

**A7+**

# The Most Versatile Quick Cure Adhesive



A7P-10

A7P-28

## APPLICATIONS / USES

- Concrete dowelling (slabs, walls, columns)
- Steel framing (columns, beams, ledgers)
- Brick pinning and CMU reinforcement
- Architectural metal fastening (railings, signage)
- Mechanical, electrical, and plumbing attachment
- Vibratory equipment anchoring

## DESCRIPTION

### Quick Curing Hybrid Epoxy Adhesive

RED HEAD A7+ is a high-strength, fast-cure adhesive that is designed to securely anchor threaded rod and rebar to cured concrete and masonry. A7+ is one of the most versatile anchoring solutions on the market, suitable for use in an extremely wide range of applications and environmental conditions.

- Qualified for use in concrete, brick, block, and clay tile
- ICC-ES approved for cracked concrete and seismic applications (ICC-ES ESR 3903).
- Cures in only 45 minutes (at base temperature of 70°F/21°C)
- No extra time required for drying saturated concrete or water-filled holes
- Easy pumping even in cold temperatures
- Low odor - suitable for use indoors and in occupied buildings
- Optimum viscosity simplifies use in overhead and horizontal holes
- 18-month storage life minimizes waste and risk of using expired product
- Rugged cartridge resists breakage due to rough handling or cold temperatures

## ADVANTAGES

- All weather formula
- Works in damp holes and underwater applications
- Fast curing time, 45 minutes at 70°F
- ICC-ES Evaluation Report ESR-3903 (Concrete) and ESR-3951 (Masonry)
- NSF 61 Listed
- S75 high flow nozzle reduces installation time
- Fast & easy dispensing, even 28 ounce cartridge can be hand dispensed

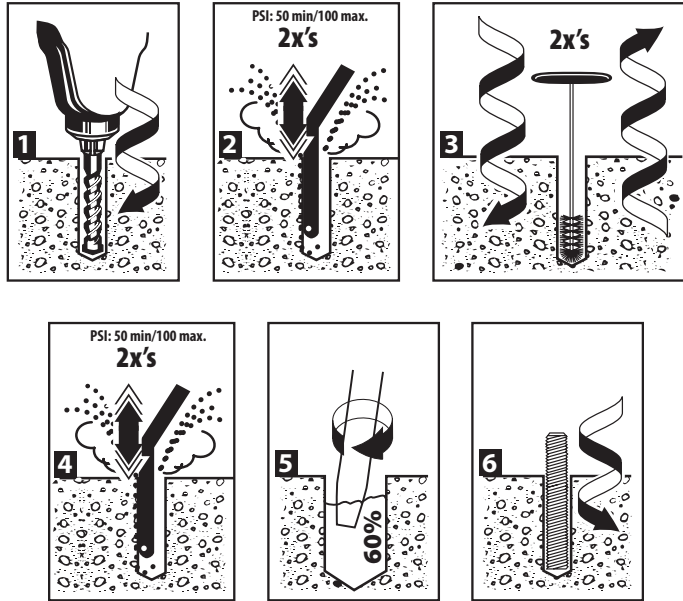
### Curing Times

CONCRETE (F°)	ADHESIVE (F°)	GEL TIME	FULL CURE TIME
110	110	1.5 minutes	45 minutes
90	90	3 minutes	45 minutes
70	70	5 minutes	45 minutes
50	50	15 minutes	90 minutes
30	30	35 minutes	4 hours
14	30	35 minutes	24 hours

### Most Competitive Spacing and Edge Distance

NOMINAL ANCHOR DIAMETER (IN.)	MINIMUM SPACING (IN.)	MINIMUM EDGE DISTANCE (IN.)
3/8	15/16	15/16
1/2	1-1/2	1-1/2
5/8	2-1/2	2-1/2
3/4	3	3
7/8	3-1/2	3-1/2
1	4	4
1-1/4	5	5

## INSTALLATION STEPS



\* Damp, submerged and underwater applications require 4x's air, 4x's brushing and 4x's air

## APPROVALS/LISTINGS

ICC-ES ESR-3903 for Cracked and Uncracked concrete including all Seismic Zones

ICC-ES ESR-3951 for masonry

IBC 2006/2009/2012/2015 Compliant

NSF/ANSI Standard 61

For the most current approvals/listings visit: [www.itwredhead.com](http://www.itwredhead.com)

## APPLICATIONS



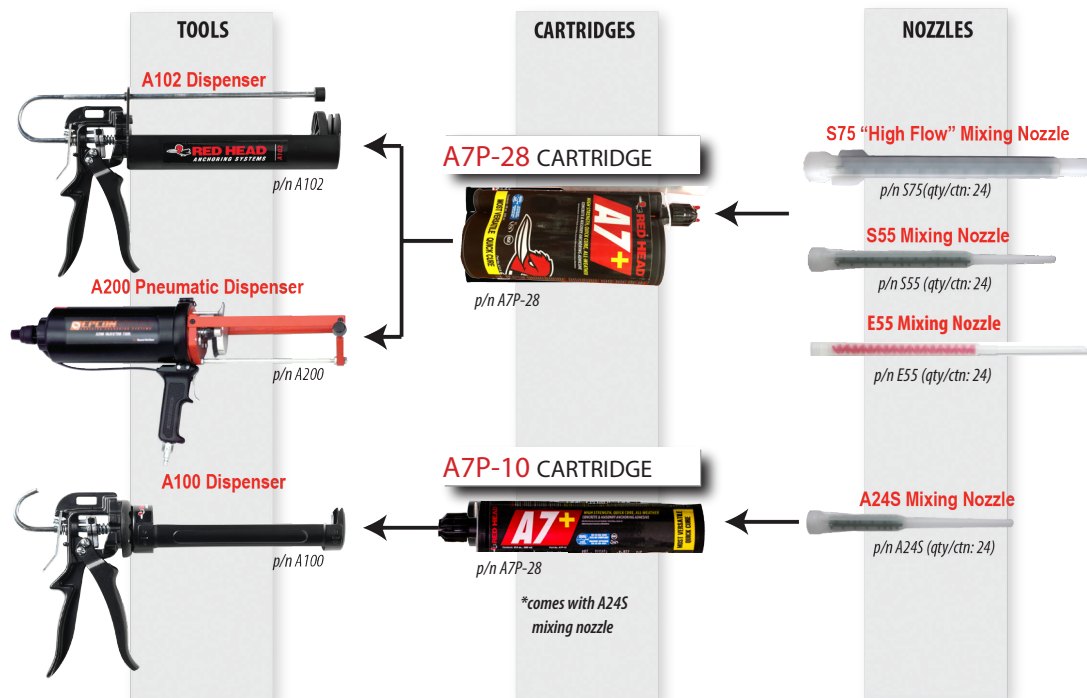
### Water Treatment Facilities

The best-in-class in edge and spacing distance of Red Head A7+ and its ability to work in water have made it a great fit for waste water treatment plants.



### Roadway Doweling

A7+ dispenses so quickly and rebar inserts so easily that contractors find installed costs are lower than many other products including grout for doweling.



## PERFORMANCE TABLE

### A7+ Quick-Cure Adhesive

### Average Ultimate Tension and Shear Loads<sup>1,2,3</sup> for Threaded Rod Installed in Solid Concrete

THREADED ROD DIA. In. (mm)	DRILL HOLE DIAMETER In. (mm)	MAX. CLAMPING FORCE AFTER PROPER CURE Ft.-Lbs. (Nm)	EMBEDMENT IN CONCRETE In. (mm)	2000 PSI (13.8 MPa) CONCRETE		4000 PSI (27.6 MPa) CONCRETE	
				ULTIMATE TENSION Lbs. (kN)	ULTIMATE SHEAR Lbs. (kN)	ULTIMATE TENSION Lbs. (kN)	ULTIMATE SHEAR Lbs. (kN)
3/8 (9.5)	7/16 (11.1)	13 - 18 (17-24)	1-1/2 (38.1)	N/A	N/A	3,734 (16.6)	4,126 (18.3)
			3-3/8 (85.7)	5,852 (26.0)	5,220 (23.2)	10,977 (48.8)	5,220 (23.2)
			4-1/2 (114.3)	7,729 (34.4)	5,220 (23.2)	11,661 (51.9)	5,220 (23.2)
1/2 (12.7)	9/16 (14.3)	22 - 25 (29-33)	2 (50.8)	N/A	N/A	6,022 (26.8)	8,029 (35.7)
			4-1/2 (114.3)	10,798 (48.0)	8,029 (35.7)	17,162 (76.3)	8,029 (35.7)
			6 (152.4)	14,210 (63.2)	8,029 (35.7)	17,372 (77.3)	8,029 (35.7)
5/8 (15.9)	3/4 (19.1)	55 - 80 (74-108)	2-1/2 (63.5)	N/A	N/A	7,330 (32.6)	11,256 (50.1)
			5-5/8 (142.9)	16,417 (73.0)	15,967 (71.0)	26,504 (117.9)	15,967 (71.0)
			7-1/2 (190.5)	18,747 (83.4)	15,967 (71.0)	29,381 (130.7)	15,967 (71.0)
3/4 (19.1)	7/8 (22.2)	106 - 160 (143-216)	3 (76.2)	N/A	N/A	8,634 (38.4)	20,126 (89.5)
			6-3/4 (171.5)	18,618 (82.8)	20,126 (89.5)	29,727 (132.2)	20,126 (89.5)
			9 (228.6)	23,934 (106.5)	20,126 (89.5)	37,728 (167.8)	20,126 (89.5)
7/8 (22.2)	1 (25.4)	185 - 250 (250-338)	3-1/2 (88.9)	N/A	N/A	13,650 (60.7)	20,920 (92.9)
			7-7/8 (200.0)	N/A	29,866 (132.9)	44,915 (199.8)	29,866 (132.9)
			10-1/2 (266.7)	36,881 (164.1)	29,866 (132.9)	48,321 (215.0)	29,866 (132.9)
1 (25.4)	1-1/8 (28.6)	276 - 330 (374-447)	4 (101.6)	N/A	N/A	16,266 (72.2)	33,152 (147.5)
			9 (228.6)	32,215 (143.3)	37,538 (167.0)	48,209 (214.5)	37,538 (167.0)
			12 (304.8)	46,064 (204.9)	37,538 (167.0)	63,950 (284.5)	37,538 (167.0)
1-1/4 (31.8)	1-3/8 (34.9)	370 - 660 (501-894)	5 (127.0)	N/A	N/A	21,838 (97.1)	33,152 (147.5)
			11-1/4 (285.8)	45,962 (204.5)	58,412 (259.8)	56,715 (252.3)	58,412 (259.8)
			15 (381.0)	62,208 (276.7)	58,412 (259.8)	84,385 (375.4)	58,412 (259.8)

1 Allowable working loads for the single installations under static loading should not exceed 25% capacity or the allowable load of the anchor rod. Divide by 4.

2 Ultimate load values in 2000 and 4000 psi stone aggregate concrete. Ultimate loads are indicated for the embedment shown in the Embedment in Concrete column. Performance values are based on the use of high strength threaded rod (ASTM A193 Gr. B7). The use of lower strength rods will result in lower ultimate tension and shear loads.

3 Linear interpolation may be used for intermediate spacing and edge distances.

## PERFORMANCE TABLE

### A7+ Quick-Cure Adhesive

### Allowable Tension Loads<sup>1</sup> for Threaded Rod Installed in Solid Concrete

THREADED ROD DIA. In. (mm)	DRILL HOLE DIAMETER In. (mm)	MIN. EMBEDMENT DEPTH In. (mm)	ALLOWABLE TENSION LOAD BASED ON ADHESIVE BOND STRENGTH		ALLOWABLE TENSION LOAD BASED ON STEEL STRENGTH		
			2000 PSI (13.8 MPa) CONCRETE Lbs. (kN)	4000 PSI (27.6 MPa) CONCRETE Lbs. (kN)	ASTM A307 (SAE 1018) Lbs. (kN)	ASTM A193 GR. B7 (SAE 4140) Lbs. (kN)	ASTM F593 AISI 304 SS Lbs. (kN)
3/8 (9.5)	7/16 (11.1)	1-1/2 (38.1)	N/A	934 (4.2)	2,080 (9.3)	4,340 (19.3)	3,995 (17.8)
		3-3/8 (85.7)	1,460 (6.5)	2,740 (12.2)	2,080 (9.3)	4,340 (19.3)	3,995 (17.8)
		4-1/2 (114.3)	1,930 (8.6)	2,915 (13.0)	2,080 (9.3)	4,340 (19.3)	3,995 (17.8)
1/2 (12.7)	9/16 (14.3)	2 (50.8)	N/A	1,505 (6.7)	3,730 (16.6)	7,780 (34.6)	7,155 (31.8)
		4-1/2 (114.3)	2,700 (12.0)	4,290 (19.1)	3,730 (16.6)	7,780 (34.6)	7,155 (31.8)
		6 (152.4)	3,550 (15.8)	4,340 (19.3)	3,730 (16.6)	7,780 (34.6)	7,155 (31.8)
5/8 (15.9)	3/4 (19.1)	2-1/2 (63.5)	N/A	1,832 (8.2)	5,870 (26.1)	12,230 (54.4)	11,250 (50.0)
		5-5/8 (142.9)	4,100 (18.3)	6,625 (29.5)	5,870 (26.1)	12,230 (54.4)	11,250 (50.0)
		7-1/2 (190.5)	4,685 (20.8)	7,345 (32.7)	5,870 (26.1)	12,230 (54.4)	11,250 (50.0)
3/4 (19.1)	7/8 (22.2)	3 (76.2)	N/A	2,158 (9.6)	8,490 (37.8)	17,690 (78.7)	14,860 (66.1)
		6-3/4 (171.5)	4,655 (20.7)	7,430 (33.1)	8,490 (37.8)	17,690 (78.7)	14,860 (66.1)
		9 (228.6)	5,980 (26.6)	9,430 (42.0)	8,490 (37.8)	17,690 (78.7)	14,860 (66.1)
7/8 (22.2)	1 (25.4)	3-1/2 (88.9)	N/A	3,413 (15.2)	11,600 (51.6)	25,510 (113.5)	20,835 (92.7)
		7-7/8 (200.0)	N/A	11,230 (49.9)	11,600 (51.6)	25,510 (113.5)	20,835 (92.7)
		10-1/2 (266.7)	9,220 (41.0)	12,080 (53.7)	11,600 (51.6)	25,510 (113.5)	20,834 (92.7)
1 (25.4)	1-1/8 (28.6)	4 (101.6)	N/A	4,067 (18.1)	15,180 (67.5)	31,620 (140.7)	26,560 (118.1)
		9 (228.6)	8,050 (35.8)	12,050 (53.6)	15,180 (67.5)	31,620 (140.7)	26,560 (118.1)
		12 (304.8)	11,515 (51.2)	15,985 (71.1)	15,180 (67.5)	31,620 (140.7)	26,560 (118.1)
1-1/4 (31.8)	1-3/8 (34.9)	5 (127.0)	N/A	5,460 (24.3)	23,800 (105.9)	49,580 (220.6)	34,670 (154.2)
		11-1/4 (285.8)	11,490 (51.1)	14,175 (63.1)	23,800 (105.9)	49,580 (220.6)	34,670 (154.2)
		15 (381.0)	15,550 (69.2)	21,095 (93.8)	23,800 (105.9)	49,580 (220.6)	34,670 (154.2)

1 Use lower value of either bond or steel strength for allowable tensile load.

## PERFORMANCE TABLE

### A7+ Quick-Cure Adhesive

### Allowable Shear Loads<sup>1</sup> for Threaded Rod Installed in Solid Concrete

THREADED ROD DIA. In. (mm)	DRILL HOLE DIAMETER In. (mm)	MIN. EMBEDMENT DEPTH In. (mm)	ALLOWABLE SHEAR LOAD BASED ON CONCRETE STRENGTH		ALLOWABLE SHEAR LOAD BASED ON STEEL STRENGTH		
			2000 PSI (13.8 MPa) CONCRETE Lbs. (kN)	4000 PSI (27.6 MPa) CONCRETE Lbs. (kN)	ASTM A307 (SAE 1018) Lbs. (kN)	ASTM A193 GR. B7 (SAE 4140) Lbs. (kN)	ASTM F593 AISI 304 SS Lbs. (kN)
3/8 (9.5)	7/16 (11.1)	1-1/2 (38.1) 3-3/8 (85.7)	N/A 1,305 (5.8)	1,031 (4.6) 1,305 (5.8)	1,040 (4.6) 1,040 (4.6)	2,170 (9.7) 2,170 (9.7)	1,995 (8.9) 1,995 (8.9)
1/2 (12.7)	9/16 (14.3)	2 (50.8) 4-1/2 (114.3)	N/A 2,005 (8.9)	2,005 (8.9) 2,005 (8.9)	1,870 (8.3) 1,870 (8.3)	3,895 (17.3) 3,895 (17.3)	3,585 (15.9) 3,585 (15.9)
5/8 (15.9)	3/4 (19.1)	2-1/2 (63.5) 5-5/8 (142.9)	N/A 3,990 (17.8)	2,814 (12.5) 3,990 (17.8)	2,940 (13.1) 2,940 (13.1)	6,125 (27.2) 6,125 (27.2)	5,635 (25.1) 5,635 (25.1)
3/4 (19.1)	7/8 (22.2)	3 (76.2) 6-3/4 (171.5)	N/A 5,030 (22.4)	5,030 (22.4) 5,030 (22.4)	4,250 (18.9) 4,250 (18.9)	8,855 (39.4) 8,855 (39.4)	7,440 (33.1) 7,440 (33.1)
7/8 (22.2)	1 (25.4)	3-1/2 (88.9) 7-7/8 (200.0)	N/A 7,465 (33.2)	5,230 (23.3) 7,465 (33.2)	5,800 (25.8) 5,800 (25.8)	12,760 (56.8) 12,760 (56.8)	10,730 (47.7) 10,730 (47.7)
1 (25.4)	1-1/8 (28.6)	4 (101.6) 9 (228.6)	N/A 9,385 (41.7)	8,288 (36.9) 9,385 (41.7)	7,590 (33.8) 7,590 (33.8)	15,810 (70.3) 15,810 (70.3)	13,285 (59.1) 13,285 (59.1)
1-1/4 (31.8)	1-3/8 (34.9)	5 (127.0) 11-1/4 (285.8)	N/A 14,600 (64.9)	8,288 (36.9) 14,600 (64.9)	11,900 (52.9) 11,900 (52.9)	24,790 (100.3) 24,790 (100.3)	18,840 (83.8) 18,840 (83.8)

<sup>1</sup> Use lower value of either concrete or steel strength for allowable shear load.

## PERFORMANCE TABLE

### A7+ Quick-Cure Adhesive

### Average Ultimate Tension Loads<sup>1,2,3</sup> for Reinforcing Bar Installed in Solid Concrete

REINFORCING BAR DIA. In. (mm)	EMBEDMENT IN CONCRETE In. (mm)	2000 PSI (13.8 MPa) CONCRETE ULTIMATE TENSION Lbs. (kN)	4000 PSI (27.6 MPa) CONCRETE ULTIMATE TENSION Lbs. (kN)	ULTIMATE TENSILE AND YIELD STRENGTH GRADE 60 REBAR	
				MINIMUM YIELD STRENGTH Lbs. (kN)	MINIMUM ULTIMATE TENSILE STRENGTH Lbs. (kN)
# 3 (9.5)	3-3/8 (85.7) 4-1/2 (114.3)	6,180 (27.5) 7,560 (33.6)	8,324 (37.0) 11,418 (50.8)	6,600 (29.4) 6,600 (29.4)	9,900 (44.0) 9,900 (44.0)
# 4 (12.7)	4-1/2 (114.3) 6 (152.4)	9,949 (44.3) 15,038 (66.9)	16,657 (74.1) 17,828 (79.3)	12,000 (53.4) 12,000 (53.4)	18,000 (80.1) 18,000 (80.1)
# 5 (15.9)	5-5/8 (142.9) 7-1/2 (190.5)	14,012 (62.3) 16,718 (74.4)	20,896 (93.0) 26,072 (116.0)	18,600 (82.7) 18,600 (82.7)	27,900 (124.1) 27,900 (124.1)
# 6 (19.1)	6-3/4 (171.5) 9 (228.6)	21,247 (94.5) 33,325 (148.2)	26,691 (118.7) 37,425 (166.5)	26,400 (117.4) 26,400 (117.4)	39,600 (176.2) 39,600 (176.2)
# 7 (22.2)	7-7/8 (200.0) 10-1/2 (266.7)	N/A 38,975 (173.4)	40,374 (179.6) 46,050 (204.8)	36,000 (160.1) 36,000 (160.1)	54,000 (240.2) 54,000 (240.2)
# 8 (25.4)	9 (228.6) 12 (304.8)	35,600 (158.4) 41,010 (182.4)	47,311 (210.5) 66,140 (294.2)	47,400 (210.9) 47,400 (210.9)	71,100 (316.3) 71,100 (316.3)
# 9 (28.6)	10-1/8 (257.2) 13-1/2 (342.9)	N/A N/A	57,221 (254.5) 79,966 (355.7)	60,000 (266.9) 60,000 (266.9)	90,000 (400.4) 90,000 (400.4)
# 10 (31.8)	11-1/4 (285.8) 15 (381.0)	49,045 (218.2) 69,079 (307.3)	73,091 (325.1) 83,295 (370.5)	76,200 (339.0) 76,200 (339.0)	114,300 (508.5) 114,300 (508.5)
# 11 (34.9)	12-3/8 (314.3) 16-1/2 (419.1)	63,397 (282.0) 81,707 (363.5)	75,047 (333.8) 91,989 (409.2)	93,600 (416.4) 93,600 (416.4)	140,400 (624.6) 140,400 (624.6)

<sup>1</sup> Allowable working loads for the single installations under static loading should not exceed 25% capacity or the allowable load of the anchor rod.

<sup>2</sup> Ultimate load values in 2000 and 4000 psi stone aggregate concrete. Ultimate loads are indicated for the embedment shown in the Embedment in Concrete column. Performance values are based on the use of minimum Grade 60 reinforcing bar. The use of lower strength rods will result in lower ultimate tension loads.

<sup>3</sup> SHEAR DATA: Provided the distance from the rebar to the edge of the concrete member exceeds 1.25 times the embedment depth of the rebar, calculate the ultimate shear load for the rebar anchorage as 60% of the ultimate tensile strength of the rebar.

## PERFORMANCE TABLE

### A7+ Quick-Cure Adhesive

### Recommended Edge Distance Requirements for Shear Loads Installed in Solid Concrete

ANCHOR DIAMETER In. (mm)	EMBEDMENT DEPTH In. (mm)	CRITICAL EDGE DISTANCE In. (mm) (100% LOAD CAPACITY)	INTERPOLATED EDGE DISTANCE In. (mm) (80% LOAD CAPACITY)	INTERPOLATED EDGE DISTANCE In. (mm) (50% LOAD CAPACITY)	MINIMUM EDGE DISTANCE In. (mm) (10% LOAD CAPACITY)
3/8 (9.5)	3-3/8 (85.7)	4-3/16 (106.4)	3-7/16 (87.3)	2-5/16 (58.7)	13/16 (20.6)
1/2 (12.7)	4-1/2 (114.3)	5-5/8 (142.9)	4-5/8 (117.5)	3-1/8 (79.4)	1-1/8 (28.6)
5/8 (15.9)	5-5/8 (142.9)	7 (177.8)	5-3/4 (146.1)	3-1/8 (79.4)	1-3/8 (34.9)
3/4 (19.1)	6-3/4 (171.5)	8-7/16 (214.2)	6-15/16 (176.2)	4-5/8 (117.5)	1-5/8 (41.3)
1 (25.4)	9 (228.6)	11-1/4 (285.8)	9-1/4 (235.0)	6-1/4 (158.8)	2-1/4 (57.2)
1-1/4 (31.8)	11-1/4 (285.8)	14-1/16 (357.2)	11-5/8 (295.3)	7-7/8 (200.0)	2-7/8 (73.0)

## PERFORMANCE TABLE

### A7+ Quick-Cure Adhesive

### Recommended Edge Distance Requirements for Tension Loads Installed in Solid Concrete

ANCHOR DIAMETER In. (mm)	EMBEDMENT DEPTH In. (mm)	CRITICAL EDGE DISTANCE In. (mm) (100% LOAD CAPACITY)	INTERPOLATED EDGE DISTANCE In. (mm) (90% LOAD CAPACITY)	INTERPOLATED EDGE DISTANCE In. (mm) (80% LOAD CAPACITY)	MINIMUM EDGE DISTANCE In. (mm) (70% LOAD CAPACITY)
3/8 (9.5)	3-3/8 (85.7) 4-1/2 (114.3)	2-1/2 (63.5) 3-3/8 (85.7)	1-15/16 (49.2) 2-5/8 (66.7)	1-3/8 (34.9) 1-7/8 (47.6)	13/16 (26.2) 1-1/8 (28.6)
1/2 (12.7)	4-1/2 (114.3) 6 (152.4)	3-3/8 (85.7) 4-1/2 (114.3)	2-5/8 (66.7) 3-1/2 (88.9)	1-7/8 (47.6) 2-1/2 (63.5)	1-1/8 (28.6) 1-1/2 (38.1)
5/8 (15.9)	5-5/8 (142.9) 7-1/2 (190.5)	4-3/16 (106.4) 5-5/8 (142.9)	3-1/4 (82.6) 4-3/8 (111.1)	2-5/16 (58.7) 3-1/8 (79.4)	1-3/8 (34.9) 1-7/8 (47.6)
3/4 (19.1)	6-3/4 (171.5) 9 (228.6)	5-1/16 (128.6) 6-3/4 (171.5)	3-15/16 (100.0) 5-1/4 (133.4)	2-13/16 (71.4) 3-3/4 (95.3)	1-5/8 (15.9) 2-1/4 (57.2)
1 (25.4)	9 (228.6) 12 (304.8)	6-3/4 (171.5) 9 (228.6)	5-1/4 (133.4) 7 (177.8)	3-3/4 (95.3) 5 (127.0)	2-1/4 (57.2) 3 (76.2)
1-1/4 (31.8)	11-1/4 (285.8) 15 (381.0)	8-7/16 (214.3) 11-1/4 (285.8)	6-9/16 (166.7) 8-3/4 (222.2)	4-3/4 (120.7) 6-1/4 (158.8)	2-7/8 (73.0) 3-3/4 (95.3)

**A7+**  
Quick-Cure Adhesive

**Allowable Stress Design Reference Tables**

**A7+ Adhesive Edge/Spacing Distance Load Factor Summary  
for Installation of Threaded Rod and Reinforcing Bar <sup>1,2</sup>**

LOAD FACTOR	DISTANCE FROM EDGE OF CONCRETE
<b>Critical Edge Distance—Tension</b>	
100% Tension Load	0.75 x Anchor Embedment
<b>Minimum Edge Distance—Tension</b>	
70% Tension Load	0.25 x Anchor Embedment
<b>Critical Edge Distance—Shear</b>	
100% Shear Load	1.25 x Anchor Embedment
<b>Minimum Edge Distance—Shear</b>	
10% Shear Load	0.25 x Anchor Embedment
LOAD FACTOR	DISTANCE FROM ANOTHER ANCHOR
<b>Critical Spacing—Tension</b>	
100% Tension Load	1.25 x Anchor Embedment
<b>Minimum Spacing—Tension</b>	
80% Tension Load	0.25 x Anchor Embedment
<b>Critical Spacing—Shear</b>	
100% Shear Load	1.25 x Anchor Embedment
<b>Minimum Spacing—Shear</b>	
25% Shear Load	0.25 x Anchor Embedment

1 Use linear interpolation for load factors at edge distances or spacing distances between critical and minimum.

2 Anchors are affected by multiple combination of spacing and/or edge distance loading and direction of the loading. Use the product of tension and shear loading factors in design.

**Combined Tension and Shear Loading—for A7+ Adhesive Anchors**

Allowable loads for anchors under tension and shear loading at the same time (combined loading) will be lower than the allowable loads for anchors subjected to 100% tension or 100% shear. Use the following equation to evaluate anchors in combined loading conditions:

$$\left( \frac{N_a}{N_s} \right)^{5/3} + \left( \frac{V_a}{V_s} \right)^{5/3} \leq 1$$

$N_a$  = Applied Service Tension Load

$N_s$  = Allowable Tension Load

$V_a$  = Applied Service Shear Load

$V_s$  = Allowable Shear Load

# STRENGTH DESIGN TABLE

## A7+ Quick-Cure Adhesive

## Rebar- ASTM A615 Grade 60 Steel in Uncracked Concrete - Tension (lbf) and Shear (lbf)

Rebar	Anchor Diameter (in.)	Embedment Depth (in.)	Tension (lbf)					Shear (lbf)
			2500 psi	3000 psi	4000 psi	5000 psi	6000 - 8000 psi	2500 - 8000 psi
#3	3/8	3 3/8	3,663	3,663	3,663	3,663	3,663	3,564
		4 1/2	4,884	4,884	4,884	4,884	4,884	3,564
		7 1/2	6,435	6,435	6,435	6,435	6,435	3,564
#4	1/2	4 1/2	7,446	7,523	7,523	7,523	7,523	6,480
		6	10,030	10,030	10,030	10,030	10,030	6,480
		10	11,700	11,700	11,700	11,700	11,700	6,480
#5	5/8	5 5/8	10,406	11,399	11,542	11,542	11,542	10,044
		7 1/2	15,389	15,389	15,389	15,389	15,389	10,044
		12 1/2	18,135	18,135	18,135	18,135	18,135	10,044
#6	3/4	6 3/4	13,679	14,871	14,871	14,871	14,871	14,256
		9	19,827	19,827	19,827	19,827	19,827	14,256
		15	25,740	25,740	25,740	25,740	25,740	14,256
#7	7/8	7 7/8	17,237	18,883	19,467	19,467	19,467	19,440
		10 1/2	25,955	25,955	25,955	25,955	25,955	19,440
		17 1/2	35,100	35,100	35,100	35,100	35,100	19,440
#8	1	9	21,060	23,070	25,115	25,115	25,115	25,596
		12	32,424	33,486	33,486	33,486	33,486	25,596
		20	46,215	46,215	46,215	46,215	46,215	25,596
#9	1 1/8	10 3/16	25,363	27,638	31,472	31,472	31,472	32,400
		13 1/2	38,845	41,816	41,816	41,816	41,816	32,400
		22 9/16	58,500	58,500	58,500	58,500	58,500	32,400
#10	1 1/4	11 1/2	30,491	33,018	38,477	43,019	46,227	41,148
		15 1/4	46,406	50,835	58,699	61,261	61,261	41,148
		25 7/16	74,295	74,295	74,295	74,295	74,295	41,148

Tabulated values are for estimation purposes only and should not be used for design (please use our TruSpec anchorage design software at [www.itwredhead.com](http://www.itwredhead.com))

Tabulated values represent design strengths per ACI 318 for a single anchor in adequate concrete thickness, not near an edge nor adjacent anchorage, not for sustained nor seismic loading

Bond strengths are for dry, cracked concrete with periodic inspection.

Bond strengths are for Temperature Range A (maximum long term temperature 110F, maximum short term temp 130F).



# STRENGTH DESIGN TABLE

## A7+ Quick-Cure Adhesive

## Threaded Rod- ASTM A193 B7 in Uncracked Concrete

Anchor Diameter (in.)	Embedment Depth (in.)	Tension (lbf)					Shear (lbf)
		2500 psi	3000 psi	4000 psi	5000 psi	6000 psi - 8000 psi	2500 psi - 8000 psi
3/8	3 3/8	3,871	3,871	3,871	3,871	3,871	3,777
	4 1/2	5,161	5,161	5,161	5,161	5,161	3,777
	7 1/2	7,268	7,268	7,268	7,268	7,268	3,777
1/2	4 1/2	6,881	6,881	6,881	6,881	6,881	6,916
	6	9,175	9,175	9,175	9,175	9,175	6,916
	10	13,305	13,305	13,305	13,305	13,305	6,916
5/8	5 5/8	10,406	10,406	10,406	10,406	10,406	11,018
	7 1/2	14,336	14,336	14,336	14,336	14,336	11,018
	12 1/2	21,188	21,188	21,188	21,188	21,188	11,018
3/4	6 3/4	13,679	14,984	14,984	14,984	15,483	16,309
	9	20,644	20,644	20,644	20,644	20,644	16,309
	15	31,358	31,358	31,358	31,358	31,358	16,309
7/8	7 7/8	17,237	17,740	17,740	17,740	17,740	22,510
	10 1/2	23,654	23,654	23,654	23,654	23,654	22,510
	17 1/2	39,423	39,423	39,423	39,423	39,423	22,510
1	9	21,060	23,070	23,070	23,070	23,171	29,530
	12	30,894	30,894	30,894	30,894	30,894	29,530
	20	51,491	51,491	51,491	51,491	51,491	29,530
1 1/4	11 1/2	30,419	33,322	38,477	43,019	43,738	47,242
	15 1/4	46,406	50,835	57,962	57,962	57,962	47,242
	25 7/16	90,855	90,855	90,855	90,855	90,855	47,242

Tabulated values are for estimation purposes only and should not be used for design (please use our TruSpec anchorage design software at [www.itwredhead.com](http://www.itwredhead.com))

Tabulated values represent design strengths per ACI 318 for a single anchor in adequate concrete thickness, not near an edge nor adjacent anchorage, not for sustained nor seismic loading. Bond strengths are for dry, cracked concrete with periodic inspection.

Bond strengths are for Temperature Range A (maximum long term temperature 110F, maximum short term temp 130F).



# STRENGTH DESIGN TABLE

**A7+**  
**Quick-Cure Adhesive**

**Threaded Rod in 2,500 - 8,000 psi**  
**Uncracked Concrete - Tension (lbf) and Shear (lbf)**

Anchor Diameter (in.)	Embedment Depth (in.)	Carbon Steel A36		Stainless Steel F593		ASTM A193 B7 Threaded Rod	
		Tension (lbf)	Shear (lbf)	Tension (lbf)	Shear (lbf)	Tension (lbf)	Shear (lbf)
3/8	3 3/8	3,375	1,755	3,871	2,280	3,871	3,777
	4 1/2	3,375	1,755	4,787	2,280	5,161	3,777
	7 1/2	3,375	1,755	4,787	2,280	7,268	3,777
1/2	4 1/2	6,173	3,211	6,881	4,044	6,881	6,916
	6	6,173	3,211	8,762	4,044	9,175	6,916
	10	6,173	3,211	8,762	4,044	13,305	6,916
5/8	5 5/8	9,833	5,116	10,752	6,441	10,752	11,018
	7 1/2	9,833	5,116	13,956	6,441	14,336	11,018
	12 1/2	9,833	5,116	13,956	6,441	21,188	11,018
3/4	6 3/4	14,550	7,566	15,483	7,614	15,483	16,309
	9	14,550	7,566	16,500	7,614	20,644	16,309
	15	14,550	7,566	16,500	7,614	31,358	16,309
7/8	7 7/8	17,740	10,446	17,740	10,533	17,740	22,510
	10 1/2	20,085	10,446	22,822	10,533	23,654	22,510
	17 1/2	20,085	10,446	22,822	10,533	39,423	22,510
1	9	23,171	13,702	23,171	13,818	23,171	29,530
	12	26,348	13,702	29,936	13,818	30,894	29,530
	20	26,348	13,702	29,936	13,818	51,491	29,530
1 1/4	11 1/2	38,477	21,925	38,477	22,092	38,477	47,242
	15 1/4	42,158	21,925	47,869	22,092	57,049	47,242
	25 7/16	42,158	21,925	47,869	22,092	90,855	47,242

Tabulated values are for estimation puposes only and should not be used for design (please use our TruSpec anchorage design software at [www.itwredhead.com](http://www.itwredhead.com))

Tabulated values represent design strengths per ACI 318 for a single anchor in adequate concrete thickness, not near an edge nor adjacent achnorage, not for sustained nor seismic loading

Bond strengths are for dry, cracked concrete with periodic inspection.

Bond strengths are for Temperature Range A (maximum long term temperature 110F, maximum short term temp 130F).

## STRENGTH DESIGN TABLE

**A7+**  
**Quick-Cure Adhesive**

**Rebar- ASTM A615 Grade 60 Steel in Cracked Concrete -  
Tension (lbf) and Shear (lbf)**

Rebar	Anchor Diameter (in.)	Embedment Depth (in.)	Tension (lbf) 2500 - 8000 psi concrete	Shear (lbf) 2500 - 8000 psi concrete
#3	3/8	3 3/8	1,651	2,311
		4 1/2	2,201	3,082
		7 1/2	3,669	3,564
#4	1/2	4 1/2	2,935	4,109
		6	3,914	5,479
		10	6,523	6,480
#5	5/8	5 5/8	4,586	6,421
		7 1/2	6,115	8,561
		12 1/2	10,192	10,044
#6	3/4	6 3/4	5,117	7,164
		9	6,823	9,552
		15	11,372	14,256
#7	7/8	7 7/8	6,965	9,751
		10 1/2	9,287	13,002
		17 1/2	15,478	19,440
#8	1	9	9,097	12,736
		12	12,130	16,982
		20	20,216	25,596
#9	1 1/8	10 3/16	11,616	16,262
		13 1/2	15,434	21,607
		22 9/16	25,726	32,400
#10	1 1/4	11 1/2	17,447	24,426
		15 1/4	23,121	32,369
		25 7/16	38,592	41,148

Tabulated values are for estimation purposes only and should not be used for design (please use our TruSpec anchorage design software at [www.itwredhead.com](http://www.itwredhead.com))

Tabulated values represent design strengths per ACI 318 for a single anchor in adequate concrete thickness, not near an edge nor adjacent anchorage, not for sustained nor seismic loading

Bond strengths are for dry, cracked concrete with periodic inspection.

Bond strengths are for Temperature Range A (maximum long term temperature 110F, maximum short term temp 130F).

# STRENGTH DESIGN TABLE

## A7+ Quick-Cure Adhesive

## Threaded Rod in 2,500 - 8,000 psi Cracked Concrete - Tension (lbf) and Shear (lbf)

Anchor Diameter (in.)	Embedment Depth (in.)	Tension (lbf)	Shear (lbf)		
			Carbon Steel A36	Stainless Steel F593	ASTM A193 B7 Threaded Rod
3/8	3 3/8	2,318	1,755	2,280	3,245
	4 1/2	3,091	1,755	2,280	3,777
	7 1/2	5,151	1,755	2,280	3,777
1/2	4 1/2	3,071	3,211	4,044	4,300
	6	4,095	3,211	4,044	5,733
	10	6,825	3,211	4,044	6,916
5/8	5 5/8	5,224	5,116	6,441	7,314
	7 1/2	6,965	5,116	6,441	9,752
	12 1/2	11,609	5,116	6,441	11,018
3/4	6 3/4	7,785	7,566	7,614	10,899
	9	10,380	7,566	7,614	14,532
	15	17,300	7,566	7,614	16,309
7/8	7 7/8	8,275	10,446	10,533	11,585
	10 1/2	11,033	10,446	10,533	15,446
	17 1/2	18,388	10,446	10,533	22,510
1	9	10,186	13,702	13,818	14,260
	12	13,581	13,702	13,818	19,014
	20	22,635	13,702	13,818	29,530
1 1/4	11 1/2	17,172	21,925	22,092	24,041
	15 1/4	22,757	21,925	22,092	31,860
	25 7/16	37,984	21,925	22,092	47,242

Tabulated values are for estimation purposes only and should not be used for design (please use our TruSpec anchorage design software at [www.itwredhead.com](http://www.itwredhead.com))

Tabulated values represent design strengths per ACI 318 for a single anchor in adequate concrete thickness, not near an edge nor adjacent anchorage, not for sustained nor seismic loading  
Bond strengths are for dry, cracked concrete with periodic inspection.

Bond strengths are for Temperature Range A (maximum long term temperature 110F, maximum short term temp 130F).

## MASONRY DESIGN TABLE

### A7+ Quick-Cure Adhesive

**Grout-filled Concrete Block: Allowable Tension and Shear Loads based on Steel Design Information for U.S. Customary Unit Threaded Rod <sup>1, 2, 3</sup>**

Anchor Diameter (in.)	Tension (lb)			Shear (lb)		
	ASTM A307 F <sub>u</sub> = 60 ksi	ASTM A193 Grade B7 F <sub>u</sub> = 125 ksi	ASTM F593 SS 304 F <sub>u</sub> = 100 ksi	ASTM A307 F <sub>u</sub> = 60 ksi	ASTM A193 Grade B7 F <sub>u</sub> = 125 ksi	ASTM F593 SS 304 F <sub>u</sub> = 100 ksi
3/8	2,185	4,555	3,645	1,125	2,345	1,875
1/2	3,885	8,100	6,480	2,000	4,170	3,335
5/8	6,075	12,655	10,125	3,130	6,520	5,215
3/4	8,750	18,225	12,390	4,505	9,390	6,385

For SI: 1 inch = 25.4mm, 1 lbf = 4.45N, 1ft-lbf = 1.356 N-M, 1 psi = 0.006895 MPa

<sup>1</sup>Allowable load used in the design must be the lesser of bond values and tabulated steel element values.

<sup>2</sup>Allowable tension and shear loads for threaded rods to resist short term loads, such as wind or seismic, must be calculated in accordance with Section 4.1 as applicable.

<sup>3</sup>Allowable steel loads are based on allowable tension and shear stresses equal to 0.33X F<sub>u</sub> and 0.17X F<sub>u</sub>, respectively.

## MASONRY DESIGN TABLE

### A7+ Quick-Cure Adhesive

**Grout-filled Concrete Block: Allowable Tension Loads for Threaded Rod <sup>1, 2, 3, 4, 7, 9, 10, 11, 12</sup>**

Anchor Diameter (in.)	Minimum Embedment (inches)	Load at s <sub>cr</sub> and c <sub>cr</sub> (lb)	Spacing <sup>5</sup>			Edge Distance <sup>6</sup>		
			Critical s <sub>cr</sub> (inches)	Minimum s <sub>min</sub> (inches)	Load reduction factor for s <sub>min</sub> <sup>8</sup>	Critical c <sub>cr</sub> (inches)	Minimum c <sub>min</sub> (inches)	Load reduction factor for c <sub>min</sub> <sup>8</sup>
3/8	3 ¾	1,125	13.5	4	1.00	12	4	1.00
1/2	4 ½	1,695	18	4	0.60	20	4	0.90
5/8	5 ¾	2,015	22.5	4	0.60	20	4	0.90
3/4	6 ¾	3,145	27	4	0.60	20	4	0.63

## MASONRY DESIGN TABLE

### A7+ Quick-Cure Adhesive

**Grout-filled Concrete Block: Allowable Shear Loads for Threaded Rod <sup>1, 2, 3, 4, 7, 9, 10, 11, 12</sup>**

Anchor Diameter (in.)	Minimum Embedment (inches)	Load at s <sub>cr</sub> and c <sub>cr</sub> (lb)	Spacing <sup>5</sup>			Edge Distance <sup>6</sup>		
			Critical s <sub>cr</sub> (inches)	Minimum s <sub>min</sub> (inches)	Load reduction factor for s <sub>min</sub> <sup>8</sup>	Critical c <sub>cr</sub> (inches)	Minimum c <sub>min</sub> (inches)	Load reduction factor for c <sub>min</sub> <sup>8</sup>
3/8	3 ¾	750	13.5	4	0.50	12	4	0.95
1/2	4 ½	1,520	18	4	0.50	20	4	0.44
5/8	5 ¾	2,285	22.5	4	0.50	12	4	0.26
3/4	6 ¾	2,345	27	4	0.50	20	4	0.26

For SI: 1 inch = 25.4mm, 1 lbf = 0.0044 kN, 1 ksi = 6.894 MPa. (Refer to Table 4 for footnotes)

<sup>1</sup>All values are for anchors installed in fully grouted concrete masonry with minimum masonry strength of 1500 psi (10.3 MPa). Concrete masonry units must be light-, medium-, or normal-weight conforming to ASTM C 90. Allowable loads have been calculated using a safety factor of 5.0.

<sup>3</sup>Anchors may be installed in any location in the face of the masonry wall (cell, web, bed joint) as shown in Figure 2.

<sup>4</sup>A maximum of two anchors may be installed in a single masonry cell in accordance with the spacing and edge or end distance requirements. Embedment is measured from the outside surface of the concrete masonry unit to the embedded end of the anchor. See Figure 2 of this report.

<sup>5</sup>The critical spacing distance, s<sub>cr</sub>, is the anchor spacing where full load values in the table may be used. The minimum spacing distance, s<sub>min</sub>, is the minimum anchor spacing for which values are available and installation is permitted. Spacing distance is measured from the centerline to centerline between two anchors.

<sup>6</sup>The critical edge or end distance, c<sub>cr</sub>, is the distance where full load values in the table may be used. The minimum edge or end distance, c<sub>min</sub>, is the minimum distance for which values are available and installation is permitted. Edge or end distance is measured from anchor centerline to the closest unrestrained edge.

<sup>7</sup>The tabulated values are applicable for anchors in the ends of grout-filled concrete masonry units where minimum edge distances are maintained.

<sup>8</sup>Load values for anchors installed less than s<sub>cr</sub> and c<sub>cr</sub> must be multiplied by the appropriate load reduction factor based on actual spacing (s) or edge distance (c). Load factors are multiplicative; both spacing and edge reduction factors must be considered.

<sup>9</sup>Linear interpolation of load values between minimum spacing (s<sub>min</sub>) and critical spacing (s<sub>cr</sub>) and between minimum edge or end distance (c<sub>min</sub>) and critical edge or end distance (c<sub>cr</sub>) is permitted.

<sup>10</sup>Concrete masonry width (wall thickness) must be equal to or greater than 1.5 times the anchor embedment depth (e.g. 3/8-inch- and 1/2-inch-diameter anchors are permitted in minimum nominally 6-inch-thick concrete masonry). The 5/8- and 3/4-inch-diameter anchors must be installed in minimum nominally 8-inch-thick concrete masonry.

<sup>11</sup>Allowable loads must be the lesser of the adjusted masonry or bond values tabulated above and the steel strength values given in Table 2.

<sup>12</sup>Tabulated allowable bond loads must be adjusted for increased in-service base material temperatures in accordance with Figure 1, as applicable.

## MASONRY DESIGN TABLE

### A7+ Quick-Cure Adhesive

### Grout-filled Concrete Block: Allowable Tension and Shear Loads for Rebar <sup>1, 2, 3</sup>

Rebar Size	Tension (lb)	Shear (lb)
	ASTM A615, Grade 60	ASTM A615, Grade 60
No. 3	3,270	1,685
No. 4	5,940	3,060
No. 5	9,205	4,745
No. 6	13,070	6,730

For SI: 1 inch = 25.4mm, 1 lbf = 4.45N, 1ft-lbf = 1.356 N-M, 1 psi = 0.006895 MPa

1Allowable load used in the design must be the lesser of bond values and tabulated steel element values.

2Allowable tension and shear loads for threaded rods to resist short term loads, such as wind or seismic, must be calculated in accordance with Section 4.1 as applicable.

3Allowable steel loads are based on allowable tension and shear stresses equal to 0.33X Fu and 0.17XFu, respectively.

## MASONRY DESIGN TABLE

### A7+ Quick-Cure Adhesive

### Grout-filled Concrete Block: Allowable Tension Loads for Rebar <sup>1, 2, 3, 4, 7, 9, 10, 11, 12</sup>

Anchor Diameter (in.)	Minimum Embedment (inches)	Load at $s_{cr}$ and $c_{cr}$ (lb)	Spacing <sup>5</sup>			Edge Distance <sup>6</sup>		
			Critical $s_{cr}$ (inches)	Minimum $s_{min}$ (inches)	Load reduction factor for $s_{min}$ <sup>8</sup>	Critical $c_{cr}$ (inches)	Minimum $c_{min}$ (inches)	Load reduction factor for $c_{min}$ <sup>8</sup>
3/8	3 3/8	1,530	13.5	4	1.00	12	4	1.00
1/2	4 1/2	1,845	18	4	0.60	20	4	0.90
5/8	5 5/8	2,465	22.5	4	0.60	20	4	0.90
3/4	6 3/4	2,380	27	4	0.60	20	4	0.63

## MASONRY DESIGN TABLE

### A7+ Quick-Cure Adhesive

### Grout-filled Concrete Block: Allowable Shear Loads for Rebar <sup>1, 2, 3, 4, 7, 9, 10, 11, 12</sup>

Anchor Diameter (in.)	Minimum Embedment (inches)	Load at $s_{cr}$ and $c_{cr}$ $\perp$ to edge (lb)	Spacing <sup>5</sup>			Edge Distance <sup>6</sup>		
			Critical $s_{cr}$ (inches)	Minimum $s_{min}$ (inches)	Load reduction factor for $s_{min}$ <sup>8</sup>	Critical $c_{cr}$ (inches)	Minimum $c_{min}$ (inches)	Load reduction factor for $c_{min}$ <sup>8</sup>
3/8	3 3/8	1,410	13.5	4	0.50	12	4	0.95
1/2	4 1/2	1,680	18	4	0.50	20	4	0.44
5/8	5 5/8	3,245	22.5	4	0.50	12	4	0.26
3/4	6 3/4	4,000	27	4	0.50	20	4	0.26

For SI: 1 inch = 25.4 mm; 1 lbf = 0.0044 kN, 1 ksi = 6.894 MPa.

(The following footnotes apply to both Tables 6 and 7)

1All values are for anchors installed in fully grouted concrete masonry with minimum masonry strength of 1500 psi (10.3 MPa). Concrete masonry units must be light-, medium, or normal-weight conforming to ASTM C 90. Allowable loads have been calculated using a safety factor of 5.0.

3Anchors may be installed in any location in the face of the masonry wall (cell, web, bed joint) as shown in figure 2.

4A maximum of two anchors may be installed in a single masonry cell in accordance with the spacing and edge or end distance requirements. Embedment is measured from the outside surface of the concrete masonry unit to the embedded end of the anchor. See Figure 2 of this report.

5The critical spacing distance,  $s_{cr}$ , is the anchor spacing where full load values in the table may be used. The minimum spacing distance,  $s_{min}$ , is the minimum anchor spacing for which values are available and installation is permitted. Spacing distance is measured from the centerline to centerline between two anchors.

6The critical edge or end distance,  $c_{cr}$ , is the distance where full load values in the table may be used. The minimum edge or end distance,  $c_{min}$ , is the minimum distance for which values are available and installation is permitted. Edge or end distance is measured from anchor centerline to the closest unrestrained edge.

7The tabulated values are applicable for anchors in the ends of grout-filled concrete masonry units where minimum edge distances are maintained.

8Load values for anchors installed less than  $s_{cr}$  and  $c_{cr}$  must be multiplied by the appropriate load reduction factor based on actual spacing ( $s$ ) or edge distance ( $c$ ). Load factors are multiplicative; both spacing and edge reduction factors must be considered.

9Linear interpolation of load values between minimum spacing ( $s_{min}$ ) and critical spacing ( $s_{cr}$ ) and between minimum edge or end distance ( $c_{min}$ ) and critical edge or end distance ( $c_{cr}$ ) is permitted.

10Concrete masonry width (wall thickness) must be equal to or greater than 1.5 times the anchor embedment depth (e.g. No. 3 and No. 4 reinforcing bars are permitted in minimum nominally 6-inch-thick concrete masonry). No. 5 and No. 6 reinforcing bars must be installed in minimum nominally 8-inch-thick concrete masonry.

11Allowable loads must be the lesser of the adjusted masonry or bond values tabulated above and the steel strength values given in Table 4.

12Tabulated allowable bond loads must be adjusted for increased in-service base material temperatures in accordance with Figure 1, as applicable.