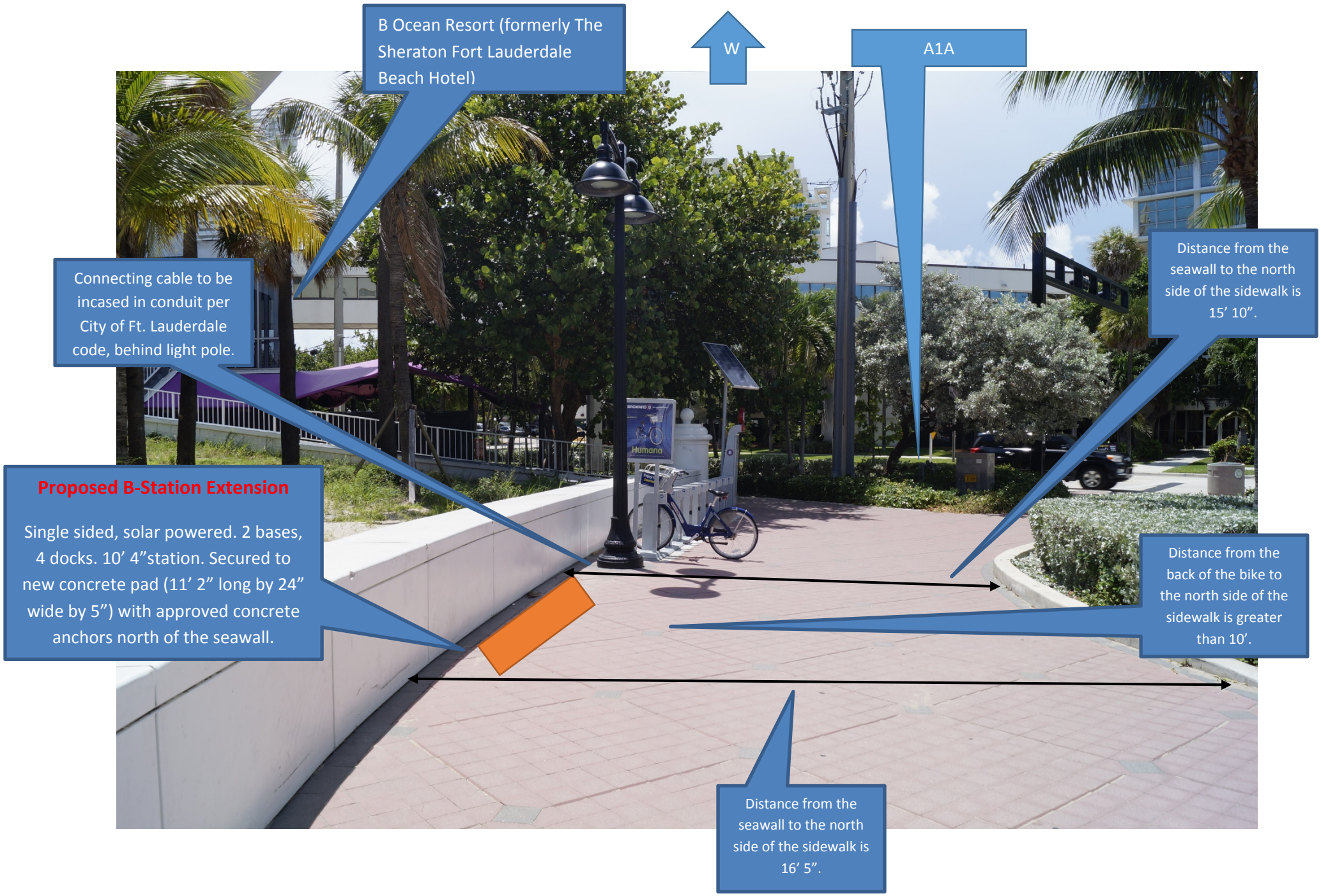
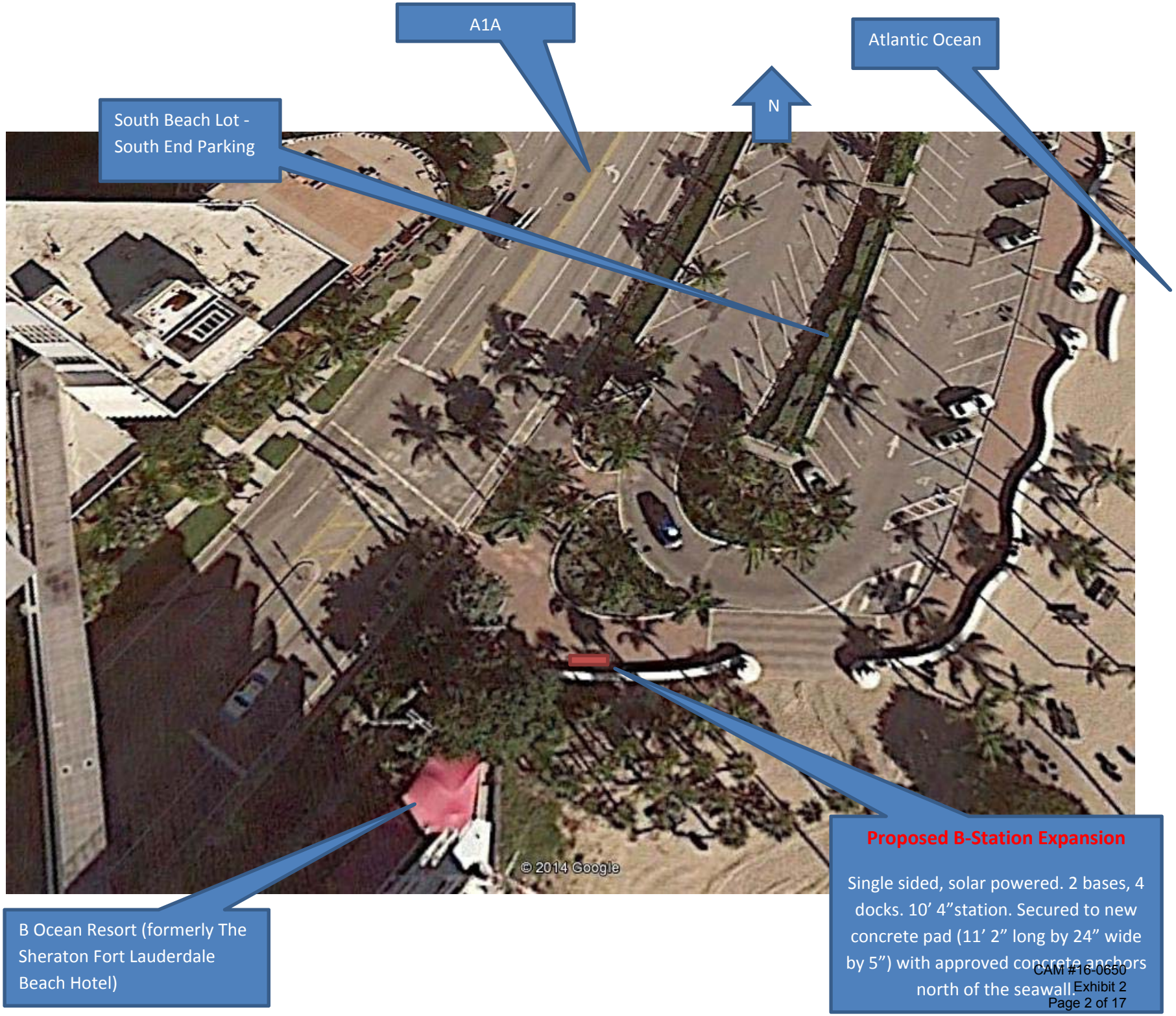

B Ocean Resort (formerly The Sheraton Fort Lauderdale Beach Hotel)
W
A1A
Connecting cable to be incased in conduit per City of Ft. Lauderdale code, behind light pole.
Distance from the seawall to the north side of the sidewalk is 15’ 10”.
Proposed B-Station Extension
Single sided, solar powered. 2 bases, 4 docks. 10’ 4”station. Secured to new concrete pad (11’ 2” long by 24” wide by 5”) with approved concrete anchors north of the seawall.
Distance from the back of the bike to the north side of the sidewalk is greater than 10’.
Distance from the seawall to the north side of the sidewalk is 16’ 5”.


A1A
Atlantic Ocean
N
South Beach Lot - South End Parking
© 2014 Google
B Ocean Resort (formerly The Sheraton Fort Lauderdale Beach Hotel)
Proposed B-Station Expansion
Single sided, solar powered. 2 bases, 4 docks. 10' 4"station. Secured to new concrete pad (11' 2" long by 24" wide by 5") with approved concrete anchors north of the seawall.

Bcycle™

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

PREPARED BY: bcc engineering
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:

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.

bcc engineering
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7300 North Kendall Drive, Suite 400
Miami, Florida 33156
Tel: 305.670.2350 Fax: 305.670.2351
www.bcceng.com

STEVEN MARK GOLDSTEIN LICENSE NO. 44423 STATE OF FLORIDA PROFESSIONAL ENGINEER

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

2	11-16-12	FBC 2010

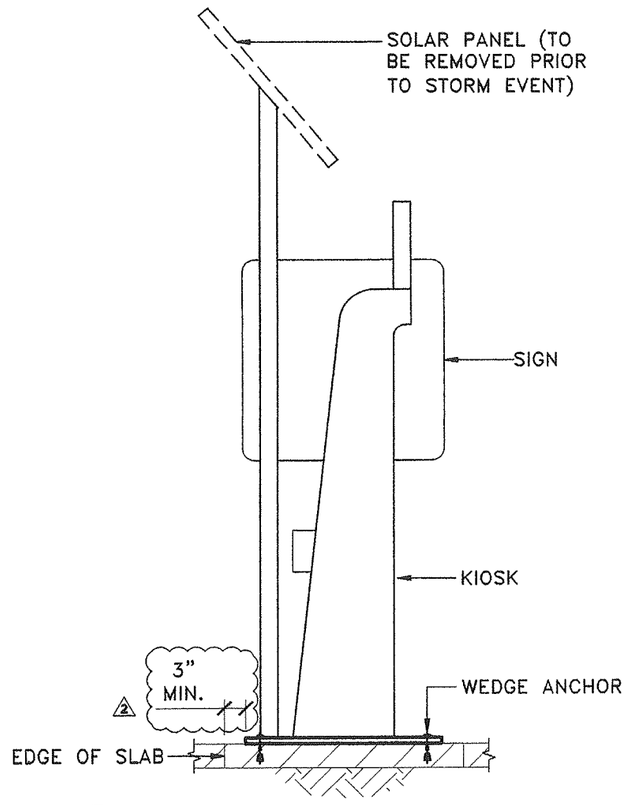
Drawn: CA
Checked: FD
Reviewed: SG 2

BCC Project No.: 100571.00
Date: 07-14-11

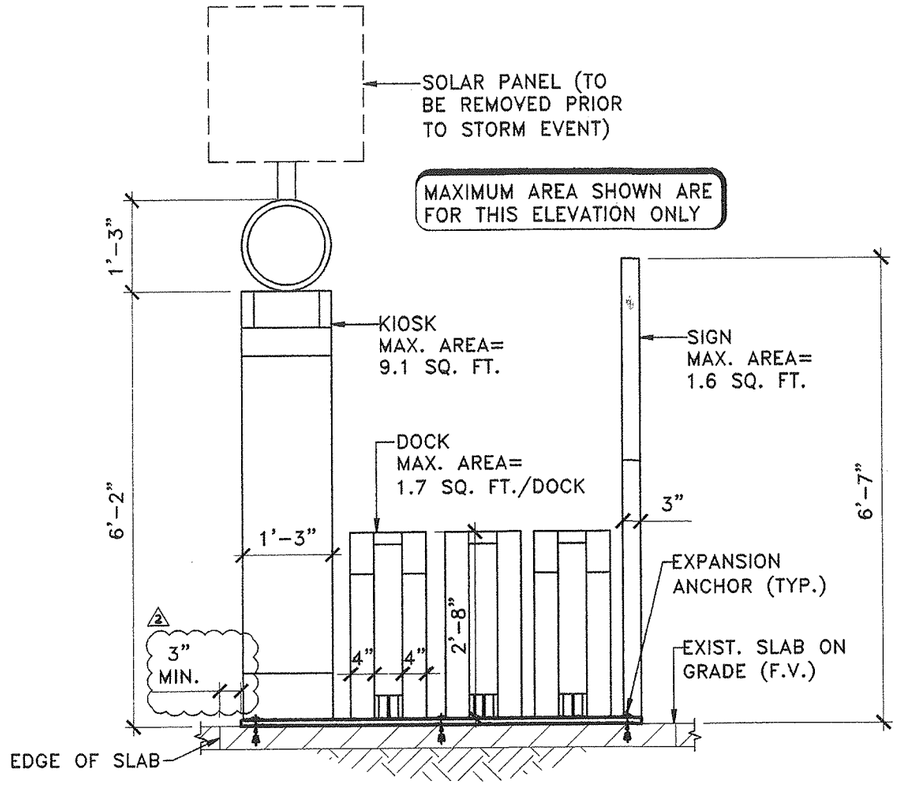
Bcycle™

GENERAL NOTES

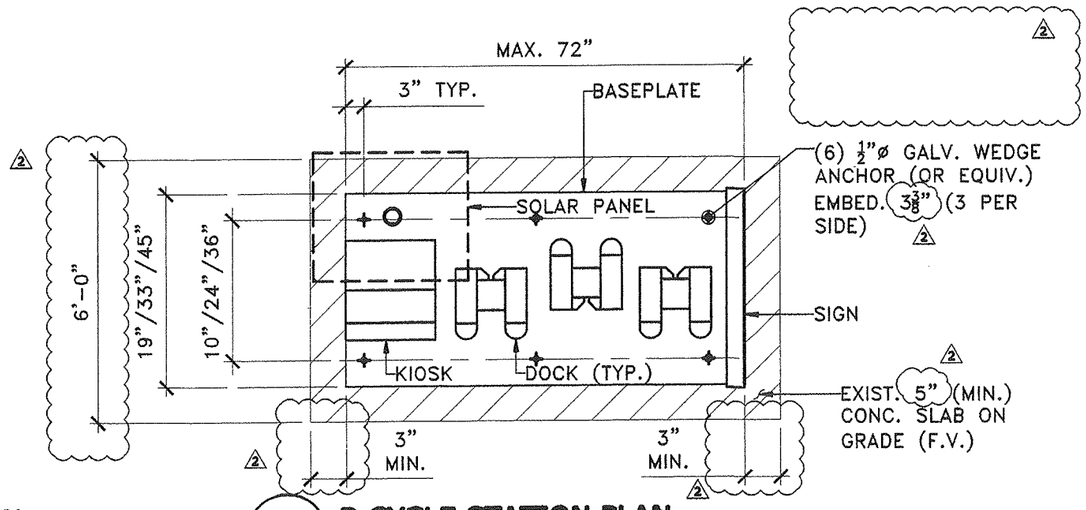
S-1.0



B CYCLE STATION SIDE ELEVATION
3 DOCK CONFIGURATION - 19"/33"/45" WIDE BASE
SCALE: 1/2" = 1'-0"



B CYCLE STATION FRONT ELEVATION
3 DOCK CONFIGURATION - 19"/33"/45" WIDE BASE
SCALE: 1/2" = 1'-0"



B CYCLE STATION PLAN
3 DOCK CONFIGURATION - 19"/33"/45" WIDE BASE
SCALE: 1/2" = 1'-0"

bcc engineering
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STEVEN MARK GOLDSTEIN LICENSE NUMBER 44423 STATE OF FLORIDA PROFESSIONAL ENGINEER

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

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

Submittals / Revisions

1	09-26-11	OWNER REV.
2	11-16-12	FBC 2010

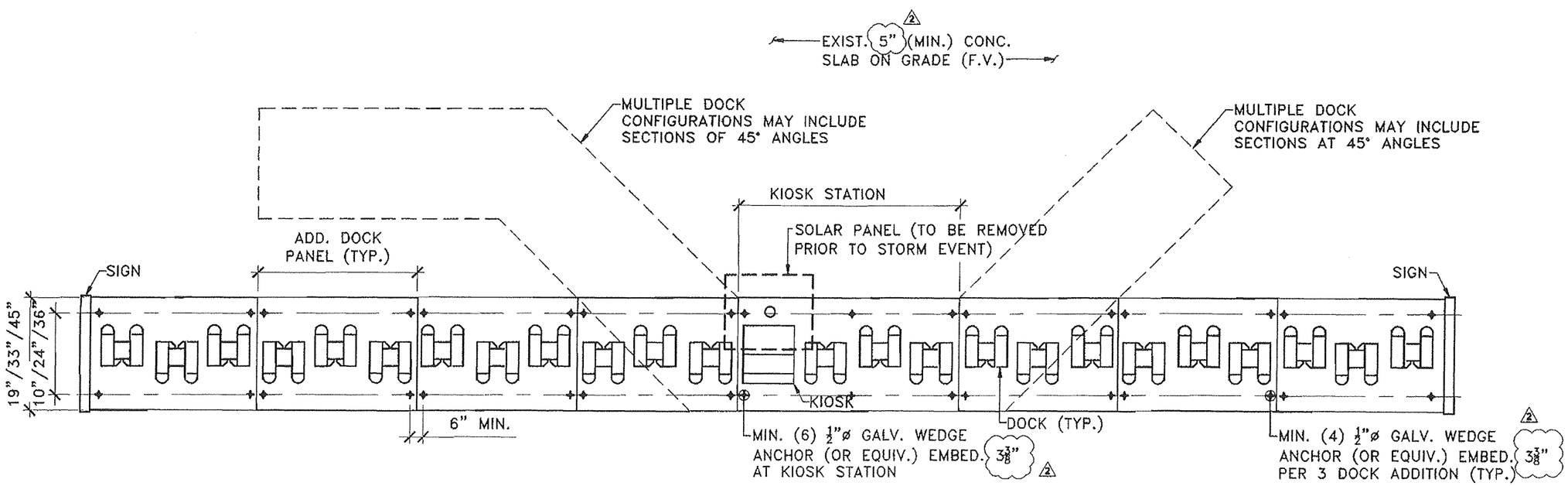
Drawn: CA
Checked: FD
Reviewed: SG 2

BCC Project No.: 100571.00
Date: 07-14-11

B cycle™

STATION PLAN AND ELEVATION (3 DOCK)

S-2.0



B CYCLE STATION PLAN

UP TO 21 DOCK CONFIGURATION - 19"/33"/45" WIDE BASE
SCALE: 3/8" = 1'-0"

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

STEVEN MARK GOLDSTEIN LICENSE No. 44423 STATE OF FLORIDA PROFESSIONAL ENGINEER

To the best of my knowledge these plans and specifications comply with the applicable minimum building codes.
2 STEVEN GOLDSTEIN, P.E.
Florida License No. 44423

Submittals / Revisions

1	09-26-11	OWNER REV.
2	11-16-12	FBC 2010

Drawn: CA
Checked: PD
Reviewed: SG 2

BCC Project No.: 100571.00
Date: 07-14-11

B cycle™

STATION PLAN (MULTIPLE DOCK LAYOUT)

S-2.1

REVISED STRUCTURAL CALCULATIONS

FOR

Bicycle

Stations throughout
Miami-Dade and Broward County

Prepared by:

bcc engineering

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.

STEVEN MARK GOLDSTEIN LICENSE No. 44423 STATE OF FLORIDA PROFESSIONAL ENGINEER

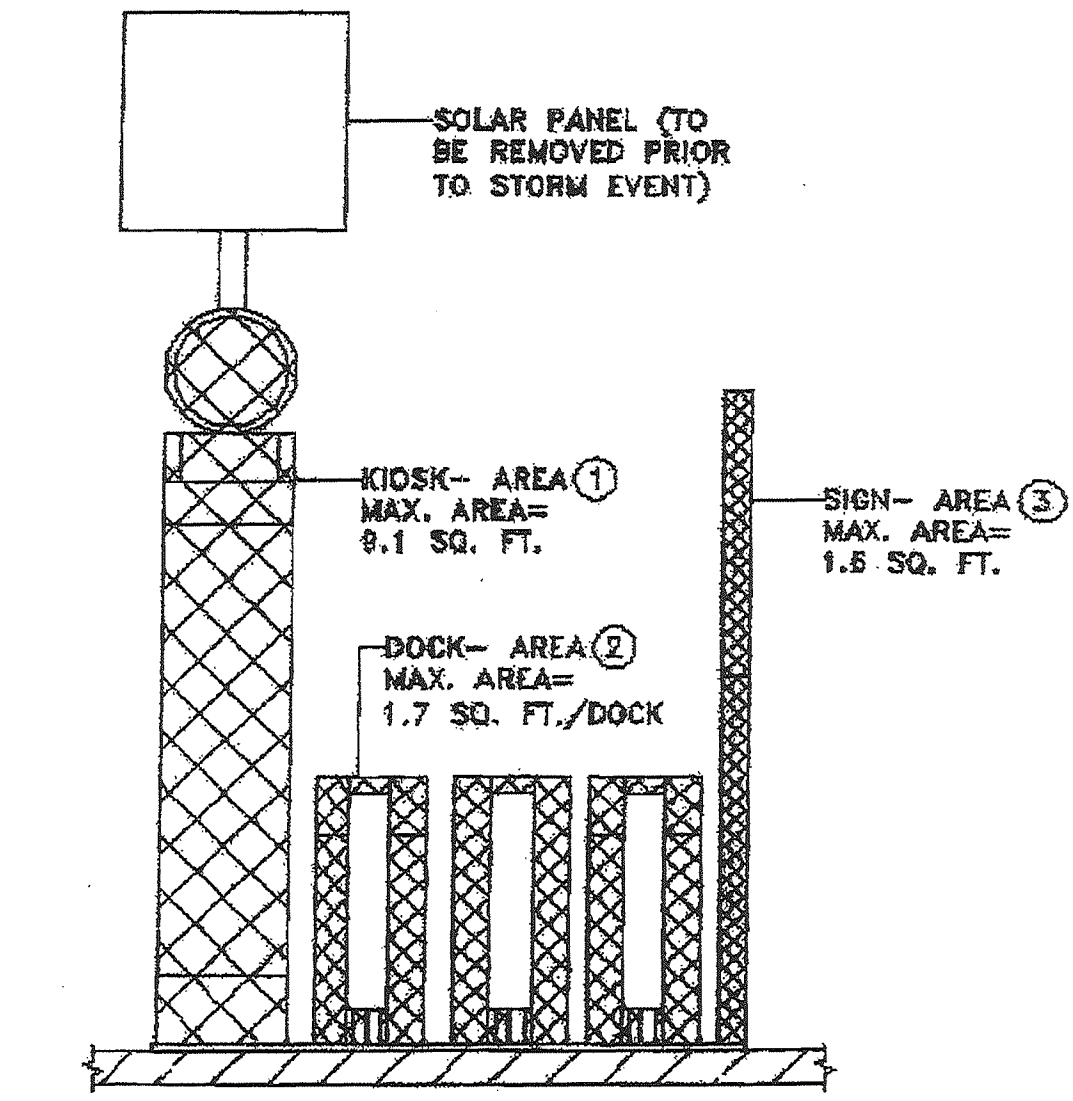
7-18-13

Steven Goldstein, PE
Florida License No. 44423

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

JOB B CYCLE WIND ANALYSIS
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

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

$K_{zt} = 1.0$

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) $\rightarrow K_d = 0.90$

$q_z = (.00256)(1.03)(1.0)(0.90)(165)^2 = 69.6$ psf

$G = 0.85$

$h/D_{kiosk} = 7.42/1.25 = 5.9 \quad C_f = 1.38$
$h/D_{sign} = 6.58/1.25 = 26 \quad C_f = 2.0$
$h/D_{dock} = 2.67/0.33 = 8 \quad C_f = 1.43$

JOB# 0100571.00 SHEET No ____ OF 3

PROJECT NAME B Cycle

SUBJECT Foundation Slab

CALCULATED BY SG DATE 11/12/12

CHECKED BY ____ DATE ____

Wind pressure

Kiosk: (64.6)(0.85)(1.38) = 75.8 psf

Sign: (64.6)(.85)(2.0) = 110 psf

Dock: (64.6)(.85)(1.43) = 78.5 psf

Total shear

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

Overturning moment = $(690)(\frac{7.42}{3}) + 176(\frac{6.58}{2}) + 401(\frac{2.67}{2}) = 3672$ ft-lb

For allowable stress design use 0.6 load factor

$M_{OT} = 0.6(3672) = 2203$ ft-lb $V = (1267)(0.6) = 760$ lb

Weight

Kiosk		170 lb
Dock	3×58	174 lb
Base		95 lb
		439 lb

For 19" base $M_{resist-19} = 439 \times \frac{19}{12}/2 = 347$ ft-lb $\times 0.6 = 209$ ft-lb

Net overturning moment to be resisted by anchors = 2203 - 209 = 1994 ft-lb

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

Shear per anchor = 760/6 = 127 lb

Tension per anchor = 1994/(3)(0.83) = 798 lb

Assume existing concrete $f'_c = 2000$ psi (conservative)

Use ½" dia wedge anchors (Wedge-All) by Simpson, or equivalent

Allowable tension = 1510 lb

Allowable shear = 1675 lb

No spacing or edge distance factors required

} See attached catalog tables

Interaction: $\frac{798}{1510} + \frac{127}{1675} = 0.60 < 1$ O.K

engineering

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

At stations without kiosk

Total shear = (1.6)(110) + 3(47)(78.5) = 176 + 401 = 577 lb

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

For allowable stress design
$M_{ut} = 0.6(1114) = 668$ ft-lb V = (577)(0.6) = 347 lb

Weight = 174+95 = 269 lb

$M_{resisting} = 269 \times \frac{14}{12}/2 = 212$ ft-lb x0.6 = 127 ft-lb

Net overturning moment to be resisted by anchors = 668 - 127 = 541 ft-lb

Shear per anchor = 347/4 = 87 lb
Tension per anchor = 541/2(0.83) = 324 lb

Forces less critical than for station with kiosk

SIMPSON Strong-Tie®

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

Size in. (mm)	Embed. Depth in. (mm)	Critical Edge Dist. in. (mm)	Critical Spacing in. (mm)	Tension Load: $f'_c \geq 2000$ psi (13.8 MPa) Concrete: Ultimate lbs. (kN)	Std. Dev. lbs. (kN)	Allowable lbs. (kN)	$f'_c \geq 3000$ psi (20.7 MPa) Concrete: Allowable lbs. (kN)	$f'_c \geq 4000$ psi (27.6 MPa) Concrete: Ultimate lbs. (kN)	Std. Dev. lbs. (kN)	Allowable lbs. (kN)	Install. Torque ft-lbs (N-m)
¼ (6.4)	1⅛ (29)	2½ (64)	1⅝ (41)	680 (3.0)	167 (0.7)	170 (0.8)	205 (0.9)	960 (4.3)	233 (1.0)	240 (1.1)	8 (10.8)
	2¼ (57)	2½ (64)	3⅛ (79)	1,920 (8.5)	286 (1.3)	480 (2.1)	530 (2.4)	2,320 (10.3)	105 (0.5)	580 (2.6)	
⅜ (9.5)	1¾ (44)	3⅜ (95)	2½ (60)	1,560 (6.9)	261 (1.2)	390 (1.7)	555 (2.5)	2,380 (12.8)	508 (2.6)	720 (3.2)	30 (40.7)
	2½ (67)	3¾ (95)	3⅝ (92)	3,360 (14.9)	464 (2.1)	840 (3.7)	1,180 (4.9)	5,440 (24.2)	523 (2.3)	1,360 (6.0)	
	3⅜ (86)	3¾ (95)	4¾ (121)	3,660 (16.4)	585 (2.6)	920 (4.1)	1,340 (5.9)	5,440 (24.2)	316 (1.4)	1360 (6.0)	
½ (12.7)	2¼ (57)	5 (127)	3⅛ (79)	3,260 (14.6)	871 (3.9)	820 (3.6)	1,070 (4.8)	5,260 (23.5)	849 (3.8)	1,320 (5.9)	60 (81.3)
	3⅜ (86)	5 (127)	4¾ (121)	6,040 (26.9)	654 (2.9)	1,510 (6.7)	1,985 (8.8)	9,840 (43.8)	1,303 (5.8)	2,460 (10.9)	
	4½ (114)	5 (127)	6¼ (159)	6,960 (31.0)	839 (3.7)	1,740 (7.7)	2,350 (10.5)	11,840 (52.7)	2,462 (11.0)	2,960 (13.2)	
⅝ (15.9)	2⅜ (70)	6⅜ (159)	3¾ (98)	4,520 (20.1)	120 (0.5)	1,130 (5.0)	1,540 (7.5)	8,680 (38.3)	729 (3.2)	2,150 (9.5)	90 (122.0)
	4½ (114)	6⅜ (159)	6¼ (159)	8,200 (36.5)	612 (2.7)	2,050 (9.1)	2,990 (13.3)	15,720 (69.9)	1,224 (5.4)	3,930 (17.5)	
	5⅝ (140)	6⅜ (159)	7¾ (197)	9,200 (36.5)	659 (2.9)	2,060 (9.1)	2,990 (13.3)	15,720 (69.9)	1,116 (5.0)	3,930 (17.5)	
¾ (19.1)	3⅜ (86)	7½ (191)	4¾ (121)	6,760 (30.1)	1,452 (6.5)	1,690 (7.5)	2,090 (9.3)	9,960 (44.3)	1,324 (5.9)	2,490 (11.1)	150 (203.4)
	5 (127)	7½ (191)	7 (178)	10,040 (44.7)	544 (2.4)	2,510 (11.2)	3,225 (14.3)	15,760 (70.1)	1,550 (6.9)	3,940 (17.5)	
	6¾ (171)	7½ (191)	9½ (241)	10,040 (44.7)	1,586 (7.1)	2,510 (11.2)	3,380 (15.0)	17,000 (75.6)	1,668 (7.4)	4,250 (18.9)	
⅞ (22.2)	3½ (90)	8¾ (222)	5½ (137)	7,400 (33.0)	821 (3.7)	1,870 (8.3)	2,275 (10.1)	10,320 (47.2)	1,250 (5.6)	2,580 (11.5)	200 (271.2)
	7⅞ (200)	8¾ (222)	11 (279)	13,040 (58.8)	1,566 (7.0)	4,260 (18.9)	5,670 (25.2)	29,320 (90.4)	2,401 (10.7)	5,980 (26.6)	
1 (25.4)	4½ (114)	10 (254)	6¼ (159)	15,400 (68.5)	2,440 (10.9)	3,850 (17.1)	3,885 (17.3)	15,680 (69.7)	1,876 (8.3)	3,920 (17.4)	300 (406.7)
	9 (229)	10 (254)	12⅝ (321)	20,760 (92.3)	3,116 (13.9)	5,190 (23.1)	6,355 (28.3)	30,080 (133.8)	1,612 (7.2)	7,520 (33.5)	
1¼ (31.8)	5⅝ (143)	12⅝ (318)	7⅞ (200)	15,760 (67.4)	1,346 (6.0)	3,790 (16.9)	4,090 (18.2)	24,760 (110.1)	1526 (6.8)	5,190 (23.5)	400 (542.3)
	9½ (241)	12⅝ (318)	12¾ (327)	20,100 (89.7)	3,250 (14.5)	5,040 (22.4)	8,535 (38.4)	48,920 (217.6)	3,886 (17.5)	12,230 (54.4)	

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 ¼-inch size at 1⅛-inch embedment apply to both the Wedge-All® and Tie-Wire anchors. Installation torque does not apply to the Tie-Wire anchor.
6. The minimum concrete thickness is 1½ times the embedment depth.

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

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

Size in. (mm)	Embed. Depth in. (mm)	Critical Edge Dist. in. (mm)	Critical Spacing in. (mm)	Shear Load $f'_c \geq 2000$ psi (13.8 MPa) Concrete			$f'_c \geq 3000$ psi (20.7 MPa) Concrete	$f'_c \geq 4000$ psi (27.6 MPa) Concrete	Install. Torque ft-lbs (N-m)
				Ultimate lbs. (kN)	Std. Dev. lbs. (kN)	Allowable lbs. (kN)	Allowable lbs. (kN)	Allowable lbs. (kN)	
¼ (6.4)	1⅛ (29)	2½ (64)	1⅝ (41)	920 (4.1)	47 (0.2)	230 (1.0)	230 (1.0)	230 (1.0)	8 (10.8)
	2¼ (57)	2½ (64)	3⅛ (79)	•	•	230 (1.0)	230 (1.0)	230 (1.0)	
⅜ (9.5)	1¾ (44)	3⅜ (95)	2⅝ (60)	2,280 (10.1)	85 (0.4)	570 (2.5)	570 (2.5)	570 (2.5)	30 (40.7)
	2⅝ (67)	3¾ (95)	3⅝ (92)	4,220 (18.8)	384 (1.7)	1,055 (4.7)	1,055 (4.7)	1,055 (4.7)	
	3⅜ (86)	3¾ (95)	4¾ (121)	•	•	1,055 (4.7)	1,055 (4.7)	1,055 (4.7)	
½ (12.7)	2¼ (57)	5 (127)	3⅛ (79)	6,560 (29.2)	850 (3.8)	1,345 (6.0)	1,485 (6.6)	1,625 (7.2)	60 (81.3)
	3⅜ (86)	5 (127)	4¾ (121)	8,160 (36.3)	880 (3.9)	1,675 (7.5)	1,850 (8.2)	2,020 (9.0)	
	4½ (114)	5 (127)	6¼ (159)	•	•	1,675 (7.5)	1,850 (8.2)	2,020 (9.0)	
⅝ (15.9)	2⅝ (70)	6¼ (159)	3¾ (98)	8,720 (38.8)	1,689 (7.5)	1,620 (7.2)	1,990 (8.9)	2,160 (9.7)	90 (122.0)
	4½ (114)	6¼ (159)	6¼ (159)	12,570 (55.9)	395 (1.8)	2,330 (10.4)	2,740 (12.2)	3,145 (14.0)	
	5½ (140)	6¼ (159)	7¾ (197)	•	•	2,330 (10.4)	2,740 (12.2)	3,145 (14.0)	
¾ (19.1)	3⅜ (86)	7½ (191)	4¾ (121)	11,360 (50.5)	792 (3.5)	2,840 (12.6)	2,840 (12.6)	2,840 (12.6)	150 (203.4)
	5 (127)	7½ (191)	7 (178)	18,430 (82.0)	1,921 (8.5)	4,610 (20.5)	4,610 (20.5)	4,610 (20.5)	
	6¾ (171)	7½ (191)	9½ (241)	•	•	4,610 (20.5)	4,610 (20.5)	4,610 (20.5)	
⅞ (22.2)	3½ (98)	8⅞ (222)	5⅜ (137)	13,760 (61.2)	2,059 (9.2)	3,440 (15.3)	3,440 (15.3)	3,440 (15.3)	200 (271.2)
	7⅞ (200)	8⅞ (222)	11 (279)	22,380 (99.2)	477 (2.1)	5,595 (24.9)	5,595 (24.9)	5,595 (24.9)	
1 (25.4)	4½ (114)	10 (254)	6¼ (159)	22,519 (100.2)	1,156 (5.1)	5,730 (25.5)	5,730 (25.5)	5,730 (25.5)	300 (406.7)
	9 (229)	10 (254)	12⅝ (321)	25,380 (112.9)	729 (3.2)	6,345 (28.2)	6,345 (28.2)	6,345 (28.2)	
1¼ (31.8)	5⅝ (143)	12½ (318)	7⅞ (200)	29,320 (130.4)	2,099 (9.3)	7,330 (32.6)	7,330 (32.6)	7,330 (32.6)	700 (949.3)
	9⅝ (244)	12½ (318)	15⅝ (397)	•	•	7,330 (32.6)	7,330 (32.6)	7,330 (32.6)	

1. The allowable loads listed are based on a safety factor of 4.0.
2. Refer to allowable load-adjustment factors for spacing and edge distance on pages 141, 142 and 144.
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 ¼-inch size at 1⅛-inch embedment apply to both the Wedge-All® and Tie-Wire anchors. Installation torque does not apply to the Tie-Wire anchor.
6. The minimum concrete thickness is 1½ times the embedment depth.

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

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 (f_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 (f_c)

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

Edge Dist. C_{act} (in.)	Size	⅛	⅜	½	⅝	¾	⅞	1	1¼
	C_{cr}	2½	3¾	5	6¼	7½	8¾	10	12½
	C_{min}	1	1½	2	2½	3	3½	4	5
	f_{cmin}	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
1		0.70							
1½		0.80	0.70						
2		0.90	0.77	0.70					
2½		1.00	0.83	0.75	0.70				
3			0.90	0.80	0.74	0.70			
3½			0.97	0.85	0.78	0.73	0.70		
3¾			1.00	0.88	0.80	0.75	0.71		
4				0.90	0.82	0.77	0.73	0.70	
4½				0.95	0.86	0.80	0.76	0.73	
5				1.00	0.90	0.83	0.79	0.75	0.70
5½					0.94	0.87	0.81	0.78	0.72
6					0.98	0.90	0.84	0.80	0.74
6¼					1.00	0.92	0.86	0.81	0.75
6½						0.93	0.87	0.83	0.76
7						0.97	0.90	0.85	0.78
7½						1.00	0.93	0.88	0.80
8							0.96	0.90	0.82
8½							0.99	0.93	0.84
8¾							1.00	0.94	0.85
10								1.00	0.90
12½									1.00
15									

*See Notes Below

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

Edge Dist. C_{act} (in.)	Size	⅛	⅜	½	⅝	¾	⅞	1	1¼
	C_{cr}	2½	3¾	5	6¼	7½	8¾	10	12½
	C_{min}	1	1½	2	2½	3	3½	4	5
	f_{cmin}	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
1		0.30							
1½		0.53	0.30						
2		0.77	0.46	0.30					
2½		1.00	0.61	0.42	0.30				
3			0.77	0.53	0.39	0.30			
3½			0.92	0.65	0.49	0.38	0.30		
3¾			1.00	0.71	0.53	0.42	0.33		
4				0.77	0.58	0.46	0.37	0.30	
4½				0.88	0.67	0.53	0.43	0.36	
5				1.00	0.77	0.61	0.50	0.42	0.30
5½					0.86	0.69	0.57	0.48	0.35
6					0.95	0.77	0.63	0.53	0.39
6¼					1.00	0.81	0.67	0.56	0.42
6½						0.84	0.70	0.59	0.44
7						0.92	0.77	0.65	0.49
7½						1.00	0.83	0.71	0.53
8							0.90	0.77	0.58
8½							0.97	0.83	0.63
8¾							1.00	0.85	0.65
10								1.00	0.77
12½									1.00
15									

1. C_{act} = actual edge distance at which anchor is installed (inches).
2. C_{cr} = 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_{ccr} = adjustment factor for allowable load at critical edge distance. f_{ccr} is always = 1.00.
6. f_{cmin} = adjustment factor for allowable load at minimum edge distance.
7. $f_c = f_{cmin} + [(1 - f_{cmin}) (C_{act} - C_{min}) / (C_{cr} - C_{min})]$.

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.

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)

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

S_{act} (in.)	Dia.	¼		⅜			½			⅝		
	E	1⅛	2¼	1¾	2⅝	3⅜	2¼	3⅜	4½	2¾	4½	5½
	S_{cr}	1⅝	3⅛	2⅝	3⅝	4⅝	3⅛	4¾	6¼	3⅞	6¼	7¾
	S_{min}	⅝	1⅛	⅞	1¾	1¾	1⅛	1¾	2¼	1⅜	2⅛	2¾
	f_{smin}	0.43	0.70	0.43	0.43	0.70	0.43	0.43	0.70	0.43	0.43	0.70
¾		0.50										
1		0.64		0.48								
1¼		0.79	0.72	0.57			0.47					
1½		0.93	0.76	0.67	0.46		0.54			0.46		
1¾		1.00	0.79	0.76	0.53	0.70	0.61	0.43		0.52		
2			0.83	0.86	0.59	0.73	0.68	0.48		0.57		
2¼			0.87	0.95	0.65	0.75	0.75	0.53	0.70	0.63	0.43	
2½			0.91	1.00	0.72	0.78	0.82	0.57	0.72	0.69	0.47	
2¾			0.94		0.78	0.80	0.89	0.62	0.74	0.74	0.50	0.70
3			0.98		0.84	0.83	0.96	0.67	0.76	0.80	0.54	0.72
3½			1.00		0.97	0.88	1.00	0.76	0.79	0.91	0.61	0.75
4					1.00	0.93		0.86	0.83	1.00	0.68	0.78
4½						0.98		0.95	0.87		0.75	0.81
5						1.00		1.00	0.91		0.82	0.84
6									0.98		0.96	0.90
7									1.00		1.00	0.96
> 8												1.00

See Notes Below

Spacing Tension (f_s)

S_{act} (in.)	Dia.	¾			⅞		1		1¼	
	E	3¾	5	6¾	3⅞	7⅞	4½	9	5⅝	9½
	S_{cr}	4¾	7	9½	5⅝	11	6¼	12⅝	7⅞	13¼
	S_{min}	1¾	2½	3⅜	2	4	2¼	4½	2⅝	4¾
	f_{smin}	0.43	0.43	0.70	0.43	0.70	0.43	0.70	0.43	0.70
2		0.48			0.43					
3		0.67	0.49		0.60		0.54		0.46	
4		0.86	0.62	0.73	0.77	0.70	0.68		0.57	
5		1.00	0.75	0.78	0.94	0.74	0.82	0.72	0.68	0.71
6			0.87	0.83	1.00	0.79	0.96	0.76	0.79	0.74
7			1.00	0.88		0.83	1.00	0.79	0.90	0.78
8				0.93		0.87		0.83	1.00	0.81
9				0.98		0.91		0.87		0.85
10				1.00		0.96		0.90		0.89
11						1.00		0.94		0.92
12								0.98		0.96
13								1.00		0.99
14										1.00

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. f_s = adjustment factor for allowable load at actual spacing distance.
6. f_{scr} = adjustment factor for allowable load at critical spacing distance. f_{scr} is always = 1.00.
7. f_{smin} = adjustment factor for allowable load at minimum spacing distance.
8. $f_s = f_{smin} + [(1 - f_{smin}) (S_{act} - S_{min}) / (S_{cr} - S_{min})]$.

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 (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 Shear (f_s)

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

S_{act} (in.)	Dia.	¼		⅜			½			⅝		
	E	1⅛	2⅛	1¾	2⅝	3⅜	2¼	3⅜	4½	2¾	4½	5½
	S_{cr}	1⅝	3⅛	2⅝	3⅝	4¾	3⅛	4¾	6¼	3⅞	6¼	7⅝
	S_{min}	⅝	1⅛	⅞	1⅜	1¾	1⅛	1¾	2¼	1⅜	2¼	2¾
	f_{smin}	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
¾		0.82										
1		0.87		0.81								
1¼		0.92	0.80	0.84			0.80					
1½		0.97	0.83	0.88	0.80		0.83			0.80		
1¾		1.00	0.86	0.91	0.83	0.79	0.86	0.79		0.82		
2			0.88	0.95	0.85	0.81	0.88	0.81		0.84		
2¼			0.91	0.98	0.87	0.83	0.91	0.83	0.79	0.86	0.79	
2½			0.93	1.00	0.90	0.84	0.93	0.84	0.80	0.88	0.80	
2¾			0.96		0.92	0.86	0.96	0.86	0.82	0.91	0.82	0.79
3			0.99		0.94	0.88	0.99	0.88	0.83	0.93	0.83	0.80
3½			1.00		0.99	0.91	1.00	0.91	0.86	0.97	0.86	0.82
4					1.00	0.95		0.95	0.88	1.00	0.88	0.84
4½						0.98		0.98	0.91		0.91	0.86
5						1.00		1.00	0.93		0.93	0.88
6									0.99		0.99	0.93
7									1.00		1.00	0.97
> 8												1.00

See Notes Below

Spacing Shear (f_s)

S_{act} (in.)	Dia.	¾			⅞		1		1¼	
	E	3⅜	5	6¾	3⅞	7⅞	4½	9	5⅝	9½
	S_{cr}	4¾	7	9½	5⅝	11	6¼	12⅝	7⅛	13¼
	S_{min}	1⅜	2½	3⅜	2	4	2¼	4½	2⅞	4¾
	f_{smin}	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
2		0.81			0.79					
3		0.88	0.81		0.85		0.83		0.80	
4		0.95	0.86	0.81	0.91	0.79	0.88		0.84	
5		1.00	0.91	0.85	0.98	0.82	0.93	0.80	0.88	0.80
6			0.95	0.88	1.00	0.85	0.99	0.83	0.92	0.82
7			1.00	0.91		0.88	1.00	0.85	0.96	0.85
8				0.95		0.91		0.88	1.00	0.87
9				0.98		0.94		0.91		0.90
10				1.00		0.97		0.93		0.92
11						1.00		0.96		0.94
12								0.98		0.97
13								1.00		0.99
14										1.00

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. f_s = adjustment factor for allowable load at actual spacing distance.
6. f_{scr} = adjustment factor for allowable load at critical spacing distance. f_{scr} is always = 1.00.
7. f_{smin} = adjustment factor for allowable load at minimum spacing distance.
8. $f_s = f_{smin} + [(1 - f_{smin}) (S_{act} - S_{min}) / (S_{cr} - S_{min})]$.

engineering

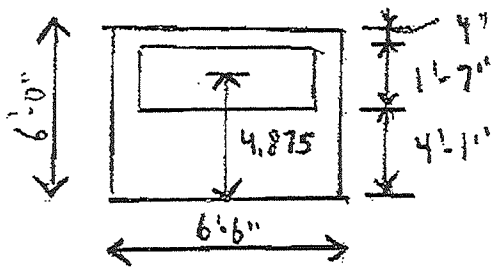
JOB# 0100571.00 SHEET No ____ OF 10
PROJECT NAME B Cycle
SUBJECT Foundation slab
CALCULATED BY SG DATE 11/12/12
CHECKED BY ____ DATE ____

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

M_{OT} = 2203 ft-lb

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

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



M_{OT} = 2203 ft-lb (wind) + 439 lb (1.875) (gravity) = 3026 ft-lb (Service)

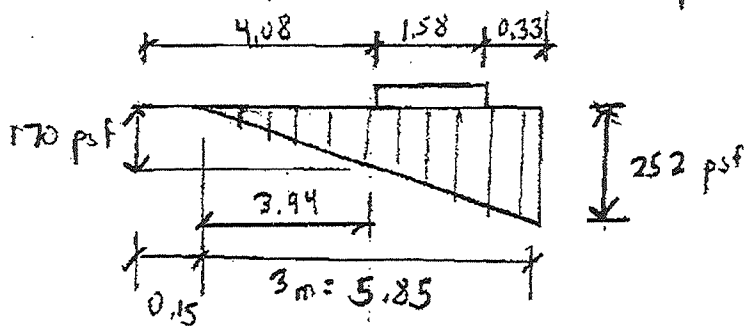
P = (150)(6)(6.5)(0.42) = 2438 lb (footing) + 439 lb (station) = 2877 lb

e = M/P = 3026/2877 = 1.05 ft → outside of middle third

m = 3 - 1.05 = 1.95'

f_b = 2P/3bm = 2(2877)/3(6.5)(1.95) = 151 psf < 2000 psf O.K.

$f_{b\ ultimate}$ = 151/0.6 = 252 psf



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

M_n = (.095)(6.5)(3.94/2)(3.94/3) = 1.60 k-ft

ϕM_n = (0.65)(5)(1)(1)($\sqrt{3000}$)(78)(5-2)^2/6/1000 = 1.74 k-ft $M_n < \phi M_n$