from the top of the excavation slope and equal to the depth of the excavation.

Utility Trenches: Backfill of utilities within roads or public right-of-ways should be placed in conformance with the requirements of the governing agency (water district, public works department, etc.). Utility trench backfill within private property should be placed in conformance with the provisions of this report. In general, service lines extending inside of property may be backfilled with native soils compacted to a minimum of 90% relative compaction. Backfill operations should be observed and tested to monitor compliance with these recommendations.

STRUCTURES

5.3 Tower Foundation

In our professional opinion, the tower foundation may be supported on a cast-in-place pile/pier. Design parameters are presented in the subsequent sections. Pier design diameters, depths, and reinforcing are the responsibility of the Structural Engineer, considering the structural loading and the geotechnical parameters given in this report. A representative of ESSW should observe foundation excavations prior to placement of reinforcing steel or concrete. Any loose rock or construction debris should be removed from footing excavations prior to placement of concrete.

A drilled, cast-in-place pier foundation may be used to support the tower. The allowable degree of settlement (one inch) is estimated to be enough to mobilize both end-bearing and side friction on a pier at this site. Therefore, the drilled pier may be designed as side friction pier with additional support considered for end bearing resistance. An experienced geotechnical engineer or technician should make a visual inspection of the bearing material prior to placing concrete. All drilled piers should have a minimum diameter of 36 inches to allow for inspection of the bearing surface. The drilled piers may require temporary casing during installation because of caving and/or sidewall breakout.

Recommended design parameters for drilled piers are presented on the following table. The lateral load capacity of the drilled piers may be designed using the non-constrained formula presented in Section 1805.7.2.1 of the 2010 CBC for piles up to 12-feet in depth. The following table also includes the parameters necessary for performing a LPILE analysis.

RECOMMENDED DRILLED PIER FOUNDATION DESIGN PARAMETERS

Depth [feet]	Description[1]	Allowable Skin Friction[2] [psf/ft]	Allowable End Bearing Pressure[3] [psf]	Allowable Passive Pressure [psf]	Internal Angle of Friction [degrees]	Cohesion [psf]	Lateral Subgrade Modulus, k [pci]	Strain, ε_{50} [in/in]
0 – 3	Sandy SILT (ML)	-	-	-	-	-	-	-
3 – 6.5	Sandy SILT (ML)	150	2,000	100	29	50	30	0.020
6.5 – 13.5	Silty SAND (SM) To SAND (SP)	300	5,000	150	32	0	25	-
13.5 – 18	CLAY (CL)	150	-	-	25	200	100	0.010
18 – 22.5	Silty SAND (SM)	500	-	-	32	0	90	-
22.5 – 43	CLAY to Silty Sandy CLAY (CL)	100	-	-	25	200	100	0.010
22.5 – 43	CLAY to Silty Sandy CLAY (CL)	100	-	-	25	200	500	0.005
22.5 – 43	CLAY to Silty Sandy CLAY (CL)	100	-	-	25	200	30	0.020
43 – 50	GRAVEL (GP) to Clayey GRAVEL (GC)	500	-	-	35	0	90	-

Notes:
1. Average unit weight of 115 pcf may be assumed for clayey material and 120 for sandy material.
2. Increases linearly with depth. Skin Friction for clayey sands assume that uplift controls design.
3. Use end bearing or allowable skin friction in design, but not both.

The allowable skin friction and the passive resistances have factors of safety of about 2 and the values given in the above table are based on information provided by our boring, laboratory testing, published values and our past experience with similar soil types. These values should, therefore, be considered approximate. The allowable end bearing pressure provided in the table has an approximate factor of safety of at least 3. If the drilled pier is designed using the above parameters, settlements are anticipated to be on the order of about ½ inch.

The upper (3) feet of soil should be ignored due to the potential effects of long-term surficial disturbance and construction activities. To avoid a reduction in lateral and uplift resistance caused by variable subsurface conditions, we recommend that drawings instruct the contractor to notify the engineer if subsurface conditions are significantly different than encountered in our boring and are disclosed during drilled pier installation. Under these circumstances, it may be necessary to adjust the overall length of the pier.

Drilled Pier Installation: Any "slough" or loose soils in the bottom must be removed or thoroughly tamped and compacted prior to setting rebar cages and placing concrete. Extreme care must be exercised to carefully position reinforcing steel cages and place concrete without disturbing the sidewalls of the drilled shafts. Where vertical support is by skin friction only, it is not necessary to remove minor amounts of loose soils and slough from the bottoms drilled pier excavations. However, excessive loose debris and slough must be removed. It is recommended that un-concreted pier excavations not be left open overnight and concrete should preferably be placed the same day.

Casing or other means may be required to prevent caving. Drilled pier foundations may be constructed by the dry method, the casing method, or by other methods, selected by the contractor, such as the slurry displacement method when accepted by the structural engineer and by the geotechnical consultant. The dry method is for concrete placed directly in a dry, drilled hole where no caving, squeezing or sloughing of soils has occurred. The casing method may be used in caving soils, when excessive water collects in the drilled hole, or if other difficulties arise

during construction of the foundation. Concrete is placed by pumping or tremie methods so that the concrete mix displaces any fluid.

Dry Method: Normally, drilled pier excavations should be made without the use of water. If necessary, water may be used to facilitate removal of cuttings, unless it aggravates caving problems. Any added water that may accumulate at the bottom of the hole should be removed from the drilled hole prior to placing the concrete. Each excavation should be completed in a continuous operation and the concrete should be placed without undue delay.

If caving conditions are encountered, no further drilling should be allowed until the contractor selects a method, subject to acceptance by the engineer, to prevent ground movement. The contractor may elect to place casing by approved means or advance the excavation by stabilizing the hole using a fluid of appropriate density, or other appropriate means. The contractor should use such appropriate means to clean the bottom of the excavation so that no loose material is present at the base of the pier where end bearing is utilized. The excavation should be protected with a platform to prevent the collar of the excavation from caving during placing of the concrete. Prior to placing the concrete, any water in the hole should be removed or the concrete tremied to the bottom of the excavation. In no case should the concrete be allowed to free fall through water or drilling fluids. The end of the tremie should be kept several feet below the top of the concrete. Concrete placement should continue until clean concrete is discharged as the top of the caisson.

Casing Method: Approved casing, when employed, should be of ample strength to withstand handling stresses and the external pressure of the caving or heaving soil. The outside diameter of the casing should not be less than the specified diameter of the drilled shaft. Casing should preferably not be left in the ground. Where casing cannot be withdrawn, the skin friction capacity is theoretically reduced, as are passive resistance and stiffness. The amount of reduction is subject to assessment by the geotechnical consultant.

Protection of Adjacent Structures: Existing adjacent structures, underground utilities and other construction should be protected from damage caused by or related to the drilled pier installation operations. The contractor should provide surveyed elevation benchmarks and horizontal location monitoring points on any adjacent structures that might potentially be damaged before commencing work. Measurements of each bench mark and monitoring point should be recorded and reported at least twice a day while drilled pier installation is in progress, or at intervals proposed by the contractor and accepted by the engineer. Should measurements indicate any displacement, operations should be halted until corrective action has been selected by the contractor and is acceptable to the geotechnical consultant.

Concrete Quality and Placement: Concrete placement should begin within four hours after completion of drilling. Concrete placement should be continuous without interruption, and at such a rate that fresh concrete will not be deposited on concrete that has hardened sufficiently to form cold joints or planes of weakness.

The concrete mix for a dry hole should be as accepted by the structural engineer, with a 4 to 6-inch slump. Concrete slump for use in cased holes should be 6 to 8 inches. If casing is required, it should be withdrawn as the concrete is being placed, maintaining a 3-foot minimum head of concrete within the casing. This is to prevent reduction in the diameter of the drilled shaft due to earth pressure on the fresh concrete, and to prevent extraneous material from falling in from the sides and mixing with the concrete. Concrete placement should continue in this manner until suitable concrete extends to the top of the excavation or forms.

Pier Inspections: Drilled pier operations should be performed in the presence of the geotechnical consultant or his representative to confirm that suitable materials for pier support are penetrated, that the dimensions of the installed piers meet the design dimensions, and that the installation has been performed as specified herein. Prior to the placement of steel, and again prior to placement of concrete, the excavation must be examined by the geotechnical consultant before proceeding with construction. The contractor should provide all aid and assistance required by the geotechnical and geologic consultants for field monitoring of the drilled pier operations.

Drilled piers are accepted or rejected based on visual observation and testing during construction. The contractor should not allow nor cause any of his work to be permanently enclosed or covered up until it has been observed, tested, and accepted by the geotechnical engineer and all legally constituted authorities having jurisdiction.

5.4 Mitigation of Soil Corrosivity

Selected chemical analyses for corrosivity were conducted on a soil sample from the project site as shown in Appendix B. Concrete design should be in accordance with the 2007 edition of the American Concrete Institute publication 318 (ACI 318).

Sulfate and other salts can attack the cement within concrete causing weakening of the cement matrix and eventual deterioration by raveling. This attack can be in the form of a physical attack or chemical attack whereby there may be a chemical reaction between the sulfate and the cement used in the concrete. For this project, the results of those samples tested suggest a low sulfate ion concentration (139 ppm). Concrete mixes should be designed following the guidelines in ACI 318 Table 4.3.1.

Electrical resistivity is a process whereby metal (ferrous) objects in direct contact with soil may be subject to attack by electrochemical corrosion. This typically pertains to buried metal pipes, valves, culverts, etc. made of ferrous metal. To avoid this type of corrosion or to slow the process, buried metal objects are generally protected with waterproof resistant barriers, i.e. epoxy corrosion inhibitors, asphalt coatings, cathodic protection, or encapsulating with densely consolidated concrete. Electrical resistivity testing of the soil (2463 ohm-cm) suggests that the site soils may present a mild potential for metal loss from electrochemical corrosion processes.

Chloride ions can cause corrosion of reinforcing steel. For this project, the results of those samples tested suggest a low chloride ion concentration (21 ppm). ACI 318 is referenced by the California Building Code, and provides commentary relative to the effects of chlorides present in the soil; from both internal and external sources. It is possible that long term saturation of foundations with chloride rich water could allow the chloride access to the reinforcing steel. Therefore, if the site is adequately drained in accordance with sound engineering practice and the applicable codes, this should be a low threat.

A minimum concrete cover of cast-in-place concrete should be in accordance with Section 7.7 of ACI 318. Additionally, the concrete should be thoroughly vibrated during placement.

The information provided above should be considered preliminary. These values can potentially change based on several factors, such as importing soil from another job site and the quality of construction water used during grading and subsequent landscape irrigation.

Earth Systems does not practice corrosion engineering. We recommend that a qualified corrosion engineer evaluate the corrosion potential on metal construction materials and concrete at the site to provide mitigation of corrosive effects, if further guidance is desired.

5.5 Seismic Design Criteria

This site is subject to strong ground shaking due to potential fault movements along regional faults including the Whittier and Newport-Inglewood faults. Engineered design and earthquake-resistant construction increase safety and allow development of seismic areas. The *minimum* seismic design should comply with the 2010 edition of the California Building Code and ASCE 7-05 using the seismic coefficients given in the table below.

2010 CBC (ASCE 7-05) Seismic Parameters

		Reference
Seismic Category:	D	Table 1613.5.6
Site Class:	D	Table 1613.5.2
Maximum Considered Earthquake [MCE] Ground Motion		
Short Period Spectral Response S_s:	1.409 g	Figure 1613.5
1 second Spectral Response, S_1:	0.501 g	Figure 1613.5
Site Coefficient, F_a:	1.00	Table 1613.5.3(1)
Site Coefficient, F_v:	1.50	Table 1613.5.3(2)
Design Earthquake Ground Motion		
Short Period Spectral Response, S_{DS}	0.940 g	
1 second Spectral Response, S_{D1}	0.501 g	

The intent of the CBC lateral force requirements is to provide a structural design that will resist collapse to provide reasonable life safety from a major earthquake, but may experience some structural and nonstructural damage. A fundamental tenet of seismic design is that inelastic yielding is allowed to adapt to the seismic demand on the structure. In other words, *damage is allowed.* The CBC lateral force requirements should be considered a *minimum* design. The owner and the designer may evaluate the level of risk and performance that is acceptable. Performance based criteria could be set in the design. The design engineer should exercise special care so that all components of the design are fully met with attention to providing a continuous load path. An adequate quality assurance and control program is urged during project construction to verify that the design plans and good construction practices are followed. This is especially important for sites lying close to the major seismic sources.

Estimated peak horizontal site accelerations based upon a probabilistic analysis (10% probability of occurrence in 50 years) is approximately 0.38 g for a stiff soil site. Actual accelerations may be more or less than estimated. Vertical accelerations are typically ⅓ to ⅔ of the horizontal accelerations, but can equal or exceed the horizontal accelerations, depending upon the local site effects and amplification.

Section 6
LIMITATIONS AND ADDITIONAL SERVICES

6.1 Uniformity of Conditions and Limitations

Our findings and recommendations in this report are based on selected points of field exploration, laboratory testing, and our understanding of the proposed project. Furthermore, our findings and recommendations are based on the assumption that soil conditions do not vary significantly from those found at specific exploratory locations. Variations in soil or groundwater conditions could exist between and beyond the exploration points. The nature and extent of these variations may not become evident until construction. Variations in soil or groundwater may require additional studies, consultation, and possible revisions to our recommendations.

Findings of this report are valid as of the issued date of the report. However, changes in conditions of a property can occur with passage of time, whether they are from natural processes or works of man, on this or adjoining properties. In addition, changes in applicable standards occur, whether they result from legislation or broadening of knowledge. Accordingly, findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of one year.

In the event that any changes in the nature, design, or location of structures are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report are modified or verified in writing.

This report is issued with the understanding that the owner or the owner's representative has the responsibility to bring the information and recommendations contained herein to the attention of the architect and engineers for the project so that they are incorporated into the plans and specifications for the project. The owner or the owner's representative also has the responsibility to verify that the general contractor and all subcontractors follow such recommendations. It is further understood that the owner or the owner's representative is responsible for submittal of this report to the appropriate governing agencies.

As the Geotechnical Engineer of Record for this project, Earth Systems Southwest (ESSW) has striven to provide our services in accordance with generally accepted geotechnical engineering practices in this locality at this time. No warranty or guarantee is express or implied. This report was prepared for the exclusive use of the Client and the Client's authorized agents.

ESSW should be provided the opportunity for a general review of final design and specifications in order that earthwork and foundation recommendations may be properly interpreted and implemented in the design and specifications. If ESSW is not accorded the privilege of making this recommended review, we can assume no responsibility for misinterpretation of our recommendations.

Although available through ESSW, the current scope of our services does not include an environmental assessment or an investigation for the presence or absence of wetlands, hazardous or toxic materials in the soil, surface water, groundwater, or air on, below, or adjacent to the subject property.

6.2 Additional Services

This report is based on the assumption that an adequate program of client consultation, construction monitoring, and testing will be performed during the final design and construction phases to check compliance with these recommendations. Maintaining ESSW as the geotechnical consultant from beginning to end of the project will provide continuity of services. *The geotechnical engineering firm providing tests and observations shall assume the responsibility of Geotechnical Engineer of Record.*

Construction monitoring and testing would be additional services provided by our firm. The costs of these services are not included in our present fee arrangements, but can be obtained from our office. The recommended review, tests, and observations include, but are not necessarily limited to, the following:

- Consultation during the final design stages of the project.
- A review of the building and grading plans to observe that recommendations of our report have been properly implemented into the design.
- Observation and testing during site preparation, grading, and placement of engineered fill as required by CBC Sections 1704.7 and Appendix J or local grading ordinances.
- Consultation as needed during construction.

-o0o-

Appendices as cited are attached and complete this report.

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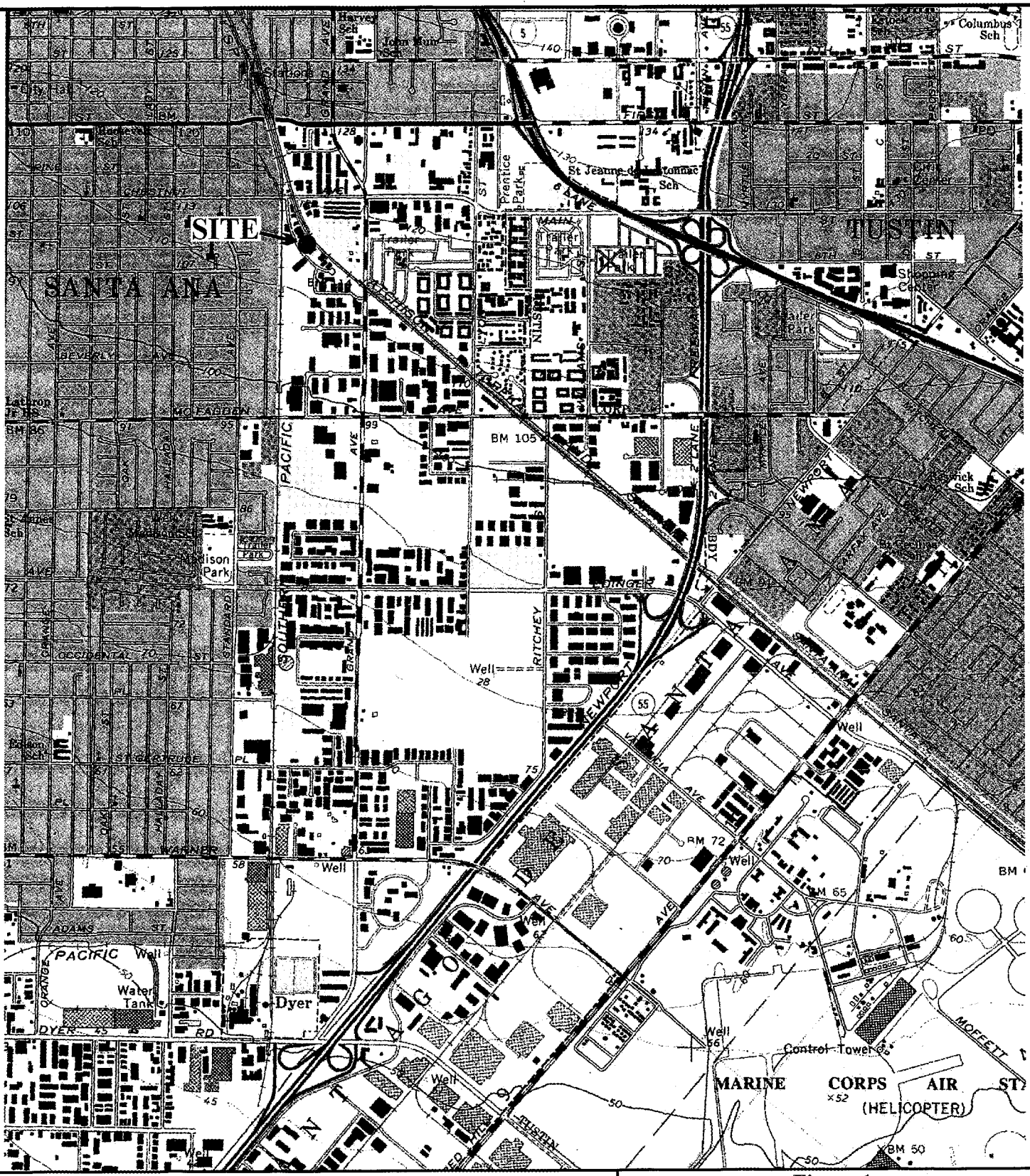
APPENDIX A

Figure 1 – Vicinity Map
Figure 2 – Boring Location Map
Figure 3 – Seismic Hazard Zone Map
Table 1 – Fault Parameters
Soil Classification System
Descriptive Soil Classification
Log of Boring
Seismic Settlement Analysis



Base Map: U.S.G.S. 7.5 Minute Quadrangle, Tustin, Calif. (photorevised, 2001).

Scale: 1" = 2,000'

0 2,000' 4,000'

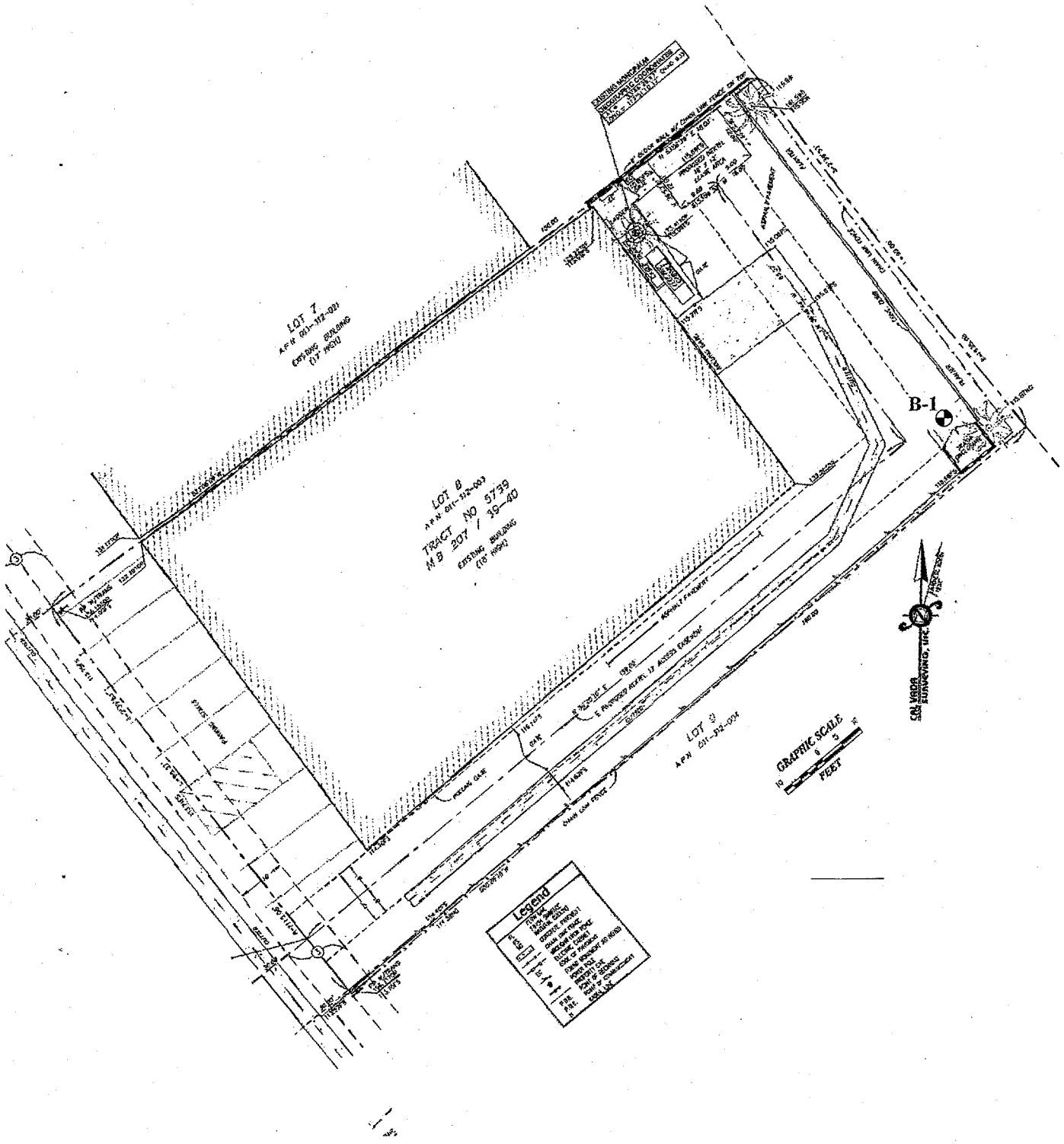
N

Figure 1
Vicinity Map

Ca2944 Bluebird Towing
601 South Santa Fe Avenue
Santa Ana, Orange County, California

Earth Systems
Southwest

09/02/11	50322-01



Base Map: LA2823A Dagerman (Nextel), LS-1, DCI Pacific, 6/21/07

LEGEND

B-1 ⊕ - Approximate ESSW Boring Location

Scale: 1" = 30'

0 30' 60'

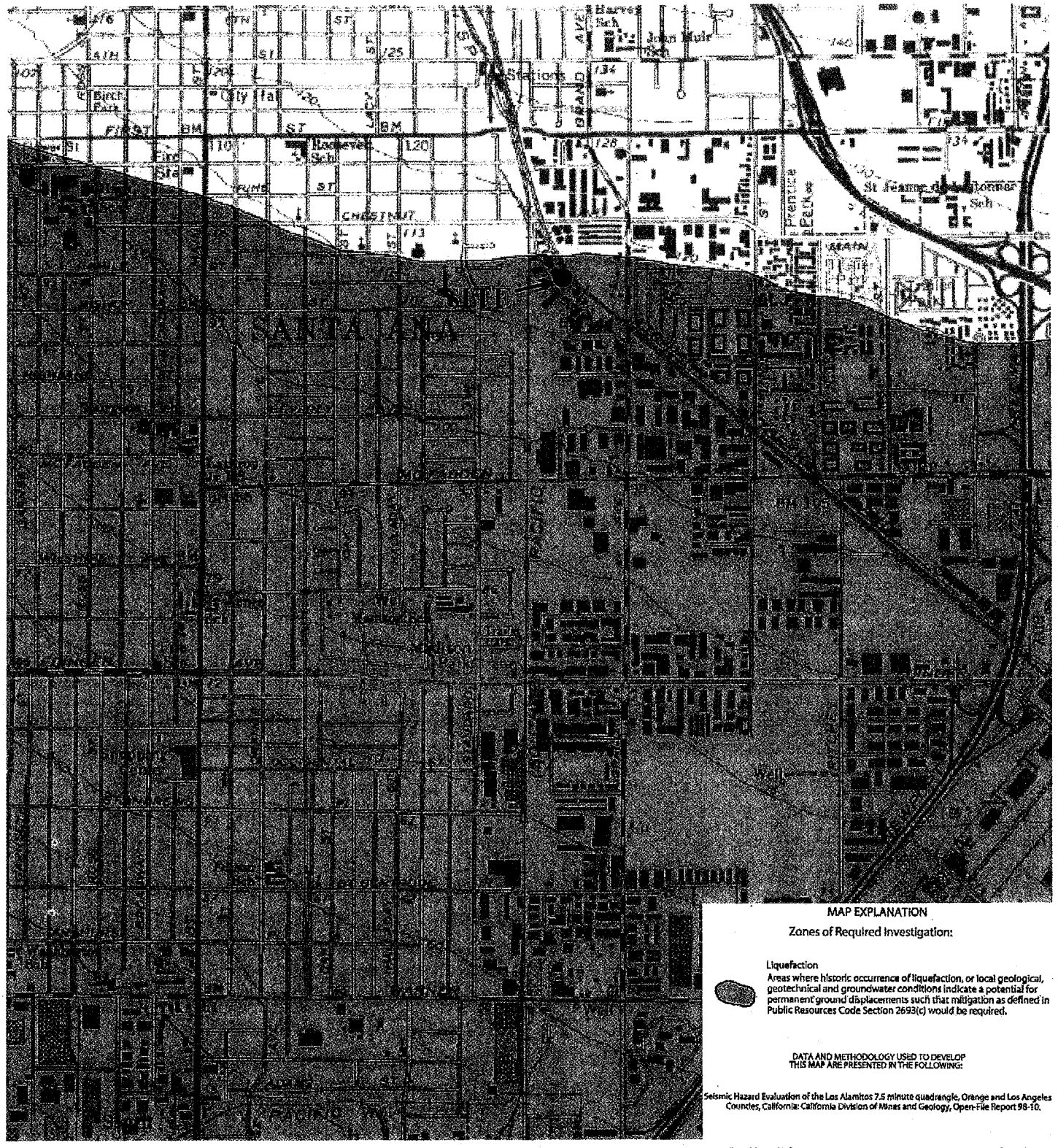
N

Figure 2
Boring Location Map

Ca2944 Bluebird Towing
601 South Santa Fe Avenue
Santa Ana, Orange County, California

Earth Systems Southwest

09/02/11 | 50322-01



Base Map: State of California Seismic Hazard Zones, 2001, Tustin Quadrangle.

Scale: 1" = 2,000'

0 2,000' 4,000'

N

Figure 3
Seismic Hazard Zone Map

Ca2944 Bluebird Towing
601 South Santa Fe Avenue
Santa Ana, Orange County, California

Earth Systems
Southwest

09/02/11 | 50322-01

Table 1
Fault Parameters

Fault Section Name	Distance (miles)	Distance (km)	Avg Dip Angle (deg.)	Avg Dip Direction (deg.)	Avg Rake (deg.)	Trace Length (km)	Fault Type	Mean Mag	Mean Return Interval (years)	Slip Rate (mm/yr)
San Joaquin Hills	3.5	5.6	23	204	90	27	B	**7.0**		0.5
Anaheim	5.9	9.5	71	45	na	16	B'	**6.3**		
Peralta Hills	6.1	9.9	50	3	na	14	B'	**6.5**		
Yorba Linda	8.4	13.5	90	153	na	18	B'	**6.5**		
Richfield	8.6	13.8	28	353	na	6	B'	**6.2**		
Newport-Inglewood, alt 2	9.2	14.8	90	49	180	66	B	**7.2**		1
Newport-Inglewood, alt 1	9.3	14.9	88	49	180	65	B	**7.2**		1
Elysian Park (Lower, CFM)	9.5	15.4	22	33	na	41	B'	**6.8**		
Puente Hills (Coyote Hills)	9.8	15.8	26	358	90	17	B	**6.8**		0.7
Newport-Inglewood (Offshore)	10.9	17.6	90	227	180	66	B	**6.9**		1.5
Whittier, alt 1	11.9	19.1	70	24	150	46	A	**7.1**	530	2.5
Whittier, alt 2	11.9	19.1	75	24	150	46	A	**7.1**	530	2.5
Compton	12.6	20.3	20	34	90	65	B'	**7.5**		
Puente Hills	12.9	20.7	25	20	90	44	B	**7.1**		0.7
Oceanside	16.1	25.9	23	69	na	120	B'	**7.5**		
Puente Hills (Santa Fe Springs)	16.2	26.1	29	347	90	11	B	**6.6**		0.7
Elsinore (Glen Ivy) rev	16.3	26.2	90	218	180	26	A	**7.0**	222	5
Chino, alt 2	16.3	26.2	65	234	150	29	B	**6.7**		1
Chino, alt 1	16.4	26.5	50	236	150	24	B	**6.6**		1
Palos Verdes	20.0	32.2	90	53	180	99	B	**7.3**		3
San Jose	20.7	33.3	74	334	30	20	B	**6.6**		0.5
Puente Hills (LA)	22.2	35.8	27	20	90	22	B	**6.9**		0.7
Fontana (Seismicity)	22.9	36.9	80	313	na	24	B'	**6.7**		
Elysian Park (Upper)	26.7	43.0	50	15	90	20	B	**6.6**		1.3
Sierra Madre	26.9	43.3	53	19	90	57	B	**7.2**		2
Elsinore (Temecula stepover)	27.1	43.6	90	212	180	12	A	**7.6**	725	2.5
Cucamonga	27.5	44.3	45	347	90	28	B	**6.6**		5
Elsinore (Glen Ivy stepover)	27.8	44.8	90	216	180	11	A	**7.1**	322	2.5
Elsinore (Stepovers Combined)	27.8	44.8	90	224	180	12	B'	**6.3**		
Raymond	29.8	48.0	79	348	60	22	B	**6.7**		1.5
Redondo Canyon, alt 2	31.3	50.3	80	187	na	25	B'	**6.6**		
Clamshell-Sawpit	31.3	50.4	50	334	90	16	B	**6.6**		0.5
Redondo Canyon, alt 1	31.5	50.7	90	171	na	13	B'	**6.3**		
Shelf (Projection)	31.8	51.1	17	21	na	70	B'	**7.8**		
Verdugo	32.0	51.5	55	31	90	29	B	**6.8**		0.5
Coronado Bank	32.0	51.5	90	237	180	186	B	**7.4**		3
San Pedro Basin	33.3	53.7	88	51	na	69	B'	**7.0**		
Hollywood	33.9	54.6	70	346	30	17	B	**6.6**		1
Elsinore (Temecula) rev	34.0	54.8	90	230	180	40	A	**7.4**	431	5
San Vicente	34.1	54.9	66	7	na	9	B'	**6.3**		

Reference: USGS OFR 2007-1437 (CGS SP 203)

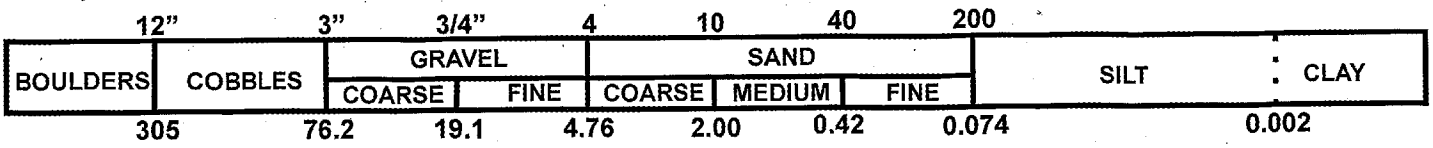
Mean Magnitude for Type A Faults based on 0.1 weight for unsegmented section, 0.9 weight for segmented model (weighted by probability of each scenario with section listed as given on Table 3 of Appendix G in OFR 2007-1437). Mean magntude is average of Ellworths-B and Hanks & Bakun moment area relationship.

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on ASTM Designations D 2487 and D 2488 (Unified Soil Classification System). Information on each b log is a compilation of subsurface conditions obtained from the field as well as from laboratory testing of selected samples. indicated boundaries between strata on the boring logs are approximate only and may be transiti

SOIL GRAIN SIZE

U.S. STANDARD SIEVE



SOIL GRAIN SIZE IN MILLIMETERS

RELATIVE DENSITY OF GRANULAR SOILS (GRAVELS, SANDS, AND NON-PLASTIC SILTS)

Very Loose	*N=0-4	RD=0-30	Easily push a 1/2-inch reinforcing rod by hand
Loose	N=5-10	RD=30-50	Push a 1/2-inch reinforcing rod by hand
Medium Dense	N=11-30	RD=50-70	Easily drive a 1/2-inch reinforcing rod with hammer
Dense	N=31-50	RD=70-90	Drive a 1/2-inch reinforcing rod 1 foot with difficulty by a hammer
Very Dense	N>50	RD=90-100	Drive a 1/2-inch reinforcing rod a few inches with hammer

*N=Blows per foot in the Standard Penetration Test at 60% theoretical energy. For the 3-inch diameter Modified California sample 140-pound weight, multiply the blow count by 0.63 (about 2/3) to estimate N. If automatic hammer is used, multiply a factor of 1.3 to 1.5 to estimate N. RD=Relative Density (%). C=Undrained shear strength (cohesion).

CONSISTENCY OF COHESIVE SOILS (CLAY OR CLAYEY SOILS)

Very Soft	*N=0-1	*C=0-250 psf	Squeezes between fingers
Soft	N=2-4	C=250-500 psf	Easily molded by finger pressure
Medium Stiff	N=5-8	C=500-1000 psf	Molded by strong finger pressure
Stiff	N=9-15	C=1000-2000 psf	Dented by strong finger pressure
Very Stiff	N=16-30	C=2000-4000 psf	Dented slightly by finger pressure
Hard	N>30	C>4000	Dented slightly by a pencil point or thumbnail

MOISTURE DENSITY

Moisture Condition: An observational term; dry, damp, moist, wet, saturated.
Moisture Content: The weight of water in a sample divided by the weight of dry soil in the soil sample expressed as a percentage.
Dry Density: The pounds of dry soil in a cubic foot.

MOISTURE CONDITION

Dry.....Absence of moisture, dusty, dry to the touch
Damp.....Slight indication of moisture
Moist.....Color change with short period of air exposure (granular soil)
Below optimum moisture content (cohesive soil)
Wet.....High degree of saturation by visual and touch (granular soil)
Above optimum moisture content (cohesive soil)
Saturated.....Free surface water

RELATIVE PROPORTIONS

Trace.....minor amount (<5%)
with/some.....significant amount
modifier/and...sufficient amount to influence material behavior (Typically >30%)

PLASTICITY

DESCRIPTION	FIELD TEST
Nonplastic	A 1/8 in. (3-mm) thread cannot be rolled at any moisture content.
Low	The thread can barely be rolled.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit.
High	The thread can be rerolled several times after reaching the plastic limit.

LOG KEY SYMBOLS

- Bulk, Bag or Grab Sample
- Standard Penetration Split Spoon Sampler (2" outside diameter)
- Modified California Sampler (3" outside diameter)
- No Recovery

GROUNDWATER LEVEL

- Water Level (measured or after drilling)
- Water Level (during drilling)

Terms and Symbols used on Boring Logs

Earth Systems Southwest

MAJOR DIVISIONS			GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS More than 50% of material is larger than No. 200 sieve size	GRAVEL AND GRAVELLY SOILS More than 50% of coarse fraction retained on No. 4 sieve	CLEAN GRAVELS		GW	Well-graded gravels, gravel-sand mixtures, little or no fines
				GP	Poorly-graded gravels, gravel-sand mixtures. Little or no fines
		GRAVELS WITH FINES		GM	Silty gravels, gravel-sand-silt mixtures
				GC	Clayey gravels, gravel-sand-clay mixtures
	SAND AND SANDY SOILS More than 50% of coarse fraction passing No. 4 sieve	CLEAN SAND (Little or no fines)		SW	Well-graded sands, gravelly sands little or no fines
				SP	Poorly-graded sands, gravelly sands, little or no fines
		SAND WITH FINES (appreciable amount of fines)		SM	Silty sands, sand-silt mixtures
				SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS More than 50% of material is smaller than No. 200 sieve size	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	Inorganic silts and very fine sands, rock flour, silty low clayey fine sands or clayey silts with slight plasticity
				CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
				OL	Organic silts and organic silty clays of low plasticity
		LIQUID LIMIT GREATER THAN 50		MH	Inorganic silty, micaceous, or diatomaceous fine sand or silty soils
				CH	Inorganic clays of high plasticity, fat clays
				OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS				PT	Peat, humus, swamp soils with high organic contents
VARIOUS SOILS AND MAN MADE MATERIALS					Fill Materials
MAN MADE MATERIALS					Asphalt and concrete

Soil Classification System

Earth Systems Southwest

Earth Systems
Southwest
9804 Crescent Center Dr. Unit 601, Rancho Cucamonga, CA
Phone (909) 484-5455, Fax (909) 484-5995

Boring No. B-1

Project Name: CA2944-Bluebird Towing
File Number: 50322-01
Boring Location: See Figure 2

Drilling Date: August 19, 2011
Drilling Method: 8" Hollow Stem Auger
Drill Type: Mobile B61
Logged By: J. Goyich

Description of Units

Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.

Graphic Trend
Blow Count Dry Density

Depth (Ft.)	Sample Type (Bulk / SPT / MOD Calif.)	Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	Description of Units
0				AC			ASPHALT CONRETE: 4 inches asphalt concrete over 2 inches gravel
0		3,4,4		ML	109	11	SANDY SILT: brown, soft, damp, fine to medium sand, some clay
5		3,4,5			90	12	
5		4,6,6		SM	109	9	SILTY SAND: brown, loose, damp, fine grained sand to fine sandy clay with silt
10		4,3,3			87	4	
10				SP-SM			SILTY SAND AND SAND: orangish red, loose, damp, fine grained sand
15		2,3,4		CL			CLAY: brown, soft, damp
20		8,12,13		SM	116	10	SILTY SAND: orange brown, medium dense, damp
25		5,5,6		CL	104	21	CLAY: brown, medium stiff, plastic
30		4,7,9		CL	106	18	SILTY CLAY: orange brown, stiff, damp
35		1,1,1		CL		31	SILTY SANDY CLAY: brown, soft, damp
40		0,0,3				20	
45		11,21,30		GP			POORLY GRADED GRAVEL: brown, very dense, moist, fine to coarse grained sand, fine to coarse gravel
50		4,1,11		GC		24	CLAYEY GRAVEL: brown, medium dense, damp, interbedded clay
55							Boring Terminated at 51.5 feet No groundwater encountered Backfilled with cuttings
60							

LIQUEFY-v 2.3.XLS - A SPREADSHEET FOR EMPIRICAL ANALYSIS OF LIQUEFACTION POTENTIAL AND INDUCED GROUND SUBSIDENCE

Project: Santa Ana Cell Tower
Job No: 11724-01
Date: 9/2/2011
Boring: B-1 Data Set: 1

Methods: **Liquefaction Analysis using 1996 & 1998 NCEER workshop method (Youd & Idriss, editors)**
Journal of Geotechnical and Enviromental Engineering (JGEE), October 2001, Vol 127, No. 10, ASCE
Settlement Analysis from Tokimatsu and Seed (1987), JGEE,Vol 113, No.8, ASCE
Modified by Pradel, JGEE, Vol 124, No. 4, ASCE

EARTHQUAKE INFORMATION:
Magnitude: **6.7** 7.5
PGA, g: **0.38** 0.28
MSF: 1.33
GWT: **####** feet
Calc GWT: **40.0** feet
Remediate to: **0.0** feet

SPT N VALUE CORRECTIONS:
Energy Correction to N60 (C_E): 1.50 Automatic Hammer
Drive Rod Corr. (C_R): 1 Default
Rod Length above ground (feet): 3.0
Borehole Dia. Corr. (C_B): 1.00
Sampler Liner Correction for SPT?: 1 Yes
Cal Mod/ SPT Ratio: 0.63

Total (ft) Liquefied Thickness
5

Total (in.) Induced Subsidence
0.1

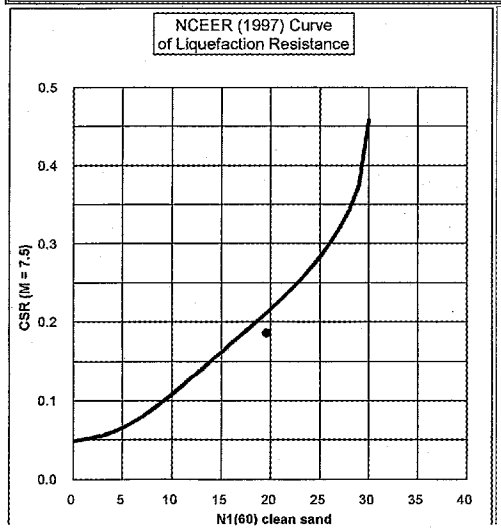
upper 50 ft

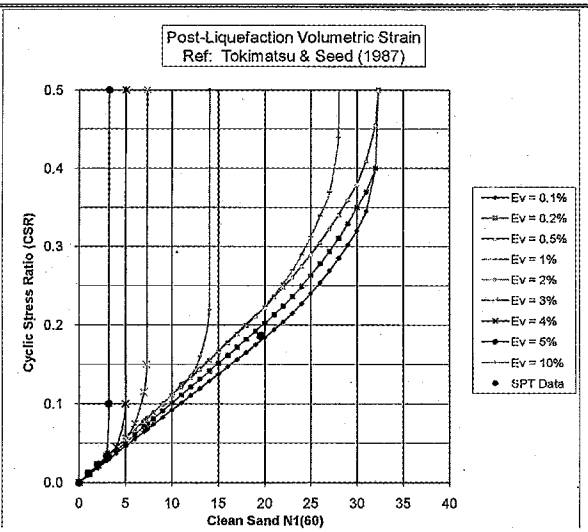
SETTLEMENT (SUBSIDENCE) OF DRY SANDS

Threshold Acceler., g: 0.43 **Minimum Calculated SF:** 1.14 **Required SF:** 1.25

Nc = 8.6

Base Depth (feet)	Cal Mod N	SPT N	Liquef. Suscept. (0 or 1)	Total Unit Wt. (pcf)	Fines Content (%)	Depth of SPT (feet)	Rod Length (feet)	Tot.Stress at SPT po (tsf)	Eff.Stress at SPT p'o (tsf)	rd	C_N	C_R	C_S	$N_{1(60)}$	Rel. Dens. Dr (%)	*Trigger FC Adj.* $\Delta N_{1(60)}$	*Equiv. Sand* $N_{1(60)cs}$	Kσ	M = 7.5 Available CRR	M =7.5 Induced CSR*	**Liquefac. Safety Factor**	*Post FC Adj.* $\Delta N_{1(60)}$	$N_{1(60)cs}$	Volumetric *Strain (%)*	**Induced Subsidence (in.)**	p (tsf)	G_{max} (tsf)	τ_{av} (tsf)	Shear Strain γ	Strain E_{15}	Strain Enc	**Dry Sand Subsidence (in.)**
								0.000																								
1.0	8	**5**		115	75	2.5	5.5	0.144	0.144	1.00	1.00	0.75	1.00	5.7				1.00	Infin.	0.184	**Non-Liq.**		5.7	0.00	**0.00**	0.096						
5.0	9	**6**		115	75	6.5	9.5	0.374	0.374	0.99	1.00	0.75	1.00	6.4				1.00	Infin.	0.183	**Non-Liq.**		6.4	0.00	**0.00**	0.250						
7.5	12	**8**	1	115	35	8.0	11.0	0.460	0.460	0.98	1.52	0.75	1.00	12.9	43	7.6	20.5	1.00	0.222	0.182	**Non-Liq.**	7.6	20.5	0.05	**0.01**	0.308	679	0.112	3.1E-04	3.0E-04	2.4E-04	**0.01**
10.0	6	**4**	1	115	15	11.5	14.5	0.661	0.661	0.98	1.26	0.80	1.00	5.7	29	2.8	8.5	1.00	0.093	0.181	**Non-Liq.**	2.8	8.5	0.32	**0.10**	0.443	607	0.159	7.3E-04	2.1E-03	1.6E-03	**0.10**
15.0	7	**4**		115	75	16.5	19.5	0.949	0.949	0.97	1.00	0.89	1.00	5.9				1.00	Infin.	0.179	**Non-Liq.**		5.9	0.00	**0.00**	0.636						
20.0	25	**16**	1	115	35	21.5	24.5	1.236	1.236	0.95	0.93	0.95	1.00	20.8	54	9.2	29.9	0.95	0.443	0.185	**Non-Liq.**	9.2	29.9	0.03	**0.02**	0.828	1,263	0.291	3.6E-04	2.2E-04	1.7E-04	**0.02**
25.0	11	**7**		115	75	26.5	29.5	1.524	1.524	0.94	1.00	1.00	1.00	10.4				0.93	Infin.	0.186	**Non-Liq.**		10.4	0.00	**0.00**	1.021						
30.0	16	**10**		115	75	31.5	34.5	1.811	1.811	0.91	1.00	1.00	1.00	15.1				0.90	Infin.	0.188	**Non-Liq.**		15.1	0.00	**0.00**	1.214						
35.0		**2**		115	75	36.5	39.5	2.099	2.099	0.88	1.00	1.00	1.10	3.3				0.87	Infin.	0.187	**Non-Liq.**		3.3	0.00	**0.00**	1.406						
40.0		**3**		115	75	41.5	44.5	2.386	2.386	0.84	1.00	1.00	1.10	5.0				0.85	Infin.	0.185	**Non-Liq.**		5.0	0.00	**0.00**	1.599						
45.0		**51**	1	115	75	46.5	49.5	2.674	2.674	0.79	0.63	1.00	1.30	62.6	95	10.0	72.6	0.71	1.200	0.222	**5.41**	10.0	72.6	0.00	**0.00**	1.791	2,495	0.521	2.6E-04			
50.0		**12**	1	115	75	51.5	54.5	2.961	2.961	0.74	0.60	1.00	1.13	12.1	42	7.4	19.6	0.84	0.211	0.186	**1.14**	7.4	19.6	0.13	**0.08**	1.984	1,697	0.539	4.7E-04			





$N_{1(60)} = C_N*C_E*C_B*C_R*C_S*N$
C_R = 0.75 for Rod lengths < 3m, 1.0 for > 10m
= min(1,max(0.75,1.4666-2.556/(z(ft))$^{0.5}$))
C_N = (1 atm/p'o)$^{0.5}$, max 1.7
C_S = max(1.1,min(1.3,1+$N_{1(60)}$/100)) for SPT without liners
MSF = $10^{2.24}/M^{2.56}$
z = Depth (m)
pa = 1 atm = 101 KPa = 1.058 tsf

p = 0.67*po
τ_{av} = 0.65*PGA*po*rd
G_{max} = 447*$N_{1(60)cs}^{(1/3)}$*$p^{0.5}$
a = 0.0389*(p/1)+0.124
b = 6400*(p/1)$^{(-0.8)}$
γ = [1+a*EXP(b*τ_{av}/G_{max})]/[(1+a)*τ_{av}/G_{max}]
E_{15} = γ*($N_{1(60)cs}$/20)$^{-1.2}$
E_{nc} = (Nc/15)$^{0.45}$*E15

Nc = (MAG-4)$^{2.17}$
S = 2*H*E_{nc}

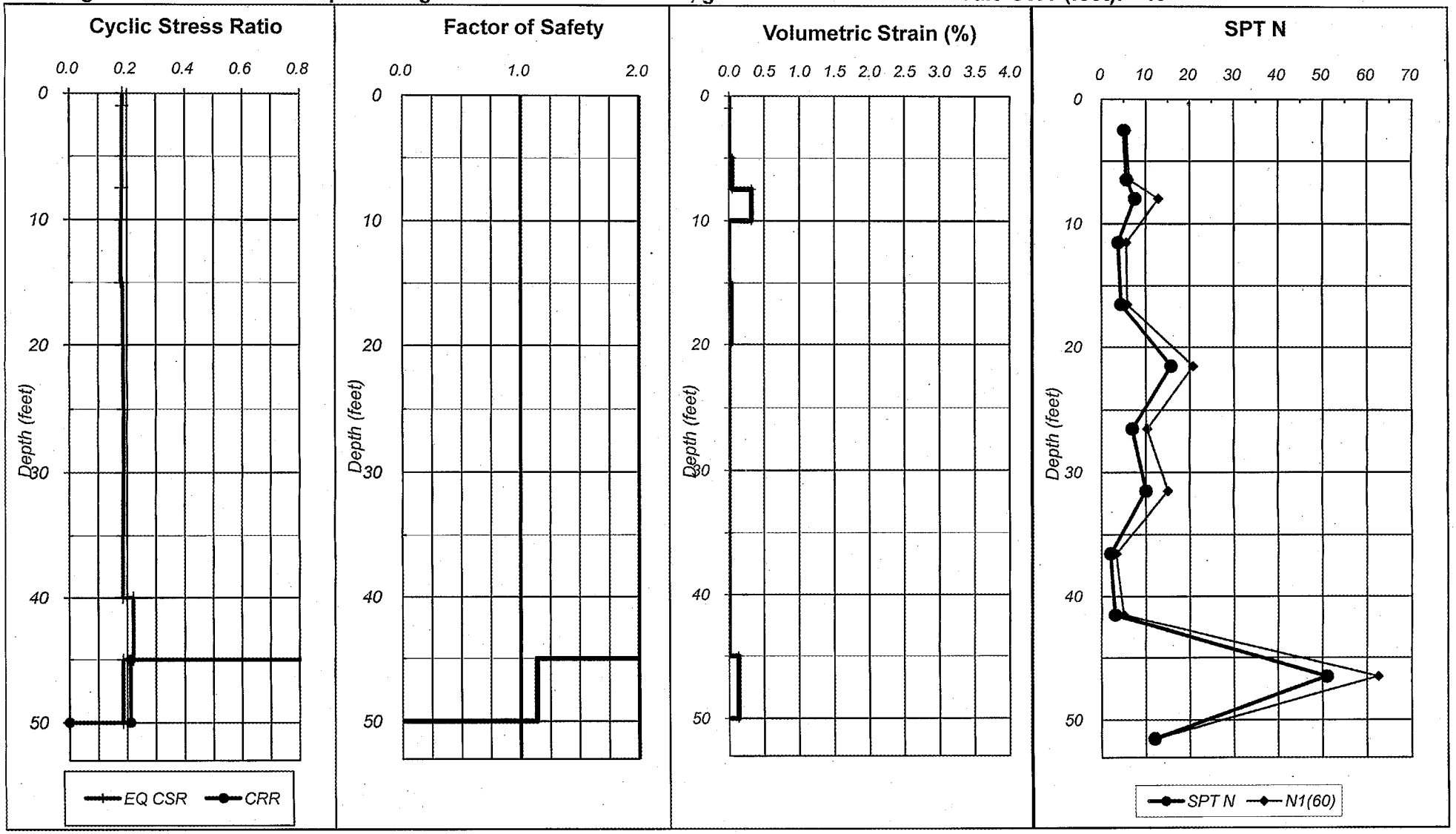
rd = (1-0.4113*z^0.5+0.04052*z+0.001753*z^1.5)/(1-0.4177*z^0.5+0.05729*z-0.006205*z^1.5+0.00121*z^2))
$\Delta N_{1(60)}$ = min(10,IF(FC<35,exp(1.76-(190/FC^2)),5)+IF(FC<=5,1,IF(FC<35,0.99+(FC^1.5/1000),1.2))*N1(60) - N1(60)
$N_{1(60)cs}$ = $N_{1(60)cs}$ + $\Delta N_{1(60)}$
Kσ = min of 1.0 or (p'o/1.058)$^{(IF(Dr>0.7,0.6,IF(Dr<0.5,0.8,0.7))-1)}$
Dr = ($N_{1(60)}$/70)$^{0.5}$
CSReq = 0.65*PGA*(po/p'o)*rd
CSR* = CSReq/MSF/Kσ
$CRR_{7.5}$ = (0.048-0.004721*N+0.0006136*N^2-0.00001673*N^3)/(1-0.1248*N+0.009578*N^2-0.0003285*N^3+0.000003714*N^4))
N = $N_{1(60)cs}$

SF = $CRR_{7.5,1atm}$/CSR*

EARTH SYSTEMS - EVALUATION OF LIQUEFACTION POTENTIAL AND INDUCED SUBSIDENCE

Santa Ana Cell Tower **Project No: 11724-01** *1996/1998 NCEER Method*

Boring: B-1 **Earthquake Magnitude: 6.7** **PGA, g: 0.38** **Calc GWT (feet): 40**



Total Thickness of Liquefiable Layers: 5.0 feet

Estimated Total Ground Subsidence: 0.1 inches

APPENDIX B

Laboratory Test Results

File No.: 50322-01 September 2, 2011

Lab No.: 11-0150

UNIT DENSITIES AND MOISTURE CONTENT ASTM D2937-04 & D2216-05

Job Name: Bluebird Towing, Santa Ana,CA

Sample Location	Depth (feet)	Unit Dry Density (pcf)	Moisture Content (%)	USCS Group Symbol
B1	2	109	11	ML
B1	5	90	12	ML
B1	7	109	9	SM
B1	10	87	4	SP-SM
B1	20	116	10	SM
B1	25	104	21	CL
B1	30	106	18	CL
B1	35	---	31	CL
B1	40	---	20	CL
B1	50	---	24	GC

File No.: 50322-01 September 2, 2011

Job Name: Bluebird Towing, Santa Ana,CA

Lab Number: 11-0150

AMOUNT PASSING NO. 200 SIEVE

ASTM D 1140-03a

Sample Location	Depth (feet)	Fines Content (%)	USCS Group Symbol
B1	5	51	ML
B1	10	10	SP-SM

File No.: 50322-01 September 2, 2011
Lab No.: 11-0150

PARTICLE SIZE ANALYSIS

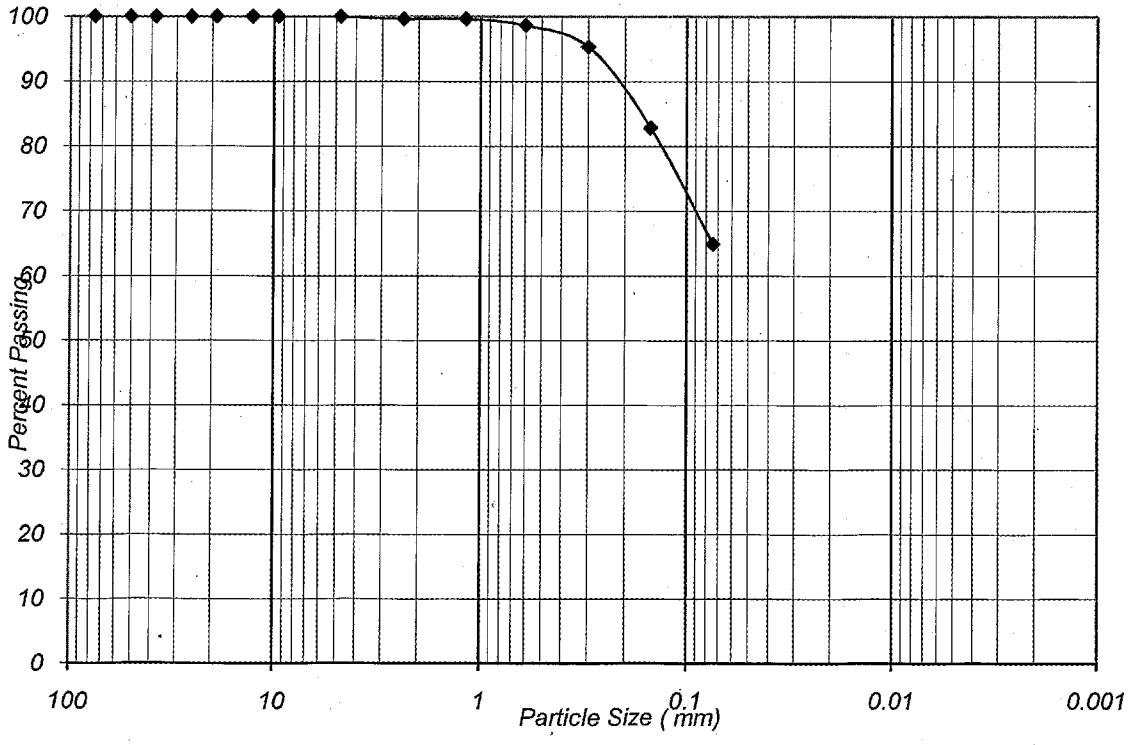
ASTM D-422-63 Reapproved 2007

Job Name: Bluebird Towing, Santa Ana,CA
Sample ID: **B1 @ 40 feet**
Description: **Sandy Clay (CL)**

Sieve Size	Percent Passing
1-1/2"	100
1"	100
3/4"	100
1/2"	100
3/8"	100
#4	100
#8	100
#16	100
#30	99
#50	95
#100	83
#200	65

% Gravel:	**0**
% Sand:	**35**
% Silt:	**38**
% Clay (2 micron):	**27**

(Clay content by short hydrometer method)



File No.: 50322-01

Job Name: Bluebird Towing, Santa Ana,CA

Lab Number: 11-0150

September 2, 2011

POCKET PENETROMETER TESTS

Sample Location	Depth (feet)	Unconfined Compressive Strength (tsf)	Cohesive Shear Strength (psf)
B1	10	0.18	180

File No.: 50322-01 September 2, 2011
Lab No.: 11-0150

SOIL CHEMICAL ANALYSES

Job Name: Bluebird Towing, Santa Ana,CA
Job No.: 50322-01

Sample ID:	Bag		
Sample Depth, feet:	2-5 feet	DF	RL
Sulfate, mg/Kg (ppm):	139	20	10.00
Chloride, mg/Kg (ppm):	21	20	4.00
pH, (pH Units):	8.02	1	---
Resistivity, (ohm-cm):	2,463	---	---
Conductivity, (µmhos-cm):	406	1	2.00

Note: Tests performed by Subcontract Laboratory:
Truesdail Laboratories, Inc.
14201 Franklin Avenue
Tustin, California 92780-7008 Tel: (714) 730-6239

DF: Dilution Factor
RL: Reporting Limit
N.D.: Not Detectable

General Guidelines for Soil Corrosivity

Chemical Agent	Amount in Soil	Degree of Corrosivity
Soluble Sulfates[1]	0 - 1,000 mg/Kg (ppm) [0-.1%]	Low
	1,000 - 2,000 mg/Kg (ppm) [0.1-0.2%]	Moderate
	2,000 - 20,000 mg/Kg (ppm) [0.2-2.0%]	Severe
	> 20,000 mg/Kg (ppm) [>2.0%]	Very Severe
Resistivity[2]	< 500 ohm-cm	Severely Corrosive
	500 to 1,000 ohm-cm	Very Corrosive
	1,000 to 2,000 ohm-cm	Moderately Corrosive
	2000-10,000 ohm-cm	Mildly Corrosive
	10,000+ ohm-cm	Progressively Less Corrosive

1 - See 2007 California Building Code, Section 1904.3 "Sulfate Exposure that refers to ACI 318, Tables 4.2.1 - Exposure Categories and Classes and Table 4.3.1 - Requirements for Concrete By Exposure Class."

2 - "Although no standard has been developed and accepted by such organizations as the American Society for Testing and Materials or the National Association of Corrosion Engineers, it is generally agreed that the classification shown above, or other similar classifications, reflect soil corrosivity." Source: Corrosionsourse.com

Royal Street Communications California , LLC

DAGERMAN LA2823A

601 SOUTH SANTA FE SANTA ANA, CA 92705

METRO PCS IS RESPONSIBLE FOR THE FOLLOWING:
- LANDSCAPING AND IRRIGATION INSTALLATION PER CITY CONDITIONS OF APPROVAL
- TO PURCHASE MOUNT, ANTENNA SOCKS, AND ANTENNA BRANCH TIPS FROM TOWER MANUFACTURER

NOTE:
NO FUEL OPERATED GENERATOR/EQUIPMENT/MACHINERY IS BEING PROPOSED FOR THIS PROJECT

ARCHITECTURAL STRUCTURAL ACCEPTED FOR CONSTRUCTION
SEPARATE PERMITS ARE REQUIRED FOR ELECTRICAL, PLUMBING & MECHANICAL PLANS
This set of plans and specifications must be kept on the job at all times and it is unlawful to make any changes or alterations on same without written permission from the City of Santa Ana.
The acceptance of this plan and specifications SHALL NOT be held to permit nor be an approval of the violation of any provisions of ANY City Ordinance or State Law.
Accepted By: JK Date: 1/30/12
CITY OF SANTA ANA
Date Issued: 3-5-12

FIRE DEPARTMENT PLAN REVIEW COMPLETED - NO INSPECTION REQUIRED
2-1-12

PERMIT TYPE: BLDG ELECT PLBG MECH GRADING
PERMIT# 10173326 F 10174348
OCC. GROUP n/a
CONSTR. TYPE n/a
CODE EDITION 2010 CBC
FLOOD ZONE X
FLOOD ZONE CERTIF. REQ'D YES NO
MICROFILM YES NO
RADIANT BARRIER @ ROOF YES NO
RESIDENTIAL DEV. TIER YES NO
SCHOOL DISTRICT YES NO

APPROVED
DATE 9-29-11
SANTA ANA POLICE DEPT.
"Police Department" Final Inspection Required 647-5840

Cell Tower + Trash Enclosure

PROJECT TEAM

ARCHITECT:
DCI PACIFIC
32 EXECUTIVE PARK, SUITE 110
IRVINE, CA 92614
CONTACT: D.K. DO E-MAIL: DK@DCIPACIFIC.COM
PHONE: (949) 475-1000 FAX: (949) 475-1001

SITE ACQUISITION:
COMPANY NAME: METRO PCS
350 COMMERCE, SUITE 200,
IRVINE, CA 92602-1302
LEASING: MICHAEL COLLIER E-MAIL: MCOLLIER@METROPCS.COM
PHONE: (949) 231-9500 FAX: –
ZONING: MICHAEL COLLIER E-MAIL: MCOLLIER@METROPCS.COM
PHONE: (949) 231-9500 FAX: –

RF ENGINEER:
COMPANY NAME: METRO PCS
350 COMMERCE, SUITE 200,
IRVINE, CA 92602-1302
CONTACT: GERALDINE ARGAMOSA E-MAIL: GARGAMOSA@METROPCS.COM
PHONE: (714) 730-3100 FAX: (714) 730-3201

CONSTRUCTION MANAGER:
COMPANY NAME: METRO PCS
350 COMMERCE, SUITE 200,
IRVINE, CA 92602-1302
CONTACT: JAKE MCKELVY E-MAIL: JMCKELVY@CORECOMGROUP.COM
PHONE: (714) 474-6300 FAX: –

SURVEYOR:
COMPANY NAME: CALVADA SURVEYING, INC.
411 JENKS CIR., SUITE 205,
CORONA, CA 92880
CONTACT: – E-MAIL: WWW.CALVADA.COM
PHONE: (951) 280-9960 FAX: (951) 280-9746

APPROVED
PLANNING DIVISION
MASTER I.D. 2010-935 16
G.P. LNO Zone M2
PLANNER [signature] DATE 2/8/12
TRANSFERRED BY DATE
PLANNING INSPECTION REQUIRED:
ROUGH FINAL NONE
NAME Vince Bacoy (714) 667-2713
RETAIN PLANS FOR FUTURE REVISIONS, SUBJECT TO ITEMS CHECKED AND CONDITIONS BELOW:
☐ INTERIOR W. ONLY
☐ NO EXTERIOR ALTERATIONS/MODIFICATIONS
☐ ALL MATERIALS TO MATCH EXISTING
☐ SCREENING REQUIRED
☐ SUBMIT LANDSCAPE PLANS
CUP 211-14

metroPCS
On Behalf Of Royal Street Communications, LLC
350 Commerce, Suite 200
Irvine, CA 92602
- 24 hour emergency number is 1-866-428-2964 (Network Service Center)
- Zeke Moreno is the next person to be contacted should NSC not respond
  - Director of Field Operations
  - 714-730-3132 (office)
  - 949-257-5047 (mobile)

GENERAL CONTRACTOR NOTES

DO NOT SCALE DRAWINGS IF NOT FULL-SIZE (24X36)

CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

ALSO, SEE GENERAL NOTES ON SHEET T2, AND SITE DEVELOPMENT NOTES ON SHEET A1.

PROJECT DESCRIPTION

THE PROJECT CONSISTS OF THE INSTALLATION OF (6) PANEL ANTENNAS ON A PROPOSED 60'-0" HIGH MONOPINE, (5) EQUIPMENT CABINETS INSIDE WROUGHT IRON FENCE ENCLOSURE AT GROUND, POWER & TELCO CABINETS, CONDUIT RUNS, (1) GPS ANTENNA AND COAX CABLE RUN.

ANTENNA ORIENTATION / CABLE TABLE

SECTORS	AZIMUTH	CABLE RUN	RAD CENTER	CABLE SIZE
'A'	30°	±140'-0"	±55'-0"	1 5/8"
'B'	90°	±140'-0"	±55'-0"	1 5/8"
'C'	150°	±140'-0"	±55'-0"	1 5/8"
'D'	230°	±140'-0"	±55'-0"	1 5/8"
'E'	270°	±140'-0"	±55'-0"	1 5/8"
'F'	330°	±140'-0"	±55'-0"	1 5/8"

PROJECT INFORMATION

APPLICANT/LESSEE: ROYAL STREET COMMUNICATIONS, LLC

LOCAL CONTACT: 350 COMMERCE, SUITE 200, IRVINE, CA 92602-1302
CONTACT: JEFFREY CLARKE
PHONE: (714) 730-3247

SITE ADDRESS: 601 SOUTH SANTA FE SANTA ANA, CA 92705

APN: 011-312-03

OWNER: HAROLD S. FINDLEY AND MAXINE E. FINDLEY TRUSTEES OF THE HAROLD S. FINDLEY FAMILY 1978 TRUST DATED 08/30/1978

CONTACT: DEBORAH DAGERMAN
PHONE: (714) 536-4818

EQUIP. LEASE AREA: 231 SQ. FT.
MONOPALM. LEASE AREA: 72 SQ. FT.
303 SQ. FT. TOTAL

OWNER SITE I.D. #: LA2823A

LATITUDE: 33° 44' 26.17"

LONGTITUDE: 117° 51' 10.17"

ZONING: M2 HEAVY MANUFACTURING

JURISDICTION: CITY OF SANTA ANA

CODE SUMMARY

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THE LOCAL CODES.

1. 2010 CALIFORNIA ADMINISTRATIVE CODE (CAC)
2. 2010 CALIFORNIA BUILDING CODE (CBC), VOLUMES 1, AND 2 (2009 EDITION INTERNATIONAL BUILDING CODE WITH 2010 CALIFORNIA AMENDMENTS)
3. 2010 CALIFORNIA ELECTRICAL CODE (2008 EDITION NATIONAL ELECTRICAL CODE WITH 2010 CALIFORNIA AMENDMENTS)
4. 2010 CALIFORNIA MECHANICAL CODE (CMC) (2009 EDITION IAPMO UNIFORM MECHANICAL CODE WITH 2010 CALIFORNIA AMENDMENTS)Z
5. 2010 CALIFORNIA ENERGY CODE (2008 EDITION CALIFORNIA ENERGY COMMISSION BUILDING ENERGY EFFICIENCY STANDARDS)
6. 2010 CALIFORNIA FIRE CODE (CFC) (2009 EDITION OF INTERNATIONAL FIRE CODE WITH 2010 CALIFORNIA AMENDMENTS)
7. 2010 CALIFORNIA GREEN CODE 8. 2010 CALIFORNINA REFERENCES STANDARDS CODE

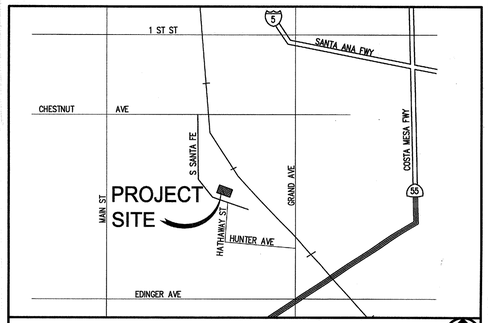
UTILITY PROVIDER

POWER:
CONTACT: JERRY CHAMBERLAIN (SCE) E-MAIL: JERRY.CHAMBERLAIN@SCE.COM
PHONE: (909) 820-5681 FAX: –

TELCO:
CONTACT: GREG MILLER (VERIZON) E-MAIL: GREG.MILLER@VERIZON.COM
PHONE: – FAX: (714) 842-6263

DRIVING DIRECTIONS

1.)Start out going NORTHWEST on EL CAMINO REAL toward WEST DR. 0.5 miles Map; 2) Turn LEFT onto TUSTIN RANCH RD. 0.2 miles Map; 3) Merge onto I-5 N toward LOS ANGELES. 2.5 miles Map; 4) Take the FOURTH ST exit- EXIT 103C- toward FIRST ST. 0.1 miles Map; 5) Take the ramp toward FIRST ST. 0.2 miles Map; 6) Stay STRAIGHT to go onto MABURY ST. <0.1 miles Map; 7) Turn RIGHT onto E 1ST ST. 0.4 miles Map; 8) Turn LEFT onto S GRAND AVE. 0.2 miles Map; 9) Turn RIGHT onto E CHESTNUT AVE. 0.2 miles Map; 10) Turn LEFT onto S SANTA FE ST. 0.1 miles Map; 11) End at 601 S Santa Fe St., Santa Ana, CA 92705-4143.



VICINITY MAP THOMAS GUIDE MAP 2005 NORTH

SHEET	DESCRIPTION	REV.
T1	TITLE SHEET	0
T2	GENERAL NOTES, ANTENNA & CABLE SCHEDULE, LEGEND AND ABBREVIATIONS	0
T3	SITE DEVELOPMENT NOTES, BATTERY SPECIFICATIONS & BATTERY TABLE	0
T4	CONDITIONAL USE PERMIT (1 OF 2)	0
T5	CONDITIONAL USE PERMIT (2 OF 2)	0
LS-1	TOPOGRAPHIC SURVEY (FOR REFERENCE ONLY)	0
A1	SITE PLAN	0
A2	PARTIAL ENLARGED SITE PLAN, EQUIPMENT AND ANTENNA LAYOUT PLANS	0
A3	ELEVATIONS	0
A4	ELEVATIONS	0
A5	ELEVATIONS	0
A6	ELEVATIONS	0
DN1	CONSTRUCTION NOTES	0
D1	DETAILS	0
D2	DETAILS	0
D3	DETAILS	0
L1	IRRIGATION PLAN	0
L2	IRRIGATION PLAN	0
L3	PLANTING PLAN	0
EN1	ELECTRICAL NOTES, SYMBOLS & DETAILS	0
E1	UTILITY PLAN, ELECTRICAL NOTES, PANEL SCHEDULE & SINGLE LINE DIAGRAM	0
E2	GROUNDING PLAN, NOTES, LEGEND AND ELECTRICAL DETAILS	0
MP1		
T-1		
N-1	STRUCT. SHEETS.	
F-1		
F-2		
22	SHEETS TOTAL	ISSUED FOR: BP SUBMITTAL

SHEET INDEX

APPROVALS

Subject To The Following Approvals:
- ☒ Planning Department
- ☒ Fire Department
- ☐ Police Department
- ☒ Public Works Agency
- ☐ Grading Permit
- ☐ County of Orange Health Department
- ☐ Cal/OSHA

OWNER / LANDLORD: _____
CONSTRUCTION MGR: _____
R.F. ENGINEER: _____
SITE ACQUISITION: _____
ZONING MANAGER: _____
UTILITY COORDINATOR: _____
REGIONAL PROGRAM MGR: _____
NET OPS: _____
SIGNATURE DATE

Royal Street Communications California, LLC
2913 EL CAMINO REAL, #561
TUSTIN, CA 92782

PROJECT INFORMATION:
DAGERMAN
LA2823A
601 SOUTH SANTA FE
SANTA ANA, CA 92705

CURRENT ISSUE DATE: 09/06/11

ISSUED FOR: BP SUBMITTAL

REV.:	DATE:	DESCRIPTION:	BY:
0	09/06/11	100% CD PER TOWERCO REDLINES #2	JGD
0	08/30/11	100% CD PER TOWERCO REDLINES	JGD
0	08/11/11	100% CD PER DRM REDLINES REV#2	JGD
0	08/01/11	100% CD PER DRM REDLINES	JGD
0	07/28/11	PRELIM 90% CD	JGD

PLANS PREPARED BY:
DCI PACIFIC
ARCHITECTURE - ENGINEERING - CONSULTING
32 EXECUTIVE PARK, SUITE 110, IRVINE, CA 92614
TEL: 949-475-1000 FAX: 949-475-1001

CONSULTANT:

RECEIVED
SEP 29 2011
City of Santa Ana

DRAWN BY: JGD CHK.: BOK APV.: DKD

LICENSURE:
LICENSED ARCHITECT D.K. DO C-30015 EXP. 08/31/13 STATE OF CALIFORNIA

SHEET TITLE: TITLE SHEET

SHEET NUMBER: T1

10173326 + 10174348

A.B.	ANCHOR BOLT
ABV.	ABOVE
ACCA	ANTENNA CABLE COVER ASSEMBLY
ADD'L	ADDITIONAL
A.F.F.	ABOVE FINISHED FLOOR
A.F.G.	ABOVE FINISHED GRADE
ALUM.	ALUMINUM
ALT.	ALTERNATE
ANT.	ANTENNA
APPRX.	APPROXIMATE(LY)
ARCH.	ARCHITECT(URAL)
AWG.	AMERICAN WIRE GAUGE
BLDG.	BUILDING
BLK.	BLOCK
BLKG.	BLOCKING
BM.	BEAM
B.N.	BOUNDARY NAILING
BTCW.	BARE TINNED COPPER WIRE
B.O.F.	BOTTOM OF FOOTING
B/U	BACK-UP CABINET
CAB.	CABINET
CANT.	CANTILEVER(ED)
C.I.P.	CAST IN PLACE
℄	CENTERLINE
CLG.	CEILING
CLR.	CLEAR
COL.	COLUMN
CONC.	CONCRETE
CONN.	CONNECTION(OR)
CONST.	CONSTRUCTION
CONT.	CONTINUOUS
d	PENNY (NAILS)
DBL.	DOUBLE
DEPT.	DEPARTMENT
D.F.	DOUGLAS FIR
DIA.	DIAMETER
DIAG.	DIAGONAL
DIM.	DIMENSION
DWG.	DRAWING(S)
DWL.	DOWEL(S)
EA.	EACH
EL.	ELEVATION
ELEC.	ELECTRICAL
ELEV.	ELEVATOR
EMT.	ELECTRICAL METALLIC TUBING
E.N.	EDGE NAIL
ENG.	ENGINEER
EQ.	EQUAL
EXP.	EXPANSION
EXST.(E)	EXISTING
EXT.	EXTERIOR
FAB.	FABRICATION(OR)
F.F.	FINISH FLOOR
F.G.	FINISH GRADE
FIN.	FINISH(ED)
FLR.	FLOOR
FDN.	FOUNDATION
F.O.C.	FACE OF CONCRETE
F.O.M.	FACE OF MASONRY
F.O.S.	FACE OF STUD
F.O.W.	FACE OF WALL
F.S.	FINISH SURFACE
FT.(')	FOOT(FEET)
FTG.	FOOTING
G.	GROWTH (CABINET)
GA.	GAUGE
G.C.	GENERAL CONTRACTOR
GI.	GALVANIZE(D)
G.F.I.	GROUND FAULT CIRCUIT INTERRUPTER
GLB	GLUE LAMINATED BEAM
GLU-LAM	GLUE LAMINATED BEAM
GPS	GLOBAL POSITIONING SYSTEM
GRND.	GROUND
HDR.	HEADER
HGR.	HANGER
H.	HIGH/HEIGHT
ICGB.	ISOLATED COPPER GROUND BUS
IN.(")	INCH(ES)
INT.	INTERIOR
LB.(#)	POUND(S)
L.B.	LAG BOLTS
L.F.	LINEAR FEET (FOOT)
L.	LONG(ITUDINAL)
MAS.	MASONRY
MAX.	MAXIMUM
M.B.	MACHINE BOLT
MECH.	MECHANICAL
MFR.	MANUFACTURER
MIN.	MINIMUM
MISC.	MISCELLANEOUS
MTL.	METAL
(N)	NEW
NO.(#)	NUMBER
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
OPNG.	OPENING
P/C	PRECAST CONCRETE
PCS	PERSONAL COMMUNICATION SERVICES
℗	PROPERTY LINE
PL.	PLATE
PLY.	PLYWOOD
PPC	POWER PROTECTION CABINET
PRC	PRIMARY RADIO CABINET
P.S.F.	POUNDS PER SQUARE FOOT
P.S.I.	POUNDS PER SQUARE INCH
P.T.	PRESSURE TREATED
PWR.	POWER (CABINET)
QTY.	QUANTITY
RAD.(R)	RADIUS
REF.	REFERENCE
REINF.	REINFORCEMENT(ING)
REQ'D.	REQUIRED
RGS.	RIGID GALVANIZED STEEL
SCH.	SCHEDULE
SHT.	SHEET
SIM.	SIMILAR
SPEC.	SPECIFICATION(S)
SQ.	SQUARE
S.S.	STAINLESS STEEL
STD.	STANDARD
STL.	STEEL
STRUC.	STRUCTURAL
TEMP.	TEMPORARY
THK.	THICK(NESS)
T.N.	TOE NAIL
T.O.A.	TOP OF ANTENNA
T.O.C.	TOP OF CURB
T.O.F.	TOP OF FOUNDATION
T.O.P.	TOP OF PLATE (PARAPET)
T.O.S.	TOP OF STEEL
T.O.W.	TOP OF WALL
TYP.	TYPICAL
U.G.	UNDER GROUND
U.L.	UNDERWRITERS LABORATORY
U.N.O.	UNLESS NOTED OTHERWISE
V.I.F.	VERIFY IN FIELD
W.	WIDE/WIDTH
W/	WITH
WD.	WOOD
W.P.	WEATHERPROOF
WT.	WEIGHT

ABBREVIATIONS | 4

NEW ANTENNA

EXISTING ANTENNA

GROUND ROD

GROUND BUS BAR

MECHANICAL GRND. CONN.

CADWELD

GROUND ACCESS WELL

ELECTRIC BOX

TELEPHONE BOX

LIGHT POLE

FOUND MONUMENT

DATUM ELEVATION POINT/LINE

SET POINT

REVISION

SWITCH

GRID REFERENCE

DETAIL REFERENCE

ELEVATION REFERENCE

SECTION REFERENCE

GROUT OR PLASTER

(E) BRICK

(E) MASONRY

CONCRETE

EARTH

GRAVEL

PLYWOOD

SAND

WOOD CONTINUOUS

WOOD BLOCKING

STEEL

CENTERLINE

PROPERTY/LEASE LINE

MATCH LINE

WORK POINT

G — G — GROUND CONDUCTOR

— — T — — — TELEPHONE CONDUIT

— — E — — — ELECTRICAL CONDUIT

— — A — — — COAXIAL CABLE

— — E/T — — — JOINT TRENCH FOR POWER & TELCO CONDUITS

— — X — — — CHAIN LINK FENCING

LEGEND | 3

SECTOR	ANTENNAS MODEL/MADE:	CABLE SIZE:	LENGTH	RAD CENTER	CABLE COLOR CODE
A (30°)	HBX-3319DS-VTM/ANDREW NO. OF ANTENNA: 1 MECH. DOWNTILT: 1° ELEC. DOWNTILT: 0°	1 5/8" COAXIAL TOP JUMPER: 2 BOT JUMBER: 2 E-PLANE: –	2 LENGTHS AT 140'	±55'-0"	RED
B (90°)	HBX-3319DS-VTM/ANDREW NO. OF ANTENNA: 1 MECH. DOWNTILT: 1° ELEC. DOWNTILT: 0°	1 5/8" COAXIAL TOP JUMPER: 2 BOT JUMBER: 2 E-PLANE: –	2 LENGTHS AT 140'	±55'-0"	YELLOW
C (150°)	HBX-3319DS-VTM/ANDREW NO. OF ANTENNA: 1 MECH. DOWNTILT: 1° ELEC. DOWNTILT: 0°	1 5/8" COAXIAL TOP JUMPER: 2 BOT JUMBER: 2 E-PLANE: –	2 LENGTHS AT 140'	±55'-0"	BLUE
D (230°)	HBX-3319DS-VTM/ANDREW NO. OF ANTENNA: 1 MECH. DOWNTILT: 1° ELEC. DOWNTILT: 0°	1 5/8" COAXIAL TOP JUMPER: 2 BOT JUMBER: 2 E-PLANE: –	2 LENGTHS AT 140'	±55'-0"	WHITE
E (270°)	HBX-3319DS-VTM/ANDREW NO. OF ANTENNA: 1 MECH. DOWNTILT: 1° ELEC. DOWNTILT: 0°	1 5/8" COAXIAL TOP JUMPER: 2 BOT JUMBER: 2 E-PLANE: –	2 LENGTHS AT 140'	±55'-0"	GREEN
F (330°)	HBX-3319DS-VTM/ANDREW NO. OF ANTENNA: 1 MECH. DOWNTILT: 1° ELEC. DOWNTILT: 0°	1 5/8" COAXIAL TOP JUMPER: 2 BOT JUMBER: 2 E-PLANE: –	2 LENGTHS AT 140'	±55'-0"	PURPLE
GPS	T.B.D.	1/2" COAXIAL	2 LENGTHS AT ±20'		

NOTE: 1. CONTRACTOR TO FIELD VERIFY ALL CABLE LENGTHS PRIOR TO ORDERING, FABRICATION, AND/OR INSTALLATION.

2. PROVIDE MECHANICAL DOWNTILT BRACKETS FOR ALL ANTENNAS

3. COAX LENGTH = ±600'-0"

ANTENNA & CABLE SCHEDULE | 2

GENERAL STRUCTURAL NOTES:

1. WHERE A CONSTRUCTION DETAIL IS NOT SHOWN OR NOTED, THE DETAIL SHALL BE THE SAME AS FOR OTHER SIMILAR WORK.
2. NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES.
3. NO PIPES, DUCTS, SLEEVES, CHASES, ETC., SHALL BE PLACED IN SLABS, BEAMS, OR WALLS UNLESS SPECIFICALLY SHOWN OR NOTED, NOR SHALL ANY STRUCTURAL MEMBER BE CUT FOR PIPES, DUCTS, ETC., UNLESS OTHERWISE NOTED. CONTRACTOR SHALL OBTAIN PRIOR APPROVAL FOR INSTALLATION OF ANY ADDITIONAL PIPES, DUCTS, ETC.
4. CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD ROYAL STREET AND THE ARCHITECT/ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF ROYAL STREET OR THE ARCHITECT/ENGINEER.
5. THE CONTRACT DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE, WORKERS AND PEDESTRIANS DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO BRACING, SHORING FOR LOADS DUE TO CONSTRUCTION EQUIPMENT, TEMPORARY STRUCTURES, AND PARTIALLY COMPLETED WORK, ETC. OBSERVATION VISITS TO THE SITE BY THE ARCHITECT/ENGINEER SHALL NOT INCLUDE INSPECTION OF SUCH ITEMS.
6. ASTM SPECIFICATIONS NOTED ON THE DRAWINGS SHALL BE OF THE LATEST REVISION.
7. CONSTRUCTION MATERIALS SHALL BE SPREAD OUT IF PLACED ON FRAMED FLOOR OR ROOF. LOAD SHALL NOT EXCEED THE DESIGN LIVE LOAD PER SQUARE FOOT. PROVIDE ADEQUATE SHORING/BRACING WHERE STRUCTURE HAS NOT ATTAINED DESIGN STRENGTH.
8. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL EXISTING UTILITIES WHETHER SHOWN HEREON OR NOT AND TO PROTECT THEM FROM DAMAGE. THE CONTRACTOR SHALL BEAR ALL EXPENSE OF REPAIR OR REPLACEMENT IN CONJUNCTION WITH THE PROSECUTION OF THIS WORK.
9. DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALES SHOWN ON DRAWINGS. 10. THESE NOTES SHALL BE CONSIDERED A PART OF THE WRITTEN SPECIFICATIONS.
11. ALL ITEMS REMOVED DURING CONSTRUCTION WORK (I.E., DRYWALL, PLYWOOD, CEILING PANELS, ETC.) SHALL BE REPLACED TO MATCH EXISTING.
12. THE FOLLOWING REQUIREMENTS SHALL BE MET FOR SPECIAL INSPECTION:
A. THE SPECIAL INSPECTOR SHALL BE UNDER THE SUPERVISION OF A REGISTERED PROFESSIONAL ENGINEER. (IF REQUIRED BY THE ARCHITECT/ENGINEER)
B. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE THE ARCHITECT/ENGINEER, AND OTHER DESIGNATED PERSONS. ALL DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION; THEN, IF UNCORRECTED, TO THE PROPER DESIGN AUTHORITY AND THE BUILDING OFFICIAL. (IF REQUIRED BY ARCHITECT/ENGINEER).
C. THE SPECIAL INSPECTOR SHALL SUBMIT A FINAL REPORT SIGNED BY BOTH HE AND HIS SUPERVISOR STATING WHETHER THE WORK REQUIRING SPECIAL INSPECTION WAS IN CONFORMANCE WITH THE APPROVED PLANS AND SPECIFICATIONS AND THE APPLICABLE WORKMANSHIP PROVISIONS OF THE 2007 CALIFORNIA BUILDING CODE.

GENERAL CONSTRUCTION NOTES:

1. THE FACILITY IS AN UNOCCUPIED DIGITAL TELECOMMUNICATION FACILITY.
2. PLANS ARE NOT TO BE SCALED AND ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY, UNLESS NOTED OTHERWISE. THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
3. PRIOR TO THE SUBMISSION OF BIDS, THE CONTRACTORS SHALL VISIT THE JOB SITE AND BE RESPONSIBLE FOR ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS, AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE IMPLEMENTATION ENGINEER AND ARCHITECT/ENGINEER PRIOR TO PROCEEDING WITH THE WORK.
4. THE CONTRACTOR SHALL RECEIVE, IN WRITING, AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.
5. CONTRACTOR SHALL CONTACT USA BEFORE PROCEEDING WITH ANY EXCAVATION, SITE WORK OR CONSTRUCTION.
6. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OTHERWISE OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
7. ALL WORK PERFORMED AND MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. MECHANICAL AND ELECTRICAL SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. THE GENERAL CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK, USING THE BEST SKILLS AND ATTENTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT INCLUDING CONTACT AND COORDINATION WITH THE IMPLEMENTATION ENGINEER AND WITH THE OWNER'S AUTHORIZED REPRESENTATIVE.
9. SEAL PENETRATIONS THROUGH FIRE RATED AREAS WITH U.L. LISTED AND FIRE CODE APPROVED MATERIALS.
10. PROVIDE A PORTABLE FIRE EXTINGUISHER WITH A RATING OF NOT LESS THAN 2-A OR 2-A10BC WITHIN 75 FEET TRAVEL DISTANCE TO ALL PORTIONS OF THE PROJECT AREA DURING CONSTRUCTION.
11. ALL CONSTRUCTION SHALL BE IN ACCORDANCE, CONSTRUCTION DOCUMENTS OF 2007 CBC. REGARDING EARTHQUAKE, PIPING, LIGHT FIXTURES, CEILING GRID, INTERIOR PARTITIONS AND MECHANICAL EQUIPMENT. ALL WORK MUST BE IN ACCORDANCE WITH LOCAL EARTHQUAKE CODES AND REGULATIONS.
12. DETAILS ARE INTENDED TO SHOW END RESULT OF DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
13. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, PAVING, CURBS, VEGETATION, GALVANIZED SURFACES, ETC., AND UPON COMPLETION OF WORK REPAIR ANY DAMAGE THAT OCCURRED DURING CONSTRUCTION TO THE SATISFACTION OF ROYAL STREET AND OWNER'S REPRESENTATIVE
14. KEEP GENERAL AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. LEAVE PREMISES IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST OR SMUDGES OF ANY NATURE.
15. REPRESENTATIONS OF TRUE NORTH, OTHER THAN THOSE FOUND ON THE PLOT OF SURVEY DRAWING (SHEET LS1), SHALL NOT BE USED TO IDENTIFY OR ESTABLISH THE BEARING OF TRUE NORTH AT THE SITE. THE CONTRACTOR SHALL RELY SOLELY ON THE PLOT OF SURVEY DRAWING AND ANY SURVEYOR'S MARKINGS AT THE SITE FOR THE ESTABLISHMENT OF TRUE NORTH, AND SHALL NOTIFY THE ARCHITECT/ENGINEER PRIOR TO PROCEEDING WITH THE WORK IF ANY DISCREPANCY IS FOUND BETWEEN THE VARIOUS ELEMENTS OF THE WORKING DRAWINGS AND THE TRUE NORTH ORIENTATION AS DEPICTED ON THE CIVIL SURVEY. THE CONTRACTOR SHALL ASSUME SOLE LIABILITY FOR ANY FAILURE TO NOTIFY THE ARCHITECT/ENGINEER.
16. PENETRATIONS OF ROOF MEMBRANES SHALL BE PATCHED/FLASHED AND MADE WATERTIGHT USING LIKE MATERIALS IN ACCORDANCE WITH NRCA ROOFING STANDARDS AND DETAILS. CONTRACTOR SHALL OBTAIN DETAILING CLARIFICATION FOR SITE-SPECIFIC CONDITIONS FROM ARCHITECT/ENGINEER, IF NECESSARY, BEFORE PROCEEDING.

STANDARD STRUCTURAL STEEL NOTES:

1. ALL METAL WORK SHALL BE IN ACCORDANCE WITH THE SPECIFICATION GALVANIZED ASTM 572 GRADE 50 (GALV.) UNLESS NOTED OTHERWISE.
2. STRUCTURAL TUBING MEMBERS SHALL CONFORM TO ASTM A500, GRADE B.
3. ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND AWS D1.1. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION", 9TH EDITION.
4. BOLTED CONNECTIONS SHALL USE BEARING TYPE GALVANIZED ASTM A325 BOLTS (3/4" DIA.) AND SHALL HAVE A MINIMUM OF TWO BOLTS U.N.O.
5. NON-STRUCTURAL CONNECTIONS FOR HANDRAIL, LADDERS AND STEEL GRATING MAY USE 5/8" DIA. GALVANIZED ASTM A307 BOLTS U.N.O.
6. MISCELLANEOUS STEEL PLATES AND STEEL ANGLES SHALL CONFORM TO ASTM A36 AND BE GALVANIZED
7. ALL WELDS EXPOSED TO WEATHER SHALL BE GALVANIZED OR PAINTED

GENERAL NOTES | 1

Royal Street Communications California, LLC
2913 EL CAMINO REAL, #561
TUSTIN, CA 92782

PROJECT INFORMATION:

DAGERMAN
LA2823A
601 SOUTH SANTA FE
SANTA ANA, CA 92705

CURRENT ISSUE DATE:

09/06/11

ISSUED FOR:

BP SUBMITTAL

REV.:	DATE:	DESCRIPTION:	BY:
0	09/06/11	100% CD PER TOWERCO REDLINES #2	JGD
0	08/30/11	100% CD PER TOWERCO REDLINES	JGD
0	08/11/11	100% CD PER DRM REDLINES REV#2	JGD
0	08/01/11	100% CD PER DRM REDLINES	JGD
0	07/28/11	PRELIM 90% CD	JGD

PLANS PREPARED BY:

DCI PACIFIC
ARCHITECTURE - ENGINEERING - CONSULTING
32 EXECUTIVE PARK, SUITE 110, IRVINE, CA 92614
TEL: 949-475-1000 FAX: 949-475-1001

CONSULTANT:

DRAWN BY: JGD | CHK.: BOK | APV.: DKD

LICENSURE:

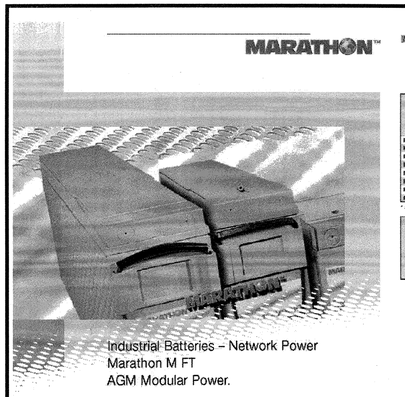
LICENSED ARCHITECT D. K. DOLL C-18015 EXP. 11/30/12 STATE OF CALIFORNIA

SHEET TITLE:

GENERAL NOTES, ANTENNA & CABLE SCHEDULE, LEGEND, AND ABBREVIATIONS

SHEET NUMBER:

T2



Industrial Batteries – Network Power
Marathon M FT
AGM Modular Power.

Specifications

EXIDE TECHNOLOGIES
INDUSTRIAL ENERGY

Type	Part number	Nominal voltage	Capacity C_1 1.65 VPC 25°C Ah	Capacity C_3 1.7 VPC 25°C Ah	Capacity C_8 1.75 VPC 25°C Ah	Capacity C_{120} 1.8 VPC 25°C Ah	Length (L) mm	Width (W) mm	Height (H) mm	Weight kg	Internal resistance acc. to IEC 60896-21 mΩ	Terminal
M 12 V 20 FT	MAMF12020FMABA	12	27.2	20.0	20	22	205	167	180	14.0	11.1	M-M6-90°
M 12 V 40 FT	MAMF12040FMABA	12	53.7	41.0	40	47	305	167	180	20.0	10.4	M-M6-90°
M 12 V 60 FT	MAMF12060FMABA	12	81.2	60.2	60	69	260	168*	268	23.0	7.9	M-M8-90°
M 12 V 90 FT	MAMF12090FMABA	12	95.8	73.2	85	96	260	168	278	30.0	6.5	F-M6-90°
M 12 V 105 FT	MAMF12105FMABA	12	71.2	86.0	104	108	511	110	208	35.0	5.7	F-M6-90°
M 12 V 135 FT	MAMF12135FMOA	12	89.4	112.0	125	135	509	134	240	43.0	4.6	F-M6-90°
M 12 V 155 FT	MAMF12155FMABA	12	104.8	131.5	145	158	509	134	282	52.0	4.3	F-M6-90°
M 6 V 200 FT	MAMF06200FMABA*	6	140.3	182.4	200	208	261*	127	290	34.0	2.9	F-M6

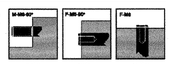
* In other length: 278 mm

Discharge figures are also valid for UL 94-HB version. Catalog "M" in "V" or "H" in the part number. (VA only for types M FT)

E.g. Catalog MAMF12020 ⓊⓁ MARA
UL 94-HB MAMF12020 ⓊⓁ MARA
"UL 94-HB" MAMF06200 ⓊⓁ MARA

Container, terminal and torque

Container: UL 94-HB = Polypropylene (PP)
UL 94-V0 = Polypropylene (PP)



6 Nm 11 Nm 11 Nm

EXIDE TECHNOLOGIES

MATERIAL SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION

MANUFACTURER: GNB Industrial Power, A Division of Exide Technologies, 3950 Sussex Avenue, Aurora, IL 60504-7932
CHEMICAL/TRADE NAME (as used on label): MARATHON V-0 and SPIRITFER V-0, Valve Regulated Lead Acid Battery

FOR INFORMATION: Primary: MACTEC Engineering and Consulting, Inc. Attention: DeLyn Thompson (770) 421-3564; Secondary: Environmental, Safety & Health; Attention: Fred Gassler (610) 921-4052
CHEMICAL FAMILY/ CLASSIFICATION: Electrical Storage Battery, Monoblock type
DATE ISSUED: May 4, 2005

FOR EMERGENCY: CHEMTREC (800) 424-9300, 24-hour Emergency Response Contact; Ask for Environmental Coordinator
CHEMTREC INTERNATIONAL (703) 527-3887 – Collect

II. HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Components	CAS Number	% by Wt.	Approximate Air Exposure Limits (µg/m³) OSHA	ACGIH	NIOSH
Inorganic components of:					
Lead	7439-92-1	71-76	50	50	50
Antimony Oxide	7440-36-0	< 0.6	500	500	500
Calcinated Clay	N/A	< 1.2	N/A	N/A	N/A
Tin	7440-31-5	0.4-0.6	2000	2000	2000
Copper	7440-50-8	< 0.1	1000	1000	1000
Electrolyte (sulfuric acid)	7664-93-9	16-18	1000	200	1000
Case Material: Polypropylene	9003-07-0	6-7	N/A	N/A	N/A
Flow separator material: Glass	N/A	2-3	N/A	N/A	N/A

NOTE: Inorganic lead and electrolyte (water and sulfuric acid solution) are the primary components of every battery manufactured by Exide Technologies or its subsidiaries. Other ingredients may be present dependent upon battery type. Polypropylene is the principal case material of automotive and commercial batteries.

III. PHYSICAL DATA

Boiling Point (Electrolyte)	203° F (at 760 mm Hg)	Specific Gravity (H_2O=1)	1.270 to 1.350
Melting Point	Not Applicable	Vapor Pressure (mm Hg @ 20 °C)	10
Solubility in Water	100%	Vapor Density (AIR=1)	Greater than 1
Evaporation Rate (Butyl acetate=1)	Less Than 1	% Volatiles by Weight	Not Applicable
Appearance and Odor	A clear liquid with a sharp, penetrating, pungent odor. A battery is a manufactured article; no apparent odor.		

IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point: Not Applicable
Flammable Limits: LEL = 4.1% (Hydrogen Gas in air); UEL = 74.2%
Extinguishing media: CO_2; foam; dry chemical

Special Fire Fighting Procedures: Use positive pressure, self-contained breathing apparatus. Beware of acid splatter during water application and wear acid-resistant clothing, gloves, face and eye protection. If batteries are on charge, shut off power to the charging equipment, but, note that strings of series connected batteries may still pose risk of electric shock even when charging equipment is shut down.

Unusual Fire and Explosion Hazards: In operation or when on charge, batteries generate hydrogen and oxygen gases (hydrogen is highly flammable and oxygen supports combustion). They must always be assumed to contain these gases which, if ignited by burning cigarette, naked flame or spark, may cause battery explosion with dispersion of casing fragments and corrosive liquid electrolyte. Carefully follow manufacturer's instructions for installation and service. Keep away all sources of gas ignition, ensure that adequate ventilation is provided, and do not allow metallic articles to simultaneously contact the negative and positive terminals of a battery.

V. REACTIVITY DATA

Stability: Stable X Unstable ___

Conditions to Avoid: Prolonged overcharging and overheating current; sparks and other sources of ignition

Incompatibility: (materials to avoid)
Electrolyte: Contact of sulfuric acid with combustibles and organic materials may cause fire and explosion. Also causes violently with strong reducing agents, most metals, carbides, chlorates, nitrates, and picrate, sulfur trioxide gas, strong oxidizers, and water. Contact with metals may produce toxic sulfur dioxide fumes and may release flammable hydrogen gas.
Lead compounds: Avoid contact with strong acids, bases, halides, halogenates, potassium nitrate, permanganates, peroxides, reactive hydrogen, potassium, carbides, sulfides, phosphorus, sulfur and reducing agents.

Hazardous Decomposition Products:
Electrolyte: Sulfur trioxide, carbon monoxide, sulfuric acid mist, sulfur dioxide, hydrogen sulfide, hydrogen.
Lead compounds: Temperatures above the melting point are likely to produce toxic metal fume, vapor, or dust; contact with strong acid or base or presence of nascent hydrogen may generate highly toxic stibine gas.
May Occur ___ Will Not Occur X
Hazardous Polymerization:

VI. HEALTH HAZARD DATA

Routes of Entry:
Electrolyte: Harmful by all routes of entry. Under normal conditions of use, sulfuric acid vapors and mist are not generated. Sulfuric acid vapors and mist may be generated when product is overheated, oxidized, or otherwise processed or damaged. Lead compounds: Under normal conditions (not dust, vapors, and fumes are not generated. Hazardous exposure can occur only when product is heated above the melting point, oxidized or otherwise processed or damaged to create dust, vapor, or fume.

Inhalation:
Electrolyte: Breathing of sulfuric acid vapors or mists may cause severe respiratory irritation.
Lead compounds: Inhalation of lead dust or fumes may cause irritation of upper respiratory tract and lungs.

Ingestion:
Electrolyte: May cause severe irritation of mouth, throat, esophagus, and stomach.
Lead compounds: Acute ingestion may cause abdominal pain, nausea, vomiting, diarrhea, and severe cramping. Has may lead rapidly to systemic toxicity. Acute ingestion should be treated by physician.

Skin Contact/Skin Absorption:
Electrolyte: Severe irritation, burns, and ulceration. Sulfuric acid is not readily absorbed through the skin.
Lead compounds: Not readily absorbed through the skin.

Eye Contact:
Electrolyte: Severe irritation, burns, comea damage, blindness.
Lead compounds: May cause eye irritation.

VI. HEALTH HAZARD DATA (CONTINUED)

Effects of Overexposure - Acute:
Electrolyte: Severe skin irritation, burns, damage to comea may cause blindness, vapor respiratory irritation
Lead compounds: Headache, fatigue, abdominal pain, loss of appetite, nausea, vomiting, diarrhea, muscular aches and weakness, sleep disturbances, and irritability.

Effects of Overexposure - Chronic:
Electrolyte: Possible erosion of tooth enamel; inflammation of nose, throat, and bronchial tubes, and scarring of the cornea
Lead compounds: Anemia; neuropathy, particularly of the motor nerves, with wrist drop; kidney damage; reproductive changes in both males and females.

Carcinogenicity:
Electrolyte: The National Toxicology Program (NTP) and the International Agency for Research on Cancer (IARC) have classified "strong inorganic acid mist containing sulfuric acid" as a substance that is carcinogenic to humans. This classification does not apply to sulfuric acid solutions in semi-liquid state or to electrolyte in batteries. Batteries subjected to abusive charging at excessively high currents for prolonged periods of time without vent caps in place may create a surrounding atmosphere of the effluents among inorganic acid mist containing sulfuric acid.
Lead compounds: Listed as a 2B carcinogen, likely to animals at extreme doses. Proof of carcinogenicity in humans is lacking at present.

Medical Conditions Generally Aggravated by Exposure:
Overexposure to sulfuric acid mist may cause lung damage and aggravate pulmonary condition. Contact of electrolyte (water and sulfuric acid solution) with skin may aggravate this disease such as eczema and contact dermatitis. Contact of electrolyte (water and sulfuric acid solution) with eyes may damage cornea and/or cause blindness. Lead and its compounds can aggravate some forms of kidney, liver, and neurologic diseases.

Emergency and First Aid Procedures:
Inhalation:
Electrolyte: Remove to fresh air immediately. If breathing is difficult, give oxygen.
Lead compounds: Remove from exposure, gargle, wash nose, eyes, and lips; consult physician.

Ingestion:
Electrolyte: Give large quantities of water; do not induce vomiting; consult physician.
Lead compounds: Consult physician immediately.

Skin:
Electrolyte: Flush with large amounts of water for at least 15 minutes; remove contaminated clothing completely, including shoes and do not wear clothes again until cleaned. If acid is splashed on shoes, remove and discard if they contain leather.
Lead compounds: Wash immediately with soap and water. Lead compounds are not readily absorbed through the skin.

Eyes: Electrolyte and Lead compounds: Flush immediately with large amounts of water for at least 15 minutes, consult physician immediately.

VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Handling and Storage:
Store batteries under roof in cool, dry, well-ventilated areas that are separated from incompatible materials and from activities which may create flames, sparks, or heat. Keep away from metallic objects that could bridge the terminals on a battery and create a dangerous short-circuit. Single batteries pose no risk of electric shock but there may be increasing risk of electric shock from strings of connected batteries exceeding three 12-volt units.

Charging:
There is a possible risk of electric shock from charging equipment and from strings of series connected batteries, whether or not being charged. Shut-off power to charging whenever one is to be used before detachment of any electrical connections. Batteries being charged will generate and release flammable hydrogen gas. Charging spaces should be ventilated. Keep battery vent caps in position. Prohibit smoking and avoid creation of flames and sparks nearby. Wear flame and eye protection when near batteries being charged.

Spill or Leak Procedures:
Remove combustible materials and all sources of ignition. Stop flow of material and contain spill by diking with soda ash, etc. Carefully neutralize spill with soda ash, etc. Make certain mixture is neutral then collect residue and place in a drum or other suitable container with a label specifying "neutralize hazardous waste" (or if uncertain call distributor regarding proper labeling procedures). Dispose of as hazardous waste. If battery is leaking, place battery in a heavy duty plastic bag. Wear acid resistant boots, face shield, chemical splash goggles and acid resistant gloves. DO NOT RELEASE UNNEUTRALIZED ACID.

VII. PRECAUTIONS FOR SAFE HANDLING AND USE (CONTINUED)

Waste Disposal Methods:
Sulfuric Acid: Neutralize as described above for a spill, collect residue and place in a container labeled as containing hazardous waste. Dispose of as a hazardous waste. If uncertain about labeling procedures, call your local battery distributor or listed contact. DO NOT FLUSH LEAD-CONTAMINATED ACID TO SEWER.

Spent batteries: Send to secondary lead smelter for recycling following applicable federal, state, and local regulations.

Precautionary Labeling:
POISON – CAUSES SEVERE BURNS
DANGER – EXPLOSIVE GASES
CORROSIVE – CONTAINS SULFURIC ACID
KEEP AWAY FROM CHILDREN

VIII. CONTROL MEASURES

Engineering Controls and Work Practices:
Store and handle in well-ventilated area. If mechanical ventilation is used, components must be acid-resistant.
Handle batteries cautiously. Make certain vent caps are on securely. If battery case is damaged, avoid bodily contact with internal components. Wear protective clothing, eye and face protection, when charging or handling batteries. Follow all manufacturers' recommendations when stacking or palletizing. Do not allow metallic materials to simultaneously contact both the positive and negative terminals of the batteries. Use a battery carrier to lift a battery or place hands at opposite corners to avoid spilling acid through the vents. Avoid contact with internal components of the batteries.

Hygiene Practices:
Wash hands thoroughly before eating, drinking or smoking after handling batteries.

Respiratory Protection:
None required under normal conditions. If an overcharging or overheating condition exists and concentrations of sulfuric acid mist are known or suspected to exceed PEL, use NIOSH or MSHA-approved respiratory protection.

Protective Clothing:
None required under normal conditions. If battery case is damaged, use rubber or plastic acid-resistant gloves with elbow-length gauntlet, acid-resistant apron, clothing, and boots.

Eye Protection:
None required under normal conditions. If battery case is damaged, chemical-goggles or face shield.

Emergency Flushing:
In areas where water and sulfuric acid solutions are handled in concentrations greater than 1%, emergency eyewash stations and showers should be provided, with unlimited water supply.

IX. OTHER REGULATORY INFORMATION

NFPA Hazard Rating for sulfuric acid:
Flammability (Red) = 0 Health (Blue) = 3 Reactivity (Yellow) = 2
Sulfuric acid is water-reactive if concentrated.

TRANSPORTATION:
US DOT identification and description for this battery is:
Batteries, wet, non-spillable, 8, UN 2800, PG III
Label: Corrosive
(Exceptions 172.159, paragraph (d), CFR 49)
For air shipments, see International Air Transportation Association (IATA) Dangerous Goods Regulations Manual, special provisions A-48 and A-67. For ocean shipments, reference International Maritime Dangerous Goods Code, P. 8121.

This is to certify that the "Non-Spillable" batteries are capable of withstanding the Vibration and Pressure Differential Test, and at a temperature of 55°C, the electrolyte will not flow from a ruptured or cracked case. The batteries have been protected against short circuits and securely packaged. The batteries and outer packaging must be plainly marked "Non-Spillable" or "Non-Spillable Battery".

RCRA: Spent lead-acid batteries are not regulated as hazardous waste when recycled. Spilled sulfuric acid is a characteristic hazardous waste; EPA hazardous waste number D002 (corrosivity).

IX. OTHER REGULATORY INFORMATION (CONTINUED)

CERCLA (Superfund) and EPCRA:
(a) Reportable Quantity (RQ) for spilled 100% sulfuric acid under CERCLA (Superfund) and EPCRA (Emergency Planning and Community Right to Know Act) is 1,000 lbs. State and local reportable quantities for spilled sulfuric acid may vary.
(b) Sulfuric acid is a listed "Extremely Hazardous Substance" under EPCRA, with a Threshold Planning Quantity (TPQ) of 1,000 lbs.
(c) EPCRA Section 302 notification is required if 1,000 lbs or more of sulfuric acid is present at one site. An average automotive/commercial battery contains approximately 5 lbs of sulfuric acid. Contact your Exide representative for additional information.
(d) EPCRA Section 312 Tier Two reporting is required for non-automotive batteries if sulfuric acid is present in quantities of 500 lbs or more and/or if lead is present in quantities of 10,000 lbs or more.
(e) Supplier Notification:

This product contains a toxic chemical or chemicals subject to the reporting requirements of section 313 of (1986) III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

Chemical	CAS	Percent by Weight
Lead (Pb)	7439-92-1	71-76
Electrolyte: Sulfuric Acid	7664-93-9	16-18

If you distribute this product to other manufacturers in SIC Codes 20 through 39, this information must be provided with the first shipment of each calendar year.
Note: The Section 313 supplier notification requirement does not apply to batteries that are "consumer products".

CAA: Exide Technologies supports preventative actions concerning ozone depletion in the atmosphere due to emissions of CFCs and other ozone-depleting chemicals (ODCs), defined by the USEPA as Class I substances. Pursuant to Section 611 of the Clean Air Act Amendments (CAAA) of 1990, finalized on January 10, 1993, Exide established a policy to eliminate the use of Class I ODCs prior to the May 15, 1995 deadline.

TSCA: Each ingredient chemical listed in Section II of this MSDS is also listed on the TSCA Registry.

CANADIAN REGULATIONS: All chemical substances in this product are listed on the CEPA DSL/NDSL or are exempt from list requirements.

CALIFORNIA PROPOSITION 65:
"WARNING: This product contains lead, a chemical known to the State of California to cause cancer, or birth defects or other reproductive harm."

PREPARED BY: GNB INDUSTRIAL POWER, A DIVISION OF EXIDE TECHNOLOGIES, 3950 SUSSEX AVENUE, AURORA, IL 60504-7932, (630) 872-0471

VENDEE AND THIRD PERSONS ASSUME THE RISK OF INJURY PROXIMATELY CAUSED BY THE MATERIAL IF REASONABLE SAFETY PROCEDURES ARE NOT FOLLOWED AS PROVIDED FOR IN THIS DATA SHEET, AND VENDOR SHALL NOT BE LIABLE FOR INJURY TO VENDEE OR THIRD PERSONS PROXIMATELY CAUSED BY ABNORMAL USE OF THE MATERIAL EVEN IF REASONABLE PROCEDURES ARE FOLLOWED.

ALL PERSONS USING THIS PRODUCT, ALL PERSONS WORKING IN AN AREA WHERE THIS PRODUCT IS USED, AND ALL PERSONS HANDLING THIS PRODUCT SHOULD BE FAMILIAR WITH THE CONTENTS OF THIS DATA SHEET. THIS INFORMATION SHOULD BE EFFECTIVELY COMMUNICATED TO EMPLOYERS AND OTHERS WHO MIGHT COME IN CONTACT WITH THE PRODUCT.

WHILE THE INFORMATION ACCUMULATED AND SET FORTH HEREIN IS BELIEVED TO BE ACCURATE AS OF THIS DATE HEREOF, EXIDE TECHNOLOGIES MAKES NO WARRANTY WITH RESPECT THERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON. RECIPIENTS ARE ADVISED TO CONFIRM IN ADVANCE OF NEED THAT THE INFORMATION IS CURRENT, APPLICABLE, AND SUITABLE FOR THEIR PARTICULAR CIRCUMSTANCES.

BATTERY SPECIFICATIONS

SCALE: N.T.S. | 2

LEAD AND ACID DATA
PER CFC ARTICLE 64 COMPLIANCE

MANUFACTURER: MARATHON MODEL NO.: M12V105FT TYPE: MONOBLOCK TYPE

OF BATTERIES PER MODCELL CABINET: 4
OF BATTERIES PER BATTERY CABINET: 8
OF MODCELL CABINETS: 2
OF BATTERY CABINETS: 2
TOTAL NUMBER OF BATTERIES: 24

DATA PROVIDED BY BATTERY MANUFACTURER (PER BATTERY)		
WEIGHT PER BATTERY	35.80	KG
	78.93	LB
LEAD % BY WEIGHT	76	%
LEAD WEIGHT	59.98	LB
ELECTROLYTE WITH SULFURIC ACID (VOL.)	1.42*	GAL
ELECTROLYTE WITH SULFURIC ACID (WEIGHT.)	15.58	LB
SULFURIC ACID % FROM ELECTROLYTE	0.30	%
SULFURIC ACID ONLY (VOLUME)	0.43*	GAL
SULFURIC ACID ONLY (WEIGHT)	6.54	LB

TOTAL SYSTEM CALCULATION		
TOTAL BATTERY WEIGHT	859.20	KG
	1894.21	LB
LEAD WEIGHT	1439.60	LB
ELECTROLYTE WITH SULFURIC ACID (VOL.)	34.08 *	GAL
ELECTROLYTE WITH SULFURIC ACID (WEIGHT.)	373.92	LB
SULFURIC ACID ONLY (VOLUME)	10.32 *	GAL
SULFURIC ACID ONLY (WEIGHT)	156.96	LB

* <50 GAL. THRESHOLD (CFC SEC.608)

FIRE DEPARTMENT NOTES:
1. FIRE DEPARTMENT FINAL INSPECTION REQUIRED*
2. A CFC PERMIT TO OPERATE BATTERY SYSTEMS WITH STATIONARY LEAD-ACID BATTERIES IS NOT REQUIRED FOR THE QUANTITIES ON SITE.
3. A CFC PERMIT MAY BE REQUIRED FOR THE HAZARDOUS MATERIALS ON SITE.
4. A HAZARDOUS MATERIALS IDENTIFICATION SIGN IS REQUIRED FOR ALL ENTRANCES INTO BATTERY STORAGE AREAS. LETTERS MUST BE AT LEAST ON (1) INCH IN HEIGHT AND IN A COLOR WHICH CONTRASTS TO THE BACK GROUND OF THE SIGN AND LIST THE FOLLOWING:

CLASS 1 WATER REACTIVE LIQUID
TOXIC LIQUID
CORROSIVE LIQUID
OTHER HEALTH HAZARD LIQUID

5. AN APPROVED METHOD TO NEUTRALIZE SPILLED ELECTROLYTE SHALL BE PROVIDED IN THE BATTERY ROOM.
6. BATTERIES SHALL BE PROVIDED WITH SAFETY VENTING CAPS.
7. LOCATIONS AND CLASSIFICATIONS OF EXTINGUISHERS SHALL BE IN ACCORDANCE WITH THE CFC STANDARD 10-1 AND PLACEMENT IS SUBJECT TO THE APPROVAL OF THE FIRE INSPECTOR.
8. STORAGE, DISPENSING OR USE OF ANY FLAMMABLE AND COMBUSTIBLE LIQUIDS, FLAMMABLE AND COMPRESSED GASES, AND OTHER HAZARDOUS MATERIALS SHALL COMPLY WITH CFC REGULATIONS.
9. EXIT DOORS SHALL BE OPENABLE FROM THE INSIDE WITHOUT THE USE OF A KEY OR ANY SPECIAL KNOWLEDGE OR EFFORT.
10. ADDRESS NUMBERS SHALL BE MINIMUM 6 INCHES HIGH AND PLAINLY VISIBLE FROM ROADWAY BUILDING IS ADDRESSED ON.

*FOR ORANGE COUNTY PROJECTS, SCHEDULE INSPECTION 2 DAYS IN ADVANCE (714) 573-6150

BATTERY TABLE

SCALE: N.T.S. | 3

1. THE ARCHITECT/ENGINEER AND REPRESENTATIVES OF THE LESSEE AND OWNER, MUST BE NOTIFIED AT LEAST TWO FULL DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. DO NOT EXCAVATE OR DISTURB SOILS BEYOND THE PROPERTY LINES OR LEASE LINES, UNLESS SPECIFICALLY INSTRUCTED, IN WRITING, BY THE ARCHITECT/ENGINEER AND LESSEE.
3. DO NOT SCALE BUILDING DIMENSIONS FROM DRAWINGS.
4. ANY DRAIN AND/OR FIELD TILE ENCOUNTERED DURING CONSTRUCTION SHALL BE RETURNED TO ITS ORIGINAL CONDITION PRIOR TO COMPLETION OF WORK. SIZE, LOCATION AND TYPE OF ANY UNDERGROUND UTILITIES OR IMPROVEMENTS SHALL BE ACCURATELY NOTED AND PLACED ON AS-CONSTRUCTED DRAWINGS BY GENERAL CONTRACTOR AND ISSUED TO ARCHITECT/ENGINEER AT COMPLETION OF PROJECT.
5. ALL EXISTING UTILITIES, FACILITIES, CONDITIONS, AND THEIR DIMENSIONS SHOWN ON PLANS HAVE BEEN PLOTTED FROM AVAILABLE RECORDS. THE ARCHITECT/ENGINEER, LESSEE, AND OWNER ASSUME NO RESPONSIBILITY WHATSOEVER AS TO THE SUFFICIENCY OR ACCURACY OF THE INFORMATION SHOWN ON THE PLANS OR THE MANNER OF THEIR REMOVAL OR ADJUSTMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING EXACT LOCATION OF ALL EXISTING UTILITIES AND FACILITIES PRIOR TO START OF CONSTRUCTION. CONTRACTOR SHALL ALSO OBTAIN FROM EACH UTILITY COMPANY DETAILED INFORMATION RELATIVE TO WORKING SCHEDULES AND METHODS OF REMOVING OR ADJUSTING EXISTING UTILITIES.
6. CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES BOTH HORIZONTALLY AND VERTICALLY PRIOR TO START OF CONSTRUCTION. ANY DISCREPANCIES OR DOUBTS AS TO THE INTERPRETATION OF PLANS SHOULD BE IMMEDIATELY REPORTED TO THE ARCHITECT/ENGINEER FOR RESOLUTION AND INSTRUCTION, AND NO FURTHER WORK SHALL BE PERFORMED UNTIL THE DISCREPANCY IS CHECKED AND CORRECTED BY THE ARCHITECT/ENGINEER. FAILURE TO SECURE SUCH INSTRUCTION MEANS CONTRACTOR WILL HAVE WORKED AT HIS/HER OWN RISK AND EXPENSE. CONTRACTOR SHALL CALL LOCAL DIGGER HOT LINE FOR UTILITY LOCATIONS 48 HOURS PRIOR TO START OF CONSTRUCTION.
7. ALL NEW AND EXISTING UTILITY STRUCTURES ON SITE AND IN AREAS TO BE DISTURBED BY CONSTRUCTION SHALL BE ADJUSTED TO FINISH ELEVATIONS PRIOR TO FINAL INSPECTION OF WORK.
8. THE BUILDING DEPARTMENT ISSUING THE BUILDING PERMIT SHALL BE NOTIFIED AT LEAST TWO WORKING DAYS PRIOR TO THE COMMENCEMENT OF WORK OR AS STIPULATED BY THE CODE ENFORCEMENT OFFICIAL HAVING JURISDICTION.
9. GRADING OF THE SITE WORK AREA IS TO BE SMOOTH AND CONTINUOUS IN SLOPE AND IS TO FEATHER INTO EXISTING GRADES AT THE GRADING LIMITS.
10. ALL TEMPORARY EXCAVATIONS FOR THE INSTALLATION OF FOUNDATIONS, UTILITIES, ETC., SHALL BE PROPERLY LAID BACK OR BRACED IN ACCORDANCE WITH CORRECT OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REQUIREMENTS.
11. STRUCTURAL FILLS SUPPORTING PAVEMENTS SHALL BE COMPACTED TO 100% OF MAXIMUM STANDARD PROCTOR DRY DENSITY.
12. NEW GRADES NOT IN BUILDING AND DRIVEWAY IMPROVEMENT AREA TO BE ACHIEVED BY FILLING WITH APPROVED CLEAN FILL AND COMPACTED TO 95% OF STANDARD PROCTOR DENSITY.
13. ALL FILL SHALL BE PLACED IN UNIFORM LIFTS. EACH LIFT'S THICKNESS SHOULD NOT EXCEED THAT WHICH CAN BE PROPERLY COMPACTED THROUGHOUT ITS ENTIRE DEPTH WITH THE EQUIPMENT AVAILABLE.
14. ANY FILLS PLACED ON EXISTING SLOPES THAT ARE STEEPER THAN 10 HORIZONTAL TO 1 VERTICAL SHALL BE PROPERLY BENCHED INTO THE EXISTING SLOPE AS DIRECTED BY A GEOTECHNICAL ENGINEER.
15. THE GRADES WITHIN FENCED AREAS ARE TO BE ACHIEVED BY COMPACTING CLEAN FILL TO A DENSITY OF 90% OF STANDARD PROCTOR COVERING THE AREA WITH GEO-TECH CLOTH (18" MIN. OVERLAP AT ALL SEAMS) FOR WEED SUPPRESSION, THEN ACHIEVING FINISH GRADE BY ADDING 6" OF 3/4" CRUSHED STONE, NO FINES.
16. CONTRACTOR SHALL CLEAN ENTIRE SITE AFTER CONSTRUCTION SUCH THAT NO PAPERS, TRASH, WEEDS, BRUSH OR ANY OTHER DEPOSITS WILL REMAIN. ALL MATERIALS COLLECTED DURING CLEANING OPERATIONS SHALL BE DISPOSED OF OFF-SITE BY THE GENERAL CONTRACTOR.
17. ALL TREES AND SHRUBS WHICH ARE NOT IN DIRECT CONFLICT WITH THE IMPROVEMENTS SHALL BE TRIMMED AS REQUIRED AND PROTECTED IN PLACE BY THE GENERAL CONTRACTOR.
18. DRIVEWAY CONSTRUCTION, GRADING AND DRAINAGE WORK SHALL CONFORM TO CALIFORNIA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION", LATEST EDITIONS, AND ALL APPLICABLE PROVISIONS OF LOCAL COUNTY ORDINANCES.
19. IT SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO OBTAIN, READ, AND FOLLOW THE GEO-TECHNICAL REPORT FOR EACH PROJECT SITE. ALL PROVISIONS WITHIN SAID REPORT SHALL BE ACCOMMODATED BY THE GENERAL CONTRACTOR AND ALL SUBCONTRACTORS. CONTINUOUS ONSITE SUPERVISION BY THE GEO-TECHNICAL/SOILS ENGINEER SHALL BE ARRANGED FOR BY THE CONTRACTOR PRIOR TO THE START OF ANY EXCAVATION AND/OR GRADING OPERATIONS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE GEO-TECHNICAL/SOILS ENGINEER PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FROM THE SUPERVISING GEO-TECHNICAL ENGINEER PRIOR TO PROCEEDING WITH PLACEMENT OF ANY FORMS AND/OR MATERIALS.
20. IT SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO PROVIDE AND INSTALL ALL REQUIRED SIGNS FOR THIS PROJECT. THE CONTRACTOR SHALL OBTAIN WRITTEN INSTRUCTIONS FROM THE CONSTRUCTION MANAGER AS TO THE EXACT MATERIAL, SIZE, WORDING, AND LOCATION FOR ALL SIGNS.

SIGNS THAT MAY BE REQUIRED INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
a. 7x24 ACCESS SIGN.
b. SITE ENTRY SIGN.
c. ANTENNA STRUCTURE COMPLIANCE SIGN.
d. NEPA RF EXPOSURE SIGN(S).
e. ANY ADDITIONAL SIGNS AS REQUIRED BY 'METRO PCS' AND/OR GOVERNMENTAL AGENCIES.

*SIGNS UNDER SEPERATE PLAN CHECK & PERMIT.

SITE DEVELOPMENT NOTES

SCALE: N.T.S. | 1

Royal Street Communications California, LLC
2913 EL CAMINO REAL, #561
TUSTIN, CA 92782

PROJECT INFORMATION:

DAGERMAN
LA2823A
601 SOUTH SANTA FE
SANTA ANA, CA 92705

CURRENT ISSUE DATE:
09/06/11

ISSUED FOR:
BP SUBMITTAL

REV.:	DATE:	DESCRIPTION:	BY:
0	09/06/11	100% CD PER TOWERCO REDLINES #2	JGD
0	08/30/11	100% CD PER TOWERCO REDLINES	JGD
0	08/11/11	100% CD PER DRM REDLINES REV#2	JGD
0	08/01/11	100% CD PER DRM REDLINES	JGD
0	07/28/11	PRELIM 90% CD	JGD

PLANS PREPARED BY:
DCI PACIFIC
ARCHITECTURE - ENGINEERING - CONSULTING
32 EXECUTIVE PARK, SUITE 110, IRVINE, CA 92614
TEL: 949-475-1000 FAX: 949-475-1001

CONSULTANT:

DRAWN BY: JGD | CHK.: BOK | APV.: DKD

LICENSURE:
LICENSED ARCHITECT C-18015 EXP. 08-31-11 STATE OF CALIFORNIA

SHEET TITLE:
SITE DEVELOPMENT NOTES, BATTERY SPECIFICATIONS AND BATTERY TABLE

SHEET NUMBER:
T3

REQUEST FOR
Planning Commission Action

PLANNING COMMISSION MEETING DATE:
JUNE 27, 2011

PLANNING COMMISSION SECRETARY

APPROVED
- ☐ As Recommended
- ☐ As Amended
- ☐ Set Public Hearing For _____

DENIED
- ☐ Applicant's Request
- ☐ Staff Recommendation

CONTINUED TO _____

TITLE:
PUBLIC HEARING - FILED BY ROYAL STREET COMMUNICATIONS FOR CONDITIONAL USE PERMIT NO. 2011-14 TO ALLOW A 60-FOOT HIGH MONOPINE WIRELESS FACILITY FOR METRO PCS AT 601 SOUTH SANTA FE STREET

Prepared by Vince Fregoso

Executive Director

Karen Halvya
Planning Manager

RECOMMENDED ACTION

Adopt a resolution approving Conditional Use Permit No. 2011-14 as conditioned.

DISCUSSION

Request of Applicant

Royal Street Communications California LLC, representing Metro PCS, is requesting approval of a conditional use permit to allow the construction of a 60-foot high wireless facility stealthed as a monopine at 601 South Santa Fe Street.

Project Location and Site Description

The project is proposed to be constructed on a 16,200 square foot parcel of land located on South Santa Fe Street, just south of Chestnut Avenue. The site currently contains an 8,500 square foot industrial building that is currently vacant, as well as an existing 58-foot tall monopalm. Land uses surrounding the site include industrial and warehouse uses to the north, south, east and west (Exhibits 1 and 2).

Project Description

Metro PCS is proposing to construct a 60-foot high wireless facility stealthed as a monopine. This facility is intended to provide increased cellular coverage and call capacity in this area of the City. To give the monopine the appearance of a natural tree, the facility has been designed to have branches that will extend five feet above the antennas to a maximum height of 65 feet. Equipment for the wireless facility will be installed within an 11-foot by 21-foot yard area at the rear (northeast) section of the site. Further, two 36-inch box Canary Island Pine trees will be installed west of the facility to assist with the stealthing of the monopine (Exhibits 3, 4 and 5).

The proposed wireless facility will contain three arrays with two panel antennas on each side, for a total of six panel antennas. A GPS and parabolic antenna will also be located on the monopine, which will be camouflaged as a Canary Island Pine Tree. Additionally, a new trash enclosure, built to City standards, will be installed.

Project Background

The building on the property is currently vacant, but was previously occupied by Blue Bird Towing, who used the site as a storage lot for vehicles until December 2009. In 2004, Conditional Use Permit No. 2004-34 was approved that allowed Sprint to install a 58-foot high cellular facility stealthed as a monopalm. The property owner will be leasing approximately 320 square feet of area on the site to Metro PCS for the installation of the cell tower and related equipment.

General Plan and Zoning Consistency

The General Plan land use designation for the site is Industrial (IND), which allows for manufacturing and industrial uses. Uses such as wireless facilities are consistent with this General Plan land use designation.

The zoning for the site is Heavy Industrial (M-2). The Heavy Industrial zoning district is a zone that also allows for manufacturing, industrial and warehouse uses. The proposed use is also consistent with the zoning designation.

Project Analysis

In July 1998, the City Council adopted Ordinance No. NS-2356, which established regulations for wireless communication facilities throughout the City. Major wireless facilities, which are ground mounted facilities such as the one proposed, or roof mounted and higher than 10 feet above the roof of a building, are required to have a stealth design and be located in an area that provides the greatest amount of visual screening. Further, these major facilities require the approval of a conditional use permit. Also, Section 41-198.4 of the Santa Ana Municipal Code (SAMC) identifies several site improvements that may be required at sites with major wireless facilities. These improvements include:

1. Landscaping around the base of the facility, including vines, groundcover and a 24-inch box tree;
2. Decorative fencing (wrought iron or block) around the facility;
3. A six-foot high solid wall between the facility and property zoned or used for residential;
4. One parking space, if on-site parking is not available;
5. Repairing, repaving and restriping of a parking lot which is in poor condition;
6. The repainting of buildings on a site; and
7. The construction of a new trash enclosure.

Conditional Use Permits are governed by Section 41-638 of the SAMC. Conditional use permits may be granted when it can be shown that the following can be established:

- That the proposed use will provide a service or facility which will contribute to the general well being of the neighborhood or community.
- That the proposed use will not, under the circumstances of the particular case, be detrimental to the health, safety, or general welfare of persons residing or working in the vicinity.
- That the proposed use will not adversely affect the present economic stability or future economic development of properties surrounding the area.
- That the proposed use will comply with the regulations and conditions specified in Chapter 41 for such use.
- That the proposed use will not adversely affect the General Plan of the city or any specific plan applicable to the area of the proposed use.

If these findings can be made, then it is appropriate to grant the conditional use permit. Conversely, the inability to make these findings would result in a denial. Using this information staff has prepared the following analysis, which, in turn forms the basis for the recommendation contained in this report. In analyzing the conditional use permit request, staff believes that the following findings of fact warrant approval of the conditional use permit.

Section 41-198.5(b) of the SAMC establishes site selection order of preference criteria for wireless facilities. These provisions require the exploration of various options before proposing a new monopole. The applicant has explored alternatives to this monopine, including providing a roof mounted facility on an existing building in the area and co-locating on another facility. The heights of the buildings (predominantly one story) in the immediate area do not provide the necessary height to provide adequate service. Also, although there is another wireless facility on the subject site, the monopalm is an inferior design for the collocation of another wireless carrier. In fact, the majority of the cellular facilities that have been approved by the City in the past few years have been designed as a monopine, which can easily stealth multiple wireless facilities.

Site improvements are proposed for the site that will bring the site into compliance with the wireless communications facility ordinance. First, two 36-inch box Canary Island Pine tree will be planted near the facility to assist in the stealthing of the monopine. Second, decorative wrought iron fencing will be used to secure the wireless facility and ancillary equipment. Third, additional bougainvillea will be planted within the existing planter at the rear of the site, which is adjacent to the proposed wireless facility. Fourth, conditions of approval that require graffiti removal, landscape maintenance and fence repairs have been incorporated into the project. Finally, a new trash enclosure will be installed that complies with the City standards. The remaining items were found to be in compliance with the requirements of the wireless facilities ordinance.

- The project will provide a service or facility which will contribute to the community. The proposed monopine will provide a service to Santa Ana residents, businesses and motorists who subscribe to Verizon's services by reducing the gaps in cellular service and providing additional calling capacity for its users in the central sector of Santa Ana.
- The proposed wireless facility at this location will not be detrimental to persons residing or working in the area as the proposed facility will be in compliance with Federal law that govern health related issues for wireless facilities, including safety regulations from the Federal Communications Commission (FCC) and Federal Aviation Administration (FAA).
- The proposed monopine, in conjunction with the new live pine trees and site improvements, will be compatible with the surrounding area and will not adversely affect the economic viability in the area. The stealth appearance and site enhancements will maintain and increase the economic stability for this commercial corridor.
- The use will comply with all provisions pertaining to the construction and installation of wireless facilities identified in Chapter 41 (Zoning Code) of the Santa Ana Municipal Code.
- The proposed monopine will not adversely affect the General Plan as cellular facilities that are designed to be compatible with the surrounding environment are consistent with the goals and objectives of the Industrial (IND) General Plan land use designation. Further, Policy 2.2 encourages land uses that accommodate the City's needs for services.

A facility designed as a monopine would provide the best stealth possible for this location. The facility is located within an industrial district and will be installed on the northeast side of the building, away from other industrial buildings and Santa Fe Street. Within the corridor, there is a mixture of trees, including palm and broad leaf trees. The pine tree design will easily blend into the area and will be designed to allow for future co-location by another provider. Of the various tree designs, the pine tree has been found to be the solution that best stealth's the equipment needed by additional wireless providers. All associated wiring and conduit for the facility will be underground or hidden within the interior of the monopine.

This location is also optimum to provide the coverage necessary for existing and expanding service. The proposed cellular antennas will provide a benefit to Santa Ana residents, businesses and motorists who subscribe to Verizon by closing service gaps in the area. Equipment for the facility will be located in an existing enclosure at the rear of the building and will be screened by wrought iron fencing. The proposed wireless facility complies with the City's Wireless Communications Facility Ordinance and will provide needed service to this area of the City. Further, the project is consistent with the goals and objectives of the General Plan, including Policy 2.2 of the Land Use Element, which encourages land uses that accommodate the City's needs for services.

Public Notification

The project site is not located within the boundaries of a neighborhood association but is adjacent to the Cornerstone Village and Lyon Street Neighborhood Associations. The presidents of these Associations were notified by mail 10 days prior to this public hearing. In addition, staff contacted the presidents to ensure that they were notified of the project and to see if there were any areas of concern. No areas of concern were identified by the Neighborhood Associations, nor was there a request that the applicant present the project to a meeting of their members.

The project site was posted with a notice advertising this public hearing, a notice was published in the Orange County Reporter and notices were sent to all property owners within 500 feet of the project site. At the time of this printing, no correspondence, either written or electronic, had been received from any members of the public.

CEQA Compliance

This project was reviewed in accordance with the Guidelines for the California Environmental Quality Act. The recommendation is exempt from further review pursuant to Section 15303. This Class 3 exemption allows in-fill developments for the construction and location of limited numbers of new, small facilities or structures. Categorical Exemption Environmental Review No. 2010-123 will be filed for this project.

Conclusion

Based on the analysis provided within this report, staff recommends that the Planning Commission approve Conditional Use Permit No. 2011-14 as conditioned.

Vince Fregoso, AICP
Principal Planner

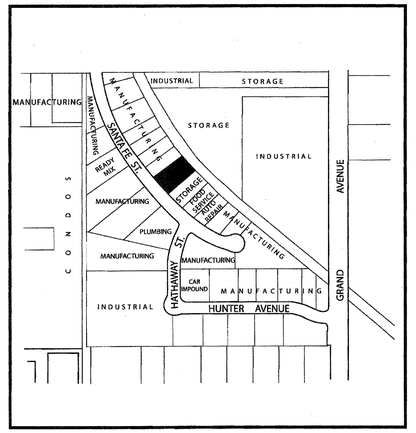
VF:jm
vfreports\CUP\CUP11-14 Metro PCS.pc

Attachments:
Exhibit 1 – Vicinity Map
Exhibit 2 – Land Use Map
Exhibit 3 – Site Plan
Exhibit 4 – Elevations
Exhibit 5 – Photo Simulation

CUP 2011-14
METRO PCS MONOPINE
601 SOUTH SANTA FE STREET

P L A N N I N G A N D B U I L D I N G A G E N C Y

VICINITY MAP
EXHIBIT 1



CUP 2011-14
METRO PCS MONOPINE
601 SOUTH SANTA FE STREET

P L A N N I N G A N D B U I L D I N G A G E N C Y

LAND USE MAP
EXHIBIT 2

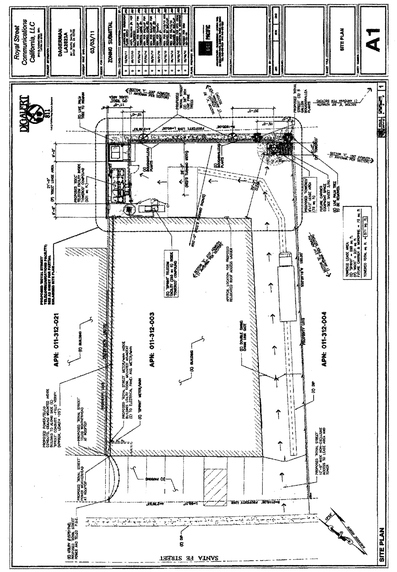


EXHIBIT 3

Royal Street Communications California, LLC
2913 EL CAMINO REAL, #561
TUSTIN, CA 92782

PROJECT INFORMATION:

DAGERMAN
LA2823A
601 SOUTH SANTA FE
SANTA ANA, CA 92705

CURRENT ISSUE DATE:
09/06/11

ISSUED FOR:
BP SUBMITTAL

REV.:	DATE:	DESCRIPTION:	BY:
0	09/06/11	100% CD PER TOWERCO REDLINES #2	JGD
0	08/30/11	100% CD PER TOWERCO REDLINES	JGD
0	08/11/11	100% CD PER DRM REDLINES REV#2	JGD
0	08/01/11	100% CD PER DRM REDLINES	JGD
0	07/28/11	PRELIM 90% CD	JGD

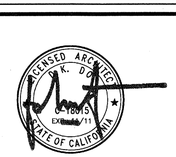
PLANS PREPARED BY:

DCI PACIFIC
ARCHITECTURE - ENGINEERING - CONSULTING
32 EXECUTIVE PARK, SUITE 110, IRVINE, CA 92614
TEL: 949-475-1000 FAX: 949-475-1001

CONSULTANT:

DRAWN BY: JGD | CHK.: BOK | APV.: DKD

LICENSURE:



SHEET TITLE:
CONDITIONAL USE PERMIT (1 of 2)

SHEET NUMBER:
T4

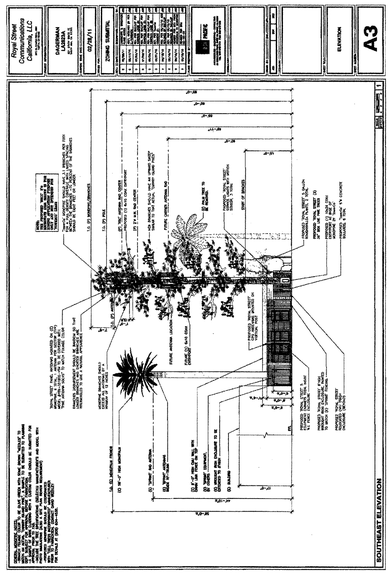


EXHIBIT 4

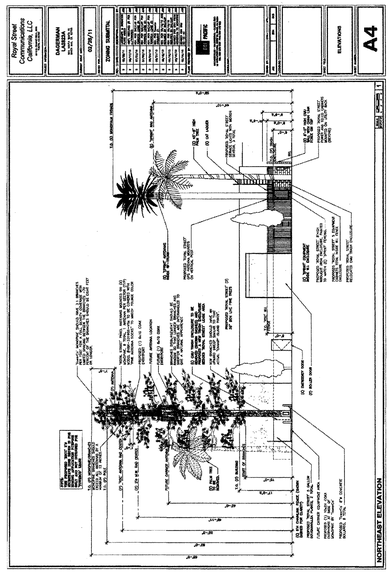


EXHIBIT 5

ROH - 06/27/11

RESOLUTION NO. 2011-xx

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF SANTA ANA APPROVING CONDITIONAL USE PERMIT NO. 2011-14 TO ALLOW A 60-FOOT HIGH WIRELESS FACILITY ON THE PROPERTY LOCATED AT 601 SOUTH SANTA FE STREET

BE IT RESOLVED BY THE PLANNING COMMISSION OF THE CITY OF SANTA ANA AS FOLLOWS:

Section 1. The Planning Commission of the City of Santa Ana hereby finds, determines and declares as follows:

A. Conditional Use Permit No. 2011-14 came before the Planning Commission of the City of Santa Ana for a duly noticed public hearing on June 27, 2011.

B. Conditional Use Permit No. 2011-14 has been filed with the City of Santa Ana seeking to allow a 60-foot high wireless facility stealthed as a monopine on the property located at 601 South Santa Fe Street.

C. Pursuant to Santa Ana Municipal Code Section 41-198.10, a Conditional Use Permit is required for major wireless communication facilities established in the City of Santa Ana.

D. Santa Ana Municipal Code Section 41-638 authorizes the Planning Commission to grant a conditional use permit upon making certain findings.

1. Will the proposed use provide a service or facility which will contribute to the general well being of the neighborhood or the community?

   The proposed 60-foot tall cellular monopine will provide a service to Santa Ana residents, businesses and motorists who subscribe to Verizon's services by reducing the gaps in digital cellular service and providing additional calling capacity for its users, especially for those users traveling within the central sector of Santa Ana.

2. Will the proposed use under the circumstances of the particular case be detrimental to the health, safety, or general welfare of persons residing or working in the vicinity?

Federal law exempts local jurisdictions from regulating health related issues as these issues are covered under Federal laws. However, the proposed facility will be in compliance with both the Federal Communications Commission (FCC) and Federal Aviation Administration (FAA) safety regulations.

3. Will the proposed use adversely affect the present economic stability or future economic development of properties surrounding the area?

   The proposed monopine, in conjunction with the new live pine trees and required site improvements, will be compatible with the surrounding area and will not adversely affect the economic viability in the area. The stealth appearance and site upgrades will be the major solution to maintaining and increasing the economic stability for this industrial corridor.

4. Will the proposed use comply with the regulations and conditions specified in Chapter 41 for such use?

   The cellular facility has been designed to comply with the regulations and conditions identified in Chapter 41 of the Santa Ana Municipal Code for a major wireless facility.

5. Will the proposed use adversely affect the General Plan or any specific plan of the City?

   The proposed monopine facility will not adversely affect the General Plan as cellular facilities that are designed to be compatible with the surrounding environment are consistent with the goals and objectives of the Industrial (IND) General Plan land use designation. Policy 2.2 of the Land Use Element encourages land uses that accommodate the City's needs for services.

E. This project was reviewed in accordance with the Guidelines for the California Environmental Quality Act. The recommendation is exempt from further review pursuant to Section 15303. This Class 3 exemption allows in-fill developments for the construction and location of limited numbers of new, small facilities or structures. Categorical Exemption Environmental Review No. 2010-123 will be filed for this project.

Section 2. The Planning Commission, after conducting the public hearing, hereby approves Conditional Use Permit No. 2011-14 as conditioned in Exhibit "A" attached hereto and incorporated herein. This decision is based upon the evidence submitted at the above said hearing, which includes but is not limited to: the Request for Planning Commission Action dated June 27, 2011, and exhibits attached thereto; and the public testimony, all of which are incorporated herein by this reference.

ADOPTED this 27th day of June, 2011 by the following vote:

AYES:	Commissioners:
NOES:	Commissioners:
ABSENT:	Commissioners:
ABSTENTIONS:	Commissioners:

_____
Eric Alderete
Chairperson

APPROVED AS TO FORM:
Joseph A. Straka, City Attorney

By:_____
Ryan O. Hodge
Assistant City Attorney

CERTIFICATE OF ATTESTATION AND ORIGINALITY

I, Martha Ramirez, Planning Commission Secretary, do hereby attest to and certify the attached Resolution No. 2011-xx to be the original resolution adopted by the Planning Commission of the City of Santa Ana on June 27, 2011.

Date: _____

_____
Planning Commission Secretary
City of Santa Ana

Conditions for Approval for Conditional Use Permit No. 2011-14

Conditional Use Permit No. 2011-14 is approved subject to compliance, to the reasonable satisfaction of the Planning Manager, with all applicable sections of the Santa Ana Municipal Code, the California Administrative Code, the California Building Standards Code and all other applicable regulations.

The applicant must comply in full with each and every condition listed below prior to exercising the rights conferred by this conditional use permit.

The applicant must remain in compliance with all conditions listed below throughout the life of the conditional use permit. Failure to comply with each and every condition may result in the revocation of the conditional use permit.

A. Planning Division

1. The applicant must comply with all conditions and requirements of the Development Review Committee for the development project (DP 2010-41).
2. Any amendment to this conditional use permit must be submitted to the Planning Division for review. At that time, staff will determine if administrative relief is available or the conditional use permit must be amended.
3. The proposed monopine shall be constructed as per approved plans and any existing landscaping shall be protected in place during the construction period for the 60-foot monopine facility.
4. Prior to issuance of an electrical meter, the following improvements shall be completed:
   a. Construction of a new trash enclosure for the building.
   b. Removal of all graffiti on the premises.
   c. Maintenance of all on-site landscaping, including the removal of weeds.
   d. Repairing of the wrought iron fence located at the front of the property.
5. The proposed monopine shall be constructed per the following specifications:
   a. The monopine should have 3.1 branches per foot for full density coverage with limited spacing between the branches; 70 percent of the branches should be eight feet or longer.

Exhibit A
Page 1 of 3

   b. Branch disbursement should be random so that longer branches and shorter branches are intermingled to give a natural appearance.
   c. Branches should exceed all antennas by a minimum of 12 inches.
   d. Branches should start at 15 feet above the ground.
   e. There should be a minimum space of seven feet between the top of the antenna and the top of the branches.
   f. Branches should have an upward sweep similar to that of actual Canary Island Pines.
   g. Branch foliage color should be an olive green with some brown "needles" to match an actual Canary Island Pine. A sample should be submitted for approval prior to fabrication.
   h. Full bark cladding with a custom color should be submitted for approval prior to fabrication.
   i. All antennas shall be covered with "pine antenna socks" that match the approved foliage color.
   j. All "stand-off mounts" and support pipe mounts shall be concealed behind antennas and painted a darker shade or green (or black) with a "flat" paint finish to reduce reflection and visibility of the mounting.
   k. Include the tree specifications (selected manufacturers and models) with photo simulations (also a site plan review requirement).
   l. Show the location of the GPS antenna on all elevations.
   m. Provide a "unistrut" detail for the utility cabinet; an "H-frame" is not acceptable.
   n. Provide a note on the plans stating "install underground utilities sleeving for two carriers during construction of the structure". Shrouds on the outside of the pole are not acceptable.
   o. All exterior conduit and electrical meters shall be installed and screened in one metal enclosure painted to match the structure.
6. At all times, the permit applicant shall not prevent the City of Santa Ana from having adequate spectrum capacity on the City's 800 MHz radio frequency.

7. The permit applicant shall provide a 24-hour phone number to which interference problems may be reported. This condition will also apply to all existing facilities in the City of Santa Ana.
8. The permit applicant will provide a "single point of contact" in its Engineering and Maintenance Departments to insure continuity on all interference issues. The name, telephone number, fax number and e-mail address of that person shall be provided to the City's designated representative upon activation of the facility.
9. The permit applicant shall insure that lessee or other user(s) shall comply with the terms and conditions of this permit, and shall be responsible for the failure of any lessee or other users under the control of permit applicant to comply.
10. The permit applicant shall provide a coverage and cell site location map for each existing and proposed facility in Santa Ana.
11. Locate all equipment and related appurtenances (appleton plug and electric meter) on the inside of the existing equipment enclosure or inside the building and underground all electrical power from the utility source shown on the approved site plan.
12. Conditional Use Permit No. 2011-14 expires 10 years from the date of City Council approval.

Royal Street Communications California, LLC
2913 EL CAMINO REAL, #561
TUSTIN, CA 92782

PROJECT INFORMATION:

DAGERMAN
LA2823A
601 SOUTH SANTA FE
SANTA ANA, CA 92705

CURRENT ISSUE DATE:

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ISSUED FOR:

BP SUBMITTAL

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CONSULTANT:

DRAWN BY: JGD | CHK.: BOK | APV.: DKD

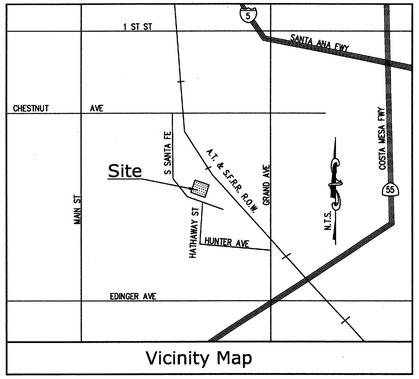
LICENSURE:

SHEET TITLE:

CONDITIONAL USE PERMIT (2 of 2)

SHEET NUMBER:

T5



Title Report

PREPARED BY: STEWART TITLE OF CALIFORNIA
ORDER NO. 98702004
REPORT DATED: FEBRUARY 08, 2007

Legal Description

THE LAND REFERRED TO HEREIN IS SITUATED IN THE STATE OF CALIFORNIA, COUNTY OF ORANGE, DESCRIBED AS FOLLOWS:

LOT 8 OF TRACT NO. 5739, IN THE CITY OF SANTA ANA, COUNTY OF ORANGE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 207, PAGES 39 AND 40 OF MISCELLANEOUS MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

Assessor's Parcel No.

011-312-003

Date of Survey

FEBRUARY 15, 2007

Easements

(2) AN EASEMENT FOR PUBLIC UTILITIES PURPOSES, RECORDED IN BOOK 7390 PAGE 854, OFFICIAL RECORDS. (DOCUMENT NOT LEGIBLE)

(3) AN EASEMENT FOR PUBLIC UTILITIES PURPOSES, RECORDED IN BOOK 7397 PAGE 833, OFFICIAL RECORDS. (PLOTTED HEREON)

Access Route

BEING A STRIP OF LAND 12 FEET IN WIDTH WITHIN A PORTION OF LOT 8 TRACT NO. 5739, IN THE CITY OF SANTA ANA, COUNTY OF ORANGE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 207, PAGES 39 THROUGH 40 OF MISCELLANEOUS MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, LYING 6 FEET ON EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE:

COMMENCING AT THE CENTERLINE INTERSECTION OF HATHAWAY STREET AND SANTA FE STREET, AS SHOWN ON SAID MAP, SAID POINT BEING THE BEGINNING OF A CURVE CONCAVE NORTHEAST HAVING A RADIUS OF 2145.08 FEET, A RADIAL LINE THROUGH SAID POINT BEARS S45°40'15"W; THENCE ALONG SAID CURVE ALSO BEING THE CENTERLINE OF SANTA FE STREET, AN ARC DISTANCE OF 192.03 FEET, THROUGH A CENTRAL ANGLE OF 05°07'45"; THENCE LEAVING SAID CENTERLINE N50°48'00"E, 30.00 FEET TO THE NORTHERLY RIGHT-OF-WAY OF SAID SANTA FE STREET AND THE POINT OF BEGINNING; THENCE N50°26'16"E, 157.44 FEET TO A POINT HEREINAFTER REFERRED TO AS POINT "A"; THENCE N36°41'12"W, 66.64 FEET TO A POINT HEREINAFTER REFERRED TO AS POINT "B" AND THE END OF SAID STRIP.

THE SIDELINES OF SAID STRIP SHOULD BE PROLONGED OR SHORTENED SOUTHWESTERLY TO THE SOUTHWESTERLY LINE OF SAID PROPERTY AND NORTHWESTERLY TO THE SOUTHEASTERLY LINE OF THE HEREINAFTER DESCRIBED LEASE AREA.

Lease Area

BEING TWO PORTIONS OF LAND WITHIN A PORTION OF LOT 8 TRACT NO. 5739, IN THE CITY OF SANTA ANA, COUNTY OF ORANGE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 207, PAGES 39 THROUGH 40 OF MISCELLANEOUS MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

LEASE AREA (A)
BEGINNING AT POINT "B" AS DESCRIBED; THENCE S53°06'09"W, 15.00 FEET; THENCE N36°41'12"W, 11.00 FEET; THENCE N53°06'09"E, 21.00 FEET; THENCE S36°41'12"E, 11.00 FEET THENCE S53°06'09"W, 6.00 FEET TO THE POINT OF BEGINNING.

CONTAINING 231 SQUARE FEET OF LAND.

LEASE AREA (B)
COMMENCING AT AT POINT "A" AS DESCRIBED; THENCE N52°42'04"E, 9.57 FEET TO THE TRUE POINT OF BEGINNING; THENCE N50°26'16"E, 6.00 FEET; THENCE S39°33'44"E, 12.00 FEET; THENCE S50°26'16"W, 6.00 FEET THENCE N39°33'44"W, 12.00 FEET TO THE POINT OF BEGINNING.

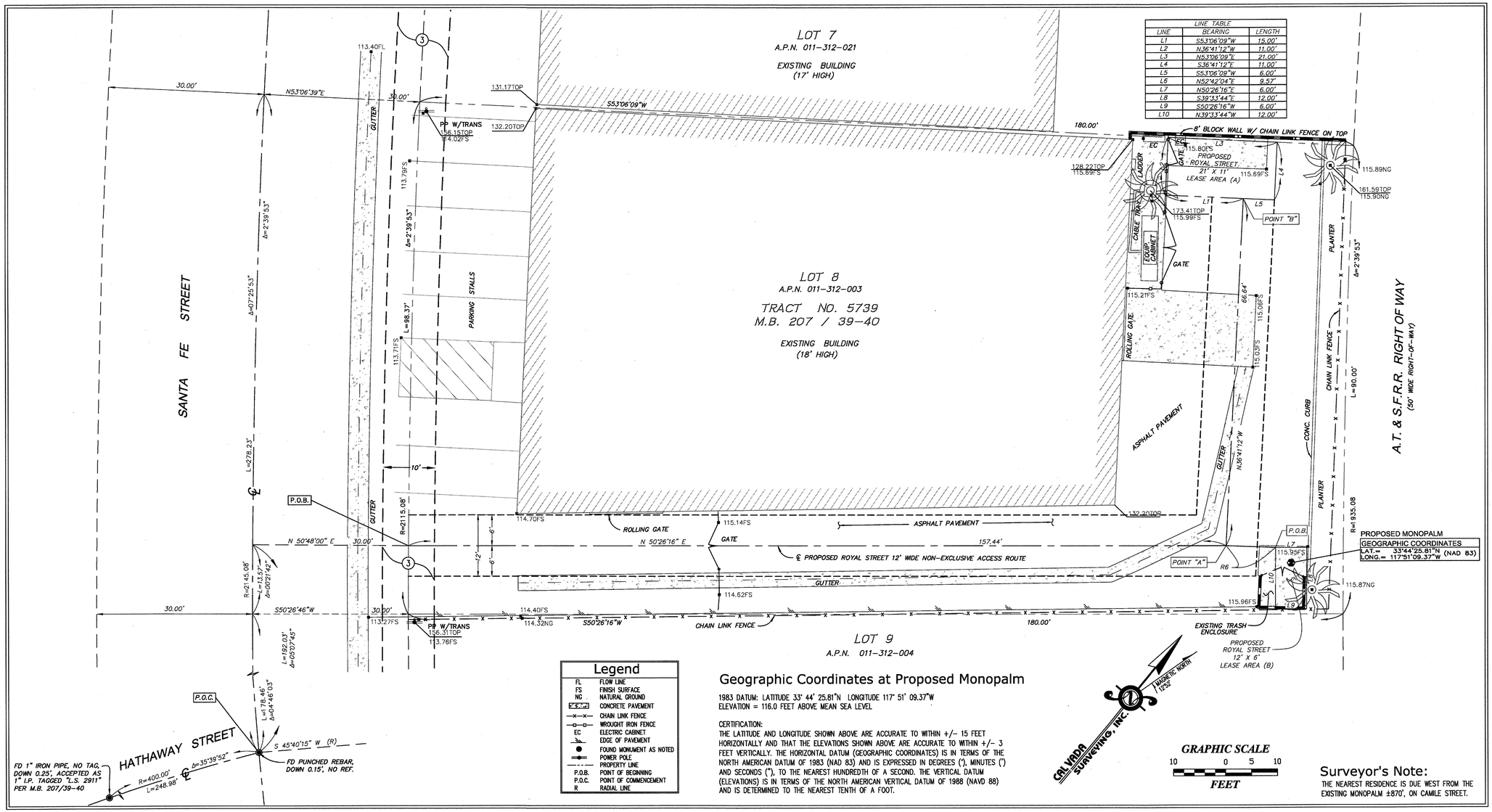
CONTAINING 72 SQUARE FEET OF LAND.

Basis of Bearings

THE BEARINGS SHOWN HEREON ARE BASED UPON THE STATE PLANE COORDINATE SYSTEM OF 1983 (NAD 83), CALIFORNIA ZONE 6.

Bench Mark

THE ELEVATIONS SHOWN HEREON ARE BASED UPON THE NGS GPS MONUMENT NO. AJ1920, ELEVATION = 80.74 FEET (NAVD 88).



Legend

FL	FLOW LINE
FS	FINISH SURFACE
NG	NATURAL GROUND
	CONCRETE PAVEMENT
-x-x-	CHAIN LINK FENCE
-o-o-	WROUGHT IRON FENCE
EC	ELECTRIC CABINET
	EDGE OF PAVEMENT
●	FOUND MONUMENT AS NOTED
	POWER POLE
----	PROPERTY LINE
P.O.B.	POINT OF BEGINNING
P.O.C.	POINT OF COMMENCEMENT
R	RADIAL LINE

Geographic Coordinates at Proposed Monopalm

1983 DATUM: LATITUDE 33° 44' 25.81"N LONGITUDE 117° 51' 09.37"W
ELEVATION = 116.0 FEET ABOVE MEAN SEA LEVEL

CERTIFICATION:
THE LATITUDE AND LONGITUDE SHOWN ABOVE ARE ACCURATE TO WITHIN +/- 15 FEET HORIZONTALLY AND THAT THE ELEVATIONS SHOWN ABOVE ARE ACCURATE TO WITHIN +/- 3 FEET VERTICALLY. THE HORIZONTAL DATUM (GEOGRAPHIC COORDINATES) IS IN TERMS OF THE NORTH AMERICAN DATUM OF 1983 (NAD 83) AND IS EXPRESSED IN DEGREES (°), MINUTES (') AND SECONDS ("), TO THE NEAREST HUNDREDTH OF A SECOND. THE VERTICAL DATUM (ELEVATIONS) IS IN TERMS OF THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) AND IS DETERMINED TO THE NEAREST TENTH OF A FOOT.

GRAPHIC SCALE
10 0 5 10
FEET

Surveyor's Note:

THE NEAREST RESIDENCE IS DUE WEST FROM THE EXISTING MONOPALM ±870', ON CAMILE STREET.

Royal Street Communications, California LLC
2913 EL CAMINO REAL #561
TUSTIN, CA. 92782

A&E DEVELOPMENT:

DCI PACIFIC
ARCHITECTURE · ENGINEERING · PLANNING
2450 DUPONT DRIVE - IRVINE - CA 92612
PHONE: 949-475-1000 FAX: 949-475-1001

CONSULTANT:

CALVADA SURVEYING, INC.
411 Jenks Cir., Suite 205, Corona, CA 92880
Phone: 951-280-9960 Fax: 951-280-9746
Toll Free: 800-CALVADA www.calvada.com
JOB NO. 07107

LICENSURE:

REVISION:

REVISION:	DATE: / BY:	DESCRIPTION:
	02 / 21 / 07 HN/MN	PRELIMINARY
1	02 / 28 / 07 VO	TITLE REPORT
2	03/13/07 EE	ACCESS EASEMENT AND LEASE AREA
3	01/29/10 HP	SITE WALK UPDATE
4	03/11/10 SM	LEASE AREA UPDATE/FINAL

SITE INFORMATION:

LA2823A
DAGERMAN
601 SOUTH SANTA FE STREET
SANTA ANA, CALIFORNIA 92705
ORANGE COUNTY

SHEET TITLE:

TOPOGRAPHIC SURVEY

SHEET NUMBER:

LS-1
SHEET 1 OF 1

DIGALERT 811
Call 2 Full Working Days in Advance

NEW POWER/TELCO CONDUITS, CEILING MOUNTED INSIDE BUILDING TO ALONG SIDE (E) 'TOWERCO' CONDUITS –FIELD VERIFY. (APPROX. LENGTH 125')

NEW 'ROYAL STREET' TELECOMMUNICATIONS FACILITY; SEE A2 SHEET FOR PARTIAL ENLARGED SITE PLAN

APN: 011-312-021

(E) UTILITY #1575174E; NEW 'ROYAL STREET' POWER AND TELCO P.O.C.

NEW 'ROYAL STREET' POWER WEATHERHEAD AT ROOFTOP

NEW 'ROYAL STREET' TELCO WEATHERHEAD AT ROOFTOP

(E) BUILDING

PROPERTY LINE S53°06'09"W 180.00'

NEW 'ROYAL STREET' METER/MAIN 200A, 120/240V, 1P, 3W, 4–CLIP INSIDE BUILDING UTILITY ROOM, MOUNTED ADJACENT (E) TO ELECTRICAL PANEL AND METER/MAIN

(E) 'TOWERCO' METER/MAIN

25'

(E) PARKING

Δ=2°39'53"

L=98.37'

SANTA FE STREET

(E) DIP

21'–0"
6'–8" (P) 'RSCC' LEASE AREA 9'–0"

NEW 'RSCC' TELECOM FACILITY INSIDE 'TOWERCO' COMPOUND (231 sq ft.)

(E) LIVE PALM TREE TO REMAIN

6"
11'–0" (P) 'RSCC' LEASE AREA
10'–0"

SECTOR 'F', 330° AZIMUTH (1 ANTENNA PER SECTOR)

(E) BOUGAINVILLEAS PLANTS

Δ=2°39'53"

(E) 'TOWERCO' COMPOUND (268 sq ft)

APN: 011-312-003

26'–0" (REQ'D TURNING WIDTH)

NEW 'ROYAL STREET' (2) 36" BOX LIVE PINE TREES

R50'–0" (REQ'D TURNING RADIUS)

(E) BUILDING

SECTOR 'E', 270° AZIMUTH (1 ANTENNA PER SECTOR)

(E) PROPERTY LINE L=90.00'

SECTOR 'A', 30° AZIMUTH (1 ANTENNA PER SECTOR)

(E) BOUGAINVILLEAS PLANTS

APPROX. LOCATION FOR NEW RELOCATED ROOF ACCESS LADDER

R=1935.08'

NEW 'ROYAL STREET' ADDRESS PLATE AT GATE AND TO REPAIR AND PAINT (E) FRONT WROUGHT IRON GATE

(E) DOUBLE SWING CHAIN LINK GATE

PROPERTY LINE

R=2115.08'

32'–7" CLEAR

20'–0"
15'–0"
2'–0"

NEW 'ROYAL STREET' (2) 5 GALLON BOUGAINVILLEA PLANTS

PROPERTY LINE S50°26'16"W 180.00'

NEW 'TOWERCO' 6'x12' LEASE AREA (72 sq ft)

6'–0" (P) 'TOWERCO'

(E) DIP

NEW 'ROYAL STREET' 12'–0" WIDE NON–EXCLUSIVE ACCESS TO LEASE AREA AND TOWER

APN: 011-312-004

SECTOR 'D', 210° AZIMUTH (1 ANTENNA PER SECTOR)

FUTURE CARRIER EQUIPMENT SPACE --SEE SHEET 3/A2.

(E) LIVE PALM TREE TO BE REMOVED.

SECTOR 'C', 150° AZIMUTH (1 ANTENNA PER SECTOR)

SECTOR 'B', 90° AZIMUTH (1 ANTENNA PER SECTOR)

NOTE:
USE GRAFFITI PROOF PAINT ON ALL PAINTED WALLS

TOWERCO LEASE AREA:
(E) 'TOWERCO' = 268 sq ft.
(P) 'RSCC' = 231 sq ft.
FUTURE CARRIER & MONOPINE = 72 sq ft

TOWERCO TOTAL sq ft. = 571 sq. ft.

12352'

MAGNETIC NORTH

SITE PLAN

NORTH | SCALE: 1/8"=1'-0" | 0 4' 8' | 1

Royal Street Communications California, LLC

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CONSULTANT:

DRAWN BY:	CHK.:	APV.:
JGD	BOK	DKD

LICENSURE:

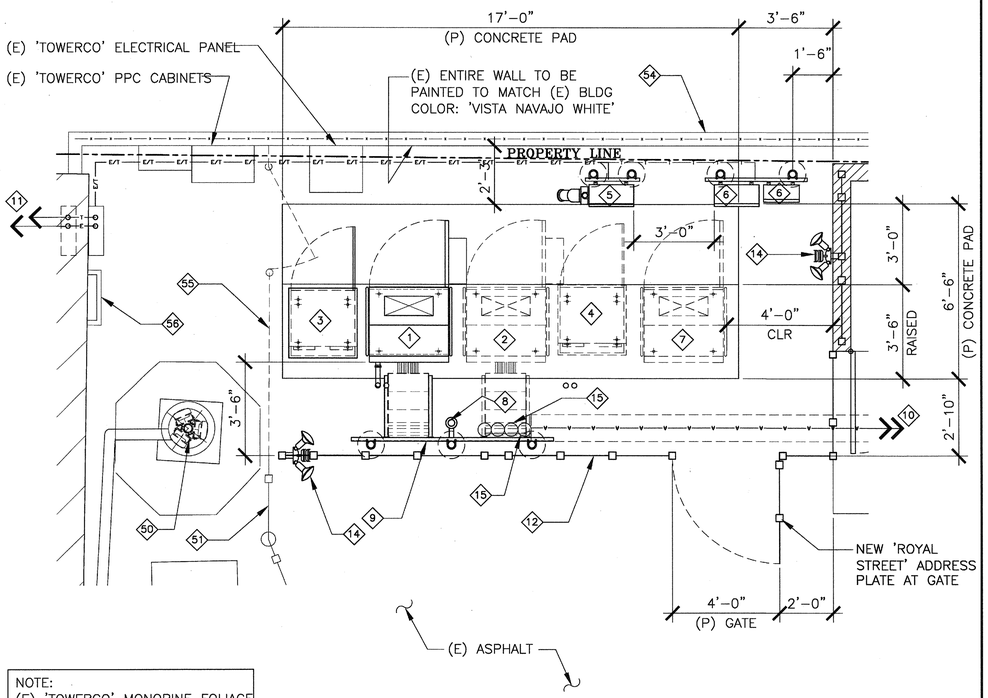
LICENSED ARCHITECT D. K. DOTY RENEWAL 08/31/2013 STATE OF CALIFORNIA

SHEET TITLE:

SITE PLAN

SHEET NUMBER:

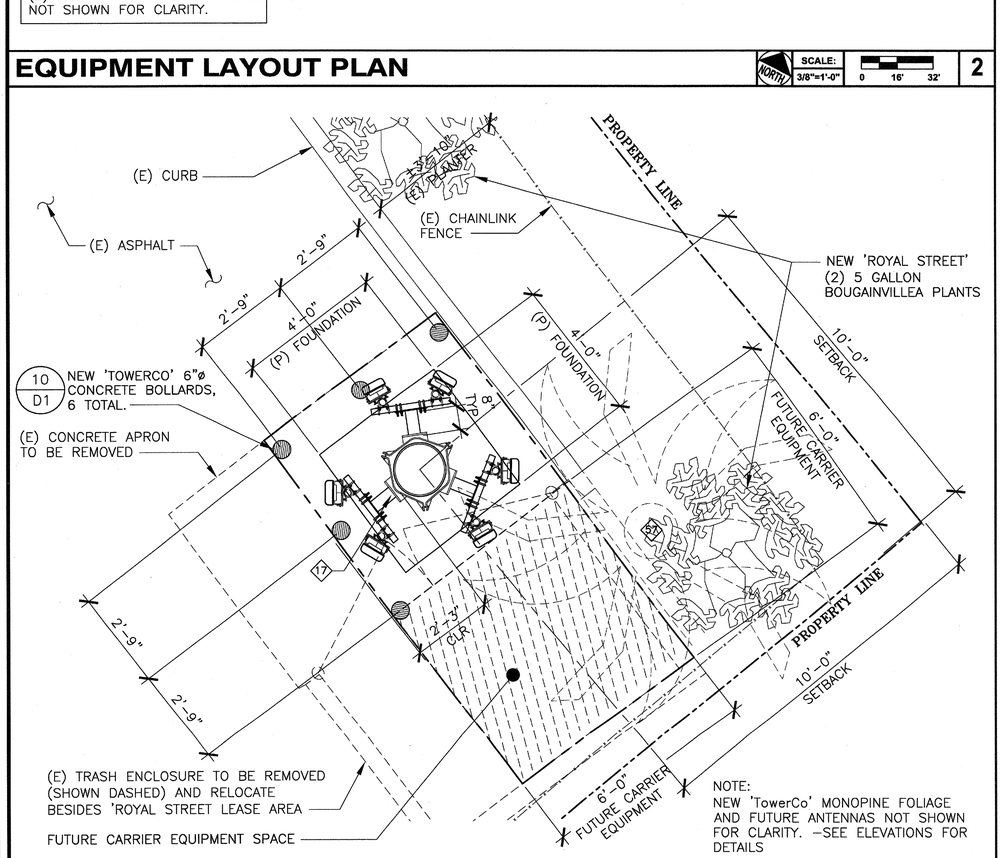
A1



NOTE:
(E) 'TOWERCO' MONOPINE FOLIAGE NOT SHOWN FOR CLARITY.

EQUIPMENT LAYOUT PLAN

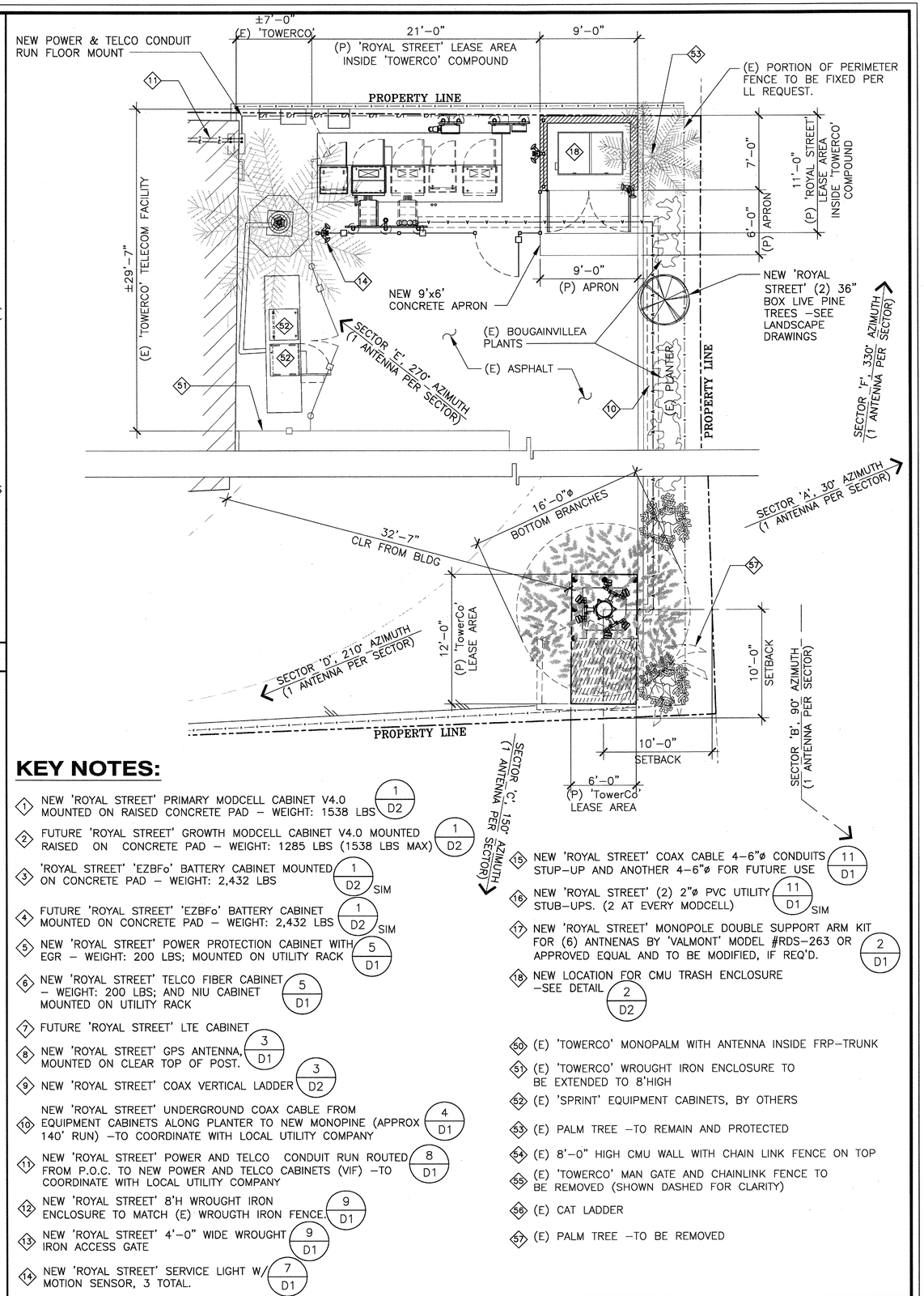
NORTH | SCALE: 3/8"=1'-0" | 0 16' 32' | 2



NOTE:
NEW 'TowerCo' MONOPINE FOLIAGE AND FUTURE ANTENNAS NOT SHOWN FOR CLARITY. -SEE ELEVATIONS FOR DETAILS

ANTENNA LAYOUT PLAN

NORTH | SCALE: 1"=1'-0" | 0 0.5' 1' | 3



KEY NOTES:

1. NEW 'ROYAL STREET' PRIMARY MODCELL CABINET V4.0 MOUNTED ON RAISED CONCRETE PAD – WEIGHT: 1538 LBS (1 / D2)
2. FUTURE 'ROYAL STREET' GROWTH MODCELL CABINET V4.0 MOUNTED RAISED ON CONCRETE PAD – WEIGHT: 1285 LBS (1538 LBS MAX) (1 / D2)
3. 'ROYAL STREET' 'EZBFo' BATTERY CABINET MOUNTED ON CONCRETE PAD – WEIGHT: 2,432 LBS (1 / D2 SIM)
4. FUTURE 'ROYAL STREET' 'EZBFo' BATTERY CABINET MOUNTED ON CONCRETE PAD – WEIGHT: 2,432 LBS (1 / D2 SIM)
5. NEW 'ROYAL STREET' POWER PROTECTION CABINET WITH EGR – WEIGHT: 200 LBS; MOUNTED ON UTILITY RACK (5 / D1)
6. NEW 'ROYAL STREET' TELCO FIBER CABINET – WEIGHT: 200 LBS; AND NIU CABINET MOUNTED ON UTILITY RACK (5 / D1)
7. FUTURE 'ROYAL STREET' LTE CABINET
8. NEW 'ROYAL STREET' GPS ANTENNA, MOUNTED ON CLEAR TOP OF POST. (3 / D1)
9. NEW 'ROYAL STREET' COAX VERTICAL LADDER (3 / D2)
10. NEW 'ROYAL STREET' UNDERGROUND COAX CABLE FROM EQUIPMENT CABINETS ALONG PLANTER TO NEW MONOPINE (APPROX 140' RUN) -TO COORDINATE WITH LOCAL UTILITY COMPANY (4 / D1)
11. NEW 'ROYAL STREET' POWER AND TELCO CONDUIT RUN ROUTED FROM P.O.C. TO NEW POWER AND TELCO CABINETS (VIF) -TO COORDINATE WITH LOCAL UTILITY COMPANY (8 / D1)
12. NEW 'ROYAL STREET' 8'H WROUGHT IRON ENCLOSURE TO MATCH (E) WROUGTH IRON FENCE. (9 / D1)
13. NEW 'ROYAL STREET' 4'-0" WIDE WROUGHT IRON ACCESS GATE (9 / D1)
14. NEW 'ROYAL STREET' SERVICE LIGHT W/ MOTION SENSOR, 3 TOTAL. (7 / D1)
15. NEW 'ROYAL STREET' COAX CABLE 4-6"ø CONDUITS STUP-UP AND ANOTHER 4-6"ø FOR FUTURE USE (11 / D1)
16. NEW 'ROYAL STREET' (2) 2"ø PVC UTILITY STUB-UPS. (2 AT EVERY MODCELL) (11 / D1 SIM)
17. NEW 'ROYAL STREET' MONOPOLE DOUBLE SUPPORT ARM KIT FOR (6) ANTNENAS BY 'VALMONT' MODEL #RDS-263 OR APPROVED EQUAL AND TO BE MODIFIED, IF REQ'D. (2 / D1)
18. NEW LOCATION FOR CMU TRASH ENCLOSURE -SEE DETAIL (2 / D2)

50. (E) 'TOWERCO' MONOPALM WITH ANTENNA INSIDE FRP-TRUNK
51. (E) 'TOWERCO' WROUGHT IRON ENCLOSURE TO BE EXTENDED TO 8'HIGH
52. (E) 'SPRINT' EQUIPMENT CABINETS, BY OTHERS
53. (E) PALM TREE -TO REMAIN AND PROTECTED
54. (E) 8'-0" HIGH CMU WALL WITH CHAIN LINK FENCE ON TOP
55. (E) 'TOWERCO' MAN GATE AND CHAINLINK FENCE TO BE REMOVED (SHOWN DASHED FOR CLARITY)
56. (E) CAT LADDER
57. (E) PALM TREE -TO BE REMOVED

PARTIAL ENLARGED SITE PLAN

NORTH | SCALE: 3/16"=1'-0" | 0 2' 4' 6' | 1

Royal Street Communications California, LLC
2913 EL CAMINO REAL, #561
TUSTIN, CA 92782

PROJECT INFORMATION:

DAGERMAN
LA2823A
601 SOUTH SANTA FE
SANTA ANA, CA 92705

CURRENT ISSUE DATE:

09/06/11

ISSUED FOR:

BP SUBMITTAL

REV.:	DATE:	DESCRIPTION:	BY:
0	09/06/11	100% CD PER TOWERCO REDLINES #2	JGD
0	08/30/11	100% CD PER TOWERCO REDLINES	JGD
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0	08/01/11	100% CD PER DRM REDLINES	JGD
0	07/28/11	PRELIM 90% CD	JGD

PLANS PREPARED BY:

DCI PACIFIC
ARCHITECTURE - ENGINEERING - CONSULTING
32 EXECUTIVE PARK, SUITE 110, IRVINE, CA 92614
TEL: 949-475-1000 FAX: 949-475-1001

CONSULTANT:

DRAWN BY: JGD | CHK.: BOK | APV.: DKD

LICENSURE:

LICENSED ARCHITECT D. K. DO C-18015 EXP. 11-30-11 STATE OF CALIFORNIA

SHEET TITLE:

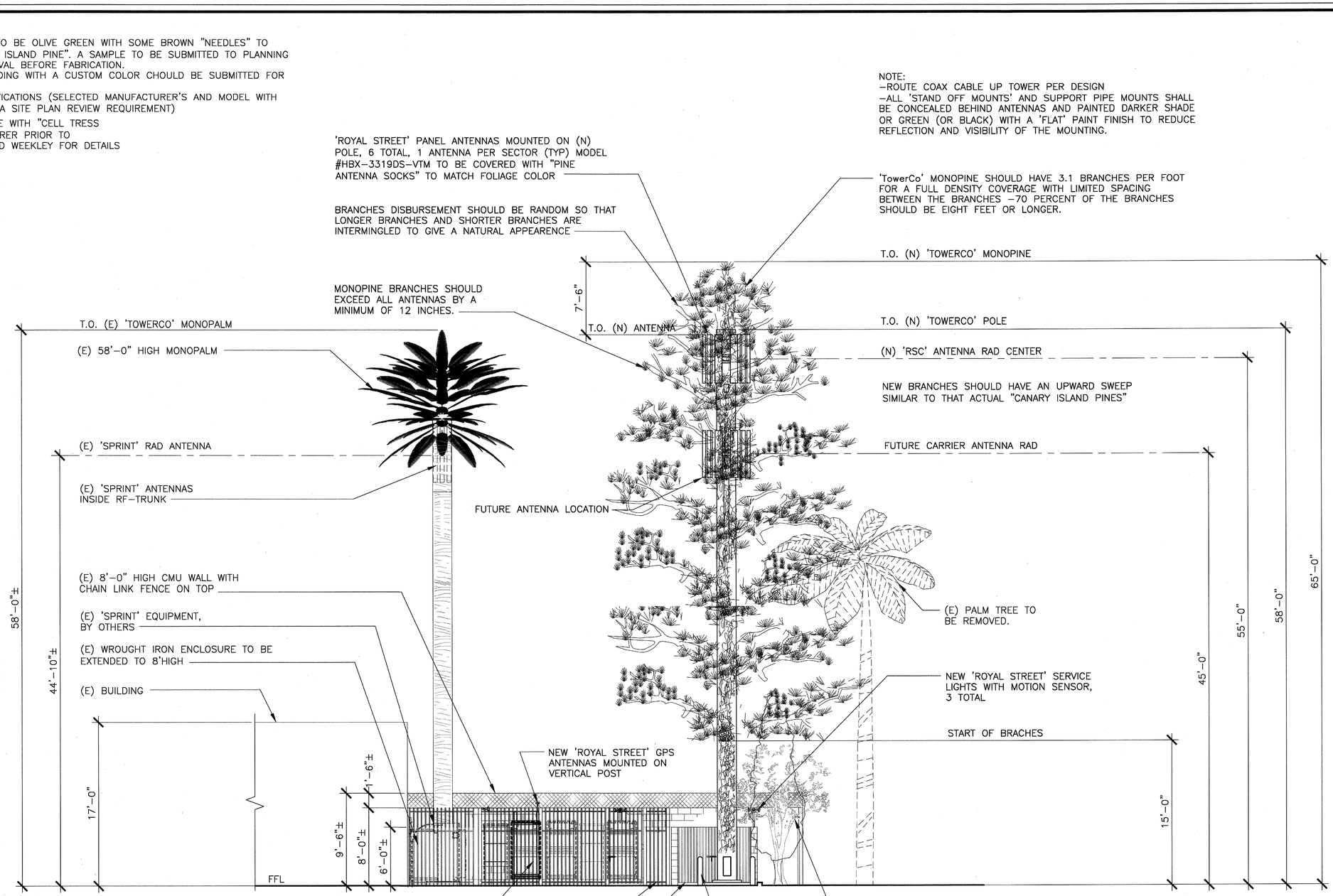
PARTIAL ENLARGED SITE PLAN, EQUIPMENT AND ANTENNA LAYOUT PLANS

SHEET NUMBER:

A2

GENERAL MONOPINE NOTES:
–BRANCH FOLIAGE COLOR TO BE OLIVE GREEN WITH SOME BROWN "NEEDLES" TO MATCH AN ACTUAL "CANARY ISLAND PINE". A SAMPLE TO BE SUBMITTED TO PLANNING DEPT. SUBJECT FOR APPROVAL BEFORE FABRICATION.
–A SAMPLE OF BARK CLADDING WITH A CUSTOM COLOR CHOULD BE SUBMITTED FOR APPROVAL PRIOR TO FAB.
–INCLUDE THE TREE SPECIFICATIONS (SELECTED MANUFACTURER'S AND MODEL WITH PHOTO SIMULATIONS (ALSO A SITE PLAN REVIEW REQUIREMENT)
–'TOWERCO' TO COORDINATE WITH "CELL TRESS INCORPORATED" MANUFACTURER PRIOR TO FABRICATION. CONTACT DAVID WEEKLEY FOR DETAILS AT (805) 934–4535.

NOTE:
–ROUTE COAX CABLE UP TOWER PER DESIGN
–ALL 'STAND OFF MOUNTS' AND SUPPORT PIPE MOUNTS SHALL BE CONCEALED BEHIND ANTENNAS AND PAINTED DARKER SHADE OR GREEN (OR BLACK) WITH A 'FLAT' PAINT FINISH TO REDUCE REFLECTION AND VISIBILITY OF THE MOUNTING.



SOUTHEAST ELEVATION

SCALE: 3/16"=1'-0" (0 2' 4' 6')

1

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CONSULTANT:

DRAWN BY: JGD | CHK.: BOK | APV.: DKD

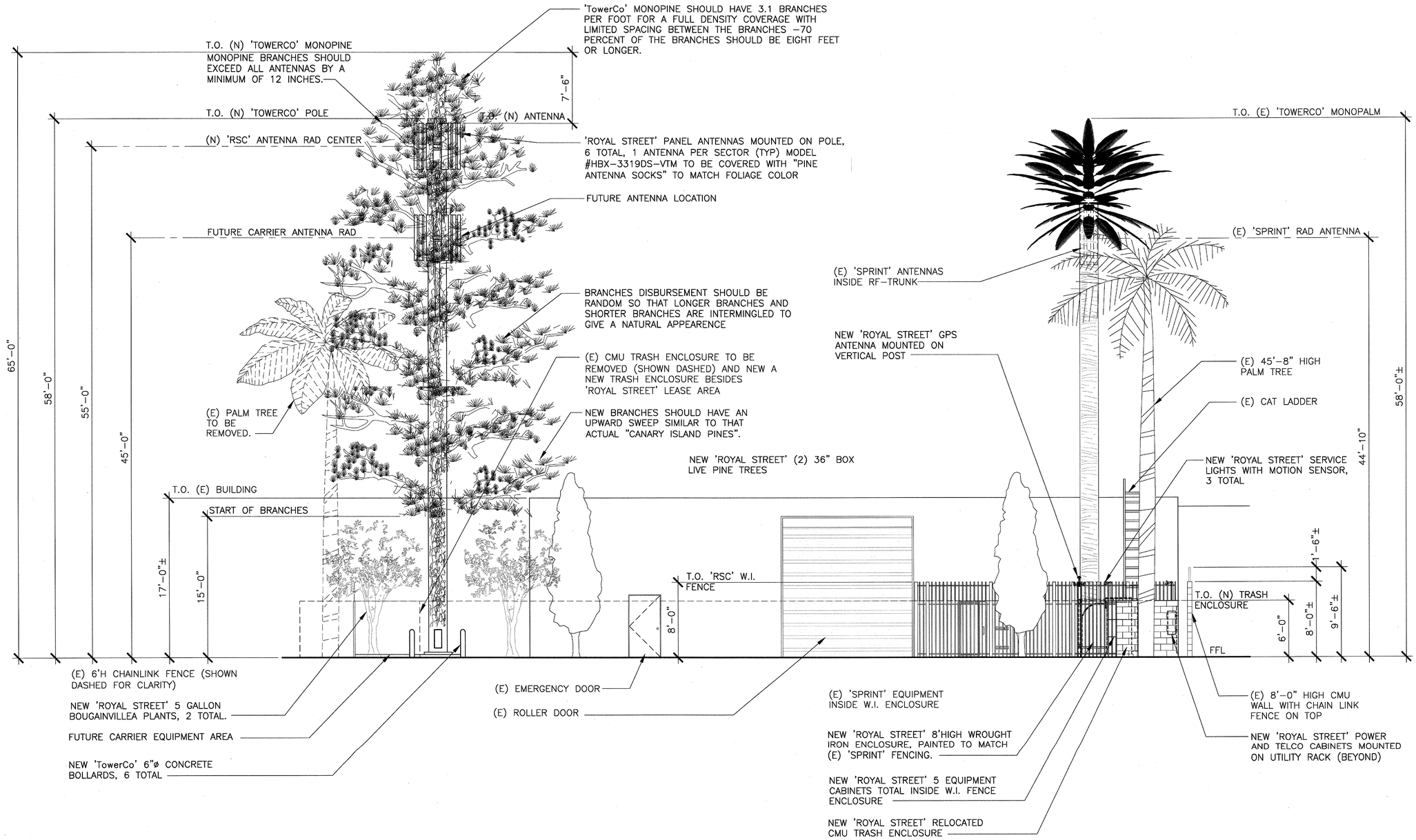
LICENSURE:

LICENSED ARCHITECT DAVID K. DOLLAR C-18015 EXP. 11/11 STATE OF CALIFORNIA

SHEET TITLE:
ELEVATION

SHEET NUMBER:
A3

NOTE:
–ROUTE COAX CABLE UP TOWER PER DESIGN
–ALL 'STAND OFF MOUNTS' AND SUPPORT PIPE MOUNTS SHALL BE CONCEALED BEHIND ANTENNAS AND PAINTED DARKER SHADE OR GREEN (OR BLACK) WITH A 'FLAT' PAINT FINISH TO REDUCE REFLECTION AND VISIBILITY OF THE MOUNTING.



NORTHEAST ELEVATION

SCALE: 3/16"=1'-0" (0 2' 4' 6')

1

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CONSULTANT:

DRAWN BY: JGD | CHK.: BOK | APV.: DKD

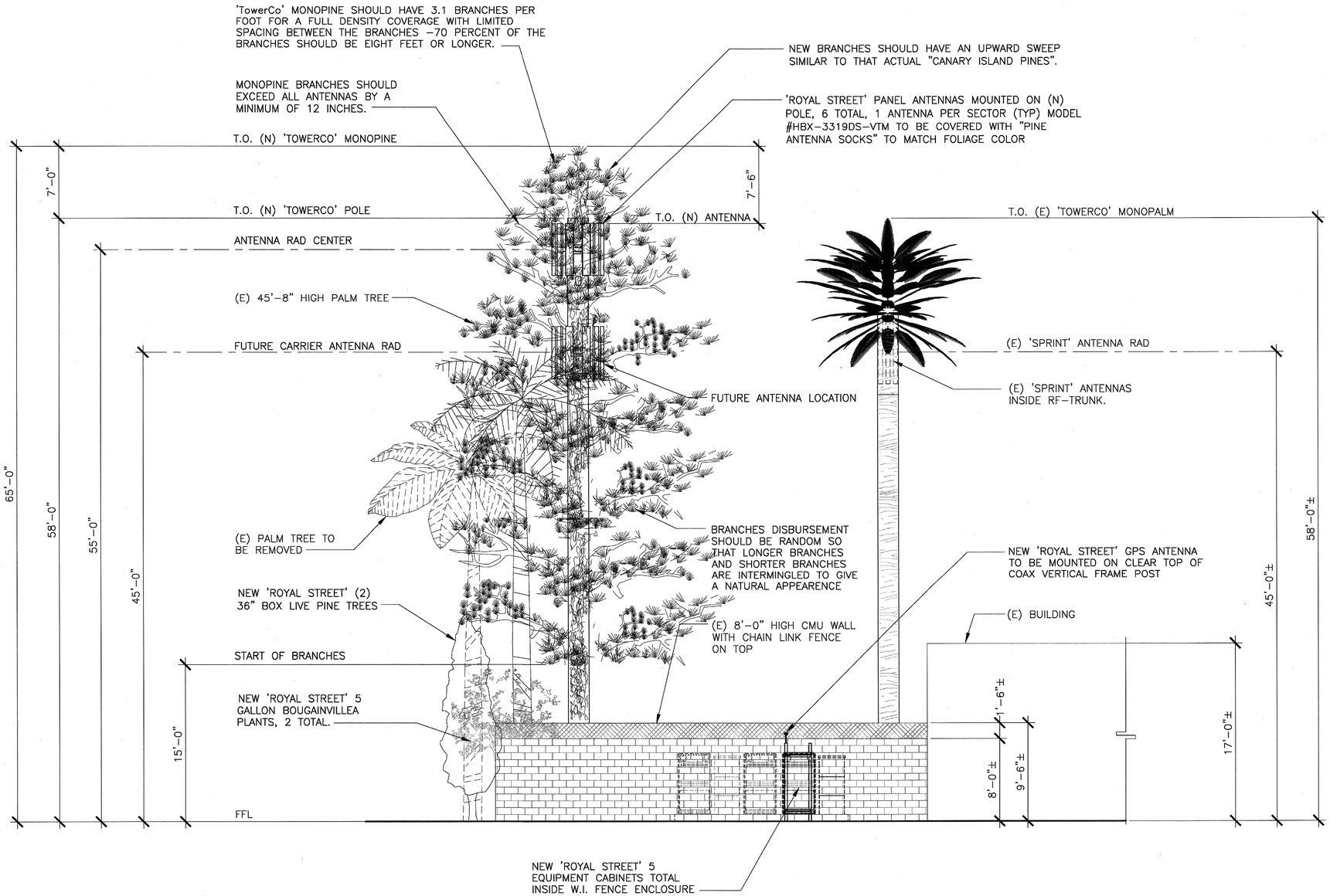
LICENSURE:

LICENSED ARCHITECT D. K. DO C-18015 EXP. 11/11 STATE OF CALIFORNIA

SHEET TITLE:
ELEVATIONS

SHEET NUMBER:
A4

NOTE:
–ROUTE COAX CABLE UP TOWER PER DESIGN
–ALL 'STAND OFF MOUNTS' AND SUPPORT PIPE MOUNTS SHALL BE CONCEALED BEHIND ANTENNAS AND PAINTED DARKER SHADE OR GREEN (OR BLACK) WITH A 'FLAT' PAINT FINISH TO REDUCE REFLECTION AND VISIBILITY OF THE MOUNTING.



NORTHWEST ELEVATION

SCALE: 3/16"=1'-0" (0 2' 4' 6')

1

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TEL: 949-475-1000 FAX: 949-475-1001

CONSULTANT:

DRAWN BY: JGD | CHK.: BOK | APV.: DKD

LICENSURE:

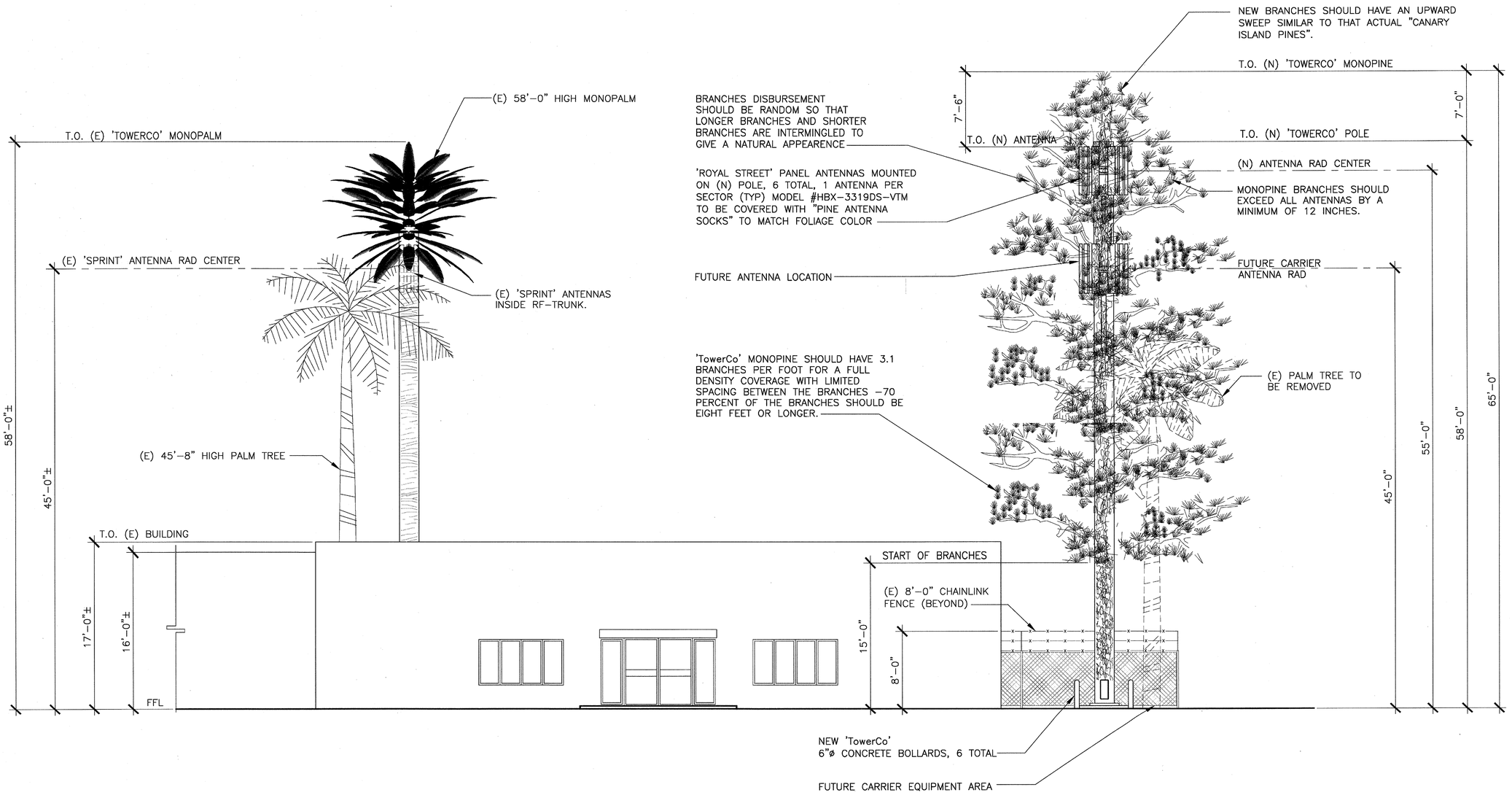
SHEET TITLE:

ELEVATIONS

SHEET NUMBER:

A5

NOTE:
–ROUTE COAX CABLE UP TOWER PER DESIGN
–ALL 'STAND OFF MOUNTS' AND SUPPORT PIPE MOUNTS SHALL BE CONCEALED BEHIND ANTENNAS AND PAINTED DARKER SHADE OR GREEN (OR BLACK) WITH A 'FLAT' PAINT FINISH TO REDUCE REFLECTION AND VISIBILITY OF THE MOUNTING.



SOUTHWEST ELEVATION

SCALE: 3/16"=1'-0" (0 2' 4' 6')

1

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CONSULTANT:

DRAWN BY:	CHK.:	APV.:
JGD	BOK	DKD

LICENSURE:

LICENSED ARCHITECT DAVID K. DOO C-18015 EXP. 08-31-11 STATE OF CALIFORNIA

SHEET TITLE:

ELEVATION

SHEET NUMBER:

A6

GENERAL NOTES:

1. DESIGN CRITERIA:
   DESIGN CODE: 2007 CALIFRONIA BUILDING CODE (CBC)
2. ALL MATERIALS AND WORK PERFORMED SHALL CONFORM WITH THE REQUIREMENTS OF THE 2007 CBC AND GOVERNING BUILDING ORDINANCES.
3. NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER THESE GENERAL NOTES.
4. WHERE A SECTION OR TYPICAL DETAIL IS SHOWN FOR ONE CONDITION, IT SHALL APPLY FOR ALL LIKE OR SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.
5. NO CHANGES ARE TO BE MADE TO THESE PLANS WITHOUT THE KNOWLEDGE AND WRITTEN CONSENT OF THIS ENGINEER. UNATHORIZED CHANGES RENDER THESE DRAWINGS VOID.
6. ANY REFERENCE TO THE WORDS APPROVED, OR APPROVAL IN THESE DOCUMENTS SHALL BE HERE DEFINED TO MEAN GENERAL ACCEPTANCE OR REVIEW AND SHALL NOT RELIEVE THE CONTRACTOR AND/OR HIS SUB-CONTRACTORS OF ANY LIABILITY IN FURNISHING THE REQUIRED MATERIALS OR LABOR SPECIFIED.
7. THE CONTRACT DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE AND DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES INCLUDING BUT, NOT LIMITED TO BRACING & SHORING. OBSERVATION VISITS TO THE SITE BY FIELD REPRESENTATIVES OF THE ARCHITECT OR ENGINEER SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES.
8. GENERAL CONTRACTOR SHALL VISIT THE JOB SITE AND VERIFY ALL GRADES, DIMENSIONS, AND CONDITIONS PRIOR TO BIDDING AND COMMENCING CONSTRUCTION. ALL DIMENSIONS CONTROLLED BY EXISTING CONDITIONS SHALL BE VERIFIED BY THE CONTRACTOR AT THE SITE.
9. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL EXISTING UTILITIES WHETHER SHOWN HEREON OR NOT, AND TO PROTECT THEM FROM DAMAGE. THE CONTRACTOR SHALL BEAR ALL EXPENSE OF REPAIR OR REPLACEMENT IN CONJUNCTION WITH THE EXECUTION OF THIS WORK.
10. GENERAL CONTRACTOR SHALL NOTIFY THE ENGINEER AND ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES FOUND WITHIN THE CONTRACT DOCUMENTS, PRIOR TO STARTING WORK.

CONCRETE:

1. ALL CONCRETE MATERIALS AND WORKMANSHIP SHALL CONFORM TO CHAPTER 19 OF THE CBC AND TO ALL REQUIREMINTS OF ACI 301-96, "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS," EXCEPT AS SPECIFIED HEREIN.
2. MIX DESIGN REQUIREMENTS:
   A. CEMENT SHALL BE TYPE II.
   B. COMPRESSIVE STRENGTH = 2,500 PSI
   C. CONCRETE SLUMP SHALL NOT EXCEED 5".
3. ALL REINFORCING STEEL SHALL BE SECURED IN POSITION AND INSPECTED BY THE BUILDING OFFICIAL PRIOR TO PLACING CONCRETE.

REINFORCING STEEL:

1. REINFORCING STEEL SHALL CONFORM TO ASTM A-615 GRADE 60 UNLESS OTHERWISE NOTED.
2. BARS SHALL BE CLEAN OF MUD, OIL, OR OTHER COATINGS LIKELY TO IMPAIR BONDING.
3. ALL REINFORCING SHALL BE SECURED IN PLACE PRIOR TO INSPECTIONS, PLACING CONCRETE, OR GROUTING MASONRY.
4. REINFORCING STEEL SHALL BE SPLICED AS SHOWN OR NOTED. SPLICES AT OTHER LOCATIONS SHALL BE REVIEWED BY THE STRUCTURAL ENGINEER. ALL VERTICAL WALL REINFORCEMENT SHALL BE CONTINUOUS BETWEEN SPLICE LOCATIONS SHOWN IN THE DETAILS.

MASONRY:

1. ALL MASONRY MATERIALS AND CONSTRUCTION SHALL CONFORM TO CHAPTER 21 OF THE CBC AND TO ALL REQUIREMENTS OF "SPECIFICATIONS FOR MASONRY STRUCTURES" (ACI 530.1/ASCE 6-88) PUBLISHED BY THE AMERICAN CONCRETE INSTITUTE.
2. CONCRETE MASONRY UNITS FOR HOLLOW UNIT MASONRY CONSTRUCTION SHALL BE MEDIUM WEIGHT GRADE "N" UNITS CONFORMING WITH ASTM C-90. SEE ARCHITECTURAL FOR TYPE (FINISH), PATTERN, AND JOINT DETAILS. PROVIDE RUNNING BOND U.O.N. CONCRETE MASONRY UNITS SHALL HAVE AN ULTIMATE COMPRESSIVE STRENGTH = 1900 PSI.
3. MORTAR SHALL BE FRESHLY PREPARED AND UNIFORMLY MIXED. MORTAR SHALL BE TYPE "M" OR "S" WITH A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 1,800 PSI AT 28 DAYS.
4. GROUT SHALL BE PROPORTIONED BY VOLUME AND SHALL HAVE SUFFICIENT WATER ADDED TO PRODUCE CONSISTENCY FOR POURING WITHOUT SEGREGATION. GROUT SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH (F'c) OF 2,000 PSI AT 28 DAYS. PROVIDE CLEAN OUT OPENINGS WHERE GROUT LIFT EXCEEDS 4'-0".
5. GROUT ALL CELLS, UNLESS OTHERWISE NOTED.
6. ALL REINFORCING STEEL SHALL BE SECURED IN POSITION PRIOR TO GROUTING.
7. PROVIDE CONTROL JOINTS AT 48'-0" o.c. MAX.
8. SPECIAL INSPECTION IS REQUIRED FOR MASONRY IN ACCORDANCE WITH CODE SECTION 1704.5

SPECIAL INSPECTION REQUIREMENTS:

1. THIS SECTION APPLIES TO THE STRUCTURAL PORTIONS OF THE PROJECT REQUIRING SPECIAL INSPECTION. REFER TO CBC TABLE 1704.5 FOR SPECIAL INSPECTOR'S DUTIES.
2. ALL TESTS AND INSPECTIONS SHALL BE PERFORMED BY AN INDEPENDENT TESTING AND INSPECTION AGENCY EMPLOYED BY THE OWNER OR ARCHITECT AND NOT THE CONTRACTOR.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A SCHEDULE TO THE TEST AND INSPECTION FIRM TO FACILITATE THE PROPER COORDINATION OF WORK.
4. PORTIONS OF WORK REQUIRING SPECIAL INSPECTION:

   CONCRETE:
   A. CONTINUOUS INSPECTION AND TEST CYLINDERS FOR STRUCTURAL CONCRETE EXCEPT FOUNDATION CONCRETE OF 2500 PSI OR LESS.

   REINFORCING STEEL:
   A. PLACING OF REINFORCING.

   MASONRY:
   A. INSPECTION DURING PREPARATION AND TAKING OF ANY REQUIRED PRISMS OR TEST SPECIMENS, PLACING OF ALL MASONRY UNITS, PLACEMENT OF REINFORCEMENT, INSPECTION OF GROUT SPACE, IMMEDIATELY PRIOR TO CLOSING OF CLEANOUTS, AND DURING ALL GROUTING OPERATIONS.

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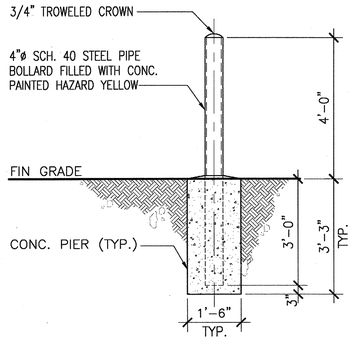
CONSULTANT:

DRAWN BY:	CHK.:	APV.:
JGD	BOK	DKD

LICENSURE:

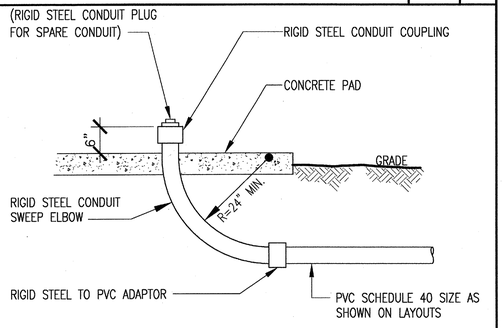
SHEET TITLE:
GENERAL STRUCTURAL NOTES

SHEET NUMBER:
DN1



BOLLARD DETAIL

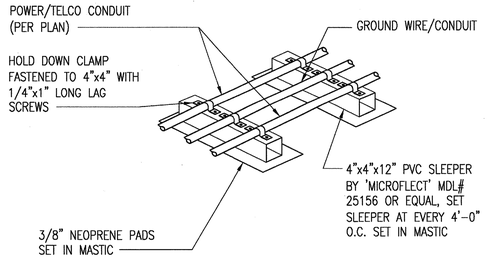
SCALE: 1/2"=1' — 10



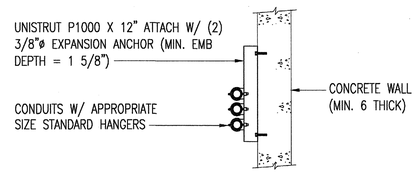
NOTE: RIGID STEEL CONDUIT MAY NOT BE USED WITH COAXIAL ANTENNA CABLE. USE PVC SCHEDULE 40 PIPE.

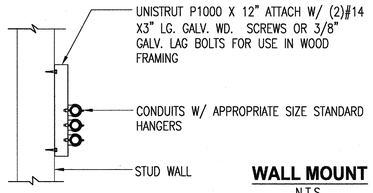
LUNDERGROUND CONDUIT STUB-UP

SCALE: 3/4"=1' — 11



ROOF / FLOOR MOUNT
N.T.S.



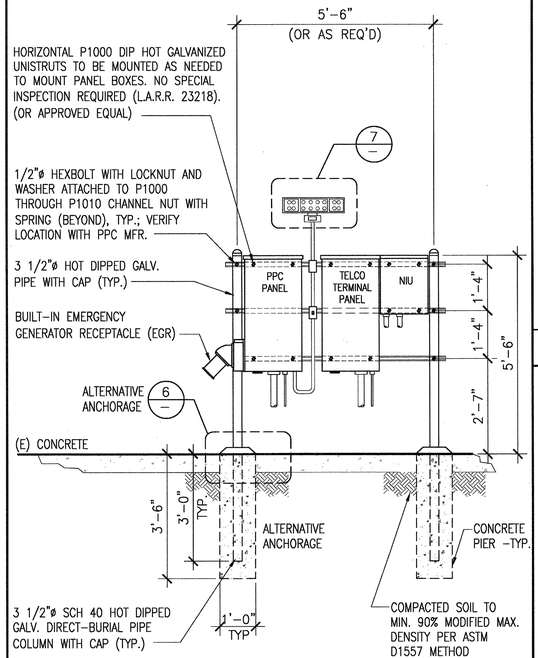


SUPPORT SPACING: 4'-0" MAX.

WALL MOUNT
N.T.S.

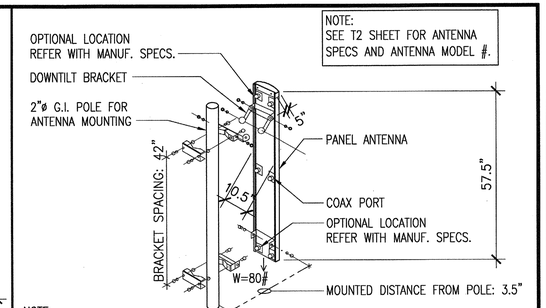
UTILITY CONDUITS MOUNT (WHERE OCCURS)

SCALE: N.T.S. — 8



UTILITY PANEL MOUNTING

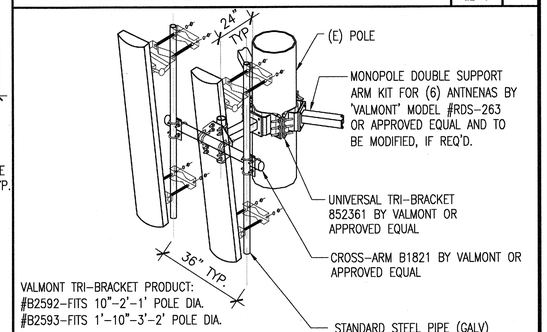
SCALE: NTS — 5



NOTE:
1. ANTENNA MOUNTING BRACKET IS PART OF THE ASSEMBLY. IT IS A PRE-FABRICATED HARDWARE.
2. FOR ANTENNA TO CROSS-ARM MOUNTING SEE DETAIL 2/-.

ANTENNA MOUNTING ASSEMBLY

SCALE: 1/2"=1' — 1

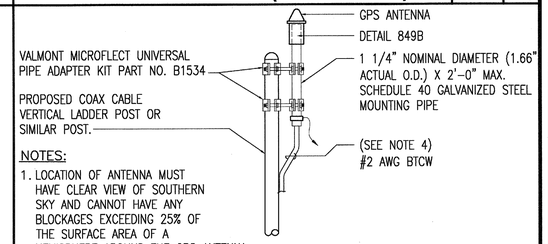


VALMONT TRI-BRACKET PRODUCT:
#B2592-FITS 10'-2'-1' POLE DIA.
#B2593-FITS 1'-10"-3'-2' POLE DIA.

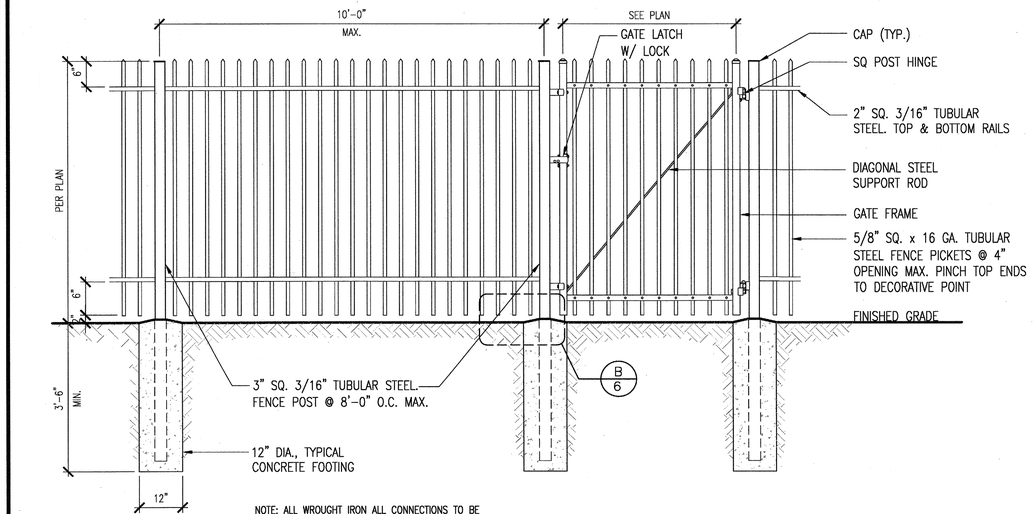
CONTRACTOR TO VERIFY POLE DIA. IN FIELD AND CONFIRM BRACKET SIZE. FIELD WELD BRACKET ON ALL STRAIGHT POLES. (MIN 3/16" FILLET x 12" TOTAL LENGTH)

ANTENNA MOUNTING (ISOMETRIC)

SCALE: 1/2"=1" — 2



NOTES:
1. LOCATION OF ANTENNA MUST HAVE CLEAR VIEW OF SOUTHERN SKY AND CANNOT HAVE ANY BLOCKAGES EXCEEDING 25% OF THE SURFACE AREA OF A HEMISPHERE AROUND THE GPS ANTENNA.
2. ALL GPS ANTENNA LOCATIONS MUST BE ABLE TO RECEIVE CLEAR SIGNALS FROM A MINIMUM OF FOUR (4) SATELLITES. VERIFY WITH HANDHELD GPS BEFORE FINAL LOCATION OF GPS ANTENNA.
3. THE WEIGHT OF THE ANTENNA MOUNT IS 6.5 LBS.
4. IF ICE BRIDGE OR SIMILAR (INCLUDING CABINETS) ARE NOT GROUNDED, GROUND WITH #2 AWG TINNED BARE COPPER WIRE EXOTHERMICALLY BONDED TO POST AND CONNECTED TO GROUND RING.

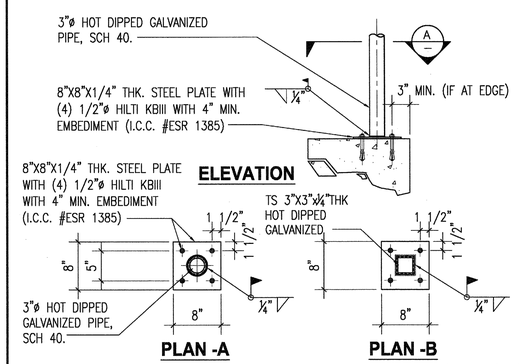


NOTE: ALL WROUGHT IRON ALL CONNECTIONS TO BE CONTINUOUS WELDED. REMOVE ALL SLAG AND SPLATTER AND GRIND ALL WELDS SMOOTH. ALL TUBING TO HAVE ENDS WELDED CLOSED. PAINT STEEL W/ (1) COAT ZINC CHROMATE PRIMER AND W/ (2) COATS "BLACK" ELECTRIC STATIC PAINT.

NOTE:
2,000 PSI CONCRETE

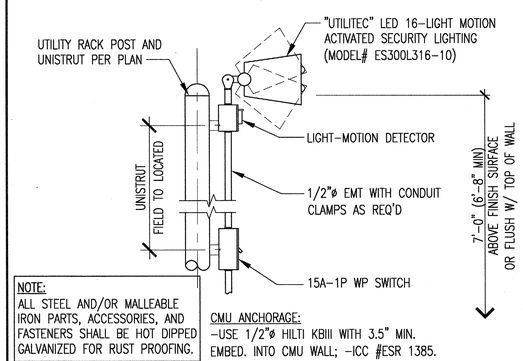
WROUGHT IRON FENCE & ACCESS GATE

SCALE: NTS — 9



VERTICAL POST MOUNTING DETAIL

SCALE: N.T.S. — 6



NOTE:
ALL STEEL AND/OR MALLEABLE IRON PARTS, ACCESSORIES, AND FASTENERS SHALL BE HOT DIPPED GALVANIZED FOR RUST PROOFING.

CMU ANCHORAGE:
-USE 1/2"ø HILTI KBIII WITH 3.5" MIN. EMBED. INTO CMU WALL; -ICC #ESR 1385.

SERVICE LIGHT AT POST

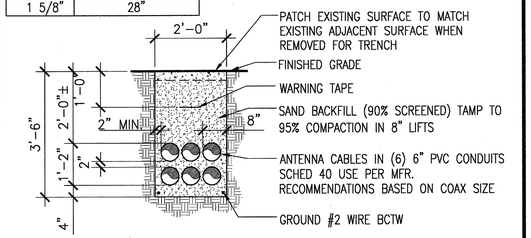
SCALE: NTS — 7

GPS ANTENNA MOUNTING

SCALE: 1"=1' — 3

COAXIAL CABLE MINI. BEND RADIUS	
CABLE SIZE	MIN. BEND RADIUS IN 4" OR 6" CONDUIT
1/2"	10"
7/8"	18"
1 1/4"	22"
1 5/8"	28"

NOTE: PROVIDE PROPER BENDING RADIUS FOR CONDUITS AS REQUIRED BY THE COAXIAL CABLE MFR.



COMBINED CABLE & UTILITY CONDUIT TRENCH

SCALE: 1/2"=1' — 4

Royal Street Communications California, LLC
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DAGERMAN
LA2823A
601 SOUTH SANTA FE
SANTA ANA, CA 92705

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09/06/11

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PLANS PREPARED BY:

DCI PACIFIC
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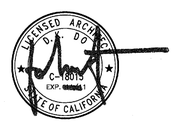
32 EXECUTIVE PARK, SUITE 110, IRVINE, CA 92614
TEL: 949-475-1000 FAX: 949-475-1001

CONSULTANT:

DRAWN BY: JGD | CHK.: BOK | APV.: DKD

LICENSURE:

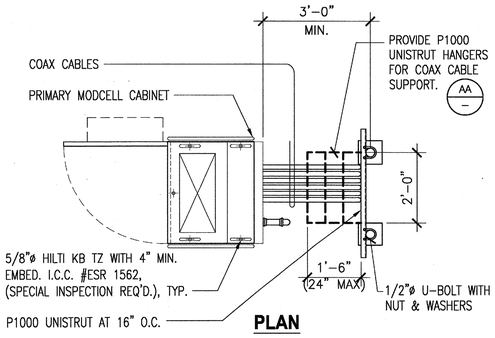


SHEET TITLE:

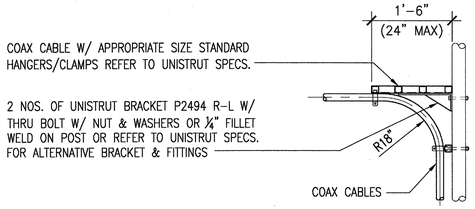
DETAILS

SHEET NUMBER:

D1



PLAN



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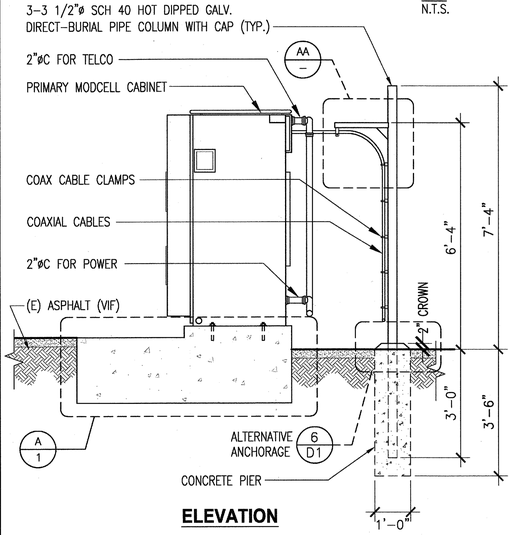
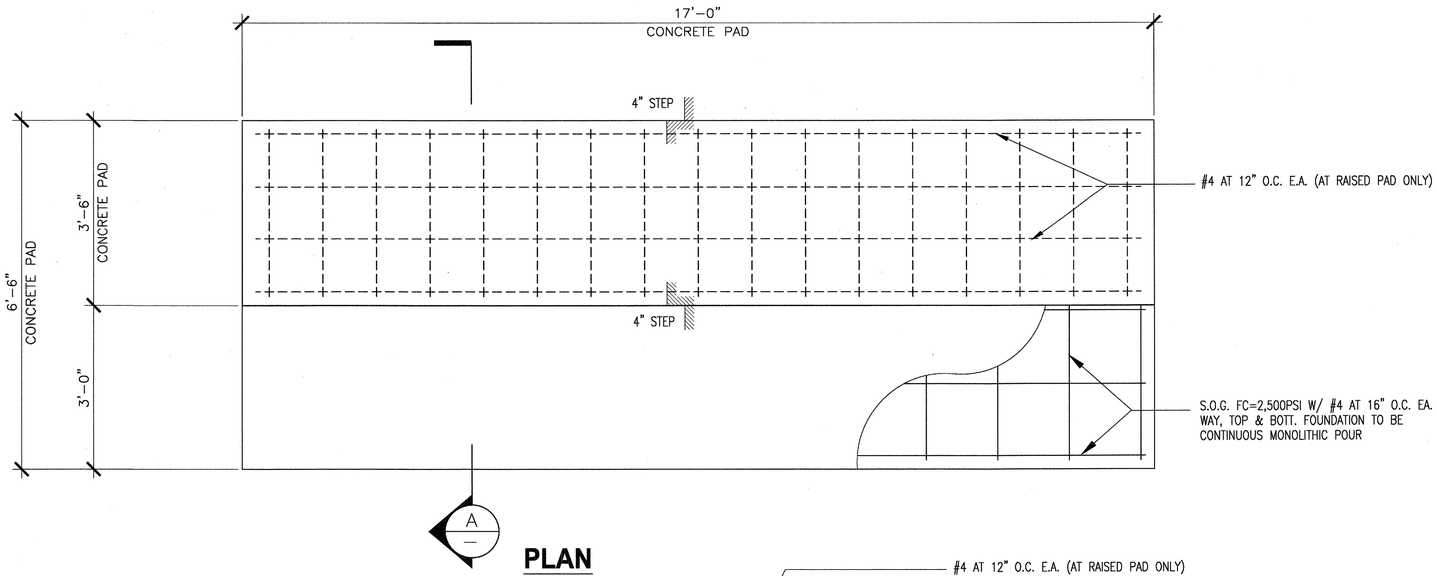
N.T.S.



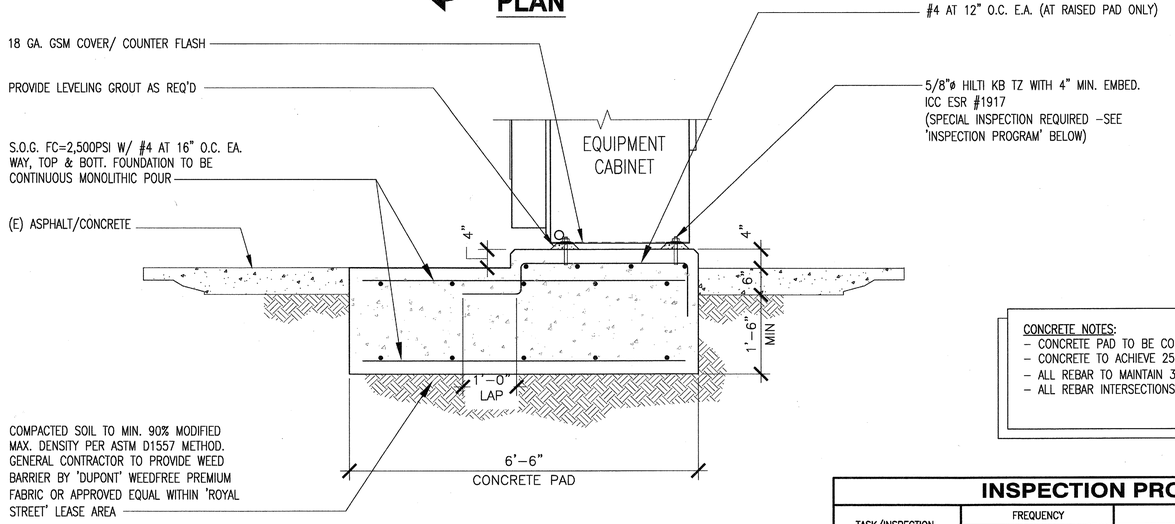
ELEVATION

MODCELL CABINET DETAIL

SCALE: 3/4"=1' | 3



PLAN



SECTION A

CONCRETE NOTES:
- CONCRETE PAD TO BE CONTINOUS MONOLITHIC POUR.
- CONCRETE TO ACHIEVE 2500 PSI AT 28 DAYS.
- ALL REBAR TO MAINTAIN 3" CLEARANCE FROM EDGES.
- ALL REBAR INTERSECTIONS SHALL BE SECURELY TIED TOGETHER.

INSPECTION PROGRAM

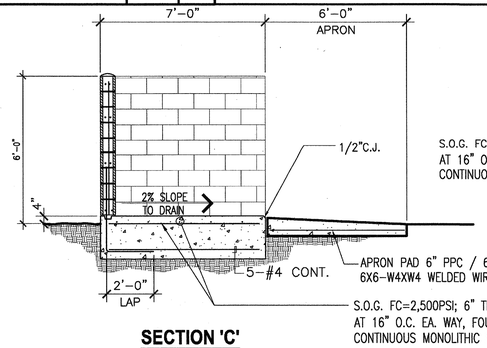
TASK/INSPECTION	FREQUENCY		REFERENCE FOR CRITERIA				
	CONTINUOUS	PERIODIC	IBC	ACI 530/ASCE 5/TMS 402	ACI 530.1/ASCE 6/TMS 602	CBC	OTHERS
POST INSTALLED ANCHORS	X	–	–	–	–	–	ICC ESR-1917

FOUNDATION PLAN AND SECTION

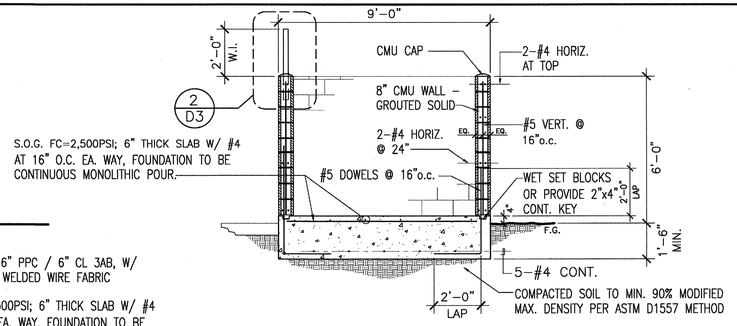
SCALE: 3/4"=1' | 1

CONSTRUCTION NOTE:
GENERAL CONTRACTOR TO MEASURE ACTUAL DIMENSION OF FIELD CONDITIONS AND SHALL NOTIFY THE ARCHITECT/ENGINEER FOR ANY DISCREPANCIES ON PLAN PRIOR TO FABRICATION AND CONSTRUCTION.

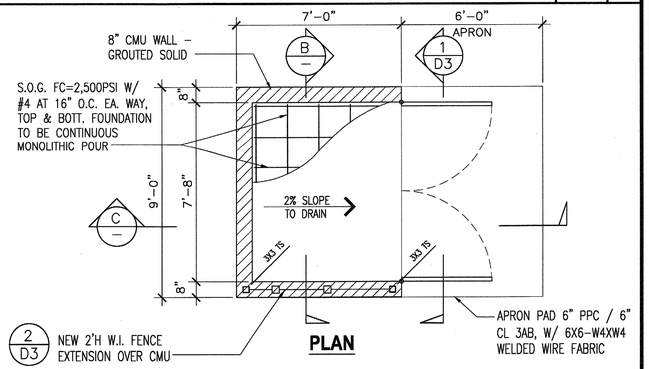
CONCRETE NOTES:
- CONCRETE PAD TO BE CONTINOUS MONOLITHIC POUR.
- CONCRETE TO ACHIEVE 2500 PSI AT 28 DAYS.
- ALL REBAR TO MAINTAIN 3" CLEARANCE FROM EDGES.
- ALL REBAR INTERSECTIONS SHALL BE SECURELY TIED TOGETHER.



SECTION 'C'



SECTION 'B'



PLAN

CMU TRASH ENCLOSURE PLAN AND DETAILS

SCALE: N.T.S. | 2

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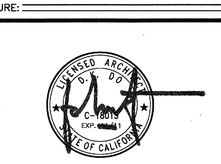
TEL: 949-475-1000 FAX: 949-475-1001

CONSULTANT:

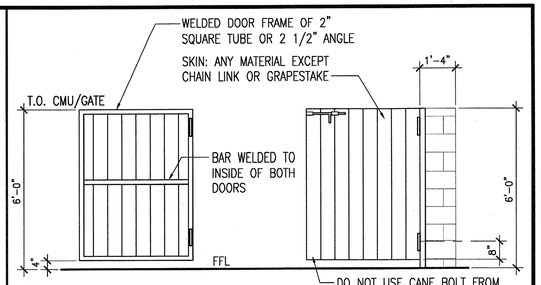
DRAWN BY: JGD | CHK.: BOK | APV.: DKD

LICENSURE:



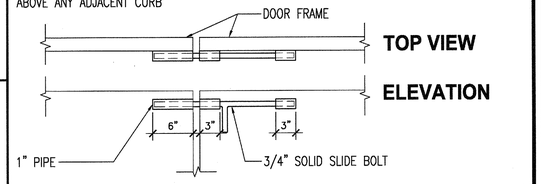
SHEET TITLE:
DETAILS

SHEET NUMBER:
D2



ELEVATION

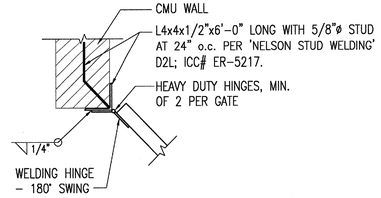
NOTE:
BOTTOM OF DOOR SHOULD BE HIGH ENOUGH TO PASS CLEAR ABOVE ANY ADJACENT CURB



TOP VIEW

ELEVATION

LATCH DETAIL



HINGE DETAIL

TRASH ENCLOSURE DOUBLE DOOR

SCALE: N.T.S. | 1

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CONSULTANT:

DRAWN BY: JGD | CHK.: BOK | APV.: DKD

LICENSURE:

LICENSED ARCHITECT D.K. DD EXP. 11/11 STATE OF CALIFORNIA

SHEET TITLE:

DETAILS

SHEET NUMBER:

D3

METRO PCS IS RESPONSIBLE FOR THE FOLLOWING:
- LANDSCAPING AND IRRIGATION INSTALLATION PER CITY CONDITIONS OF APPROVAL

IRRIGATION NOTES

THE DESIGN IS DIAGRAMMATIC. ALL EQUIPMENT SHOWN IN PAVED AREAS IS FOR DESIGN CLARIFICATION ONLY AND IS TO BE INSTALLED WITHIN PLANTING AREAS AS NECESSARY.

DO NOT WILLFULLY INSTALL ANY EQUIPMENT AS SHOWN ON PLANS WHEN IT IS OBVIOUS IN THE FIELD THAT UNKNOWN CONDITIONS EXIST THAT WERE NOT EVIDENT AT THE TIME THESE PLANS WERE PREPARED. ANY SUCH CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE OWNERS REPRESENTATIVES PRIOR TO ANY WORK OR THE IRRIGATION CONTRACTOR SHALL ASSUME ALL RESPONSIBILITY FOR ANY FIELD CHANGES DEEMED NECESSARY BY THE OWNER.

INSTALL ALL EQUIPMENT AS SHOWN IN THE DETAILS AND SPECIFICATIONS. CONTRACTOR SHALL BE RESPONSIBLE TO COMPLY WITH ALL LOCAL CITY AND COUNTY REQUIREMENTS FOR BOTH EQUIPMENT AND INSTALLATION.

THE SYSTEM IS DESIGN FOR A MINIMUM OPERATING PRESSURE OF 65 PSI. THE MAXIMUM DEMAND OF GALLONS PER MINUTE IS 2 . THE IRRIGATION CONTRACTOR SHALL VERIFY THE AVAILABLE WATER PRESSURE ON THE SITE PRIOR TO THE START OF INSTALLATION.

THE ACTUAL LOCATION FOR THE INSTALLATION OF THE AUTOMATIC CONTROLLER IS TO BE DETERMINED IN THE FIELD BY THE OWNERS AUTHORIZED REPRESENTATIVE AND/OR THE LANDSCAPE ARCHITECT.

110 V. ELECTRICAL POWER SOURCE TO BE PROVIDED BY OTHERS TO THE LOCATION FOR THE AUTOMATIC CONTROLLER. IRRIGATION CONTRACTOR TO BE RESPONSIBLE FOR THE FINAL CONNECTION TO THE EQUIPMENT.

ALL QUICK COUPLERS VALVES ARE TO BE INSTALLED IN SHRUB OR GROUNDCOVER AREAS WHENEVER POSSIBLE AND WITHIN 18" OF THE HARDSCAPE. ALL QUICK COUPLER VALVES SHALL BE INSTALLED IN A 10" DIA. GREEN PLASTIC VALVE BOX.

ALL VALVE BOX COVERS ARE TO BE LABELED WITH 1" HEAT BRANDED LETTERS: "Q.C." FOR QUICK COUPLERS, "G.V." FOR GATE VALVES AND I.V.C. AND STATION NO. FOR CONTROL VALVES. ALL VALVE BOX COVERS ARE TO BE PURPLE (TO INDICATE NON-POTABLE WATER.)

CONTRACTOR SHALL INSTALL ANTI-DRAINAGE DEVICES FOR ALL LOW HEADS TO PREVENT LOW HEAD DRAINAGE AND POSSIBLE SOIL EROSION.

THE IRRIGATION CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF POSSIBLE ON-SITE INSPECTIONS WITH THE LANDSCAPE ARCHITECT TO BE SCHEDULED AT THE FOLLOWING STAGES OF INSTALLATION:

THE CONTRACTOR SHALL PROVIDE TO THE LANDSCAPE ARCH. AND/OR CITY REP., UPON THE COMPLETION OF THE JOB, A SET OF REPRODUCIBLE AS-BUILT DRAWINGS, WHICH SHALL BE VERIFIED FOR ACCURACY AT THE TIME OF THE FINAL JOB WALK-THROUGH.

THE IRRIGATION SYSTEM SHALL BE FULLY GUARANTIED IN WRITING FOR A PERIOD OF (1) YEAR. ANY DEFECTIVE EQUIPMENT. MATERIALS OR POOR WORKMANSHIP SHALL BE REPLACED OR CORRECTED BY THE IRRIGATION CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

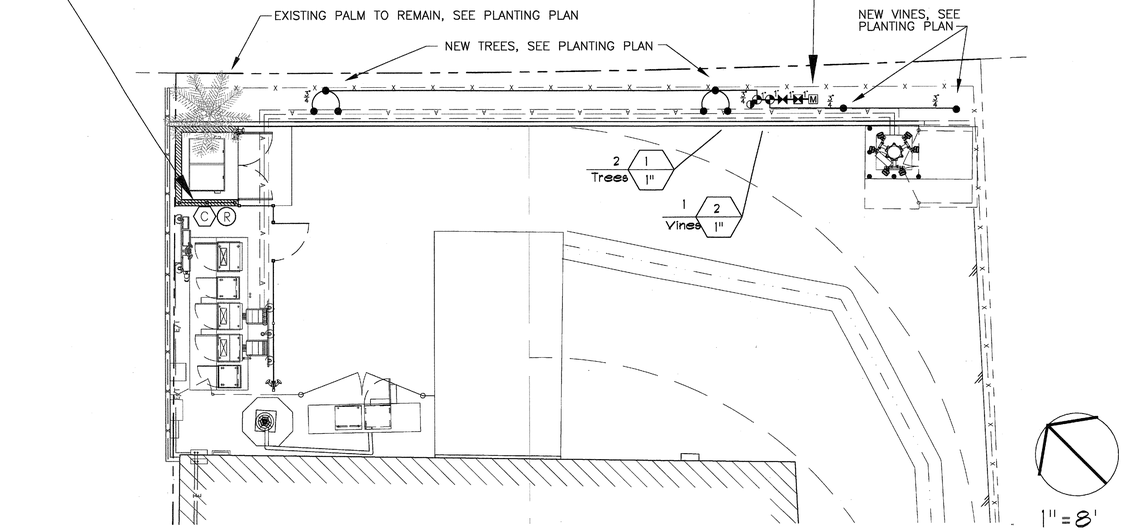
AUTOMATIC CONTROLLER LOCATION:

IF CONTRACTOR IN UNABLE TO EXTEND EXISTING IRRIGATION CONTROL WIRES TO THIS AREA OF THE SITE, THEN... CONTRACTOR TO INSTALL NEW WALL-MOUNTED RANBIRD SMART CONTROLLER AND RAIN SENSOR WITHIN ENCLOSURE AS INDICATED. CONTRACTOR TO VERIFY POWER AND LOCATION.

POINT OF CONNECTION:

CONTRACTOR TO VERIFY AVAILABILITY OF EXISTING IRRIGATION AND IF POSSIBLE EXTEND MAINLINE TO TWO (2) NEW VALVES. IF IT IS NOT POSSIBLE TO EXTEND EXISTING MAINLINE, THEN CONTRACTOR TO INSTALL NEW FEBCO 825Y BACKFLOW DEVICE AND GATE VALVE AT POINT OF CONNECTION AS INDICATED AND LOCATE IN SHRUB AREA. CONTRACTOR TO VERIFY LOCATION IN FIELD.

STATIC PRESSURE: 65 PSI
DESIGN PRESSURE: 45 PSI
MAXIMUM DEMAND: 2 GPM



IRRIGATION PLAN

IRRIGATION LEGEND

SYMBOL	MFG.	MODEL NO.	DESCRIPTION	RAD.	GPM.	PSI	DET. REF.
◉	RAINBIRD	1401	FLOOD BUBBLER - 3 PER TREE	N/A	0.25	30	E
◑	RAINBIRD	33NP	3/4" QUICK COUPLING VALVE.				G
◕	RAINBIRD	PESB - 100	REMOTE CONTROL VALVE. SIZE NOTED.				B
⋈	NIBCO	T-580	LINE-SIZE BALL VALVE.				C
(C)(R)	RAINBIRD	ESP-SMT 4 STATION	SMART CONTROLLER AND WEATHER SENSOR CONTRACTOR TO VERIFY POWER SOURCE AND LOCATION.				A
M	WATER METER BY OTHERS						
NOT SHOWN	UF DIRECT BURIAL CONTROL WIRE # 12 GA.COMMON / # 14 GA. PILOT W/ PIPE SLEEVE						F, H
— — —	PVC SCH 40 FOR PIPES 1-1/2" AND SMALLER, PVC CLASS 315 FOR PIPES 2" AND LARGER. PRESSURE MAINLINE -18" DEEP.						D
———	PVC CLASS 200 NON-PRESSURE LATERAL LINE. 12" DEEP. SIZE NOTED.						D
=========	PVC SCH 40 WIRE AND PIPE SLEEVES.						F, H
GPM PLANT / QTA SIZE	CALLOUT						

SEE SHEET L2 FOR IRRIGATION DETAILS
SEE SHEET L3 FOR PLANTING PLAN

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CONSULTANT:

Shapton Landscape Architecture
31 Cascade - Irvine, CA 92604
714/955-9325
billshapton@hotmail.com

DRAWN BY:	CHK.:	APV.:
JGD	BOK	DKD

LICENSURE:

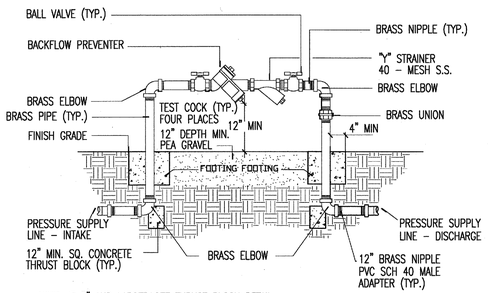
REGISTERED LANDSCAPE ARCHITECT
WILLIAM SHAPTON
NO. 2985
Signature
11-30-11
Renewal Date
2-25-11
Date
STATE OF CALIFORNIA

SHEET TITLE:

IRRIGATION PLAN

SHEET NUMBER:

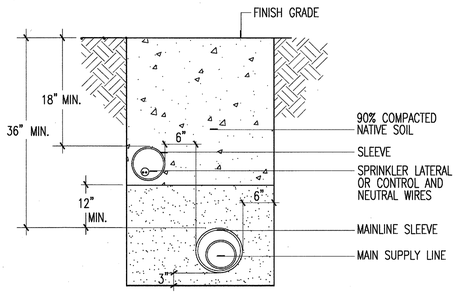
L1



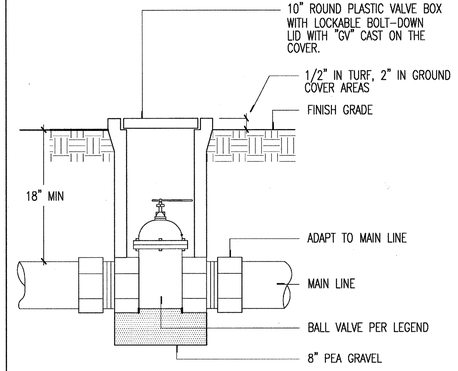
NOTE: IF 4" AND LARGER SEE THRUST BLOCK DETAIL.

NOTE:
1. EQUIPMENT TO BE INSTALLED AT A MINIMUM OF 12" FROM WALLS, BUILDINGS, ETC. INSTALL IN PLANTING AREA.
2. ALL ABOVE GROUND ASSEMBLY SHALL RECEIVE ONE (1) COAT RED LEAD PRIMER AND ONE (1) COAT PAINT
3. WHEN UNIT IS NEXT TO BUILDING, WALL, ETC., TEST COCKS TO BE ON OUTSIDE.
4. VERTICAL BRASS RISERS AND UNION MAY BE CHANGED TO GALV. / SCH 40 PIPE WITH WRITTEN PERMISSION OF WATER PERVEYOR.

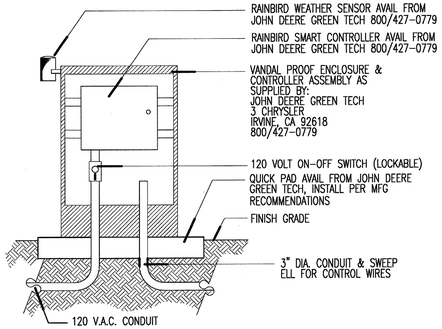
J BACKFLOW DEVICE



F SLEEVING



C BALL VALVE



NOTE: ALL WIRE TO BE INSTALLED AS PER LOCAL CODE. PROVIDE COMMERCIAL PADLOCK AND TWO (2) KEYS TO OWNER INSTALL ONE (1) 2' X 3' PRECAST CONCRETE PAVER IN FRONT OF EACH DOOR OF THE CONTROLLER ASSEMBLY

A CONTROLLER W/ RAIN SENSOR

SECTION A: HYDROZONE INFORMATION TABLE

Provide the Square Footage of Landscape Area per Hydrozone

Hydrozone	Zone or Valve	Irrigation Method	Area (s.f.)	% of Landscape Area
M/L W	1	B	4	6
M W	2	B	60	94
			64	100

SECTION B: WATER BUDGET CALCULATIONS

SECTION B1: MAXIMUM APPLIED WATER ALLOWANCE (MAWA)

The project's Maximum Applied Water Allowance shall be calculated using this equation:

MAWA = ETo (0.62) [(0.7 X LA) + (0.3 X SLA]

MAWA = 48.2 (0.62) [(0.7 X 64) + (0.3 X 0)]

MAWA = (29.88) (45)

MAWA = 1,345 GALLONS PER YEAR

SECTION B2: ESTIMATED TOTAL WATER USE (ETWU)

The project's Estimated Total Water Use is calculated using the following formula:

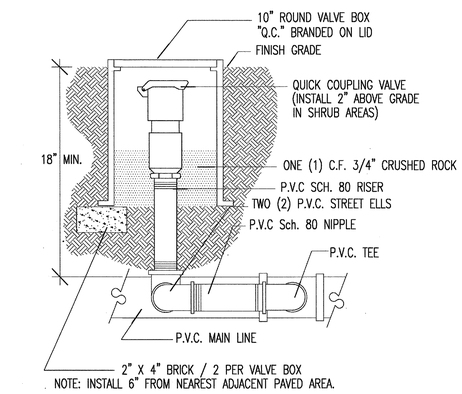
$$ETWU = ETo\ (0.62)\ \frac{(PF\ X\ HA + SLA)}{IE}$$

$$ETWU = 48.2\ (0.62)\ \frac{(0.4\ X\ 64 + 0)}{0.71}$$

ETWU = (29.88) (36)

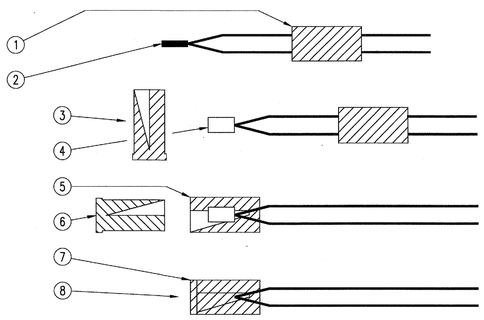
ETWU = 1,076 GALLONS PER YEAR

K WATER CALCULATIONS



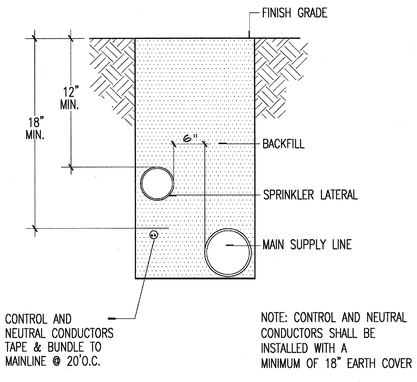
NOTE: INSTALL 6" FROM NEAREST ADJACENT PAVED AREA.

G QUICK COUPLER



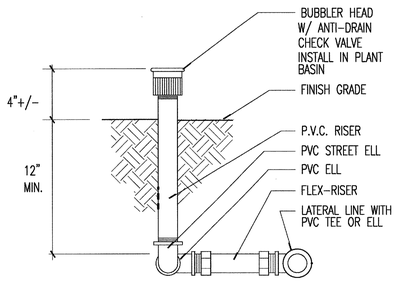
1. SLIP BASE SOCKET OVER END OF WIRES
2. STRIP WIRES APPROX. 5/8" FROM ENDS - TWIST TOGETHER
3. APPLY SEALER TO OUTSIDE OF SEALING PLUG AND FILL CAVITY WITH SEALER
4. PUT CRIMP END OVER WIRE ENDS - CRIMP SLEEVE AND CUT OFF EXCESS WIRE
5. PULL BASE SOCKET OVER END OF WIRES AS FAR AS POSSIBLE
6. PUSH SEALING PLUG INTO BASE SOCKET
7. PUSH WIRES TO END OF BASE SOCKET TO INSURE COMPLETE SEALING OF CONNECTION
8. COMPLETED WATERPROOF WIRE CONNECTION

H WIRE CONNECTION



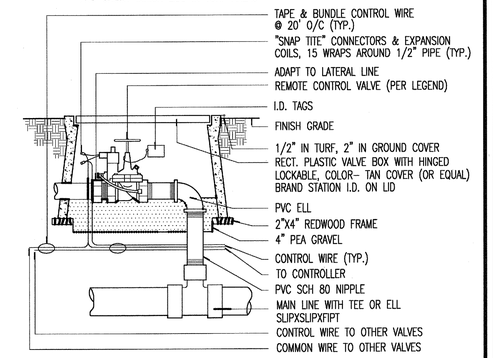
NOTE: CONTROL AND NEUTRAL CONDUCTORS SHALL BE INSTALLED WITH A MINIMUM OF 18" EARTH COVER

D TRENCHING



E BUBBLER ON RISER

NOTE: INSTALL TAN COLOR LIDS IN D.G. AREAS AND GREEN COLOR LIDS IN TURF AREAS



B REMOTE CONTROL VALVE

DIGALERT
DIAL BEFORE YOU DIG TOLL FREE
TWO WORKING DAYS BEFORE YOU DIG
A PUBLIC SEVICE BY UNDERGROUND SERVICE ALERT
1-800-227-2600

SEE SHEET L1 FOR IRRIGATION PLAN
SEE SHEET L3 FOR PLANTING PLAN

Royal Street Communications California, LLC
2913 EL CAMINO REAL, #561
TUSTIN, CA 92782

PROJECT INFORMATION:

DAGERMAN
LA2823A
601 SOUTH SANTA FE
SANTA ANA, CA 92705

CURRENT ISSUE DATE:

09/06/11

ISSUED FOR:

BP SUBMITTAL

REV.:	DATE:	DESCRIPTION:	BY:
0	09/06/11	100% CD PER TOWERCO REDLINES #2	JGD
0	08/30/11	100% CD PER TOWERCO REDLINES	JGD
0	08/11/11	100% CD PER DRM REDLINES REV#2	JGD
0	08/01/11	100% CD PER DRM REDLINES	JGD
0	07/28/11	PRELIM 90% CD	JGD

PLANS PREPARED BY:

DCI PACIFIC
ARCHITECTURE - ENGINEERING - CONSULTING
32 EXECUTIVE PARK, SUITE 110, IRVINE, CA 92614
TEL: 949-475-1000 FAX: 949-475-1001

CONSULTANT:

Shapton Landscape Architecture
31 Cascade - Irvine, CA 92604
714/955-9325
billshapton@hotmail.com

DRAWN BY:	CHK.:	APV.:
JGD	BOK	DKD

LICENSURE:

REGISTERED LANDSCAPE ARCHITECT
WILLIAM SHAPTON
NO. 2285
Signature
11-30-11
Renewal Date
2-25-11
Date
STATE OF CALIFORNIA

SHEET TITLE:

IRRIGATION DETAILS

SHEET NUMBER:

L2

PLANTING NOTES:

SOIL TEST

AFTER SOIL HAS BEEN SET IN PLACE & PRIOR TO ANY SOIL PREPARATION, THE CONTRACTOR SHALL FURNISH SOIL TESTS OF THE SITE FOR AGRICULTURAL FERTILITY AND TO DETERMINE PROPER SOIL AMMENDMENTS. TEST ARE TO BE PERFORMED BY A MEMBER OF THE CALIFORNIA ASSOCIATION OF AGRICULTURAL LABORITORIES WITH COPIES SENT TO THE OWNER & LANDSCAPE ARCHITECT, PRIOR TO INSTALLATION.

SOIL PREPARATION

THE FOLLOWING IS PROVIDED FOR BID PURPOSES ONLY AND SHALL BE MODIFIED AS NECESSARY GIVEN THE RESULTS OF THE SOILS TEST. THE CONTRACTOR SHALL BE PREPARED TO PROVIDE DELIVERY SLIPS AND EMPTY FERTILIZER BAGS ON SITE FOR VERIFICATION OF MATERIAL.

1. BACKFILL MIX FOR USE OF PLANTING ALL TREES & VINES

   6 PARTS BY VOLUME ON SITE SOIL.
   4 PARTS BY VOLUME ORGANIC AMMENDMENT.
   1 LB. 12–12–12 COMMERCIAL FERTILIZER PER CUBIC YARD.
   1 LB. IRON SULFATE PER CU. YD. OF MIX.

2. PLANT TABLET FOR ALL TREES AND VINES

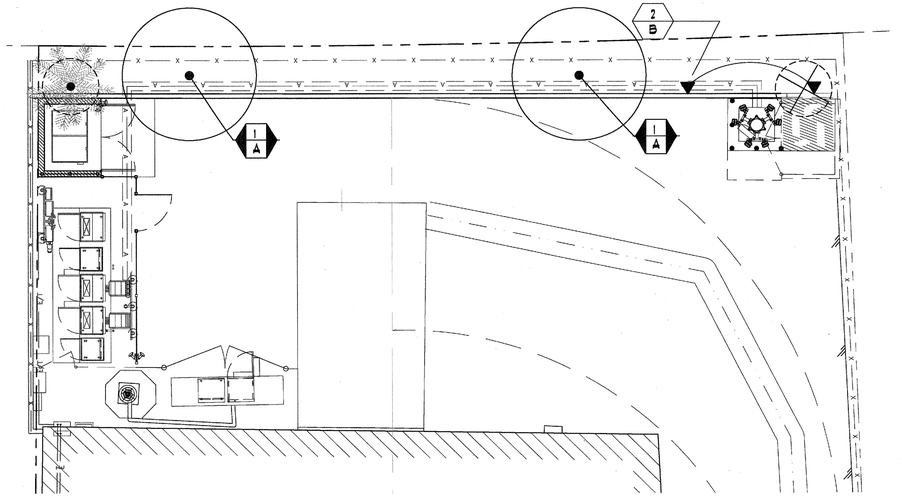
   1–21 GRAM AGRIFORM FERTILIZER PER 1/2" TREE CALIPER FOR ALL BOX SIZED TREE NEXT TO ROOT BALL
   3–21 GRAM AGRIFORM FERTILIZER TABLETS PER 5 GALLON STOCK

TOP DRESSING

ALL SHRUBS AND GROUNDCOVER AREAS ARE TO BE TOP DRESSED WITH 1" THICK LAYER OF SHREDDED TREE BARK

VINES & ESPALIERS

ALL NURSERY STAKES AND/OR TRELLISES SHALL BE REMOVED. PLANTS BRANCHES ARE TO BE CAREFULLY SPREAD AND ATTACHED TO WALLS OR FENCES WITH AN APPROVED FASTENER AND TWIST TIE.



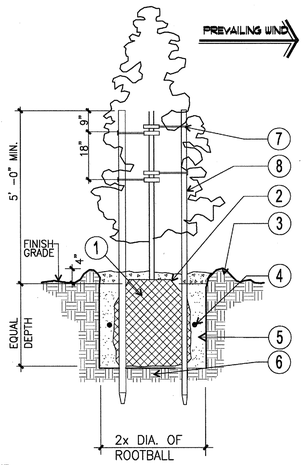
1/8" = 1'

LANDSCAPE PLAN

PLANT MATERIAL LEGEND

SYMBOL	BOTANICAL NAME	COMMON NAME	QTY	SIZE	SPACING	REMARKS
	TREE					
•	PINUS CANARIENSIS	CANARY ISLAND PINE	2	36" BOX	AS SHOWN	REFER TO TREE PLANTING NOTES AND DETAIL THIS SHEET, PLANT PLUMB
●	–	–	–	–	–	EXISTING PALM TO REMAIN PROTECT IN PLACE
⊗	–	–	–	–	–	EXISTING PALM TO BE REMOVED
▼	BOUGAINVILLEA SPP	BOUGAINVILLEA	2	5 GAL	AS SHOWN	REFER TO VINE PLANTING NOTES AND DETAIL THIS SHEET

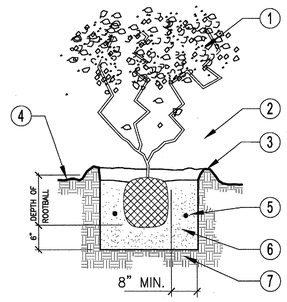
SIZING LEGEND



LEGEND:

1. Rootball
2. Set top of rootball 1" above finish grade. Install 3" nitrolized wood chip mulch
3. 3" water basin / remove once plant is established per Landscape Archtiect's direction.
4. Agriform Fertilizer Tablets. Application rates per planting notes and Agrinomic Soils Report.
5. Backfill Mix per Planting Notes and Agronomic Soils Report
6. Native soil subgrade. Excavate to correct depth for planting. Scarify bottom to ensure adequate drainage for healthy growth of plant.
7. "V.I.T. Cinch Tie" Tree Tie (4) Required. Secure to Stake per Manufacturer's Recommendation. Place below branching Yoke of Tree.
8. Lodgepole Pine Stake 2 for 15 gallon trees and larger

P1 | TREE PLANTING DETAIL (NTS)



LEGEND:

1. Vine per Plant Legend, this sheet
2. Existing CMU Wall or Fence, See Planting Notes, this sheet
3. Water Basin with/2" of nitrolized wood chip mulch. Remove once plant is established
4. Finish grade.
5. Agriform fertilizer tablets. Application rates per planting notes
6. Backfill mix per planting notes
7. Undisturbed Native Soil

P2 | VINE PLANTING DETAIL

SEE SHEET L1 FOR IRRIGATION PLAN
SEE SHEET L2 FOR IRRIGATION DETAILS

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billshapton@hotmail.com

DRAWN BY:	CHK.:	APV.:
JGD	BOK	DKD

LICENSURE:

REGISTERED LANDSCAPE ARCHITECT
WILLIAM SHAPTON
NO. 2385
Signature
11-30-11
Renewal Date
2-25-11
Date
STATE OF CALIFORNIA

SHEET TITLE:

PLANTING PLAN

SHEET NUMBER:

L3

GENERAL NOTES:

1. ALL STEEL SHALL MEET THE REQUIREMENTS OF THE "STANDARD SPECIFICATIONS FOR STRUCTURAL STEEL" ASTM A36, UNLESS OTHERWISE NOTED ON THE STRUCTURAL PLANS OR BELOW.

2. ALL ROUND STEEL PIPE SHALL MEET THE REQUIREMENTS OF ASTM A53 TYPE E OR S GRADE B (35 KSI YIELD POINT MATERIAL) OR ASTM A501 (36 KSI YIELD POINT MATERIAL).

3. ALL TUBE STEEL (SQUARE OR RECTANGULAR) SHALL MEET THE REQUIREMENTS OF ASTM A500 GRADE B (46 KSI YIELD POINT MATERIAL).

4. ALL POLYGON FORMED STEEL SHAFTS SHALL MEET THE REQUIREMENTS OF ASTM A572 GR. 65 (Fy= 65 ksi).

5. ALL WELDED CONNECTIONS SHALL CONFORM TO THE LATEST VERSION OF THE AMERICAN WELDING SOCIETY AWS D1.1 CODE. ALL WELD ELECTRODES OR WIRE SHALL AT A MINIMUM CONFORM TO AWS E81T1-Ni1CJ H8 ELECTRODES (80 KSI YIELD).

6. ALL STEEL SHAPES AND PLATES SHALL BE HOT-DIPPED GALVANIZED ACCORDING TO ASTM A123. ALL STEEL NUTS AND BOLTS AND ASSOCIATED HARDWARE SHALL BE HOT-DIPPED ACCORDING TO ASTM A153.

7. WIND TESTING OF ARTIFICIAL TREE BRANCHES HAS BEEN COMPLETED BY THE SUPPLIER OF THE BRANCHES, CELL TREES, INC.. CELL TREES, INC. HAS VERIFIED THE STRENGTH OF THE BRANCHES THROUGH FULL SCALE WIND TESTING. THE WIND AREA USED IN THE CALCULATIONS IS BASED ON THE WIND TEST DATA. THE CALCULATIONS ACCOUNT FOR BRANCHES ATTACHED TO THE MONOPOLE SHAFT AS SHOWN IN THE BRANCH LAYOUT TABLE ON SHEET MP-2. DAVINCI ENGINEERING, INC. HAS REVIEWED AND APPROVED THE WIND TEST METHODS.

8. THE MAIN MONOPOLE STRUCTURE SHALL BE FABRICATED BY TRANS AMERICAN POWER PRODUCTS. TAPP IS A CERTIFIED FABRICATOR OF CONVENTIONAL STEEL STRUCTURES. ADDITIONAL FABRICATOR LICENSE INCLUDE: CITY OF LOS ANGELES # 1965.

9. SPECIAL INSPECTION SHALL BE PERFORMED ACCORDING TO SECTION 1704 OF THE CBC 2010.

10. IT IS THE CONTRACTORS SOLE RESPONSIBILITY TO NOTIFY THE SPECIAL INSPECTOR OR INSPECTION AGENCY (OR THE INSPECTING GEOTECHNICAL ENGINEER) AT LEAST ONE WORKING DAY PRIOR TO PERFORMING ANY WORK THAT REQUIRES SPECIAL INSPECTION. PER THE CBC 2010. ANY WORK THAT REQUIRES SPECIAL INSPECTION THAT IS INSTALLED OR COVERED WITHOUT THE APPROVAL OF THE SPECIAL INSPECTION IS SUBJECT TO REMOVAL.

11. THE LIST OF SPECIAL INSPECTIONS IS IN ADDITION TO INSPECTIONS REQUIRED BY SECTION 108.4.4 OF THE CBC 2010. SPECIAL INSPECTION IS NOT A SUBSTITUTION FOR INSPECTION BY A CITY INSPECTOR.

12. THE SPECIAL INSPECTOR SHALL BE APPROVED BY THE LOCAL JURISDICTION TO PERFORM THE TYPES OF INSPECTION REQUIRED.

13. CONTINUOUS INSPECTION IS ALWAYS REQUIRED DURING THE PERFORMANCE OF THE WORK UNLESS OTHERWISE SPECIFIED.

14. ANY SUPPORT SERVICE PERFORMED BY THE ENGINEER OF RECORD DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES, WHICH ARE FURNISHED BY OTHERS. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER OF RECORD ARE ONLY FOR THE PURPOSE OF ASSISTING IN THE QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH THE CONTRACT DOCUMENTS. THIS SUPPORT DOES NOT GUARANTEE THE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.

ERECTION NOTES:

1. ALL ANTENNA COAXIAL CABLES SHALL BE RUN INSIDE THE MONOPOLE SHAFT.

2. THE CONTRACTOR SHALL INSTALL THE ANTENNA AND MOUNT AS REQUIRED BY THE OWNER.

3. ALL ANCHOR BOLT NUTS SHALL BE TIGHTENED TO AISC SNUG TIGHT REQUIREMENTS. THE SNUG TIGHT CONDITION IS DEFINED AS THE TIGHTNESS THAT EXIST WHEN ALL PLIES IN A JOINT ARE IN FIRM CONTACT, THIS MAY BE ATTAINED BY A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF A MAN USING AN ORDINARY SPUD WRENCH.

4. ALL GALVANIZED SURFACES THAT ARE DAMAGED BY ABRASIONS, CUTS, DRILLING OR FIELD WELDING DURING SHIPPING OR ERECTION SHALL BE TOUCHED UP WITH TWO COATS OF A COLD GALVANIZING COMPOUND MEETING THE REQUIREMENTS OF ASTM A780.

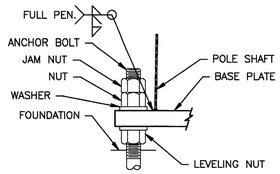
5. THE ANCHOR BOLT TEMPLATES AND BASE PLATE WILL TYPICALLY HAVE AN AZIMUTH WELDED OR A NOTCH INDICATING THE CORRECT ORIENTATION OF THE ANCHOR BOLTS. THIS IS NECESSARY TO PROPERLY ORIENT THE MONOPOLE EXIT PORTS

6. ALL SLIP SPLICES SHALL BE JACKED TO WITHIN THE SLIP SPLICE DESIGN CRITERIA AS SHOWN ON THESE DRAWINGS. IF THE DESIGN SPLICE CANNOT BE ATTAINED DAVINCI ENGINEERING SHALL BE CONTACTED TO ADVISE.

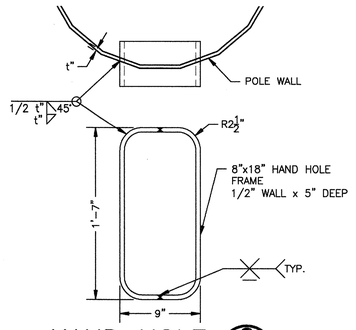
MONOPOLE ANCHORAGE:

1. CELL TREES, INC. STANDARD ANCHOR ROD LENGTH IS 7-FT LONG WITH 6-FT OF EMBEDMENT INTO THE CONCRETE. IT IS THE RESPONSIBILITY OF THE ENGINEER DESIGNING THE FOUNDATION TO ENSURE THAT THE FULL STRENGTH OF THE ANCHOR ROD IS DEVELOPED IN THE CONCRETE. CONTACT DAVINCI ENGINEERING, INC. WITH ANY QUESTION PERTAINING TO THE ANCHOR ROD DEVELOPMENT.

Additional Notes:

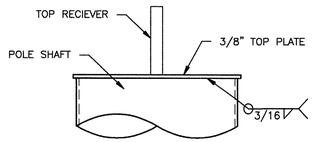


ANCHOR BOLT 1 MP-1

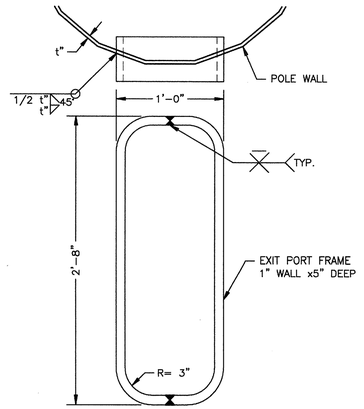


HAND HOLE 6 MP-1

ASTM A572 GR. 50 (50 KSI)



TOP PLATE 5 MP-1



EXIT PORT 3 MP-1

ASTM A572 GR. 65 (65 KSI)

BRANCH LAYOUT

Elevation	deg.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
59.00	90									6									
59.00	30					4						4						4	
58.25	50		4						4						4				
57.50	15				6						6						6		
56.50	15						6						6						6
55.50	15			4						4						4			
55.00																			
54.00	0	4						4						4					
53.00	0					6						6						6	
52.00	0		4						4						4				
51.00	15				8						8						8		
50.00	15						8						8						8
49.00	15			6						6						6			
48.00	15	8						8						8					
47.00	15					6						6						6	
46.00	15		6						6						6				
45.50	15				6						6						6		
45.00																			
44.00	15						6						6						6
43.00	15			8						8						8			
42.00	15	8						8						8					
41.00	15					6						6						6	
40.00	15		8						8						8				
39.00	15				6						6						6		
38.00	15						8						8						8
37.00	15			8						8						8			
36.00	15	8						8						8					
35.50	15					6						6						6	
35.00																			
34.00	15		6						6						6				
33.00	15				8						8						8		
32.00	15						8						8						8
31.00	15			6						6						6			
30.00	15	8						8						8					
29.00	15					8						8						8	
28.00	15		8						8						8				
27.00	15				6						6						6		
26.00	15						8						8						8
25.00	15			8						8						8			
24.00	15	8						8						8					
23.00	15					8						8						8	
22.00	15		8						8						8				
21.00	15				8						8						8		
20.00	15						8						8						8
19.00	15			8						8						8			
18.00	15	10						10						10					
17.00	15					8						8						8	
16.25	15		10						10						10				
15.50	15				10						10						10		
15.00	15						10						10						10

SEE DETAIL 7/MP-1 FOR FLAT NUMBERING
TOTAL BRANCH COUNT =139
AVG. 3.16 BRANCHES/FT
ANTENNA SOCK PROVIDED FOR EACH ANTENNA
TB = TOP BRANCH
4=4 FT BRANCH
6=6 FT BRANCH
8=8 FT BRANCH
10=10 FT BRANCH

COAX PORT HOLE SCHEDULE				
ELEVATION (AGL)	PORT SIZE	QTY	AZIMUTH (DEG.)	REFERENCE DETAIL
53'-0"	8"x18"	3	0,120,240	6\MP-1
43'-0"	8"x18"	3	0,120,240	6\MP-1
33'-0"	8"x18"	3	0,120,240	6\MP-1
3'-6"	10"x30"	2	0,180	3\MP-1
–	–	–	–	–
–	–	–	–	–
–	–	–	–	–

DESIGN SPECIFICATIONS			
DESIGNED ACCORDING TO: ANSI/TIA-222-G-2			
COMPLIES WITH: 2010 CALIFORNIA BUILDING CODE			
EARTHQUAKE DESIGN DATA			
(PER THE EQUIVALENT LATERAL FORCE PROCEDURE; SECTION 1613)			
IMPORTANCE FACTOR (I): 1		OCCUPANCY CATEGORY: Group I	
Sds: 0.928	Sds:0.500	Sd: 1.392	S1: 0.500
SEISMIC DESIGN CATEGORY: E; SITE CLASS D			
DESIGN BASE SHEAR = 24K (WIND)			
SEISMIC RESPONSE COEFFICIENT (Cs): 0.62			
RESPONSE MODIFICATION FACTOR (R): 1.50			
Wind Speed Load Cases: (According to the ANSI/TIA-222-G-2)			
STRUCTURE CLASS	EXPOSURE CATEGORY	TOPOGRAPHIC CATEGORY	CREST HEIGHT
II	C	1	0.0
LOAD CASE 1: 85 MPH DESIGN WIND SPEED			
LOAD CASE 2: 60 MPH OPERATIONAL WIND SPEED			
POLE STEEL SPECIFICATIONS			
POLE SHAFT SHAPE: 18-SIDED TAPERED POLYGON			
POLE SHAFT TAPER: 0.21336 inches/ft.			
POLE SHAFT STEEL: ASTM A572 GR. 65 (Fy= 65 ksi)			
BASE PLATE STEEL: ASTM A572 GR. 60 (Fy= 60 ksi)			
ANCHOR RODS: 2 1/4"ø #18J A615 GR. 75 x 7 FT LONG			

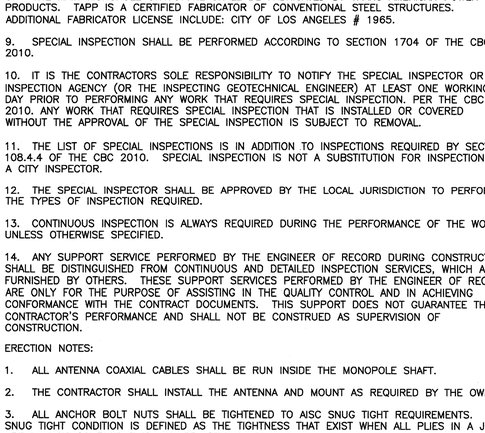
MONOPOLE BASE REACTIONS: (Maximum Factored Reactions)		
MOMENT:	808	ft-kips
SHEAR:	21.5	kips
AXIAL:	15.4	kips

POLE SHAFT SECTION DIMENSIONS					
	SECTION LENGTH (ft)	WALL THK. (inches)	SPLICE LENGTH (ft)	TOP DIA. (inches)	BOT. DIA. (inches)
Top	41.75	0.1875	3.75	18.000	26.908
	20.00	0.2188	0.00	25.733	30.000

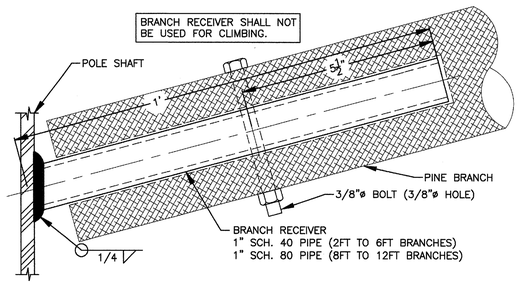
MONOPOLE TWIST & SWAY CRITERIA				
	85 MPH WIND SPEED		60 MPH WIND SPEED	
ELEVATION	DEFLECTION	ROTATION	DEFLECTION	ROTATION
59 ft	24.46"	2.9°	6.79"	0.8°

APPURTENANCE LIST	
Elev.(ft)	Equipment Description:
TOP	LIGHTNING ROD (OPTIONAL)
55.0	(12) HBX-3319DS-VTM PANEL ANTENNA
55.0	STD. 4-FT T-ARM MOUNT
45.0	(12) 72"x12"x7" PANEL ANTENNA (FUTURE)
45.0	STD. 8-FT T-ARM MOUNT (FUTURE)
35.0	(12) 60"x12"x7" PANEL ANTENNA (FUTURE)
35.0	STD. 8-FT T-ARM MOUNT (FUTURE)

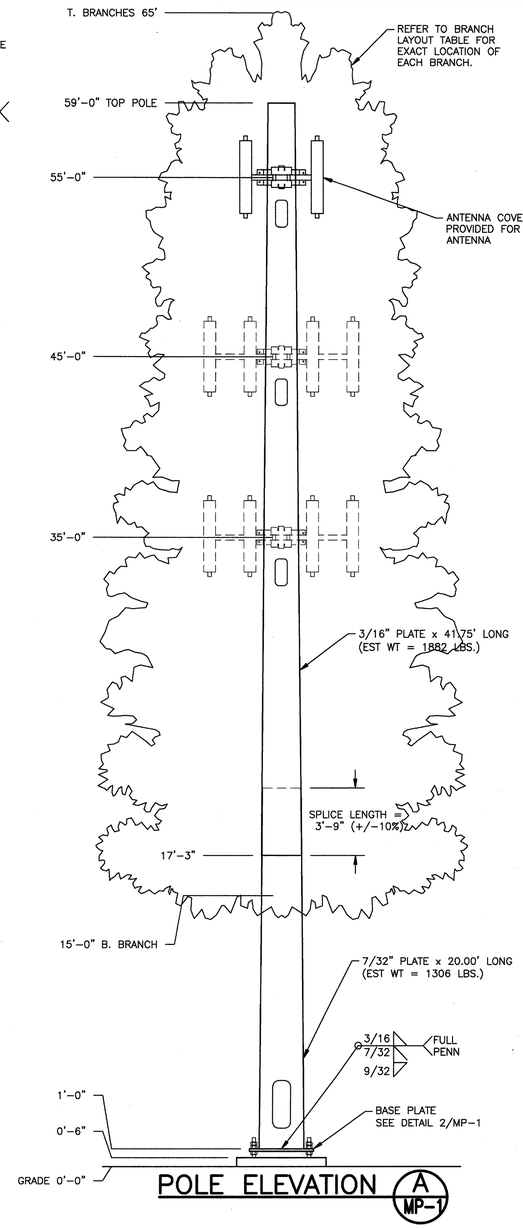
NOTES: ARTIFICIAL TREE BARK ON POLE SHAFT TO FULL HEIGHT
ANTENNA COAX CABLES ROUTED INSIDE POLE SHAFT



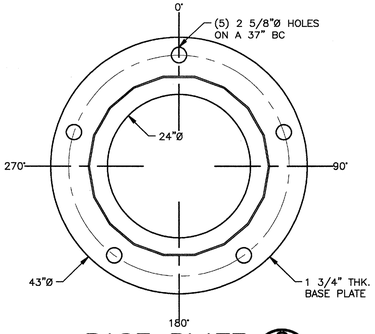
FLAT NUMBERING 7 MP-1



BRANCH RECEIVER 4 MP-1



POLE ELEVATION A MP-1



BASE PLATE 2 MP-1

DESIGNED ACCORDING TO: ANSI/TIA-222-G-2
MEETS THE REQUIREMENTS OF: CBC 2010

DaVinci Engineering, Inc.
P.O. BOX 1966
SANTA MARIA, CA 93456
(805) 922-5221

Cell Trees Inc.
5401 S. CANADA PLACE
TUCSON, AZ 85706
(520) 663-1330

Site Name: DEBIRD TOWING
Site No.: CA2944
Site Location: 601 SOUTH SANTA FE SANTA ANA, CA
Designed By: SWL
Drawn By: SWL
Date: 09-01-2011
Scale: NTS/_AS_NOTED

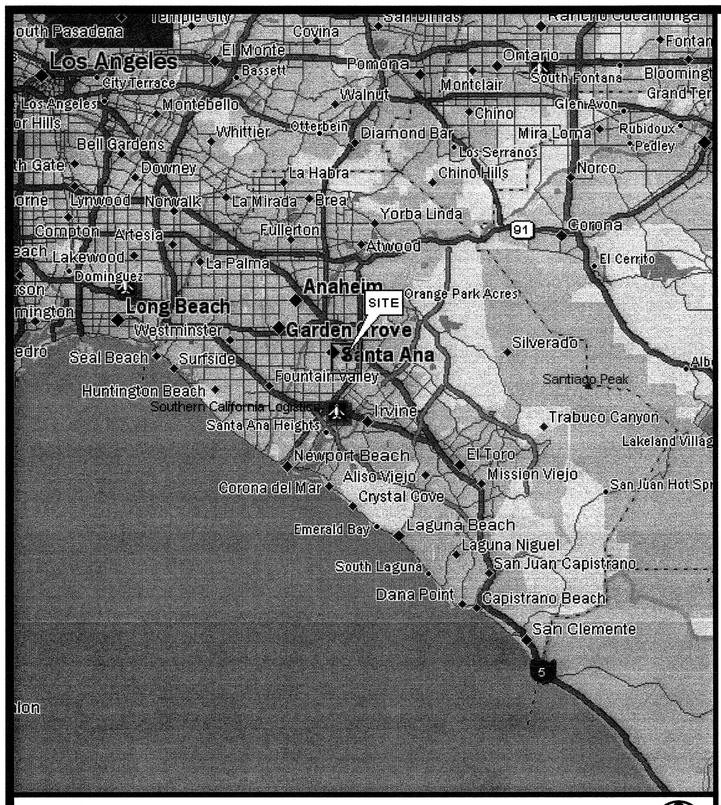
Project Description: 65-FT PINE TREE MONOPOLE
Project Number: 6111225-115
CELL TREES, INC. 11-123
Owner: TOWERCO

Description: APPROVED FOR FABRICATION
Revision: Date: By:

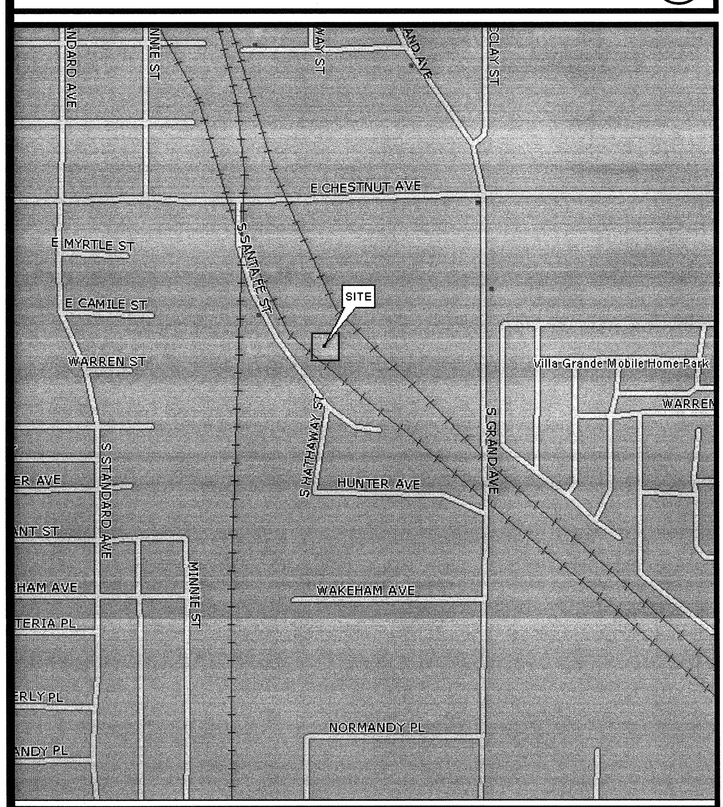
REGISTERED PROFESSIONAL ENGINEER SHAWN W. LEAND 68807 exp. 9/30/13 CIVIL STATE OF CALIFORNIA
9/6/11

Sheet No.
MP-1

R:\Engineering Documents\AutoCAD Drawings\Cell Trees, Inc 225\2011\1225-115.dwg MP-1 | Tue 06-Sep-2011 03:18 pm



VICINITY MAP



LOCATION MAP

START AT LONG BEACH /DAUGHERTY FIELD. GO STRAIGHT (E) ON E DONALD DOUGLAS DR. IN 0.46 MI TURN RIGHT (SSW) ON TO SR 19 (N LAKEWOOD BLVD). IN 1.00 MI KEEP RIGHT (ESE) ON TO I-405 S (SAN DIEGO FWY) RAMP. IN 6.63 MI KEEP RIGHT (E) ON TO GARDEN GROVE FWY (SR 22) RAMP 21.IN 0.29 MI KEEP LEFT (E) ON GARDEN GROVE FWY (SR 22) RAMP. IN 9.77 MI GO STRAIGHT (SE) ON TO I-5 S (SANTA ANA FWY) RAMP 14C. IN 2.20 MI KEEP RIGHT (SE) ON TO E SANTA ANA BLVD RAMP 104B. IN 0.20 MI TURN LEFT (E) ON TO E SANTA ANA BLVD. IN 0.11 MI TURN RIGHT (S) ON TO N GRAND AVE. IN 0.61 MI GO STRAIGHT (SSE) ON TO S GRAND AVE. IN 0.22 MI TURN RIGHT (W) ON TO E CHESTNUT AVE. IN 0.22 MI TURN LEFT (SSE) ON TO S SANTA FE ST. IN 0.16 MI FINISH AT SITE.

LATITUDE: N33° 44' 26.10"±
LONGITUDE: W117° 51' 10.10"±

DRIVING DIRECTIONS

PROJECT INFORMATION:

59' SELF-SUPPORTING STEALTH POLE STRUCTURE DRILLED SHAFT FOUNDATION DESIGN

SITE NAME:

BLUEBIRD TOWING

SITE NUMBER:

CA2944

SITE LOCATION:

601 S. SANTA FE SANTA ANA, CA 92701 (ORANGE COUNTY)

RECEIVED
JAN 03 2012
City of Santa Ana

DIGALERT
CALIFORNIA ONE CALL
CALL BEFORE YOU DIG
1-800-227-2600

THE UTILITIES SHOWN HEREON ARE FOR THE CONTRACTORS CONVENIENCE ONLY. THERE MAY BE OTHER UTILITIES NOT SHOWN ON THESE PLANS. THE ENGINEER/SURVEYOR ASSUMES NO RESPONSIBILITY FOR THE LOCATIONS SHOWN AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL UTILITIES WITHIN THE LIMITS OF THE WORK. ALL DAMAGE MADE TO EXISTING UTILITIES BY THE CONTRACTOR SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

UTILITY STATEMENT

SHEET	DESCRIPTION	REV
T-1	TITLE SHEET	1
N-1	PROJECT NOTES	0
F-1	DRILLED SHAFT DESIGN & BILL OF MATERIAL	1
F-2	SECTION ELEVATION DETAIL	1

INDEX OF SHEETS

REGISTERED PROFESSIONAL ENGINEER — Lutz Kunze — No. C-025801 — Exp. 12-31-11 — CIVIL — STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER — LUTZ KUNZE — No. GE 493 — Exp. 12/31/11 — GEOTECHNICAL — STATE OF CALIFORNIA

THIS PLAN HAS BEEN REVIEWED BY EARTH SYSTEMS SOUTHWEST AND APPEARS TO BE IN GENERAL CONFORMITY WITH THE RECOMMENDATIONS IN OUR REPORT DATED 9/2/11 WE MAKE NO REPRESENTATION AS TO ACCURACY OF DIMENSIONS, MEASUREMENTS, CALCULATIONS OR ANY PORTION OF THE DESIGN.

CIVIL/SOIL ENGINEER

RCE NO. C-025801 DATE 12/22/11

SEAL:

REGISTERED PROFESSIONAL ENGINEER — Lutz Kunze — No. C-025801 — 12/31/2012 — CIVIL — STATE OF CALIFORNIA

September 23, 2011

REV	DATE
1	09-23-11
0	09-19-11

DRAWN BY: MEA | CHECKED BY: MER

SHEET NUMBER: T-1 | REVISION: 1

VSI #: 111256

PREPARED FOR:
TowerCo
5000 Valleystone Drive
Cary, NC 27519
Office: (919) 468-5559
Fax: (919) 469-5530

PROJECT NAME: BLUEBIRD TOWING (D.S.)

TOWERCO JOB #: CA2944

PREPARED BY:
vertical solutions
2002 Production Drive
Apex, NC 27539
Office: (888) 321-6167
www.verticalsolutions-inc.com

10173326 – Rck JASON

GENERAL NOTES:

1. DESIGN(S) ARE BASED ON:
   A. REACTIONS AND ANCHOR BOLT LAYOU T BY CELL TREES INC. DRAWINGS DATED SEPTEMBER 1, 2011, PROJECT NO. 6111225-115.
      i. MOMENT = 505 KIPS-FT (UNFACTORED,DESIGN) 252 KIPS-FT (UNFACTORED, SERVICE) 808 KIPS-FT (FACTORED,DESIGN)
      ii. SHEAR = 13.4 KIPS (UNFACTORED,DESIGN) 6.7 KIPS (UNFACTORED, SERVICE) 21.5 KIPS (FACTORED,DESIGN)
      iii. AXIAL = 12.8 KIPS (UNFACTORED,DESIGN) 12.8 KIPS (UNFACTORED, SERVICE) 15.4 KIPS (FACTORED,DESIGN)
      iv. (5) 2.25"Ø ANCHOR RODS EQUALLY SPACED ON 37" B.C. WITH MINIMUM EMBEDMENT PER MANUFACTURER.
   B. GEOTECHNICAL INVESTIGATION BY EARTH SYSTEMS SOUTHWEST. DATED SEPTEMBER 2, 2011, FILE NO. 50322-01/ DOC. NO. 11-09-700.
   C. 1.50" DEFLECTION LIMIT CRITERIA AT UNFACTORED DESIGN REACTIONS.
   D. 0.75" DEFLECTION LIMIT CRITERIA AT UNFACTORED SERVICE REACTIONS.

2. ABBREVIATIONS:
   A. CONC = CONCRETE
   B. VERT = VERTICAL REINFORCEMENT BAR
   C. TIE = TIE REINFORCEMENT BAR
   D. HORIZ = HORIZONTAL REINFORCEMENT BAR
   E. T&B = TOP AND BOTTOM
   F. E.W. = EACH WAY
   G. O/C = ON CENTER
   H. CY = CUBIC YARDS
   J. PSI = POUNDS PER SQUARE INCH

3. SEISMIC DESIGN
   A. OCCUPANCY CATAGORY II (COMMERCIAL USE & NON-EMERGENCY COMMUNICATION)
   B. MAPPED SPECTRAL RESPONSE VALUES
      i. Ss = 1.409g
      ii. S1 = 0.501g
      iii. SITE CLASS D
      iv. Fa = 1.00
      v. Fv = 1.50
      vi. S(Ds) = 0.940g
      vii. S(Di) = 0.501g
   C.SEISMIC DESIGN CATEGORY "D"

FOUNDATION NOTES:

1. CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI.
2. REBAR SHALL CONFORM TO ASTM SPECIFICATION A615.
3. ALL REBAR SHALL HAVE 3 INCHES MINIMUM COVER.
4. ALL EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED 1 INCH.
5. SEE GEOTECHNICAL REPORT FOR INSTALLATION REQUIREMENTS.
6. REINFORCEMENT SHALL BE 3 INCHES CLEAR FROM EDGES OF CONCRETE.

REGISTERED PROFESSIONAL ENGINEER Lutz Kunze No. C-025801 Exp. 12-31-11 CIVIL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER LUTZ K. KUNZE No.GE 493 Exp. 12/31/11 GEOTECHNICAL STATE OF CALIFORNIA

THIS PLAN HAS BEEN REVIEWED BY EARTH SYSTEMS SOUTHWEST AND APPEARS TO BE IN GENERAL CONFORMITY WITH THE RECOMMENDATIONS IN OUR REPORT DATED 9/2/11 WE MAKE NO REPRESENTATION AS TO ACCURACY OF DIMENSIONS, MEASUREMENTS, CALCULATIONS OR ANY PORTION OF THE DESIGN.

Lutz Kunze

CIVIL/SOIL ENGINEER

RCE NO. C-025801 DATE 12/22/11

SEAL:

REGISTERED PROFESSIONAL ENGINEER C 63529 Renewal 06/30/2012 CIVIL STATE OF CALIFORNIA

September 19, 2011

DRAWN BY: MEA | CHECKED BY: MER

SHEET NUMBER: **N-1**

REVISION: 0

VSI #: 111256

REV	DATE
0	09-19-11

PREPARED FOR:

TowerCo

5000 Valleystone Drive
Cary, NC 27519
Office: (919) 469-5559
Fax: (919) 469-5530

PROJECT NAME: **BLUEBIRD TOWING (D.S.)**

TOWERCO JOB #: **CA2944**

PREPARED BY:

vertical solutions

2002 Production Drive
Apex, NC 27539
Office: (888) 321-6167

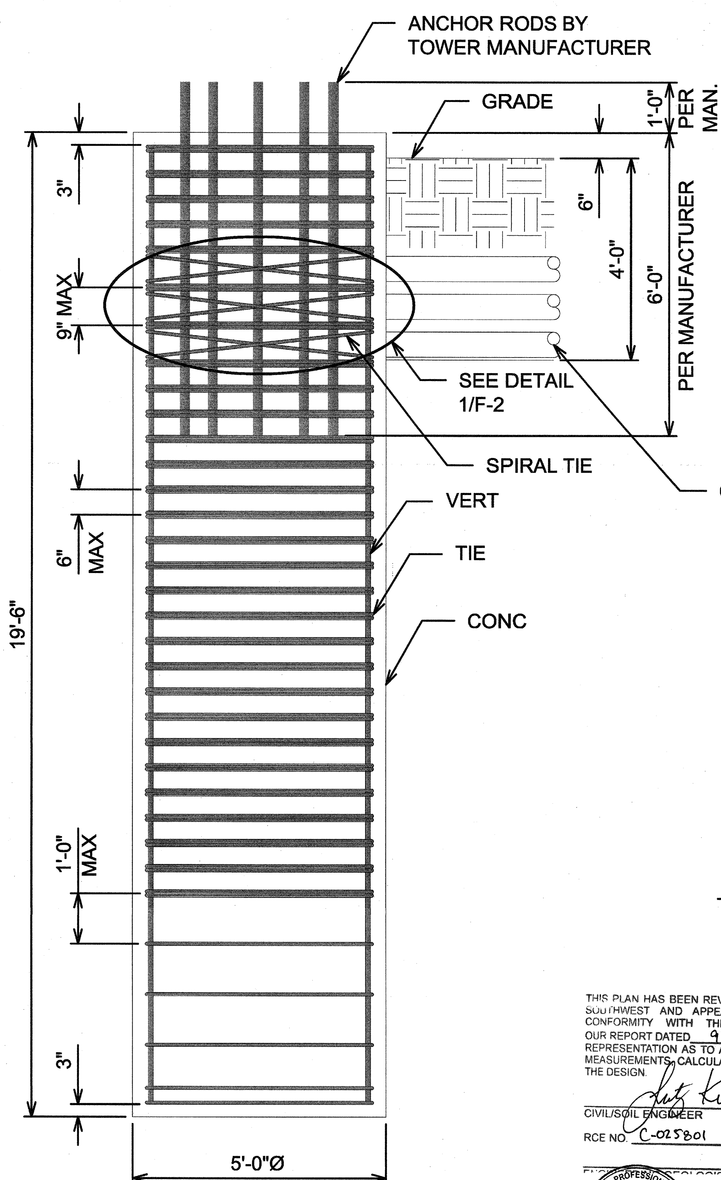
www.verticalsolutions-inc.com

BILL OF MATERIAL - DRILLED SHAFT DESIGN

MARK NO.	DESCRIPTION	SIZE	QTY
CONC.	4000-PSI MIX	14.2 CY	1
VERT.	VERTICAL BAR	#9 ASTM A615-60 x 19'-0"	21
TIE	TIE	#6 ASTM A615-60 x 16'-2"	63
SPIRAL TIE	SPIRAL TIE	#6 ASTM A615-60 x 14'-6"	6

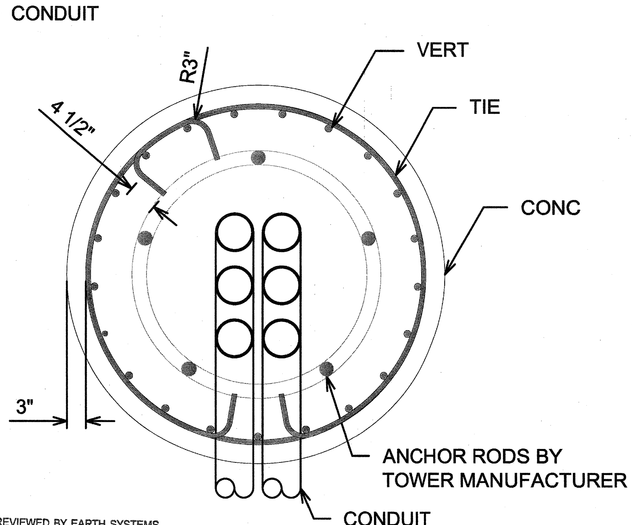
NOTE:

1. THERE ARE (2) TIES EVERY 6" FROM 0'-3" TO 15'-0".



1/F-1 FOUNDATION - ELEV

SCALE: 1/4" = 1'-0"



2/F-1 FOUNDATION - PLAN

SCALE: 3/8 = 1'-0"

THIS PLAN HAS BEEN REVIEWED BY EARTH SYSTEMS SOUTHWEST AND APPEARS TO BE IN GENERAL CONFORMITY WITH THE RECOMMENDATIONS IN OUR REPORT DATED 9/2/11 WE MAKE NO REPRESENTATION AS TO ACCURACY OF DIMENSIONS, MEASUREMENTS, CALCULATIONS OR ANY PORTION OF THE DESIGN.

CIVIL/SOIL ENGINEER

RCE NO. C-025801 DATE 12/22/11

REGISTERED PROFESSIONAL ENGINEER LUTZ KUNZE No.GE 493 Exp. 12/31/11 GEOTECHNICAL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER Lutz Kunze No. C-025801 Exp. 12-31-11 CIVIL STATE OF CALIFORNIA

SEAL:

REGISTERED PROFESSIONAL ENGINEER 63629 CIVIL STATE OF CALIFORNIA

September 23, 2011

DRAWN BY: MEA | CHECKED BY: MER

SHEET NUMBER: F-1

REVISION: 1

VSI #: 111256

REV	DATE
1	09-23-11
0	09-19-11

PREPARED FOR:

TowerCo

5000 Valleystone Drive
Cary, NC 27519
Office: (919) 469-5559
Fax: (919) 469-5530

PROJECT NAME: BLUEBIRD TOWING (D.S.)

TOWERCO JOB #: CA2944

PREPARED BY:

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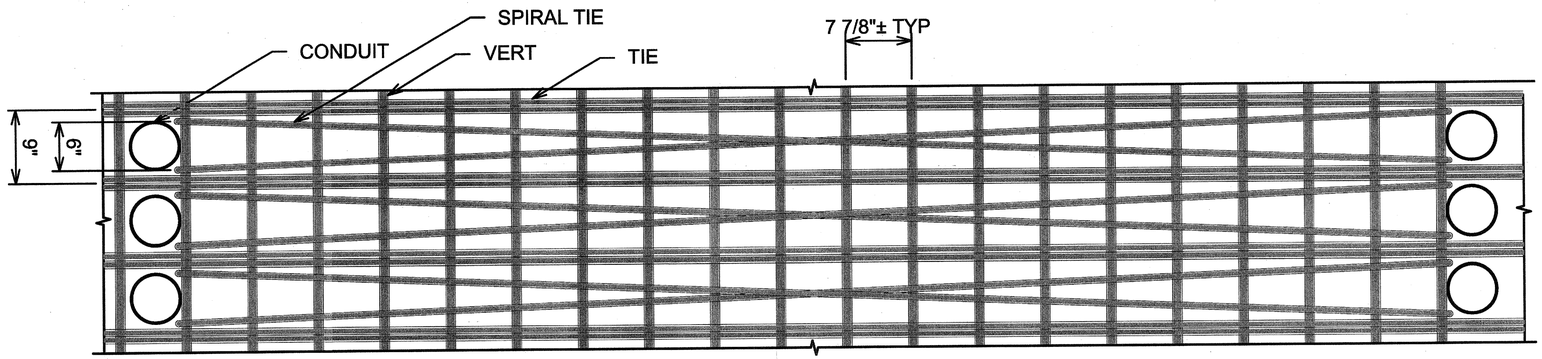

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CIVIL/SOIL ENGINEER

RCE NO. C-065801 DATE 12/22/11

REGISTERED PROFESSIONAL ENGINEER — LUTZ KUNZ — No. C 065801 — Exp. 12/31/11 — CIVIL — STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER — LUTZ KUNZ — No. C 065801 — Exp. 12/31/11 — CIVIL — STATE OF CALIFORNIA

SEAL:

REGISTERED PROFESSIONAL ENGINEER — MICHAEL E. REESE — No. 033279 — Exp. 06/30/2012 — CIVIL — STATE OF CALIFORNIA

September 23, 2011

1/F-2 SECTION ELEVATION

SCALE: 1/2" = 1'-0"

PREPARED BY:

vertical solutions
2002 Production Drive
Apex, NC 27539
Office: (888) 321-6167

www.verticalsolutions-inc.com

PROJECT NAME: (D.S.)

BLUEBIRD TOWING

TOWERCO JOB #:

CA2944

PREPARED FOR:

TowerCo
5000 Valleystone Drive
Cary, NC 27519
Office: (919) 469-5559
Fax: (919) 469-5530

REV	DATE
1	09-23-11
0	09-19-11

DRAWN BY: MEA | CHECKED BY: MER

SHEET NUMBER: F-2

REVISION: 1

VSI #: 111256