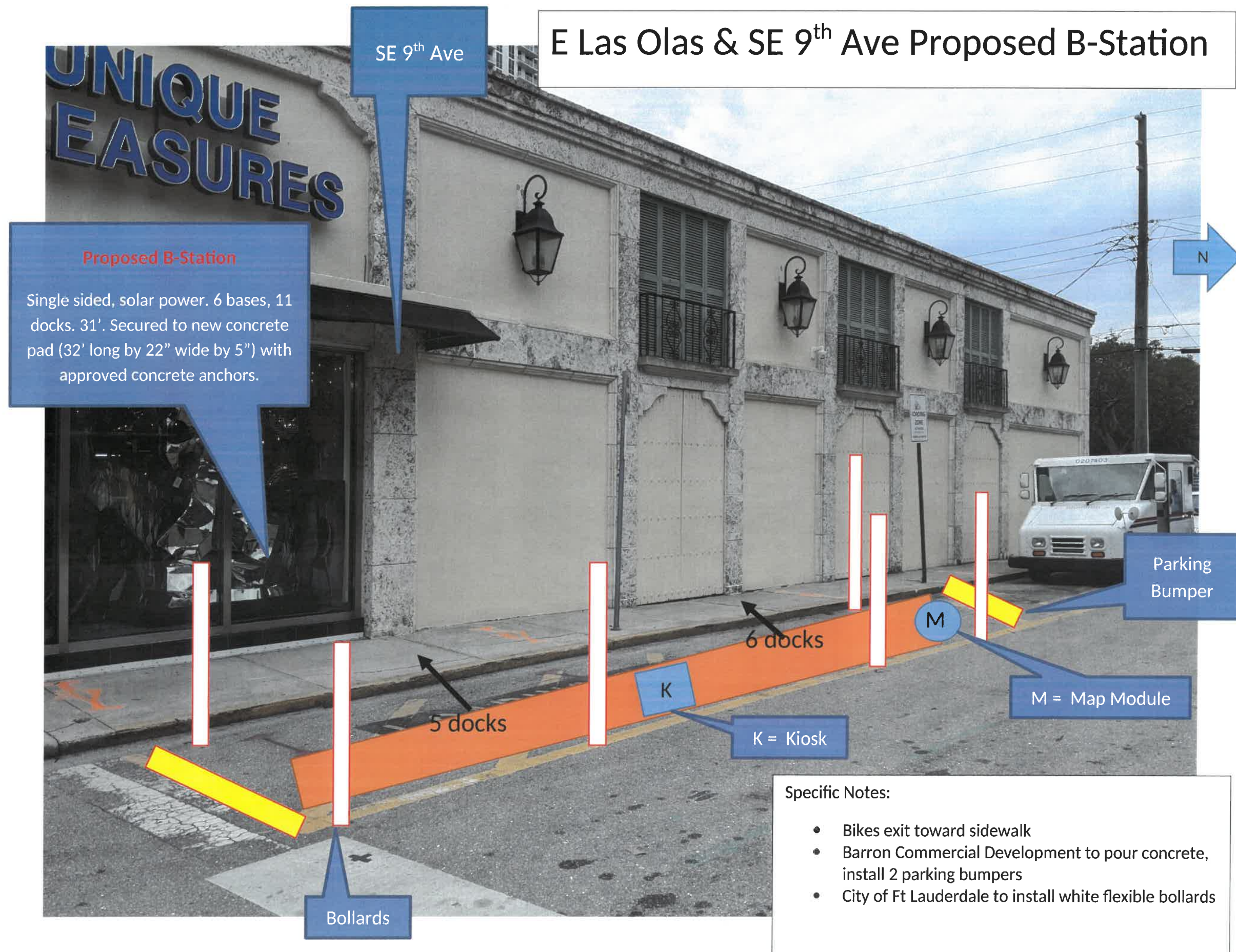


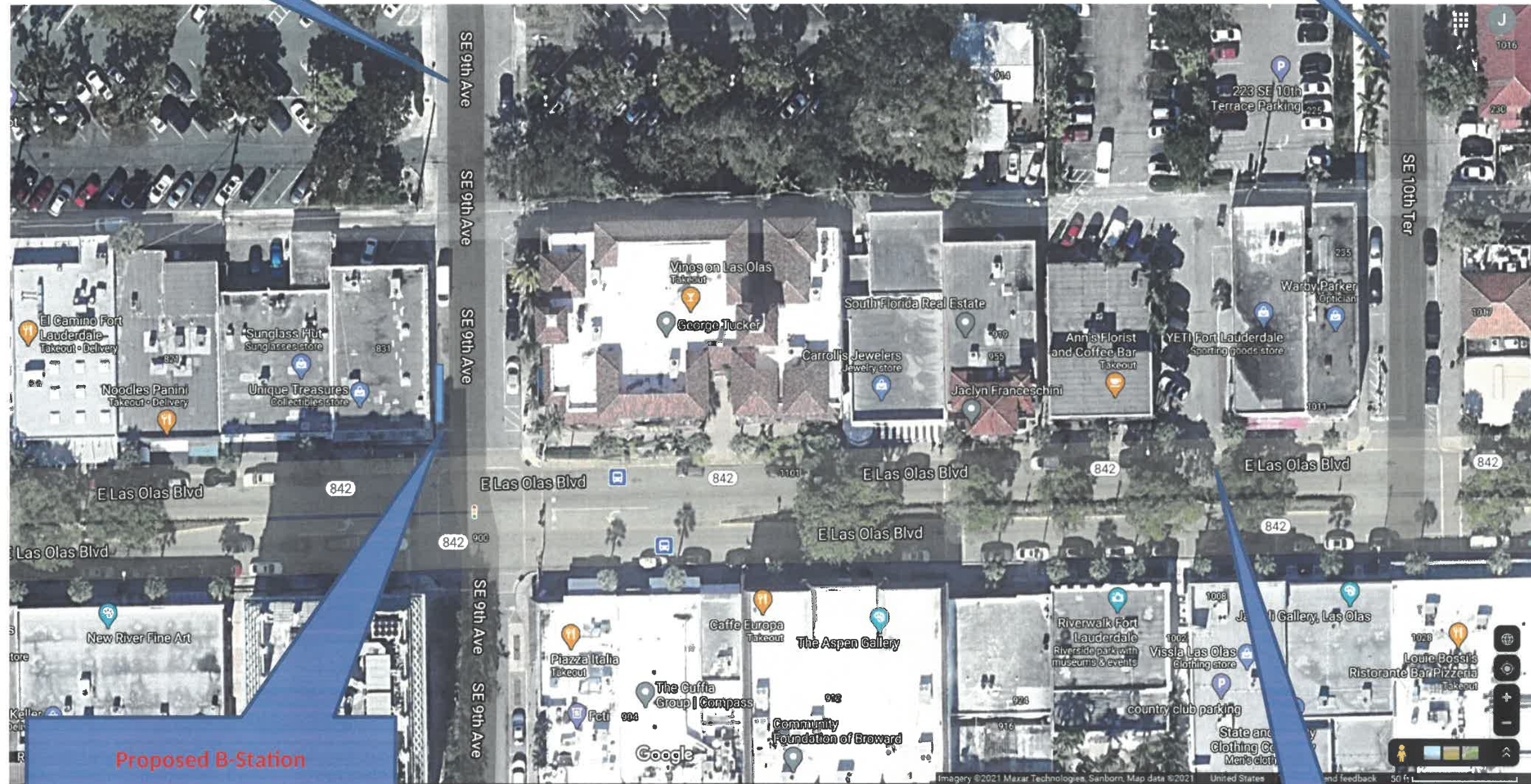
E Las Olas & SE 9th Ave Proposed B-Station



SE 9th Ave

N

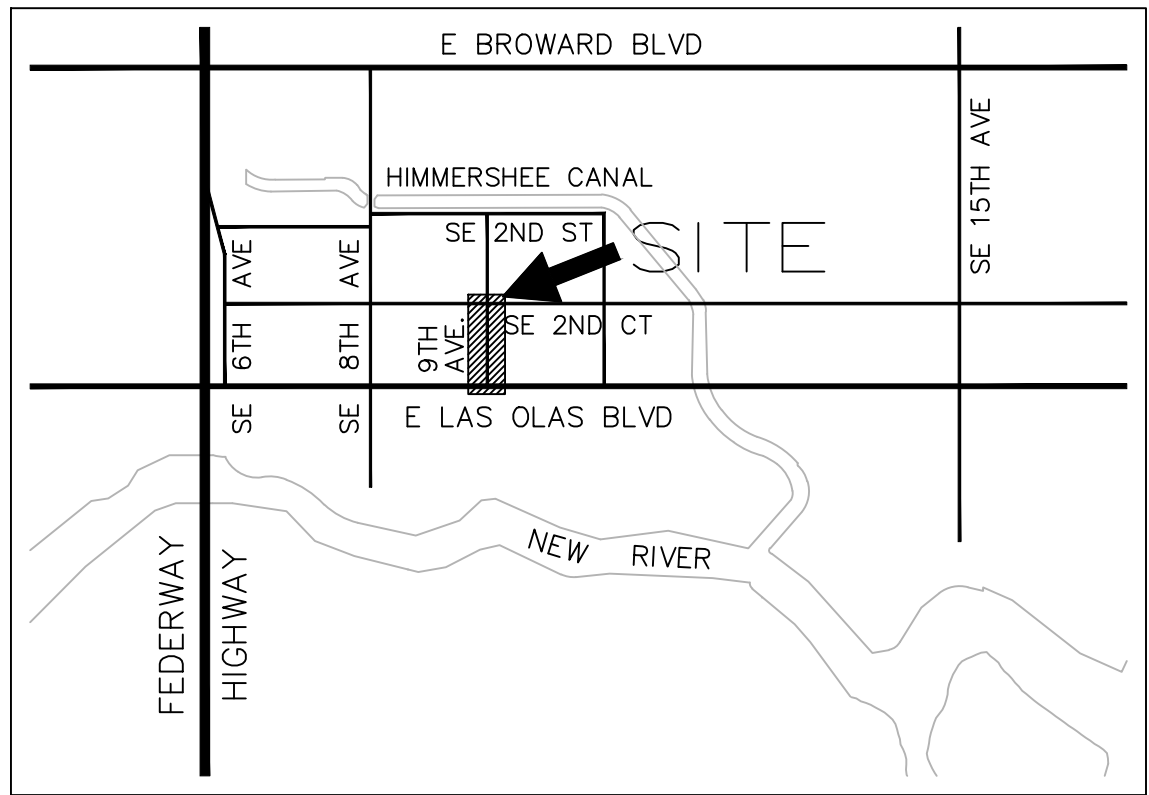
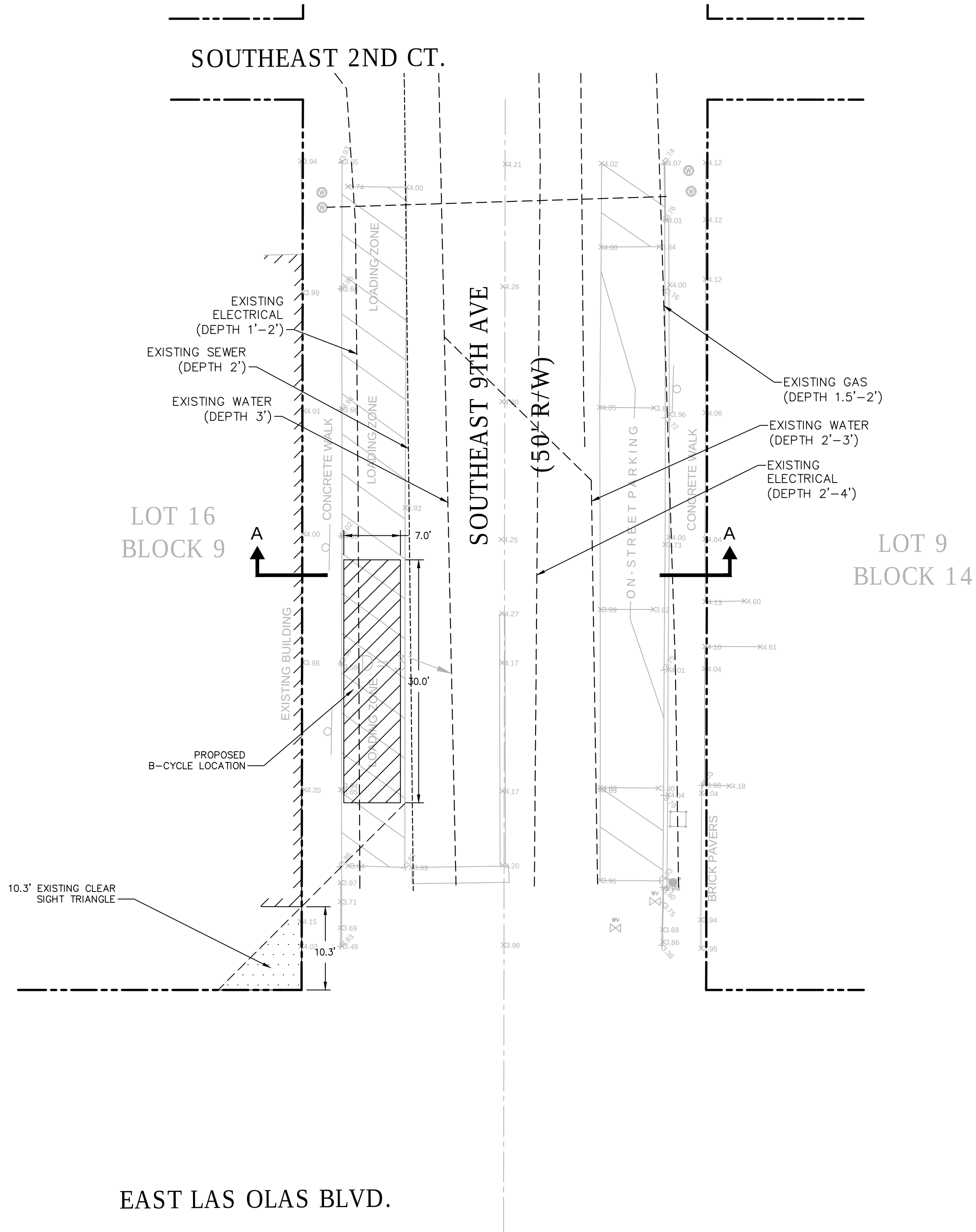
SE 10th Terr



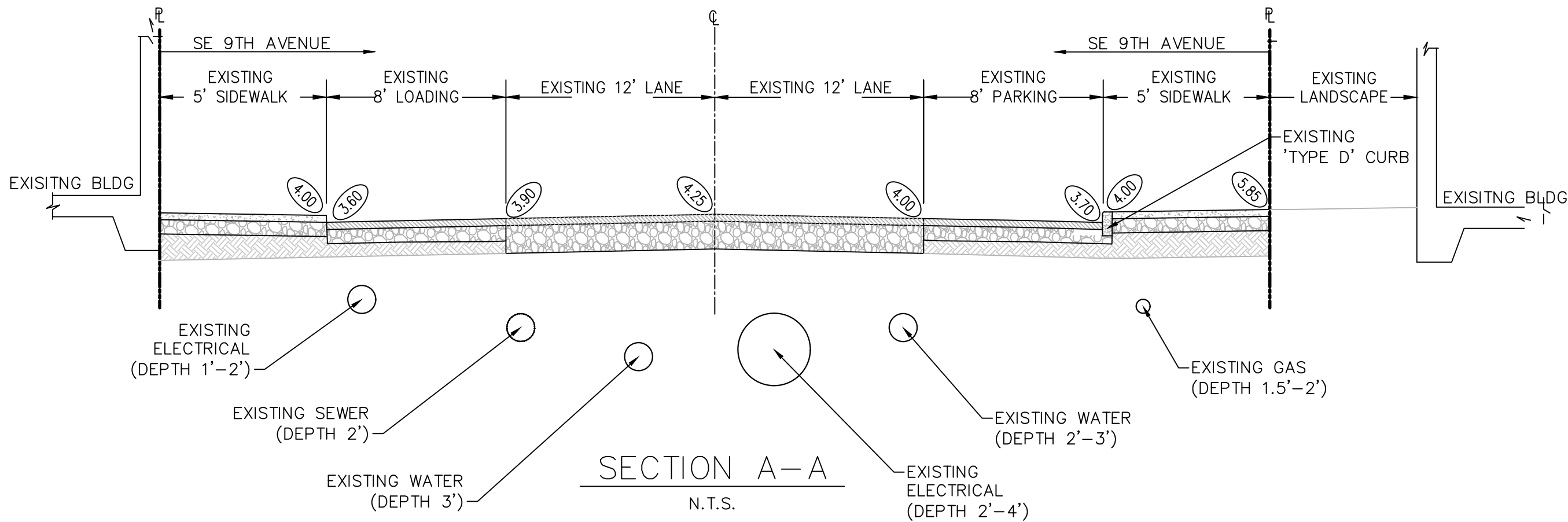
Proposed B-Station

Single sided, solar power. 6 bases, 11 docks. 31'. Secured to new concrete pad (32' long by 22" wide by 5") with approved concrete anchors.

E Las Olas
Blvd

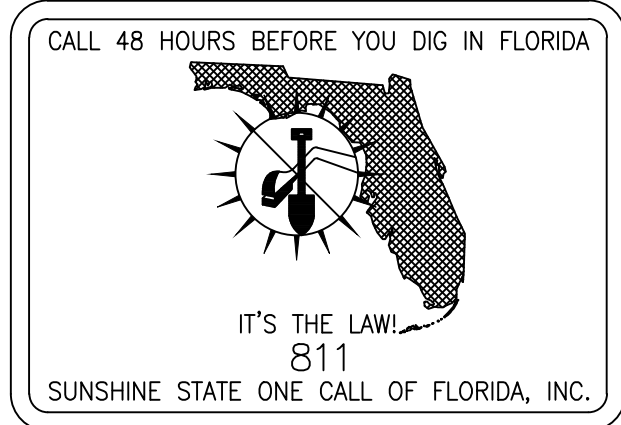


- LEGEND:**
- PROPOSED ELEVATION (NAVD)
 - EXISTING ELEVATION (NAVD)
 - PROPOSED CATCH BASIN
 - PROPOSED PLUG
 - TEE
 - WATER METER
 - DOUBLE DETECTOR CHECK W/ WAFER CHECK VALVE ON DOWNSTREAM SIDE
 - REDUCED PRESSURE BACKFLOW PREVENTOR
 - DIRECTIONAL FLOW ARROW AND GRAVITY SEWER
 - PROPOSED MANHOLE
 - WATER MAIN
 - SANITARY FORCE MAIN
 - VALVE
 - FIRE HYDRANT
 - SIAMESE CONNECTION
 - CLEANOUT
 - EDGE OF PROPOSED PAVEMENT (ASPHALT)
 - DIRECTION OF SURFACE DRAINAGE
 - SAMPLE POINT
 - EXIST. WATER MAIN
 - EXIST. UTILITY LINE TO BE ABANDONED IN PLACE



THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY DENNIS R. SHULTZ, P.E. ON Jul 19, 2021

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES



VERTICAL DATUM CONVERSION

GRADING SHOWN UTILIZES N.A.V.D. 88

N.G.V.D. 29
N.A.V.D. 88
N.A.V.D. 88 = N.G.V.D. 29 - 1.5'
N.G.V.D. 29 = N.A.V.D. 88 + 1.5'



Revisions

06/01/21	REV PER CITY ENGR
07/09/21	ADD CPR INFO
07/14/21	REV PER CITY ENGR
07/19/21	REV PER CITY ENGR

Phase:
PERMIT
DOCUMENTS

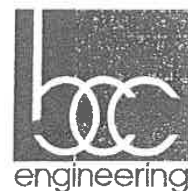
SEAL

Scale:	Date
1"=10'	05/11/21
Job No.	Plot Date
17-1364.01	07/19/21
Drawn by	Sheet No.
BMK	X1
Proj. Mgr.	
BMK	
Appr. by	1 of 1
DRS	



B CYCLE STATION STRUCTURAL DRAWINGS FOR MULTIPLE LOCATIONS THROUGHOUT MIAMI-DADE AND BROWARD COUNTIES.

PREPARED BY:



7300 North Kendall Drive, Suite 400
Miami, Florida 33156
Tel: 305.670.2350 Fax: 305.670.2351
Certificate of Authorization No. 7184
www.bcceng.com

INDEX OF DRAWINGS:

S-1.0	GENERAL NOTES
S-2.0	STATION PLAN AND ELEVATION (3 DOCK)
S-2.1	STATION PLAN (MULTIPLE DOCK LAYOUT)

DATE: JULY 14, 2011
REVISION No. 1: SEPTEMBER 26, 2011
REVISION No. 2: NOVEMBER 12, 2012



GENERAL NOTES:

1. THE GOVERNING CODE FOR THIS PROJECT IS THE FLORIDA BUILDING CODE, 2010 EDITION. THIS CODE PRESCRIBES WHICH EDITION OF EACH REFERENCED STANDARD APPLIES TO THIS PROJECT.
2. TO THE BEST OF OUR KNOWLEDGE, THE STRUCTURAL DRAWINGS AND SPECIFICATIONS COMPLY WITH THE APPLICABLE REQUIREMENTS OF THE GOVERNING BUILDING CODE.
3. CONSTRUCTION IS TO COMPLY WITH THE REQUIREMENTS OF THE GOVERNING BUILDING CODE AND ALL OTHER APPLICABLE FEDERAL, STATE, AND LOCAL CODES, STANDARDS, REGULATIONS AND LAWS.
4. THE STRUCTURAL DOCUMENTS ARE TO BE USED IN CONJUNCTION WITH THE PRODUCT DOCUMENTS.
5. CONTRACTORS WHO DISCOVER DISCREPANCIES, OMISSIONS OR VARIATIONS IN THE CONTRACT DOCUMENTS DURING BIDDING SHALL IMMEDIATELY NOTIFY THE ARCHITECT. THE ARCHITECT WILL RESOLVE THE CONDITION AND ISSUE A WRITTEN CLARIFICATION.
6. THE GENERAL CONTRACTOR SHALL COORDINATE ALL CONTRACT DOCUMENTS WITH FIELD CONDITIONS AND DIMENSIONS PRIOR TO CONSTRUCTION.
7. THE CONTRACTOR SHALL PROTECT ADJACENT PROPERTY, HIS OWN WORK AND THE PUBLIC FROM HARM. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS AND METHODS, AND JOBSITE SAFETY INCLUDING ALL OSHA REQUIREMENTS.

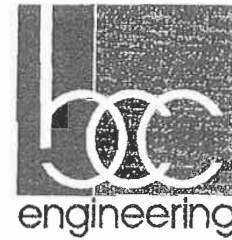
8. DESIGN WIND LOADS

GOVERNING CODE	ASCE 7-10
BASIC WIND SPEED	V = 165 MPH
RISK CATEGORY	I
DIRECTIONALITY FACTOR	Kd = 0.85
EXPOSURE	D

9. MAXIMUM ALLOWABLE SOIL BEARING PRESSURES ARE PRESUMED TO BE 2000 PSF.

EXPANSION ANCHORS:

1. USE GALVANIZED WEDGE-TYPE EXPANSION ANCHORS SUCH AS THE HILTI KWIK BOLT III, ITW RAMSET RED HEAD TRUBOLT WEDGE, SIMPSON STRONG-TIE WEDGE-ALL OR EQUIVALENT. FOLLOW MANUFACTURER'S SPECIFICATIONS FOR USE AND INSTALLATION.
2. PROVIDE ANCHOR EMBEDMENT, SPACING AND EDGE DISTANCE AS SHOWN ON THE DRAWINGS.



Certificate of Authorization No. 7164
7300 North Kendall Drive, Suite 400
Miami, Florida 33156
Tel: 305.670.2350 Fax: 305.670.2351
www.bcceng.com



To the best of my knowledge these plans and specifications comply with the applicable minimum building codes.

STEVEN GOLDSTEIN, P.E.
Florida License No. 44423

Submittals / Revisions

11-16-12 FBC 2010

Drawn: CA

Checked: FD

Reviewed: SG

BCC Project No.: 100571.00

Date: 07-14-11



GENERAL NOTES

S-1.0



To the best of my knowledge these plans and specifications comply with the applicable minimum building codes.

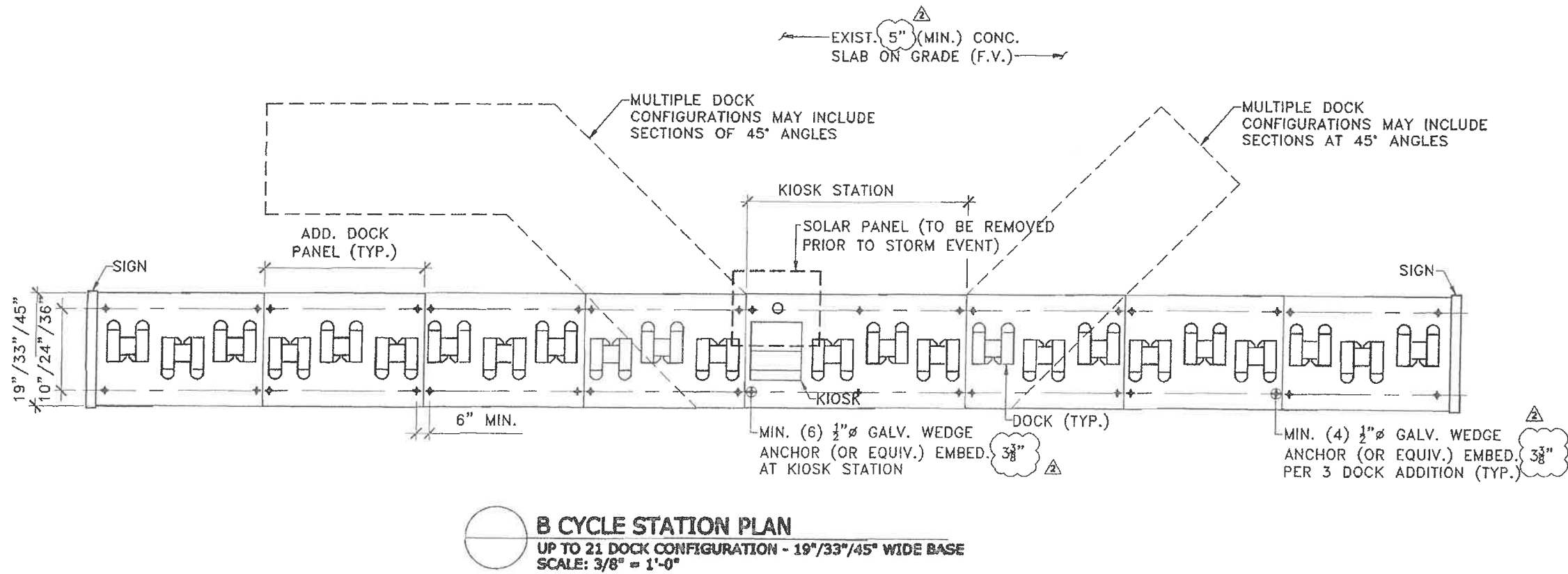
STEVEN GOLDSTEIN, P.E.
Florida License No. 44423

Submittals / Revisions	
09-26-11	OWNER REV.
11-16-12	FBC 2010

Drawn: CA
Checked: PD
Reviewed: SG
BCC Project No.: 100571.00
Date: 07-14-11



S-2.1



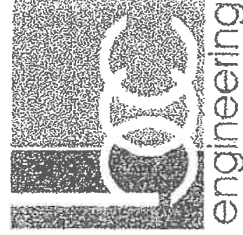
REVISED STRUCTURAL CALCULATIONS

FOR



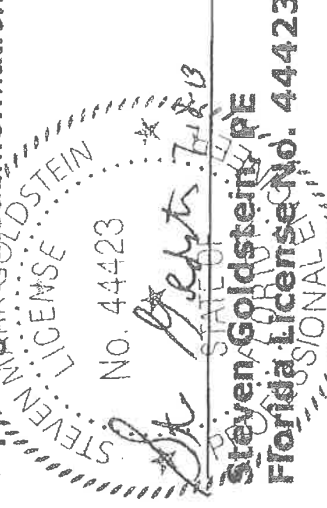
**Stations throughout
Miami-Dade and Broward County**

Prepared by:



**BCC Engineering, Inc.
Certificate of Authorization No. 7184
November 16, 2012- Revision 2**

Calculations have been prepared by the undersigned engineer assuming responsibility for manual and computer generated information.



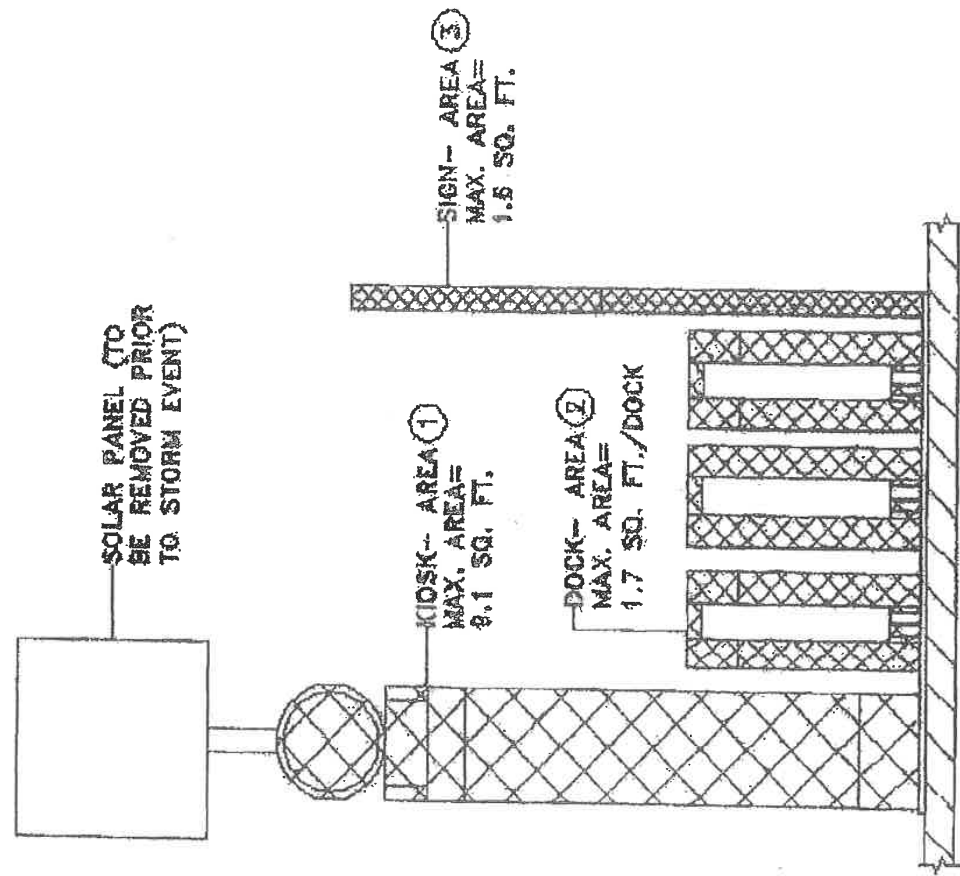
BCC ENGINEERING, INC. • 7300 N. Kendall Drive, Suite 400 • Miami, FL 33156 • Phone (305) 670-2350 • Fax (305) 670-2351



BCC ENGINEERING, INC.
7300 N. Kendall Drive
Suite 400
Miami, Florida 33156
t. 305.670.2350
f. 305.670.2351

B CYCLE WIND ANALYSIS

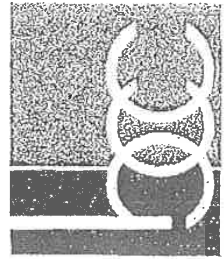
JOB			
SHEET No.	OF	JOB No.	100571.00
CALCULATED BY	JJF	DRAWN BY	
SCALE		DATE	11/10



B CYCLE STATION FRONT ELEVATION
3 DOCK CONFIGURATION - 33°/45° WIDE BASE

B Cycle stations have multiple configurations from 3 to 21 docks in linear or variations of 45 deg. angle layouts. Of all configurations, the one shown above is the controlling case (single 3 dock station).

P:\100571.00-B Cycle\Calcs\Excel\B CYCLE WIND AREAS



JOB# 0100571.00 SHEET No. 2 OF 2
PROJECT NAME BCycle
SUBJECT Foundation slab
CALCULATED BY SG DATE 11/12/12
CHECKED BY _____ DATE _____

Governing Code: IBC 2010
Governing Wind Load Standard: 7-10

Risk Category I

Location: Miami-Dade or Broward County
Design for worst case - Miami-Dade County
V = 165 MPH

Exposure = C or D depending on location
Design for worst case - Exposure D

$$K_{zt} = 1.0$$

$$\text{Height} = 7'-5" < 15' \Rightarrow K_z = 1.03$$

Load case A: Wind in short direction (wind acts on kiosk, 3 docks & narrow face of sign)

Load case B: Wind in long direction (wind acts on kiosk, 3 docks & broad face of sign)

Wind load for load case B slightly higher than for load case A, but by inspection, foundation loading much more critical for load case A due to much narrower base resisting overturning moment

Consider kiosk, docks and narrow face of sign as "Chimneys, Tanks, Similar Structures" (square) $\rightarrow K_d = 0.90$

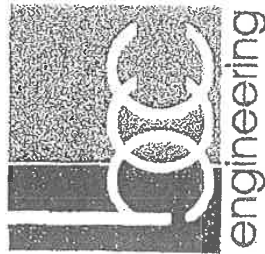
$$q_z = (1.00)(256)(1.03)(1.0)(0.90)(165)^2 = 64.6 \text{ psf}$$

$$C = 0.85$$

$$h/10_{\text{kiosk}} = 7.42/1.25 = 5.9 \quad C_f = 1.38$$

$$h/10_{\text{sign}} = 6.58/1.25 = 5.26 \quad C_f = 2.0$$

$$h/10_{\text{dock}} = 2.67/0.33 = 8 \quad C_f = 1.43$$



JOB# 010057100 SHEET No. 3 OF
PROJECT NAME B Cycle
SUBJECT Foundation Slab
CALCULATED BY SG DATE 11/12/12
CHECKED BY _____ DATE _____

Wind pressure

$$K_{\text{risk}}: (64.6)(0.85)(1.38) = 75.8 \text{ psf}$$

$$S_{\text{ign}}: (64.6)(.85)(2.0) = 110 \text{ psf}$$

$$D_{\text{ock}}: (64.6)(.85)(1.43) = 78.5 \text{ psf}$$

Total shear

$$(9.1)(75.8) + (1.6)(110) + (3)(1.7)(78.5) = 690 + 176 + 401 = 1267 \text{ lb}$$

$$\text{Overturning moment} = (690)\left(\frac{7.42}{2}\right) + 176\left(\frac{6.58}{2}\right) + 401\left(\frac{2.67}{2}\right) = 3672 \text{ ft-lb}$$

For allowable stress design use 0.6 load factor

$$M_{0.7} = 0.6(3672) = 2203 \text{ ft-lb} \quad V = (1267)(0.6) = 760 \text{ lb}$$

Weight

$$R_{\text{risk}} = 170 \text{ lb}$$

$$D_{\text{ock}} = 174 \text{ lb}$$

$$B_{\text{ase}} = 95 \text{ lb}$$

$$\underline{439 \text{ lb}}$$

$$\text{For } 19" \text{ base } M_{\text{resisting}} = 439 \times \frac{19}{2} / 2 = 347 \text{ ft-lb} \times 0.6 = 209 \text{ ft-lb}$$

Net overturning moment M_o to be resisted by anchors = $2203 - 209 = 1994 \text{ ft-lb}$

Use 3 anchors per side (6 total) spaced at 10", edge distance = 6" min.

$$\text{Shear per anchor} = 760 / 6 = 127 \text{ lb}$$

$$\text{Tension per anchor} = 1994 / (3)(0.83) = 798 \text{ lb}$$

Assume existing concrete $f'_c = 2000 \text{ psi}$ (conservative)

Use 1/2" dia wedge anchors (Wedge-All) by Simpson, or equivalent

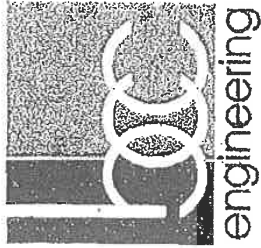
$$\text{Allowable Tension} = 1510 \text{ lb}$$

$$\text{Allowable shear} = 1675 \text{ lb}$$

No spacing or edge distance factors required

} See attached catalog tables

$$\text{Interaction: } \frac{798}{1510} + \frac{127}{1675} = 0.60 < 1.0 \text{ OK}$$



JOB# 0100571.00 SHEET No 4 OF 4
PROJECT NAME B Cycle
SUBJECT Foundation Slob
CALCULATED BY SG DATE 11/12/12
CHECKED BY _____ DATE _____

At stations without kiosk

$$\text{Total shear} = (1.6)(110) + 3(1.7)(78.5) = 176 + 401 = 577 \text{ lb}$$

$$\text{Overturning moment} = 176 \left(\frac{6.58}{2} \right) + 401 \left(\frac{2.67}{2} \right) = 1114 \text{ ft-lb}$$

For allowable stress design

$$M_o = 0.6(1114) = 668 \text{ ft-lb} \quad V = (577)(0.6) = 347 \text{ lb}$$

$$\text{Weight} = 174 + 95 = 269 \text{ lb}$$

$$M_{\text{resisting}} = 269 \times \frac{19}{12} = 212 \text{ ft-lb} \times 0.6 = 127 \text{ ft-lb}$$

Net overturning moment to be resisted by anchors = $668 - 127 = 541 \text{ ft-lb}$

$$\text{Shear per anchor} = 347/4 = 87 \text{ lb}$$

$$\text{Tension per anchor} = 541 / 2(0.83) = 324 \text{ lb}$$

Forces less critical than for station with kiosk



Simpson Strong-Tie® Anchoring and Fastening Systems for Concrete and Masonry
Wedge-All® Wedge Anchors

Tension Loads for Carbon-Steel Wedge-All® (and Tie-Wire) Anchors
in Normal-Weight Concrete



Tension Load										
Size in. (mm)	Embed Depth in. (mm)	Critical Edge Dist. in. (mm)	Ultimate Spacing in. (mm)	(18.3 MPa) Concrete		(27.6 MPa) Concrete		(32.6 MPa) Concrete		Inst. Torque ft-lb (N-m)
				Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)	
1/4 (6.4)	1 1/2 (38)	2 1/4 (57)	1 1/2 (38)	680 (3.0)	170 (0.8)	205 (0.9)	360 (1.6)	233 (1.0)	240 (1.1)	8 (10.8)
	2 1/4 (57)	2 1/4 (57)	3 1/4 (86)	1,920 (8.5)	480 (2.1)	530 (2.4)	2,820 (10.3)	105 (0.5)	580 (2.6)	
	3 1/4 (86)	3 1/4 (86)	3 1/4 (86)	1,580 (7.0)	390 (1.7)	555 (2.5)	2,400 (10.7)	588 (2.6)	720 (3.2)	
3/8 (9.5)	2 1/4 (57)	3 1/4 (86)	3 1/4 (86)	3,880 (17.2)	404 (1.8)	1,180 (5.3)	5,440 (24.2)	583 (2.6)	1,360 (6.1)	20 (40.7)
	3 1/4 (86)	3 1/4 (86)	4 1/4 (111)	3,680 (16.5)	565 (2.5)	1,380 (6.1)	5,440 (24.2)	583 (2.6)	1,360 (6.1)	
	4 1/4 (111)	4 1/4 (111)	4 1/4 (111)	3,280 (14.6)	871 (3.9)	1,070 (4.8)	5,280 (23.5)	849 (3.8)	1,320 (5.9)	
1/2 (12.7)	3 1/4 (86)	5 (127)	4 1/4 (111)	6,040 (26.9)	1,510 (6.7)	1,985 (8.8)	9,840 (43.8)	1,303 (5.8)	2,460 (10.9)	60 (81.3)
	4 1/4 (111)	5 (127)	5 1/4 (136)	6,960 (31.0)	1,740 (7.7)	2,350 (10.5)	11,840 (52.7)	2,462 (11.0)	2,960 (13.2)	
	5 1/4 (136)	5 1/4 (136)	5 1/4 (136)	4,520 (20.3)	1,130 (5.0)	1,646 (7.3)	8,880 (39.3)	729 (3.2)	2,150 (9.6)	
5/8 (15.9)	4 1/4 (111)	6 1/4 (162)	6 1/4 (162)	8,200 (36.5)	2,080 (9.1)	2,984 (13.3)	15,720 (69.9)	1,224 (5.4)	3,980 (17.5)	90 (122.6)
	5 1/4 (136)	6 1/4 (162)	7 1/4 (183)	9,200 (40.8)	2,080 (9.1)	2,980 (13.3)	15,720 (69.9)	1,216 (5.3)	3,980 (17.5)	
	6 1/4 (162)	6 1/4 (162)	7 1/4 (183)	6,760 (30.1)	1,590 (7.5)	2,090 (9.3)	9,960 (44.3)	1,324 (5.9)	2,490 (11.1)	
3/4 (19.1)	5 (127)	7 1/4 (183)	7 1/4 (183)	10,040 (44.7)	2,510 (11.2)	3,225 (14.3)	15,760 (70.1)	1,550 (6.9)	3,940 (17.5)	150 (203.4)
	6 1/4 (162)	7 1/4 (183)	8 1/4 (209)	10,040 (44.7)	2,510 (11.2)	3,380 (15.0)	17,000 (75.6)	1,668 (7.4)	4,260 (18.9)	
	7 1/4 (183)	7 1/4 (183)	8 1/4 (209)	7,480 (33.3)	1,470 (6.3)	2,275 (10.1)	10,720 (47.7)	1,253 (5.6)	2,680 (11.9)	
1 (25.4)	6 1/4 (162)	10 (254)	6 1/4 (162)	15,400 (68.5)	3,850 (17.1)	3,885 (17.3)	15,680 (69.7)	1,876 (8.3)	3,920 (17.4)	300 (406.7)
	8 (203)	10 (254)	12 1/4 (311)	20,760 (92.3)	5,190 (23.1)	6,365 (28.3)	30,080 (133.8)	1,612 (7.2)	7,520 (33.5)	
	12 1/4 (311)	12 1/4 (311)	12 1/4 (311)	15,760 (69.7)	1,380 (6.1)	3,980 (17.5)	21,780 (96.3)	1,801 (8.0)	3,920 (17.4)	
1 1/8 (31.8)	8 1/4 (209)	12 1/4 (311)	12 1/4 (311)	20,160 (89.7)	5,440 (24.3)	6,485 (28.8)	28,920 (127.5)	1,801 (8.0)	7,520 (33.5)	600 (813.5)
	10 (254)	12 1/4 (311)	12 1/4 (311)	20,160 (89.7)	5,440 (24.3)	6,485 (28.8)	28,920 (127.5)	1,801 (8.0)	7,520 (33.5)	
	12 1/4 (311)	12 1/4 (311)	12 1/4 (311)	15,760 (69.7)	1,380 (6.1)	3,980 (17.5)	21,780 (96.3)	1,801 (8.0)	7,520 (33.5)	

1. The allowable loads listed are based on a safety factor of 4.0.
2. Refer to allowable load adjustment factors for edge distance and spacing on pages 141 and 143.
3. Drill bit diameter used in base material corresponds to nominal anchor diameter.
4. Allowable loads may be linearly interpolated between concrete strengths listed.
5. Allowable loads for 1/2-inch size at 1 1/4-inch embedment apply to both the Wedge-All® and Tie-Wire anchors.
6. The minimum concrete thickness is 1 1/2 times the embedment depth.

* See page 13 for an explanation of the load table icons

Mechanical Anchors

Simpson Strong-Tie® Anchoring and Fastening Systems for Concrete and Masonry

Wedge-All® Wedge Anchors

Shear Loads for Carbon-Steel Wedge-All® (and Tie-Wire) Anchors
In Normal-Weight Concrete

Size in. (mm)	Embed- Depth in. (mm)	Optimal Edge Dist. in. (mm)	Optimal Spacing in. (mm)	T _s = 2000 psi (138 MPa) Concrete			T _s = 3000 psi (207 MPa) Concrete			T _s = 4000 psi (27.6 MPa) Concrete	T _s = 5000 psi (34.5 MPa) Concrete	T _s = 6000 psi (41.4 MPa) Concrete	T _s = 7000 psi (48.3 MPa) Concrete	T _s = 8000 psi (55.2 MPa) Concrete	T _s = 9000 psi (62.1 MPa) Concrete	T _s = 10,000 psi (69.0 MPa) Concrete	T _s = 11,000 psi (75.9 MPa) Concrete	T _s = 12,000 psi (82.8 MPa) Concrete	T _s = 13,000 psi (89.7 MPa) Concrete	T _s = 14,000 psi (96.6 MPa) Concrete	T _s = 15,000 psi (103.5 MPa) Concrete	T _s = 16,000 psi (110.4 MPa) Concrete	T _s = 17,000 psi (117.3 MPa) Concrete	T _s = 18,000 psi (124.2 MPa) Concrete	T _s = 19,000 psi (131.1 MPa) Concrete	T _s = 20,000 psi (138.0 MPa) Concrete	T _s = 21,000 psi (144.9 MPa) Concrete	T _s = 22,000 psi (151.8 MPa) Concrete	T _s = 23,000 psi (158.7 MPa) Concrete	T _s = 24,000 psi (165.6 MPa) Concrete	T _s = 25,000 psi (172.5 MPa) Concrete	T _s = 26,000 psi (179.4 MPa) Concrete	T _s = 27,000 psi (186.3 MPa) Concrete	T _s = 28,000 psi (193.2 MPa) Concrete	T _s = 29,000 psi (200.1 MPa) Concrete	T _s = 30,000 psi (207.0 MPa) Concrete	T _s = 31,000 psi (213.9 MPa) Concrete	T _s = 32,000 psi (220.8 MPa) Concrete	T _s = 33,000 psi (227.7 MPa) Concrete	T _s = 34,000 psi (234.6 MPa) Concrete	T _s = 35,000 psi (241.5 MPa) Concrete	T _s = 36,000 psi (248.4 MPa) Concrete	T _s = 37,000 psi (255.3 MPa) Concrete	T _s = 38,000 psi (262.2 MPa) Concrete	T _s = 39,000 psi (269.1 MPa) Concrete	T _s = 40,000 psi (276.0 MPa) Concrete	T _s = 41,000 psi (282.9 MPa) Concrete	T _s = 42,000 psi (289.8 MPa) Concrete	T _s = 43,000 psi (296.7 MPa) Concrete	T _s = 44,000 psi (303.6 MPa) Concrete	T _s = 45,000 psi (310.5 MPa) Concrete	T _s = 46,000 psi (317.4 MPa) Concrete	T _s = 47,000 psi (324.3 MPa) Concrete	T _s = 48,000 psi (331.2 MPa) Concrete	T _s = 49,000 psi (338.1 MPa) Concrete	T _s = 50,000 psi (345.0 MPa) Concrete	T _s = 51,000 psi (351.9 MPa) Concrete	T _s = 52,000 psi (358.8 MPa) Concrete	T _s = 53,000 psi (365.7 MPa) Concrete	T _s = 54,000 psi (372.6 MPa) Concrete	T _s = 55,000 psi (379.5 MPa) Concrete	T _s = 56,000 psi (386.4 MPa) Concrete	T _s = 57,000 psi (393.3 MPa) Concrete	T _s = 58,000 psi (400.2 MPa) Concrete	T _s = 59,000 psi (407.1 MPa) Concrete	T _s = 60,000 psi (414.0 MPa) Concrete	T _s = 61,000 psi (420.9 MPa) Concrete	T _s = 62,000 psi (427.8 MPa) Concrete	T _s = 63,000 psi (434.7 MPa) Concrete	T _s = 64,000 psi (441.6 MPa) Concrete	T _s = 65,000 psi (448.5 MPa) Concrete	T _s = 66,000 psi (455.4 MPa) Concrete	T _s = 67,000 psi (462.3 MPa) Concrete	T _s = 68,000 psi (469.2 MPa) Concrete	T _s = 69,000 psi (476.1 MPa) Concrete	T _s = 70,000 psi (483.0 MPa) Concrete	T _s = 71,000 psi (489.9 MPa) Concrete	T _s = 72,000 psi (496.8 MPa) Concrete	T _s = 73,000 psi (503.7 MPa) Concrete	T _s = 74,000 psi (510.6 MPa) Concrete	T _s = 75,000 psi (517.5 MPa) Concrete	T _s = 76,000 psi (524.4 MPa) Concrete	T _s = 77,000 psi (531.3 MPa) Concrete	T _s = 78,000 psi (538.2 MPa) Concrete	T _s = 79,000 psi (545.1 MPa) Concrete	T _s = 80,000 psi (552.0 MPa) Concrete	T _s = 81,000 psi (558.9 MPa) Concrete	T _s = 82,000 psi (565.8 MPa) Concrete	T _s = 83,000 psi (572.7 MPa) Concrete	T _s = 84,000 psi (579.6 MPa) Concrete	T _s = 85,000 psi (586.5 MPa) Concrete	T _s = 86,000 psi (593.4 MPa) Concrete	T _s = 87,000 psi (600.3 MPa) Concrete	T _s = 88,000 psi (607.2 MPa) Concrete	T _s = 89,000 psi (614.1 MPa) Concrete	T _s = 90,000 psi (621.0 MPa) Concrete	T _s = 91,000 psi (627.9 MPa) Concrete	T _s = 92,000 psi (634.8 MPa) Concrete	T _s = 93,000 psi (641.7 MPa) Concrete	T _s = 94,000 psi (648.6 MPa) Concrete	T _s = 95,000 psi (655.5 MPa) Concrete	T _s = 96,000 psi (662.4 MPa) Concrete	T _s = 97,000 psi (669.3 MPa) Concrete	T _s = 98,000 psi (676.2 MPa) Concrete	T _s = 99,000 psi (683.1 MPa) Concrete	T _s = 100,000 psi (690.0 MPa) Concrete	T _s = 101,000 psi (696.9 MPa) Concrete	T _s = 102,000 psi (703.8 MPa) Concrete	T _s = 103,000 psi (710.7 MPa) Concrete	T _s = 104,000 psi (717.6 MPa) Concrete	T _s = 105,000 psi (724.5 MPa) Concrete	T _s = 106,000 psi (731.4 MPa) Concrete	T _s = 107,000 psi (738.3 MPa) Concrete	T _s = 108,000 psi (745.2 MPa) Concrete	T _s = 109,000 psi (752.1 MPa) Concrete	T _s = 110,000 psi (759.0 MPa) Concrete	T _s = 111,000 psi (765.9 MPa) Concrete	T _s = 112,000 psi (772.8 MPa) Concrete	T _s = 113,000 psi (779.7 MPa) Concrete	T _s = 114,000 psi (786.6 MPa) Concrete	T _s = 115,000 psi (793.5 MPa) Concrete	T _s = 116,000 psi (800.4 MPa) Concrete	T _s = 117,000 psi (807.3 MPa) Concrete	T _s = 118,000 psi (814.2 MPa) Concrete	T _s = 119,000 psi (821.1 MPa) Concrete	T _s = 120,000 psi (828.0 MPa) Concrete	T _s = 121,000 psi (834.9 MPa) Concrete	T _s = 122,000 psi (841.8 MPa) Concrete	T _s = 123,000 psi (848.7 MPa) Concrete	T _s = 124,000 psi (855.6 MPa) Concrete	T _s = 125,000 psi (862.5 MPa) Concrete	T _s = 126,000 psi (869.4 MPa) Concrete	T _s = 127,000 psi (876.3 MPa) Concrete	T _s = 128,000 psi (883.2 MPa) Concrete	T _s = 129,000 psi (890.1 MPa) Concrete	T _s = 130,000 psi (897.0 MPa) Concrete	T _s = 131,000 psi (903.9 MPa) Concrete	T _s = 132,000 psi (910.8 MPa) Concrete	T _s = 133,000 psi (917.7 MPa) Concrete	T _s = 134,000 psi (924.6 MPa) Concrete	T _s = 135,000 psi (931.5 MPa) Concrete	T _s = 136,000 psi (938.4 MPa) Concrete	T _s = 137,000 psi (945.3 MPa) Concrete	T _s = 138,000 psi (952.2 MPa) Concrete	T _s = 139,000 psi (959.1 MPa) Concrete	T _s = 140,000 psi (966.0 MPa) Concrete	T _s = 141,000 psi (972.9 MPa) Concrete	T _s = 142,000 psi (979.8 MPa) Concrete	T _s = 143,000 psi (986.7 MPa) Concrete	T _s = 144,000 psi (993.6 MPa) Concrete	T _s = 145,000 psi (1000.5 MPa) Concrete	T _s = 146,000 psi (1007.4 MPa) Concrete	T _s = 147,000 psi (1014.3 MPa) Concrete	T _s = 148,000 psi (1021.2 MPa) Concrete	T _s = 149,000 psi (1028.1 MPa) Concrete	T _s = 150,000 psi (1035.0 MPa) Concrete	T _s = 151,000 psi (1041.9 MPa) Concrete	T _s = 152,000 psi (1048.8 MPa) Concrete	T _s = 153,000 psi (1055.7 MPa) Concrete	T _s = 154,000 psi (1062.6 MPa) Concrete	T _s = 155,000 psi (1069.5 MPa) Concrete	T _s = 156,000 psi (1076.4 MPa) Concrete	T _s = 157,000 psi (1083.3 MPa) Concrete	T _s = 158,000 psi (1090.2 MPa) Concrete	T _s = 159,000 psi (1097.1 MPa) Concrete	T _s = 160,000 psi (1104.0 MPa) Concrete	T _s = 161,000 psi (1110.9 MPa) Concrete	T _s = 162,000 psi (1117.8 MPa) Concrete	T _s = 163,000 psi (1124.7 MPa) Concrete	T _s = 164,000 psi (1131.6 MPa) Concrete	T _s = 165,000 psi (1138.5 MPa) Concrete	T _s = 166,000 psi (1145.4 MPa) Concrete	T _s = 167,000 psi (1152.3 MPa) Concrete	T _s = 168,000 psi (1159.2 MPa) Concrete	T _s = 169,000 psi (1166.1 MPa) Concrete	T _s = 170,000 psi (1173.0 MPa) Concrete	T _s = 171,000 psi (1179.9 MPa) Concrete	T _s = 172,000 psi (1186.8 MPa) Concrete	T _s = 173,000 psi (1193.7 MPa) Concrete	T _s = 174,000 psi (1200.6 MPa) Concrete	T _s = 175,000 psi (1207.5 MPa) Concrete	T _s = 176,000 psi (1214.4 MPa) Concrete	T _s = 177,000 psi (1221.3 MPa) Concrete	T _s = 178,000 psi (1228.2 MPa) Concrete	T _s = 179,000 psi (1235.1 MPa) Concrete	T _s = 180,000 psi (1242.0 MPa) Concrete	T _s = 181,000 psi (1248.9 MPa) Concrete	T _s = 182,000 psi (1255.8 MPa) Concrete	T _s = 183,000 psi (1262.7 MPa) Concrete	T _s = 184,000 psi (1269.6 MPa) Concrete	T _s = 185,000 psi (1276.5 MPa) Concrete	T _s = 186,000 psi (1283.4 MPa) Concrete	T _s = 187,000 psi (1290.3 MPa) Concrete	T _s = 188,000 psi (1297.2 MPa) Concrete	T _s = 189,000 psi (1304.1 MPa) Concrete	T _s = 190,000 psi (1311.0 MPa) Concrete	T _s = 191,000 psi (1317.9 MPa) Concrete	T _s = 192,000 psi (1324.8 MPa) Concrete	T _s = 193,000 psi (1331.7 MPa) Concrete	T _s = 194,000 psi (1338.6 MPa) Concrete	T _s = 195,000 psi (1345.5 MPa) Concrete	T _s = 196,000 psi (1352.4 MPa) Concrete	T _s = 197,000 psi (1359.3 MPa) Concrete	T _s = 198,000 psi (1366.2 MPa) Concrete	T _s = 199,000 psi (1373.1 MPa) Concrete	T _s = 200,000 psi (1380.0 MPa) Concrete	T _s = 201,000 psi (1386.9 MPa) Concrete	T _s = 202,000 psi (1393.8 MPa) Concrete	T _s = 203,000 psi (1400.7 MPa) Concrete	T _s = 204,000 psi (1407.6 MPa) Concrete	T _s = 205,000 psi (1414.5 MPa) Concrete	T _s = 206,000 psi (1421.4 MPa) Concrete	T _s = 207,000 psi (1428.3 MPa) Concrete	T _s = 208,000 psi (1435.2 MPa) Concrete	T _s = 209,000 psi (1442.1 MPa) Concrete	T _s = 210,000 psi (1449.0 MPa) Concrete	T _s = 211,000 psi (1455.9 MPa) Concrete	T _s = 212,000 psi (1462.8 MPa) Concrete	T _s = 213,000 psi (1469.7 MPa) Concrete	T _s = 214,000 psi (1476.6 MPa) Concrete	T _s = 215,000 psi (1483.5 MPa) Concrete	T _s = 216,000 psi (1490.4 MPa) Concrete	T _s = 217,000 psi (1497.3 MPa) Concrete	T _s = 218,000 psi (1504.2 MPa) Concrete	T _s = 219,000 psi (1511.1 MPa) Concrete	T _s = 220,000 psi (1518.0 MPa) Concrete	T _s = 221,000 psi (1524.9 MPa) Concrete	T _s = 222,000 psi (1531.8 MPa) Concrete	T _s = 223,000 psi (1538.7 MPa) Concrete	T _s = 224,000 psi (1545.6 MPa) Concrete	T _s = 225,000 psi (1552.5 MPa) Concrete	T _s = 226,000 psi (1559.4 MPa) Concrete	T _s = 227,000 psi (1566.3 MPa) Concrete	T _s = 228,000 psi (1573.2 MPa) Concrete	T _s = 229,000 psi (1580.1 MPa) Concrete	T _s = 230,000 psi (1587.0 MPa) Concrete	T _s = 231,000 psi (1593.9 MPa) Concrete	T _s = 232,000 psi (1600.8 MPa) Concrete	T _s = 233,000 psi (1607.7 MPa) Concrete	T _s = 234,000 psi (1614.6 MPa) Concrete	T _s = 235,000 psi (1621.5 MPa) Concrete	T _s = 236,000 psi (1628.4 MPa) Concrete	T _s = 237,000 psi (1635.3 MPa) Concrete	T _s = 238,000 psi (1642.2 MPa) Concrete	T _s = 239,000 psi (1649.1 MPa) Concrete	T _s = 240,000 psi (1656.0 MPa) Concrete	T _s = 241,000 psi (1662.9 MPa) Concrete	T _s = 242,000 psi (1669.8 MPa) Concrete	T _s = 243,000 psi (1676.7 MPa) Concrete	T _s = 244,000 psi (1683.6 MPa) Concrete	T _s = 245,000 psi (1690.5 MPa) Concrete	T _s = 246,000 psi (1697.4 MPa) Concrete	T _s = 247,000 psi (1704.3 MPa) Concrete	T _s = 248,000 psi (1711.2 MPa) Concrete	T _s = 249,000 psi (1718.1 MPa) Concrete	T _s = 250,000 psi (1725.0 MPa) Concrete	T _s = 251,000 psi (1731.9 MPa) Concrete	T _s = 252,000 psi (1738.8 MPa) Concrete	T _s = 253,000 psi (1745.7 MPa) Concrete	T _s = 254,000 psi (1752.6 MPa) Concrete	T _s = 255,000 psi (1759.5 MPa) Concrete	T _s = 256,000 psi (1766.4 MPa) Concrete	T _s = 257,000 psi (1773.3 MPa) Concrete	T _s = 258,000 psi (1780.2 MPa) Concrete	T _s = 259,000 psi (1787.1 MPa) Concrete	T _s = 260,000 psi (1794.0 MPa) Concrete	T _s = 261,000 psi (1800.9 MPa) Concrete	T _s = 262,000 psi (1807.8 MPa) Concrete	T _s = 263,000 psi (1814.7 MPa) Concrete	T _s = 264,000 psi (1821.6 MPa) Concrete	T _s = 265,000 psi (1828.5 MPa) Concrete	T _s = 266,000 psi (1835.4 MPa) Concrete	T _s = 267,000 psi (1842.3 MPa) Concrete	T _s = 268,000 psi (1849.2 MPa) Concrete	T _s = 269,000 psi (1856.1 MPa) Concrete	T _s = 270,000 psi (1863.0 MPa) Concrete	T _s = 271,000 psi (1869.9 MPa) Concrete	T _s = 272,000 psi (1876.8 MPa) Concrete	T _s = 273,000 psi (1883.7 MPa) Concrete	T _s = 274,000 psi (1890.6 MPa) Concrete	T _s = 275,000 psi (
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Simpson Strong-Tie® Anchoring and Fastening Systems for Concrete and Masonry

Wedge-All® Technical Information

SIMPSON

Strong-Tie®

Load-Adjustment Factors for Carbon-Steel and Stainless-Steel Wedge-All® Anchors in Normal-Weight Concrete:
Edge Distance, Tension and Shear Loads

How to use these charts:

1. The following tables are for reduced edge distance.
2. Locate the anchor size to be used for either a tension and/or shear load application.
3. Locate the edge distance (C_{act}) at which the anchor is to be installed.

4. The load adjustment factor (i_c) is the intersection of the row and column.
5. Multiply the allowable load by the applicable load adjustment factor.
6. Reduction factors for multiple edges are multiplied together.

Edge Distance Tension (i_c)



Edge Dist.	Size	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/4
Dist.	C_{er}	2 1/2	3 1/4	5	6 1/4	7 1/2	8 1/4	10	12 1/4
C_{act}	C_{min}	1	1 1/4	2	2 1/4	3	3 1/4	4	5
(in.)	f_{min}	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
1									
1 1/4		0.80	0.70						
2		0.90	0.77	0.70					
2 1/4		1.00	0.83	0.75	0.70				
3			0.90	0.80	0.74	0.70			
3 1/4			0.97	0.85	0.78	0.73	0.70		
3 3/4			1.00	0.88	0.80	0.75	0.71		
4				0.90	0.82	0.77	0.73	0.70	
4 1/4				0.95	0.86	0.80	0.76	0.73	
5				1.00	0.90	0.83	0.79	0.75	0.70
5 1/4					0.94	0.87	0.81	0.78	0.72
6					0.98	0.90	0.84	0.80	0.74
6 1/4					1.00	0.92	0.86	0.81	0.75
6 3/4						0.93	0.87	0.83	0.76
7						0.97	0.90	0.85	0.78
7 1/4						1.00	0.93	0.88	0.80
8							0.98	0.90	0.82
8 1/4							0.99	0.93	0.84
8 3/4							1.00	0.94	0.85
10								1.00	0.90
12 1/4									1.00
15									

* See page 13 for an explanation of the load table icons

See Notes Below

Edge Distance Shear (i_c)
(Shear Applied Perpendicular to Edge)



Edge Dist.	Size	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/4
Dist.	C_{er}	2 1/2	3 1/4	5	6 1/4	7 1/2	8 1/4	10	12 1/4
C_{act}	C_{min}	1	1 1/4	2	2 1/4	3	3 1/4	4	5
(in.)	f_{min}	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
1									
1 1/4		0.53	0.30						
2		0.77	0.46	0.30					
2 1/4		1.00	0.61	0.42	0.30				
3			0.77	0.53	0.39	0.30			
3 1/4			0.92	0.65	0.49	0.38	0.30		
3 3/4			1.00	0.71	0.53	0.42	0.33		
4				0.77	0.58	0.46	0.37	0.30	
4 1/4				0.88	0.67	0.53	0.43	0.36	
5				1.00	0.77	0.61	0.50	0.42	0.30
5 1/4					0.85	0.69	0.57	0.48	0.35
6					0.95	0.77	0.63	0.53	0.39
6 1/4					1.00	0.81	0.67	0.56	0.42
6 3/4						0.84	0.70	0.59	0.44
7						0.92	0.77	0.65	0.49
7 1/4						1.00	0.83	0.71	0.53
8							0.90	0.77	0.58
8 1/4							0.97	0.83	0.63
8 3/4							1.00	0.85	0.65
10								1.00	0.77
12 1/4									1.00
15									

1. C_{act} = actual edge distance at which anchor is installed (inches).
2. C_{er} = critical edge distance for 100% load (inches).
3. C_{min} = minimum edge distance for reduced load (inches).
4. f_c = adjustment factor for allowable load at actual edge distance.
5. f_{act} = adjustment factor for allowable load at critical edge distance.
6. $f_{\text{act min}}$ = adjustment factor for allowable load at minimum edge distance.
7. $i_c = f_{\text{act min}} + [(N - f_{\text{act min}}) (C_{\text{act}} - C_{\text{min}}) / (C_{\text{er}} - C_{\text{min}})]$.

Load-Adjustment Factors for Reduced Spacing:

Critical spacing is listed in the load tables. No adjustment in load is required when the anchors are spaced at critical spacing. No additional testing has been performed to determine the adjustment factors for spacing dimensions less than those listed in the load tables.

Simpson Strong-Tie Anchoring and Retention Systems for Concrete and Masonry

Wedge-All® Technical Information

SIMPSON
Strong-Tie®

Load-Adjustment Factors for Carbon-Steel and Stainless-Steel Wedge-All® Anchors in Normal-Weight Concrete:
Spacing, Tension Loads

How to use these charts:

1. The following tables are for reduced spacing.
2. Locate the anchor size to be used for a tension load application.
3. Locate the anchor embedment (E) used for a tension load application.
4. Locate the spacing (S_{act}) at which the anchor is to be installed.
5. The load adjustment factor (f_s) is the intersection of the row and column.
6. Multiply the allowable load by the applicable load adjustment factor.
7. Reduction factors for multiple spacings are multiplied together.

Spacing Tension (f_s)

S _{act} (in.)	Dia.		1/4			3/8			1/2			5/8		
			1 1/4			2 1/4			3 1/4			4 1/4		
			E	S _{cr}	S _{min}	E	S _{cr}	S _{min}	E	S _{cr}	S _{min}	E	S _{cr}	S _{min}
3/4			0.43	0.50	0.64	0.43	0.50	0.64	0.43	0.50	0.64	0.43	0.50	0.64
1			0.79	0.93	1.00	0.79	0.93	1.00	0.79	0.93	1.00	0.79	0.93	1.00
1 1/4			0.87	0.94	0.98	0.87	0.94	0.98	0.87	0.94	0.98	0.87	0.94	0.98
1 1/2			0.91	0.94	0.98	0.91	0.94	0.98	0.91	0.94	0.98	0.91	0.94	0.98
1 3/4			0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98
2			0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98
2 1/4			0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98
2 1/2			0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98
2 3/4			0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98
3			0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98
3 1/4			0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98
4			0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98
4 1/4			0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98
5			0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98
6			0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98
7			0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98
> 8			0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98	0.94	0.94	0.98

See Notes Below

Spacing Tension (f_s)

S _{act} (in.)	Dia.		3/4			1			1 1/4		
			1 1/4			2 1/4			3 1/4		
			E	S _{cr}	S _{min}	E	S _{cr}	S _{min}	E	S _{cr}	S _{min}
2			0.48	0.67	0.86	0.48	0.67	0.86	0.48	0.67	0.86
3			0.67	0.86	1.00	0.67	0.86	1.00	0.67	0.86	1.00
4			0.86	1.00	1.00	0.86	1.00	1.00	0.86	1.00	1.00
5			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
6			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
7			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
8			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
9			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
11			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
14			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

1. E = Embedment depth (inches).
2. S_{cr} = actual spacing distance at which anchors are installed (inches).
3. S_{act} = critical spacing distance for 100% load (inches).
4. S_{min} = minimum spacing distance for reduced load (inches).
5. f_s = adjustment factor for allowable load at actual spacing distance.
6. f_{cr} = adjustment factor for allowable load at critical spacing distance.
7. f_{cr} is always = 1.00.
8. f_s = f_{cr} + [(1 - f_{cr}) (S_{cr} - S_{min}) / (S_{act} - S_{min})].

Simpson Strong-Tie® Anchoring and Fastening Systems for Concrete and Masonry

Wedge-All®
Technical Information

SIMPSON

Strong-Tie

Load-Adjustment Factors for Carbon-Steel and Stainless-Steel Wedge-All® Anchors in Normal-Weight Concrete: Spacing, Shear Loads

How to use these charts:

1. The following tables are for reduced spacing.
2. Locate the anchor size to be used for a shear load application.
3. Locate the anchor embedment (E) used for a shear load application.
4. Locate the spacing (S_{act}) at which the anchor is to be installed.

5. The load adjustment factor (i_s) is the intersection of the row and column.
6. Multiply the allowable load by the applicable load adjustment factor.
7. Reduction factors for multiple spacings are multiplied together.

Spacing Shear (i_s)

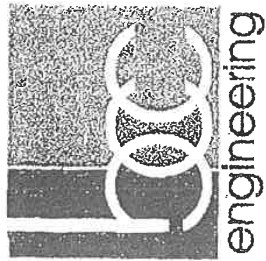
S _{act} (in.)	Dia.												*											
	1/4			3/8			1/2			5/8			3/4			7/8			1			1 1/8		
	E			S _{cr}			S _{min}			f _{act,min}			3/4			7/8			1			1 1/8		
	1 1/4	1 1/2	1 3/4	1 1/4	1 1/2	1 3/4	1 1/4	1 1/2	1 3/4	1 1/4	1 1/2	1 3/4	1 1/4	1 1/2	1 3/4	1 1/4	1 1/2	1 3/4	1 1/4	1 1/2	1 3/4	1 1/4	1 1/2	1 3/4
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7																								
> 8																								

See Notes Below

Spacing Shear (i_s)

S _{act} (in.)	Dia.												*											
	3/4			1			1 1/8			1 1/4			1 3/8			1 1/2			1 5/8			1 3/4		
	E			S _{cr}			S _{min}			f _{act,min}			1 1/4			1 1/2			1 5/8			1 3/4		
	1 1/4	1 1/2	1 3/4	1 1/4	1 1/2	1 3/4	1 1/4	1 1/2	1 3/4	1 1/4	1 1/2	1 3/4	1 1/4	1 1/2	1 3/4	1 1/4	1 1/2	1 3/4	1 1/4	1 1/2	1 3/4	1 1/4	1 1/2	1 3/4
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14																								

1. E = Embedment depth (inches).
2. S_{act} = actual spacing distance at which anchors are installed (inches).
3. S_{cr} = critical spacing distance for 100% load (inches).
4. S_{min} = minimum spacing distance for reduced load (inches).
5. i_s = adjustment factor for allowable load at actual spacing distance.
6. f_{act} = adjustment factor for allowable load at critical spacing distance.
7. f_{act} is always = 1.00.
8. i_s = f_{act,min} + [(1 - f_{act,min}) (S_{act} - S_{min}) / (S_{cr} - S_{min})].



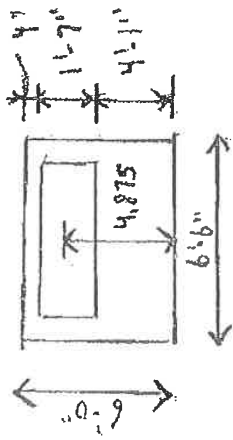
JOB# 0100571.00 SHEET No 10 OF 10
PROJECT NAME B Cycle
SUBJECT Foundation slab
CALCULATED BY SG DATE 11/12/12
CHECKED BY _____ DATE _____

Slab overturning - 6'-0" x 6'-6" x 5" slab

$$M_{OT} = 2203 \text{ ft-lb}$$

$$M_{resisting} = (0.6)(150)(6)(6.5)(0.42)(6/2) = 4388 \text{ ft-lb} \quad \text{O.K.}$$

Check flexure in unreinforced slab. Assume station is placed eccentrically on slab



$$M_{OT} = 2203 \text{ ft-lb} + 4391 \text{ lb} \left(\overset{\substack{\uparrow \\ \text{wind}}}{1.875} \right) = 3026 \text{ ft-lb (Service)}$$

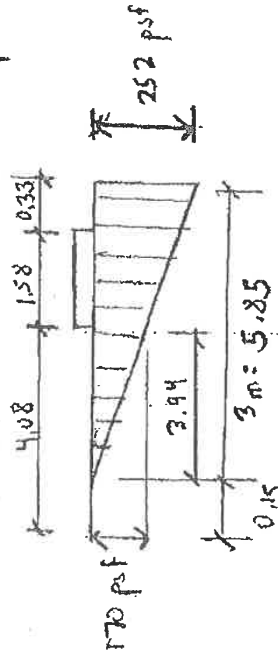
$$P = (150)(6)(6.5)(0.42) = 2438 \text{ lb} + 439 \text{ lb} \left(\overset{\substack{\uparrow \\ \text{station}}}{\text{gravity}} \right) = 2877 \text{ lb}$$

$$e = M/P = 3026/2877 = 1.05 \text{ ft} \rightarrow \text{outside of middle third}$$

$$m = 3 - 1.05 = 1.95'$$

$$f_b = 2813 \text{ lbm} = 2(2877)/3(6.5)(1.95) = 151 \text{ psf} \ll 2000 \text{ psf} \quad \text{O.K.}$$

$$f_b \text{ ultimate} = 151/0.6 = 252 \text{ psf}$$



At face of support $f_{a, \text{gross}} = 170 \text{ psf}$, $f_{a, \text{net}} = 170 - 1.2(62.5) = 95 \text{ psf}$

$$M_u = (0.95)(6.5)(3.94/2)(3.94/3) = 1.60 \text{ k-ft}$$

$$\phi M_u = (0.65)(5)(1)(\sqrt{3000})(78)(5-2)^2 / 6 = 1.74 \text{ k-ft} \quad M_u < \phi M_u$$