ROSS
Technology Corporation

DEXCO

CANTILEVER RACKS
OPERATION AND MAINTENANCE

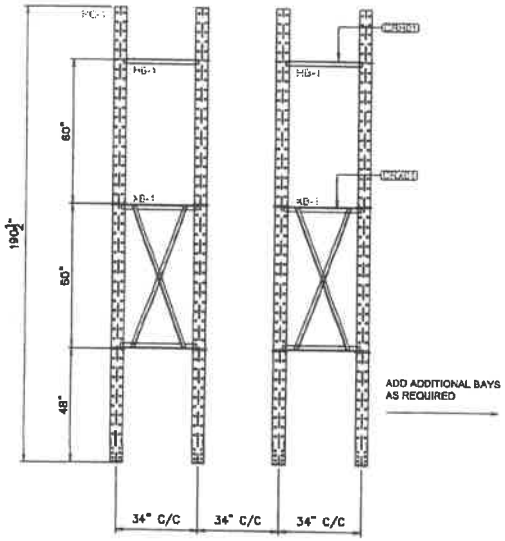
OPERATION

- Never climb or stand on racks. Always use appropriate safety equipment to service racks.
- Place loads onto rack vertically. Do not push or slide loads into position. Train operators to set loads gently onto racks, and not drop them
- Do not overload rack arms, uprights, or decking (if applicable). Each rack system is custom designed to meet the load specifications that were established at time of purchase. Do not exceed these loads without contacting our engineering department.
- Train equipment operators to avoid rack contact. A rack system's useable lifespan is directly related to operator care.
- Be sure to keep all aisles clear of debris. Do not store materials in aisles. Workers and/or customers should stay clear of aisles while equipment is present.
- If racks become damaged, remove loads immediately and do not use that section of rack until the damaged components can be repaired or replaced.

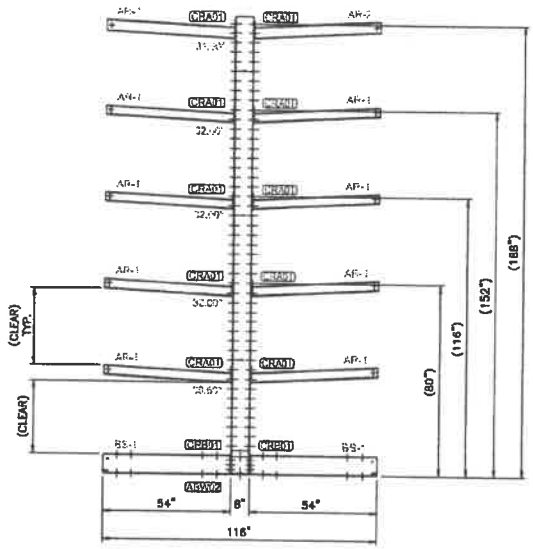
INSTALLATION / MAINTENANCE

- Maintenance should be performed on a regular basis, preferably semi-annually, but at least annually.
- Check all connections for missing or loose bolts. Replace any bolt or nut that is missing or has been damaged . Tighten any bolts that may have come loose.

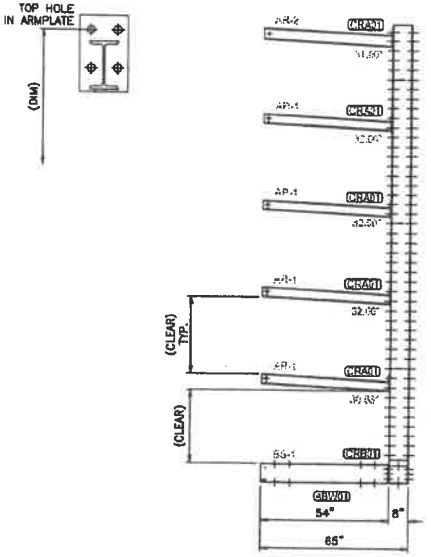
- Check all arms for damage. Replace any arm that has been bent by fork contact or being overloaded. Any arm that falls below horizontal when loaded must be replaced. Also, any arm that has been bent horizontally more than 3 degrees should be replaced. Do not attempt to straighten a bent arm.
- Inspect welds on arms and bases for cracks or damage.
- Inspect horizontal and diagonal bracing for damage. Replace any angles or flat bar straps that have been bent or broken.
- Inspect anchors and tighten as necessary.
- Inspect rack for plumb. Rack uprights should be vertical to within 1 inch per 20 feet of height when unloaded. Shim under the bases or columns as necessary.



RACK ASSEMBLY - TYPICAL BAY DETAIL
SCALE: 1/2" = 1'-0"

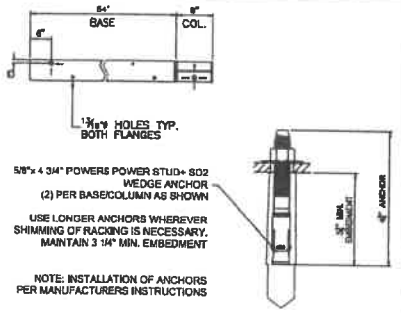


RACK ASSEMBLY - DOUBLE SIDED
SCALE: 1/2" = 1'-0"

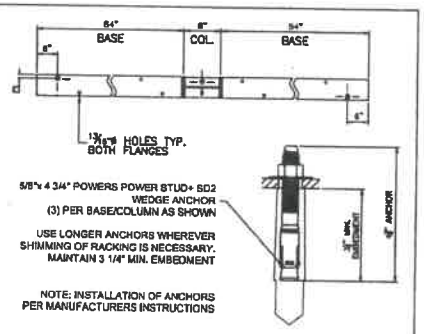


RACK ASSEMBLY - SINGLE SIDED
SCALE: 1/2" = 1'-0"

Typical Non-Seismic Anchoring



CANTILEVER RACK
ANCHOR BOLT CONNECTION - SINGLE SIDED



CANTILEVER RACK
ANCHOR BOLT CONNECTION - DOUBLE SIDED

ABW01	RK1		(2) 5/8" x 4 3/4" POWERS POWER STUD+ SD2 WEDGE ANCHOR
ABW02	RK1		(3) 5/8" x 4 3/4" POWERS POWER STUD+ SD2 WEDGE ANCHOR

COLUMN TYPE(S)			
MARK	SIZE	O.A.H (H)	DESCRIPTION
4C-1	W8x18#	190.50"	COLUMNS
BASE TYPE(S)			
MARK	SIZE	O.A.L (L)	DESCRIPTION
BS-1	W8x18#	54.00"	BASES
BRACE TYPE(S)			
MARK	SIZE	O.A.L (L)	DESCRIPTION
HB-1	3/16"	31.75"	2"x2" ANGLE, HORIZONTAL BRACE
AB-1	3/16"	62.25"	2"x2" ANGLE, X-BRACE
ARM TYPE(S)			
MARK	SIZE	O.A.L (L)	DESCRIPTION
AR-1	S4x7.7#	54.00"	TYPICAL ARM LEVEL
AP-2	S5x10#	54.00"	TOP ARM LEVELS

MATERIAL SPECIFICATIONS FOR STEEL:
1. ALL COLUMNS, BASES, AND LOAD ARMS TO HAVE AN Fy = 50 ksi.
2. ALL BRACE PANELS TO HAVE Fy = 36 ksi.
3. ALL WELDING ROD TO BE E70 OR BETTER.
4. ALL BOLTS TO BE GRADE GR. 5.

CONN. ID DETAIL	CONN. ID SHEET	CONNECTION TYPE(S)	CONNECTION DESCRIPTION(S)
ABW01	RK1	(2) 5/8" x 4 3/4" POWER STUD+ SD2 WEDGE ANCHORS	CANTILEVER RACK ANCHOR BOLT CONNECTION - SINGLE SIDED
ABW02	RK1	(3) 5/8" x 4 3/4" POWER STUD+ SD2 WEDGE ANCHORS	CANTILEVER RACK ANCHOR BOLT CONNECTION - DOUBLE SIDED
CBB01	..	(6) 3/4" x 2" GR. 5 BOLT	CANTILEVER RACK 8" BASE CONNECTION
CRA01	..	(4) 3/4" x 2" GR. 5 BOLT	CANTILEVER RACK ARM CONNECTION
CBX01	..	(4) 3/4" x 2" GR. 5 BOLT	CANTILEVER RACK X-BRACE CONNECTON
CBH01	..	(2) 3/4" x 2" GR. 5 BOLT	CANTILEVER RACK HORIZONTAL BRACE CONNECTION

REV.	DATE	DESCRIPTION	BY
00	11/04/99	PRELIMINARY DESIGN	EDGE
01	07/27/15	REVISED	EXAR

7/28/2015 2:03 PM

A Division of WTD Holdings, Inc.
2255 Justin Trail | Alpharetta, GA 30004
(PH) 800.353.0852 (FAX) 770.569.0944
www.CT-Daniels.com | www.Sunbelt-Rack.com

SALESPERSON: TRAVIS
PROJECT NUMBER:

PROJECT NAME: LOWE'S
SHEET DESCRIPTION: CANTILEVER RACK ARRANGEMENT
SHEET FILE NO:
STRC #:
SHEET NO: RK1
SCALE: AS NOTED

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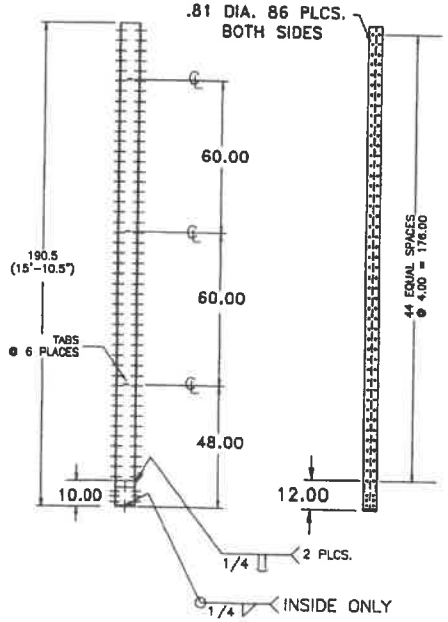
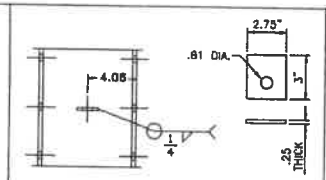
APPENDIX 7

COLUMN TYPE(S)

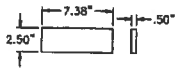
MARK	SIZE	O.A.H (H)	DESCRIPTION
C1-1	W8x18#	190.50"	COLUMNS



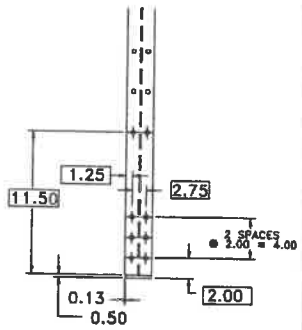
COLUMNS



TAB DETAIL



GUSSET DETAIL

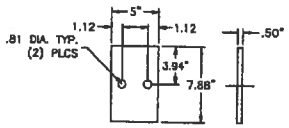


HOLE LOCATIONS

WELD IN ACCORDANCE WITH STRUCTURAL WELDING CODE AWS-D1.1-2002

MATERIAL SPECIFICATIONS FOR STEEL:
1. ALL COLUMNS, BASES, AND LOAD ARMS TO HAVE AN Fy = 50 ksi.
2. ALL BRACE PANELS TO HAVE Fy = 36 ksi.
3. ALL WELDING ROD TO BE E70 OR BETTER.
4. ALL BOLTS TO BE GR 5.

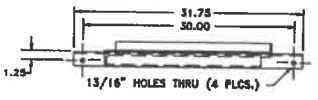
MATERIAL SPECS



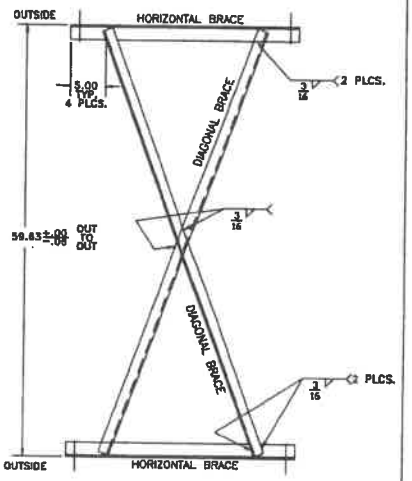
BASE PLATES

BRACE TYPE(S)

MARK	SIZE	O.A.L (L)	DESCRIPTION
BP-1	3/16"	31.75"	2"x2" ANGLE, HORIZONTAL BRACE
BP-2	3/16"	82.25"	2"x2" ANGLE, DIAGONAL BRACE



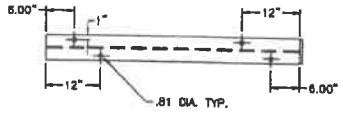
HORIZONTAL BRACE

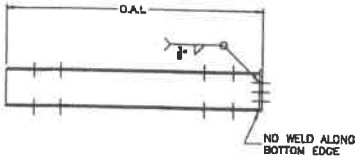


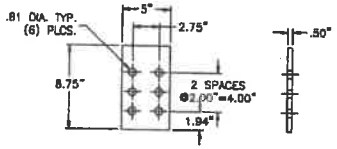
X-BRACE PANEL
BAY(S) @ 34" O.C / TABS @ 80" O.C

BASE TYPE(S)

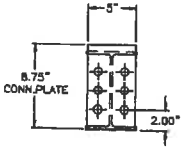
MARK	SIZE	O.A.L (L)	DESCRIPTION
B1-1	W8x18#	54.00"	BASES





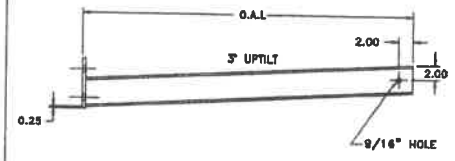


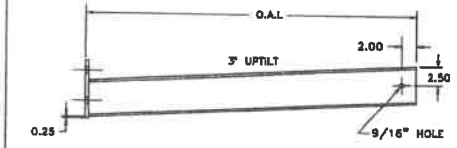
BASE CONNECTION PLATE

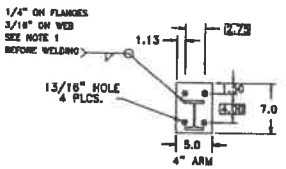


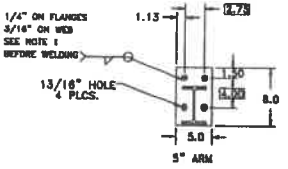
ARM TYPE(S)

MARK	SIZE	O.A.L (L)	DESCRIPTION
AR-1	S4x7.7#	54.00"	TYPICAL ARM LEVEL
AR-2	S5x10#	54.00"	TOP ARM LEVELS









REV.	DATE	DESCRIPTION	BY
00	11/04/99	PRELIMINARY DESIGN	EDGE
01	07/27/15	REVISED	EXAR

7/28/2015 2:03 PM

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2255 Justin Trail | Alpharetta, GA 30004
(PH) 800.353.0892 (FAX) 770.569.9644
www.CT-Darnell.com | www.Bluebell-Rack.com

SALESPERSON: TRAVIS
PROJECT NUMBER:
SHEET FILE NO:
PROJECT NAME: LOWE'S
SHEET DESCRIPTION: DETAILS - CANTILEVER RACK
STRC #:
SHEET NO: RD1
SCALE: AS NOTED

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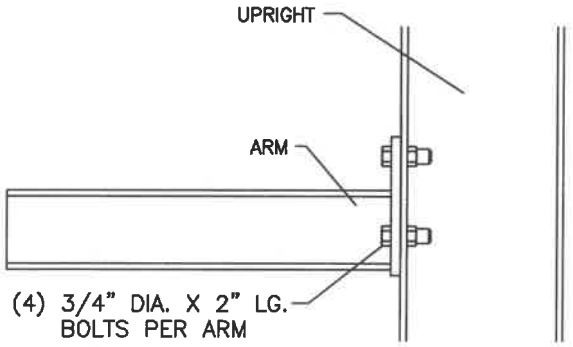
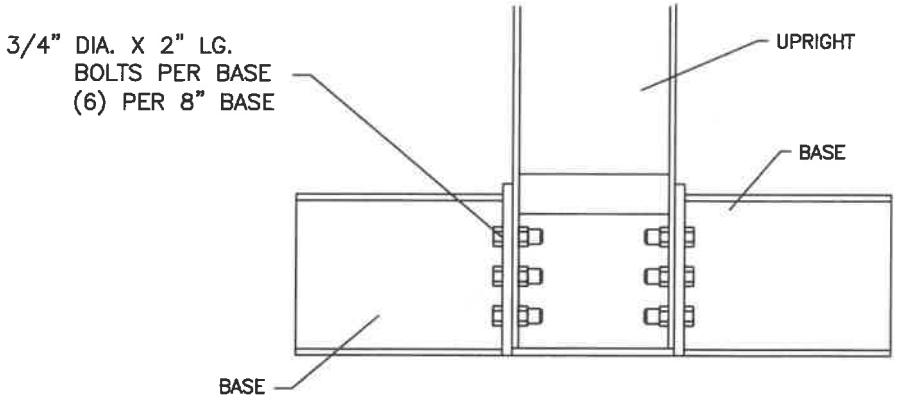
APPENDIX 7



ARM TO UPRIGHT



BASE TO UPRIGHT

TOLERANCES UNLESS NOTED:
ANGULAR (DEC/FRAC) ± 2°
ANGULAR (DEG/MIN) ± 30'
LINEAR (FRAC) ± N/A
LINEAR (DEC.) .0-± N/A
.00-± N/A
.000-± N/A

DEXCO INC. LEOLA, PA. 17540

SCALE N/A | DR. BY ROD | DATE 3/24/08 | CH. BY | APP. BY

CUSTOMER

TITLE AC-RACK1.PDF

TYP. RACK ASSY. DETAILS

WORK ORDER NO. | REV. | DISK NO. | DWG. NO. RA016709

GENERAL INFORMATION

POWER-STUD® +SD2

High Performance Wedge Expansion Anchor

PRODUCT DESCRIPTION

The Power-Stud+ SD2 anchor is a fully threaded, torque-controlled, wedge expansion anchor which is designed for consistent performance in cracked and uncracked concrete. Suitable base materials include normal-weight concrete, sand-lightweight concrete and concrete over steel deck. The anchor is manufactured with a zinc plated carbon steel body and stainless steel expansion clip for premium performance.

GENERAL APPLICATIONS AND USES

- Structural connections, i.e., beam and column anchorage
- Utility and safety-related attachments
- Interior applications / low level corrosion environment
- Tension zone applications, i.e., cable trays and strut, pipe supports, fire sprinklers
- Seismic and wind loading
- Medium to heavy duty purposes

FEATURES AND BENEFITS

+ Consistent performance in high and low strength concrete
+ Nominal drill bit size is the same as the anchor diameter
+ Anchor can be installed through standard fixture holes
+ Length ID code and identifying marking stamped on head of each anchor
+ Anchor design allows for follow-up expansion after setting under tensile loading

APPROVALS AND LISTINGS

- International Code Council, Evaluation Service (ICC-ES), ESR-2502 for cracked and uncracked concrete
- Code Compliant with the 2015, IBC, 2015 IRC, 2012 IBC, 2012 IRC, 2009 IBC, and 2009 IRC
- Tested in accordance with ACI 355.2 and ICC-ES AC193 for use in structural concrete under the design provisions of ACI 318-14 Chapter 17 or ACI 318-11/08 Appendix D
- Evaluated and qualified by an accredited independent testing laboratory for recognition in cracked and uncracked concrete including seismic and wind loading (Category 1 anchors)
- FM Global (Factory Mutual) - File No. 3033795, 3/8" and 1/2" diameters Pipe hanger components for automatic sprinkler systems
- Underwriters Laboratories (UL Listed) - File No. EX1289 - See listing

GUIDE SPECIFICATIONS

CSI Divisions: 03 16 00 - Concrete Anchors, 04 05 19.16 - Masonry Anchors and 05 05 09 - Post-Installed Concrete Anchors. Expansion anchors shall be Power-Stud+ SD2 as supplied by DEWALT, Towson, MD. Anchors shall be installed in accordance with published instructions and the Authority Having Jurisdiction.

MATERIAL SPECIFICATIONS

Anchor component	Specification
Anchor Body	Medium carbon steel
Hex nut	Carbon steel, ASTM A 563, Grade A
Washer	Carbon Steel, ASTM F 844; meets dimensional requirements of ANSI B18.22.2. Type A Plain
Expansion wedge (clip)	Type 316 Stainless Steel
Plating (anchor body, nut and washer)	Zinc plating according to ASTM B 633, SC1 Type III (Fe/Zn 5). Minimum plating requirements for Mild Service Condition.

SECTION CONTENTS

POWER-STUD+ SD2 ASSEMBLY

THREAD VERSION

- UNC threaded stud

ANCHOR MATERIALS

- Zinc plated carbon steel body with stainless steel expansion clip, zinc plated carbon steel nut and washer

ANCHOR SIZE RANGE (TYP.)

- 3/8" diameter through 3/4" diameter

SUITABLE BASE MATERIALS

- Normal-weight concrete
- Sand-lightweight concrete
- Concrete over steel deck
- Grouted-filled concrete masonry (CMU)

INSTALLATION SPECIFICATIONS

Installation Table for Power-Stud+ SD2[4]

Anchor Property/ Setting Information	Notation	Units	Nominal Anchor Size									
			3/8"	1/2"			5/8"			3/4"		
Anchor diameter	d_a	in. (mm)	0.375 (9.5)	0.500 (12.7)			0.625 (15.9)			0.750 (19.1)		
Minimum diameter of hole clearance in fixture	d_h	in. (mm)	7/16 (11.1)	9/16 (14.3)			11/16 (17.5)			13/16 (20.6)		
Nominal drill bit diameter	d_{bit}	in.	3/8 ANSI	1/2 ANSI			5/8 ANSI			3/4 ANSI		
Minimum nominal embedment depth[1]	h_{nom}	in. (mm)	2-3/8 (60)	2-1/2 (64)		3-3/4 (95)	3-7/8 (98)	4-7/8 (124)		4-1/2 (114)	5-3/4 (146)	
Effective embedment	h_{ef}	in. (mm)	2 (51)	2 (51)		3-1/4 (83)	3-1/4 (83)	4-1/4 (108)		3-3/4 (95)	5 (127)	
Minimum hole depth[2]	h_o	in. (mm)	2-5/8 (67)	2-3/4 (70)		4 (102)	4-1/4 (108)	5-1/4 (133)		5 (127)	6-1/4 (159)	
Minimum concrete member thickness	h_{min}	in. (mm)	4 (102)	4-1/2 (114)	6 (152)	5-3/4 (146) 5-3/4 (146)	5-3/4 (146)	6-1/2 (165)	8 (203)	7 (178)	10 (254)	
Minimum overall anchor length[3]	ℓ_{anch}	in. (mm)	3 (76.2)	3-3/4 (95)		4-1/2 (114)	4-3/4 (121)	6 (152)		5-1/2 (140)	7 (178)	
Minimum edge distance[2]	c_{min}	in. (mm)	2-1/2 (63.5)	4 (102)	2-3/4 (70)	4 (102) 2-3/4 (70)	4-1/4 (108)	4-1/4 (108)		5 (127)	4-1/2 (114)	
Minimum spacing distance[2]	s_{min}	in. (mm)	3-1/2 (88.9)	6 (152)	6 (152)	4 (102) 6 (152)	4-1/4 (108)	4-1/4 (108)		6 (152)	6 (152)	
Critical edge distance[2]	c_{ac}	in. (mm)	6-1/2 (165.1)	8 (203)		10 (254)	8 (203)	15-3/4 (400)	10 (254)	12 (305)	12 (305)	
Installation torque	T_{inst}	ft.-lb. (N-m)	20 (27)	40 (54)			60 (81)			110 (149)		
Torque wrench socket size	-	in.	9/16	3/4			15/16			1-1/8		
Nut height	-	in.	21/64	7/16			35/64			41/64		

For SI: 1 inch = 25.4 mm, 1 ft-lbf = 1.356 N-m.

1. The embedment depth, h_{nom}, is measured from the outside surface of the concrete member to the embedded end of the anchor prior to tightening.
2. For installations through the soffit of steel deck into concrete see the installation details in Figure A, B, and C. In addition, anchors shall have an axial spacing along the flute equal to the greater of $3h_{ef}$ or 1.5 times the flute width. The hole diameter in the steel deck must not exceed the hole diameter in the concrete by more than 1/8-inch (3.2 mm).
3. The listed minimum overall anchor length is based on anchor sizes commercially available at the time of publication compared with the requirements to achieve the minimum nominal embedment depth and possible fixture attachment.
4. The anchors may be installed in the topside of concrete-filled steel deck floor and roof assemblies in accordance with the installation specifications and design information provided the concrete thickness above the upper flute meets the minimum thicknesses specified in the tables; see Setting Information for Installation on the Top of Concrete-Filled Steel Deck Assemblies table and installation detail D.

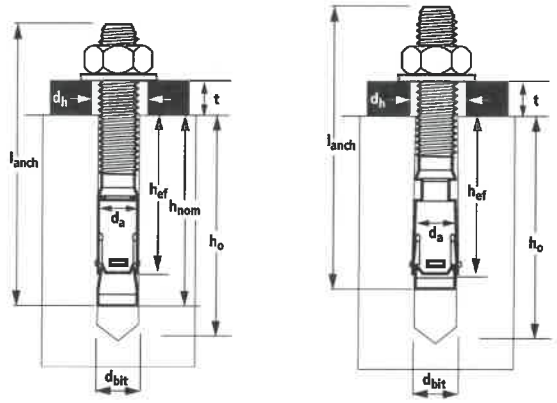
Anchor Setting Information for Installation on the Top of Concrete-Filled Steel Deck Assemblies[3,4]

Anchor Property/ Setting Information	Notation	Units	Nominal Anchor Size (inch)			
			3/8"		1/2"	
Nominal drill bit diameter	d_{bit}	in.	3/8 ANSI		1/2 ANSI	
Minimum nominal embedment depth[1]	h_{nom}	in. (mm)	2-3/8 (60)		2-1/2 (64)	
Effective embedment	h_{ef}	in. (mm)	2.00 (51)		2.00 (51)	
Minimum concrete member thickness[2]	$h_{min,deck}$	in. (mm)	2-1/2 (64)		2-1/2 (64)	
Critical edge distance	$c_{ac,deck,top}$	in. (mm)	8 (203)		9 (229)	
Minimum edge distance	$c_{min,deck,top}$	in. (mm)	4 (102)	2-3/4 (70)	4 (102)	8 (203
Minimum spacing distance	$s_{min,deck,top}$	in. (mm)	3-1/2 (89)	6 (152)	8 (203)	4 (102)
Minimum hole depth	h_o	in. (mm)	2-1/2 (64)		2-1/2 (64)	
Installation torque	T_{inst}	ft.-lb. (N-m)	20 (27)		40 (54)	
Torque wrench socket size	-	in.	9/16		3/4	
Nut height	-	in.	21/64		7/16	

For SI: 1 inch = 25.4 mm, 1 ft-lbf = 1.356 N-m.

1. The embedment depth, h_{nom}, is measured from the outside surface of the concrete member to the embedded end of the anchor prior to tightening.
2. The anchors may be installed in the topside of concrete-filled steel deck floor and roof assemblies provided the concrete thickness above the upper flute meets the minimum thicknesses specified in this table. Minimum concrete member thickness refers to the concrete thickness above the upper flute (topping thickness). See Installation Detail D.
3. For all other anchor diameters and embedment depths, refer to the installation table for applicable values of h_{min}, c_{min} and s_{min}.
4. Design capacities shall be based on calculations according to values in Tension and Shear Design Information for Anchors in Concrete tables.

Power-Stud+ SD2 Anchor Detail



Head Marking

Legend

Letter Code = Length Identification Mark

'+' Symbol = Strength Design Compliant Anchor

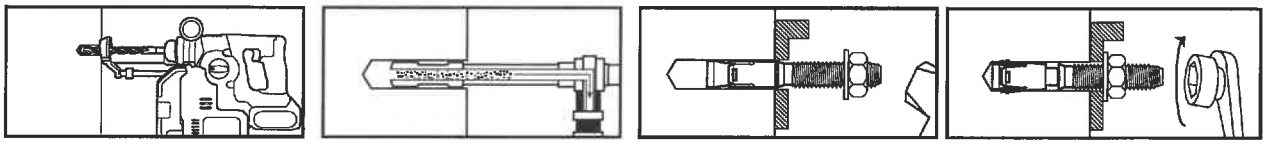
Number Code 2 = Carbon Steel Body and Stainless Steel Expansion Clip

Length Identification

Mark	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
From	1-1/2"	2"	2-1/2"	3"	3-1/2"	4"	4-1/2"	5"	5-1/2"	6"	6-1/2"	7"	7-1/2"	8"	8-1/2"	9"
Up to but not including	2"	2-1/2"	3"	3-1/2"	4"	4-1/2"	5"	5-1/2"	6"	6-1/2"	7"	7-1/2"	8"	8-1/2"	9"	9-1/2"
Length Identification mark indicates overall length of anchor.																

INSTALLATION INSTRUCTIONS

Installation Instructions for Power-Stud+ SD2



Step 1

Using the proper drill bit size, drill a hole into the base material to the required depth. The tolerances of the drill bit used should meet the requirements of ANSI Standard B212.15.

Step 2

Remove dust and debris from the hole during drilling, (e.g. dust extractor, hollow bit) or following drilling (e.g. suction, forced air) to extract loose particles created by drilling.

Step 3

Position the washer on the anchor and thread on the nut. If installing through a fixture, drive the anchor through the fixture into the hole. Be sure the anchor is driven to the minimum required embedment depth, h_{nom}.

Step 4

Tighten the anchor with a torque wrench by applying the required installation torque, T_{inst}.

ORDERING INFORMATION

Power-Stud+ SD2 (Carbon Steel Body with Stainless Steel Expansion Clip)

Cat. No.	Anchor Size	Thread Length	Box Qty.	Carton Qty.	Wt./100 (lbs.)	Suggested ANSI Carbide Drill Bit Cat. No.				
						Full Head SDS-Plus	SDS-Plus	SDS-Max	Hollow Bit SDS-Plus	Hollow Bit SDS-Max
7413SD2	3/8" x 3"	1-3/4"	50	300	10	DW5527	DW5427	-	-	-
7414SD2	3/8" x 3-1/2"	2-1/4"	50	300	12	DW5527	DW5427	-	-	-
7415SD2	3/8" x 3-3/4"	2-1/2"	50	300	13	DW5527	DW5427	-	-	-
7416SD2	3/8" x 5"	3-3/4"	50	300	16	DW55300	DW5429	-	-	-
7422SD2	1/2" x 3-3/4"	2-1/8"	50	200	23	DW5537	DW5437	DW5803	DWA54012	-
7423SD2	1/2" x 4-1/2"	2-7/8"	50	200	28	DW5539	DW5438	DW5803	DWA54012	-
7424SD2	1/2" x 5-1/2"	3-7/8"	50	150	32	DW5539	DW5438	DW5803	DWA54012	-
7426SD2	1/2" x 7"	5-3/8"	25	100	44	DW5539	DW5438	DW5803	DWA54012	-
7427SD2	1/2" x 8-1/2"	6-7/8"	25	100	46	DW5539	DW5439	DW5804	DWA54012	-
7435SD2	5/8" x 4-3/4"	2-7/8"	25	100	52	-	DW5446	DW5806	DWA54058	DWA58058
7433SD2	5/8" x 5"	3-1/8"	25	50	57	-	DW5446	DW5806	DWA54058	DWA58001
7434SD2	5/8" x 6"	4-1/8"	25	75	64	-	DW5446	DW5806	DWA54058	DWA58001
7436SD2	5/8" x 7"	5-1/8"	25	75	72	-	DW5447	DW5806	DWA54058	DWA58001
7438SD2	5/8" x 8-1/2"	6-5/8"	25	75	84	-	DW5447	DW5809	DWA54058	DWA58001
7442SD2	3/4" x 5-1/2"	3-1/4"	20	60	88	-	DW5453	DW5810	DWA54074	DWA58034
7444SD2	3/4" x 6-1/4"	4"	20	60	90	-	DW5455	DW5810	DWA54074	DWA58034
7446SD2	3/4" x 7"	4-3/4"	20	60	95	-	DW5455	DW5810	DWA54074	DWA58034
7448SD2	3/4" x 8-1/2"	6-1/4"	10	40	95	-	DW5455	DW5812	DWA54074	DWA58034

The published size includes the diameter and the overall length of the anchor.

All anchors are packaged with nuts and washers.

A manual hand pump is available (Cat. No. 08280).
Hollow drill bits must be used with a dust extraction vacuum (Cat. No. DW012).