BRIGHTON BEST, INC.
US ANCHOR ULTRAWEDGE+ WEDGE ANCHORS - ENGINEERING DATA SHEET

Allowable Stress Design Values for Anchorages in Normal-Weight Concrete

GENERAL INFORMATION

PRODUCT DESCRIPTION

US Anchor Ultrawedge+ Wedge Anchors are torque-controlled, mechanical expansion anchors. The anchors consist of a stud, nut, washer and expander wedge (clip) as illustrated in Figure 1 of this document. The stud for all sizes is manufactured from cold-drawn carbon steel meeting the requirements of UNS G10350 and is partially threaded with one end terminating in a flared mandrel. The expander wedge (clip) is manufactured from Chinese steel standard GB/T3522 Grade 50 steel subsequently through hardened to Rockwell HRC 28-32 and is formed around the stud mandrel so it is able to move freely. The clip movement is restrained by the mandrel taper and a collar. The anchor is installed in a predrilled hole with a hammer. When torque is applied to the nut of the installed anchor, the mandrel is drawn into the expansion element which is in turn expanded against the wall of the drilled hole. Nuts are in accordance with ASTM A563, Grade A and washers are in accordance with ASTM F844 meeting the dimensional requirements of ANSI B18.22.2 Type A plain. All components, including nuts and washers, are zinc plated in accordance with ASTM B633 Classification SC1, Type III. The nuts and washers have a supplementary friction-reducing and corrosion-resisting proprietary coating.

GENERAL APPLICATION AND USES

- Structural connections, i.e., beam and column anchorage
- Safety-related attachments
- Protective barriers and racking
- Tension zone applications, i.e., cable trays and strut, pipe supports, fire sprinklers
- Seismic and wind loading
- Interior applications / low level corrosion environment

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

ICC Evaluation Service (ICC-ES) ESR-3981 for cracked and uncracked concrete

City of Los Angeles Department of Building and Safety (LADBS), ICC-ES ESR-3981 Supplement for 2020 City of Los Angeles Building Code (LABC) and 2020 City of Los Angeles Residential Code (LARC)

State of California, ICC-ES ESR-3981 Supplement for 2019 California Building Code (CBC) including applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) and the Division of State Architect (DSA) and 2019 California Residential Code (CRC)

State of Florida, ICC-ES ESR-3981 Supplement for 2020 Florida Building Code (FBC) – Building and 2020 Florida Building Code (FBC) – Residential

Miami-Dade County Approved, Notice of Acceptance (NOA) No. 21-0615-02

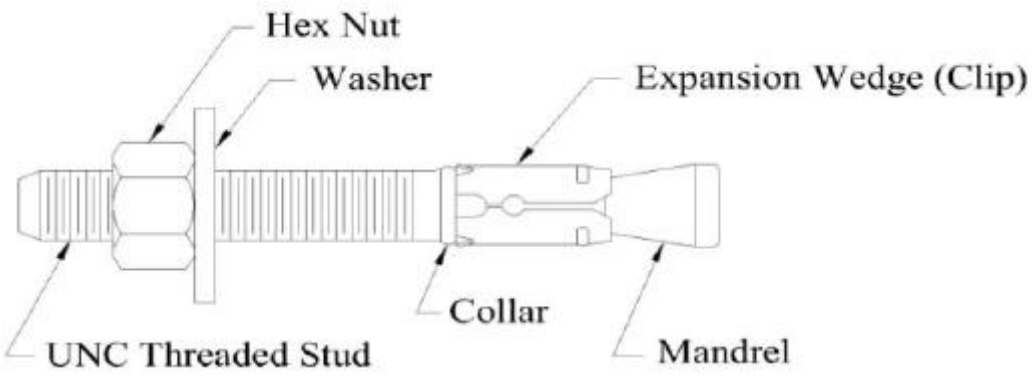
Code compliant with applicable sections of 2009, 2012, 2015 and 2018 International Building Code (IBC) and of 2009, 2012, 2015 and 2018 International Residential Code (IRC)

Tested in accordance with ACI 355.2/ASTM E488 and ICC-ES AC193 for use in structural concrete under anchoring to concrete design provisions of ACI 318-14, ACI 318-11 and ACI 318-08.

INSTALLATION INSTRUCTIONS

1. Use a rotary hammer drill in the percussion mode with the correct size carbide drill bit meeting the requirements of ANSI Standard B212-15 to drill the hole perpendicular to the concrete surface and to the required depth.
2. Use a hand pump, compressed air or vacuum to remove debris and dust from the drilling operation.
3. If installation is through a fixture, position the fixture over the hole and install the anchor through the hole in the fixture. Using a hammer drive the anchor into the hole insuring that it is installed to the minimum required embedment depth, h_{nom}. See Figure 2 of this document fro installation details.
4. Install the washer and nut on the projecting thread and tighten the nut to the required installation torque value, T_{inst}, using a torque wrench.

FIGURE 1—ANCHOR COMPONENTS



Note: Length Identification Marking is stamped on the threaded stud head (see Figure 3 of this document)

FIGURE 2— ANCHOR INSTALLATION

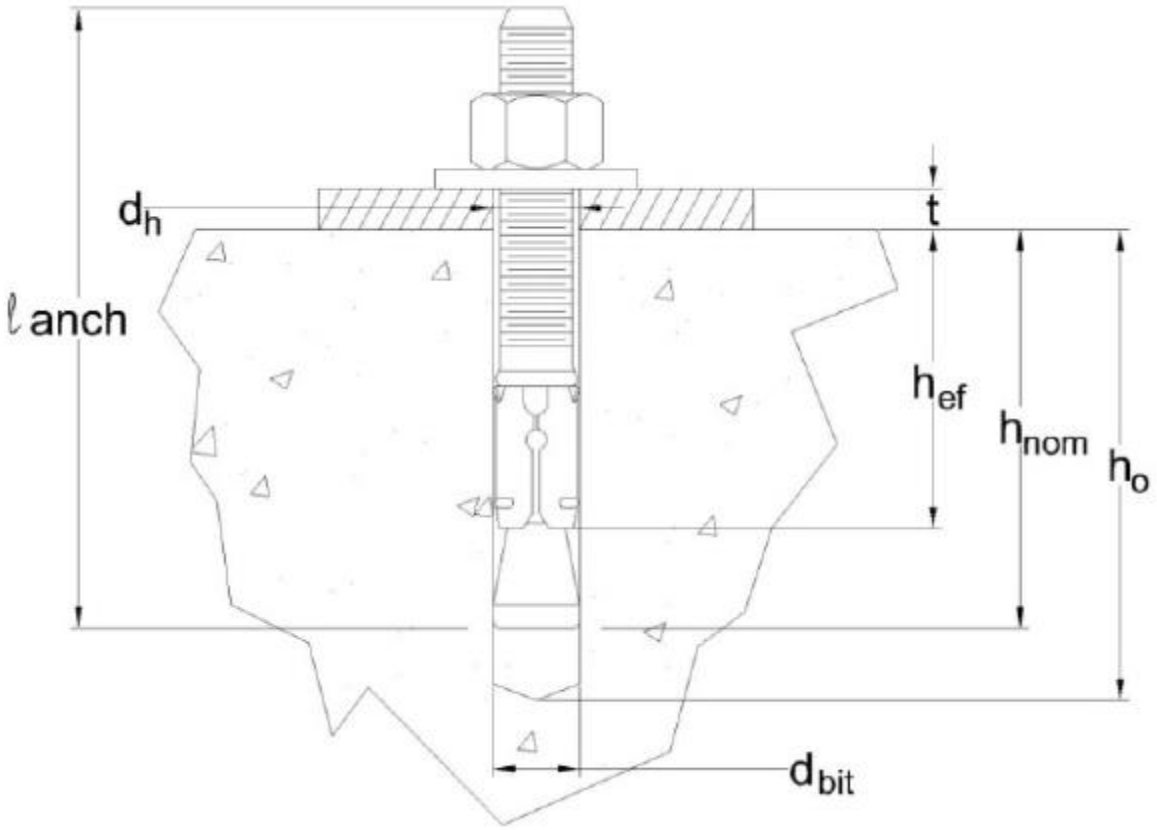


FIGURE 3— LENGTH CODE IDENTIFICATION SYSTEM

Length ID marking on threaded stud head		**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**
Overall anchor length, l_{anch}, (inches)	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	9 1/2	10	11
	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	10	11	12

INSTALLATION SPECIFICATIONS

CHARACTERISTIC	**SYMBOL**	**UNITS**	**Nominal Anchor Diameter, in.**			
			3/8	**1/2**	**5/8**	3/4
Anchor diameter	d_a	in.	3/8	1/2	5/8	3/4
Minimum diameter of fixture hole clearance	d_h	in.	7/16	9/16	11/16	13/16
Nominal drill bit diameter	d_{bit}	in.	3/8	1/2	5/8	3/4
Minimum nominal embedment depth	h_{nom}	in.	2 3/8	3	3 9/16	4 1/8
Minimum effective embedment depth	h_{ef}	in.	2	2 1/2	3	3 1/2
Minimum hole depth	h_o	in.	2 3/4	3 1/4	3 3/4	4 1/2
Installation torque	T_{inst}	ft-lb	29	40	80	110
Minimum concrete thickness	h_{min}	in.	4 1/2 or 6	6	6 1/2	

ALLOWABLE STRESS DESIGN VALUES FOR ANCHORAGES TO NORMAL-WEIGHT CONCRETE

ESR-3981 provides design information for load factor and resistance design (LRFD), however allowable stress design (ASD) is still in use by some users. Translation of LRFD to ASD values is possible, however it is dependent on the levels of dead load and live load. Dead load is defined in the ACI 318-14 Building Code Requirements for Structural Concrete as "the weights of members, supported structure and permanent attachments that are likely to be present on a structure in service". Live load is defined in ACI 318-14 as "load that is not permanently applied to a structure, but is likely to occur during the service life of the structure (excluding environmental loads)". Examples of live loads are traffic on a walkway and nonpermanent loads associated with usage of a structure. Live load values are stipulated in the building code for various loading conditions and parts of structures.

ESR-3981 Section 4.2 provides the method and details of the calculations for the translation of LRFD to ASD loads, and the ESR provides example calculations in Table 3. The method and details are not repeated here, and the user should review the noted ESR provisions if so desired. They are used to calculate the ASD tension and shear loads in the following tables.

To facilitate the translation of LRFD design values to ASD design values, two scenarios of dead load and live load levels are used to conservatively address the most common applications as follows:

- 100% Dead Load
- 10% Dead Load and 90% Live Load

For 100% dead load, ACI 318-14 Table 5.3 Equation (5.3.1a) provides a conversion factor of 1.4 which is divided into the LRFD design loads and multiplied by a ϕ factor of 0.65 to determine an equivalent ASD load.

For 10% dead and 90% live load, ACI 318-14 Equation (5.3.1b) provides a conversion factor of 1.56 which is divided into the LRFD design loads and multiplied by a ϕ factor of 0.65 to determine an equivalent ASD load.

It is the responsibility of the user to select the appropriate ASD values based on the example loadings shown in this document or alternative dead versus live loading that may be applicable to the specific design.

The ASD values are provided in the following tables for tension and shear for each load scenario. Reduction factors for spacing and edge distances along with instructions for how to determine the applicable factors are provided in tables at the end of this document.

ALLOWABLE NON-SEISMIC TENSION LOADS FOR ULTRAWEDGE+ ANCHORS INSTALLED IN UNCRACKED NORMAL-WEIGHT CONCRETE – 100% DEAD LOAD (Pounds)[1,2]

ANCHOR DIAMETER (inches)	MINIMUM NOMINAL EMBEDMENT (inches) [3]	MINIMUM CONCRETE COMPRESSIVE STRENGTH, f_c', psi				
		2500	3000	4000	5000	6000
3/8	2-3/8	1399	1532	1769	1978	2167
½	3	1576	1726	1993	2229	2441
5/8	3-9/16	3257	3568	4120	4606	5046
¾	4-1/8	4104	4496	5191	5804	6358

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ALLOWABLE NON-SEISMIC SHEAR LOADS FOR ULTRAWEDGE+ ANCHORS INSTALLED IN NORMAL-WEIGHT CONCRETE – 100% DEAD LOAD (Pounds)[1,2]

ANCHOR DIAMETER (inches)	MINIMUM NOMINAL EMBEDMENT (inches) [3]	MINIMUM CONCRETE COMPRESSIVE STRENGTH, f_c', psi
		2500
3/8	2-3/8	1164
1/2	3	2554
5/8	3-9/16	4607
3/4	4-1/8	8504

ALLOWABLE NON-SEISMIC TENSION LOADS FOR ULTRAWEDGE+ ANCHORS INSTALLED IN UNCRACKED NORMAL-WEIGHT CONCRETE – 10% DEAD LOAD, 90% LIVE LOAD (Pounds)[1,2]

ANCHOR DIAMETER (inches)	MINIMUM NOMINAL EMBEDMENT (inches) [3]	MINIMUM CONCRETE COMPRESSIVE STRENGTH, f_c', psi				
		2500	3000	4000	5000	6000
3/8	2-3/8	1255	1375	1588	1775	1945
1/2	3	1414	1549	1789	2000	2191
5/8	3-9/16	2923	3202	3697	4134	4528
3/4	4-1/8	3683	4035	4659	5209	5706

ALLOWABLE NON-SEISMIC SHEAR LOADS FOR ULTRAWEDGE+ ANCHORS INSTALLED IN NORMAL-WEIGHT CONCRETE – 10% DEAD LOAD, 90% LIVE LOAD (Pounds)[1,2]

ANCHOR DIAMETER (inches)	MINIMUM NOMINAL EMBEDMENT (inches) [3]	MINIMUM CONCRETE COMPRESSIVE STRENGTH, f_c', psi
		2500
3/8	2-3/8	1045
1/2	3	2292
5/8	3-9/16	4135
3/4	4-1/8	7632

ALLOWABLE SEISMIC TENSION LOADS FOR ULTRAWEDGE+ ANCHORS INSTALLED IN CRACKED NORMAL-WEIGHT CONCRETE – 100% DEAD LOAD (Pounds)[1,2]

ANCHOR DIAMETER (inches)	MINIMUM NOMINAL EMBEDMENT (inches) [3]	MINIMUM CONCRETE COMPRESSIVE STRENGTH, f_c', psi				
		2500	3000	4000	5000	6000
3/8	2-3/8	1116	1223	1412	1579	1729
1/2	3	1379	1510	1744	1950	2136
5/8	3-9/16	1874	2053	2371	2651	2904
3/4	4-1/8	3648	3996	4615	5159	5652

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ALLOWABLE SEISMIC SHEAR LOADS FOR ULTRAWEDGE+ ANCHORS INSTALLED IN NORMAL-WEIGHT CONCRETE – 100% DEAD LOAD (Pounds)[1,2]

ANCHOR DIAMETER (inches)	MINIMUM NOMINAL EMBEDMENT (inches) [3]	MINIMUM CONCRETE COMPRESSIVE STRENGTH, f_c', psi
		2500
3/8	2-3/8	931
1/2	3	2043
5/8	3-9/16	3686
3/4	4-1/8	7654

ALLOWABLE SEISMIC TENSION LOADS FOR ULTRAWEDGE+ ANCHORS INSTALLED IN CRACKED NORMAL-WEIGHT CONCRETE – 10% DEAD LOAD, 90% LIVE LOAD (Pounds)[1,2]

ANCHOR DIAMETER (inches)	MINIMUM NOMINAL EMBEDMENT (inches) [3]	MINIMUM CONCRETE COMPRESSIVE STRENGTH, f_c', psi				
		2500	3000	4000	5000	6000
3/8	2-3/8	1002	1097	1267	1417	1552
1/2	3	1237	1356	1565	1750	1917
5/8	3-9/16	1682	1843	2128	2379	2606
3/4	4-1/8	3274	3586	4141	4630	5072

ALLOWABLE SEISMIC SHEAR LOADS FOR ULTRAWEDGE+ ANCHORS INSTALLED IN NORMAL-WEIGHT CONCRETE – 10% DEAD LOAD, 90% LIVE LOAD (Pounds)[1,2]

ANCHOR DIAMETER (inches)	MINIMUM NOMINAL EMBEDMENT (inches) [3]	MINIMUM CONCRETE COMPRESSIVE STRENGTH, f_c', psi
		2500
3/8	2-3/8	836
1/2	3	1833
5/8	3-9/16	3308
3/4	4-1/8	6869

Notes to all tables:

[1] Based on ESR-3981 LRFD values

[2] The tabulated values are for anchors installed in normal-weight concrete that has reached the minimum designated compressive strength at the time of installation.

[3] Measured from the concrete surface to the embedded end of the anchor (nominal embedment)

When anchors resist both tension and shear forces, the following is applicable.

For tension loads $T_{applied} \leq 0.2T_{allowable,ASD}$, the full allowable load in shear can be used.

For shear loads $V_{applied} \leq 0.2V_{allowable,ASD}$, the full allowable load in tension can be used.

For all other loading cases:

$$\frac{T_{applied}}{T_{allowable,ASD}} + \frac{V_{applied}}{V_{allowable,ASD}} \leq 1.2$$

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TENSION REDUCTION FACTORS FOR CRACKED OR UNCRACKED NORMAL-WEIGHT CONCRETE [1]

OPTION 1

MINIMUM EDGE DISTANCE

Edge Distances, in.	Anchor Diameter, in.			
	3/8	1/2	5/8	3/4
2 1/2	0.92			
2 3/4	0.96	0.87		
3	1.00	0.90		
3 1/4	1.00	0.93		
3 1/2	1.00	0.97		
3 3/4	1.00	1.00		
4	1.00	1.00	0.94	
4 1/4	1.00	1.00	0.97	
4 1/2	1.00	1.00	1.00	
4 3/4	1.00	1.00	1.00	
5	1.00	1.00	1.00	0.98
5 1/4	1.00	1.00	1.00	1.00
5 1/2	1.00	1.00	1.00	1.00
5 3/4	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00
6 1/4	1.00	1.00	1.00	1.00
6 1/2	1.00	1.00	1.00	1.00
6 3/4	1.00	1.00	1.00	1.00
7	1.00	1.00	1.00	1.00
7 1/4	1.00	1.00	1.00	1.00
7 1/2	1.00	1.00	1.00	1.00
7 3/4	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00
8 1/4	1.00	1.00	1.00	1.00
8 1/2	1.00	1.00	1.00	1.00
8 3/4	1.00	1.00	1.00	1.00
9	1.00	1.00	1.00	1.00
9 1/4	1.00	1.00	1.00	1.00
9 1/2	1.00	1.00	1.00	1.00
9 3/4	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00
10 1/4	1.00	1.00	1.00	1.00
10 1/2	1.00	1.00	1.00	1.00

MAXIMUM SPACING DISTANCE

Spacing Distances, in.	Anchor Diameter, in.			
	3/8	1/2	5/8	3/4
2 1/2				
2 3/4				
3				
3 1/4				
3 1/2				
3 3/4				
4				
4 1/4				
4 1/2				
4 3/4				
5	0.92			
5 1/4	0.94			
5 1/2	0.96			
5 3/4	0.98			
6	1.00	0.90	0.83	
6 1/4	1.00	0.92	0.85	
6 1/2	1.00	0.93	0.86	
6 3/4	1.00	0.95	0.88	
7	1.00	0.97	0.89	
7 1/4	1.00	0.98	0.90	
7 1/2	1.00	1.00	0.92	
7 3/4	1.00	1.00	0.93	
8	1.00	1.00	0.94	
8 1/4	1.00	1.00	0.96	
8 1/2	1.00	1.00	0.97	
8 3/4	1.00	1.00	0.99	
9	1.00	1.00	1.00	0.93
9 1/4	1.00	1.00	1.00	0.94
9 1/2	1.00	1.00	1.00	0.95
9 3/4	1.00	1.00	1.00	0.96
10	1.00	1.00	1.00	0.98
10 1/4	1.00	1.00	1.00	0.99
10 1/2	1.00	1.00	1.00	1.00

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TENSION REDUCTION FACTORS FOR CRACKED OR UNCRACKED NORMAL-WEIGHT CONCRETE [1]

OPTION 2

MAXIMUM EDGE DISTANCE

Edge Distances, in.	Anchor Diameter, in.			
	3/8	1/2	5/8	3/4
2 1/2				
2 3/4				
3				
3 1/4				
3 1/2				
3 3/4				
4	1.00	1.00		
4 1/4	1.00	1.00		
4 1/2	1.00	1.00		
4 3/4	1.00	1.00		
5	1.00	1.00		
5 1/4	1.00	1.00		
5 1/2	1.00	1.00		
5 3/4	1.00	1.00		
6	1.00	1.00	1.00	
6 1/4	1.00	1.00	1.00	
6 1/2	1.00	1.00	1.00	
6 3/4	1.00	1.00	1.00	
7	1.00	1.00	1.00	
7 1/4	1.00	1.00	1.00	
7 1/2	1.00	1.00	1.00	
7 3/4	1.00	1.00	1.00	
8	1.00	1.02	1.00	
8 1/4	1.00	1.00	1.00	
8 1/2	1.00	1.00	1.00	
8 3/4	1.00	1.00	1.00	
9	1.00	1.00	1.00	1.00
9 1/4	1.00	1.00	1.00	1.00
9 1/2	1.00	1.00	1.00	1.00
9 3/4	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00
10 1/4	1.00	1.00	1.00	1.00
10 1/2	1.00	1.00	1.00	1.00

MINIMUM SPACING DISTANCE

Spacing Distances, in.	Anchor Diameter, in.			
	3/8	1/2	5/8	3/4
2 1/2	0.71			
2 3/4	0.73			
3	0.75	0.70		
3 1/4	0.77	0.72		
3 1/2	0.79	0.73		
3 3/4	0.81	0.75	0.71	
4	0.83	0.77	0.72	
4 1/4	0.85	0.78	0.74	
4 1/2	0.88	0.80	0.75	
4 3/4	0.90	0.82	0.76	
5	0.92	0.83	0.78	0.74
5 1/4	0.94	0.85	0.79	0.75
5 1/2	0.96	0.87	0.81	0.76
5 3/4	0.98	0.88	0.82	0.77
6	1.00	0.90	0.83	0.79
6 1/4	1.00	0.92	0.85	0.80
6 1/2	1.00	0.93	0.86	0.81
6 3/4	1.00	0.95	0.88	0.82
7	1.00	0.97	0.89	0.83
7 1/4	1.00	0.98	0.90	0.85
7 1/2	1.00	1.00	0.92	0.86
7 3/4	1.00	1.00	0.93	0.87
8	1.00	1.00	0.94	0.88
8 1/4	1.00	1.00	0.96	0.89
8 1/2	1.00	1.00	0.97	0.90
8 3/4	1.00	1.00	0.99	0.92
9	1.00	1.00	1.00	0.93
9 1/4	1.00	1.00	1.00	0.94
9 1/2	1.00	1.00	1.00	0.95
9 3/4	1.00	1.00	1.00	0.96
10	1.00	1.00	1.00	0.98
10 1/4	1.00	1.00	1.00	0.99
10 1/2	1.00	1.00	1.00	1.00

[1] See instructions for use of tables on the last page of this document

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SHEAR REDUCTION FACTORS FOR CRACKED OR UNCRACKED NORMAL-WEIGHT CONCRETE [1]

OPTION 1

MINIMUM EDGE DISTANCE

Edge Distances, in.	Anchor Diameter, in.			
	3/8	1/2	5/8	3/4
2 1/2	0.45			
2 3/4	0.52	0.26		
3	0.59	0.30		
3 1/4	0.67	0.33		
3 1/2	0.75	0.37		
3 3/4	0.83	0.41		
4	0.91	0.46	0.30	
4 1/4	1.00	0.50	0.32	
4 1/2	1.00	0.54	0.35	
4 3/4	1.00	0.59	0.38	
5	1.00	0.64	0.41	0.25
5 1/4	1.00	0.69	0.45	0.26
5 1/2	1.00	0.74	0.48	0.28
5 3/4	1.00	0.79	0.51	0.30
6	1.00	0.84	0.54	0.32
6 1/4	1.00	0.89	0.58	0.34
6 1/2	1.00	0.94	0.61	0.36
6 3/4	1.00	1.00	0.65	0.39
7	1.00	1.00	0.69	0.41
7 1/4	1.00	1.00	0.72	0.43
7 1/2	1.00	1.00	0.76	0.45
7 3/4	1.00	1.00	0.80	0.47
8	1.00	1.00	0.84	0.50
8 1/4	1.00	1.00	0.88	0.52
8 1/2	1.00	1.00	0.92	0.54
8 3/4	1.00	1.00	0.96	0.57
9	1.00	1.00	1.00	0.59
9 1/4	1.00	1.00	1.00	0.62
9 1/2	1.00	1.00	1.00	0.64
9 3/4	1.00	1.00	1.00	0.67
10	1.00	1.00	1.00	0.69
10 1/4	1.00	1.00	1.00	0.72
10 1/2	1.00	1.00	1.00	0.75
10 3/4	1.00	1.00	1.00	0.77
11	1.00	1.00	1.00	0.80
11 1/4	1.00	1.00	1.00	0.83
11 1/2	1.00	1.00	1.00	0.86
11 3/4	1.00	1.00	1.00	0.88
12	1.00	1.00	1.00	0.91
12 1/4	1.00	1.00	1.00	0.94
12 1/2	1.00	1.00	1.00	0.97
12 3/4	1.00	1.00	1.00	1.00

MAXIMUM SPACING DISTANCE

Spacing Distances, in.	Anchor Diameter, in.			
	3/8	1/2	5/8	3/4
2 1/2				
2 3/4				
3				
3 1/4				
3 1/2				
3 3/4				
4				
4 1/4				
4 1/2				
4 3/4				
5	1.00			
5 1/4	1.00			
5 1/2	1.00			
5 3/4	1.00			
6	1.00	0.96	0.80	
6 1/4	1.00	1.00	0.83	
6 1/2	1.00	1.00	0.87	
6 3/4	1.00	1.00	0.90	
7	1.00	1.00	0.93	
7 1/4	1.00	1.00	0.97	
7 1/2	1.00	1.00	1.00	
7 3/4	1.00	1.00	1.00	
8	1.00	1.00	1.00	
8 1/4	1.00	1.00	1.00	
8 1/2	1.00	1.00	1.00	
8 3/4	1.00	1.00	1.00	
9	1.00	1.00	1.00	1.00
9 1/4	1.00	1.00	1.00	1.00
9 1/2	1.00	1.00	1.00	1.00
9 3/4	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00
10 1/4	1.00	1.00	1.00	1.00
10 1/2	1.00	1.00	1.00	1.00
10 3/4	1.00	1.00	1.00	1.00
11	1.00	1.00	1.00	1.00
11 1/4	1.00	1.00	1.00	1.00
11 1/2	1.00	1.00	1.00	1.00
11 3/4	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00
12 1/4	1.00	1.00	1.00	1.00
12 1/2	1.00	1.00	1.00	1.00
12 3/4	1.00	1.00	1.00	1.00

[1] See instructions for use of tables on the last page of this document

BRIGHTON BEST, INC.
US ANCHOR ULTRAWEDGE+ WEDGE ANCHORS - ENGINEERING DATA SHEET

Allowable Stress Design Values for Anchorages in Normal-Weight Concrete

SHEAR LOAD REDUCTION FACTORS FOR CRACKED OR UNCRACKED NORMAL-WEIGHT CONCRETE [1]

OPTION 2

MAXIMUM EDGE DISTANCE

Edge Distances, in.	Anchor Diameter, in.			
	3/8	1/2	5/8	3/4
2 1/2				
2 3/4				
3				
3 1/4				
3 1/2				
3 3/4				
4	0.91	0.46		
4 1/4	1.00	0.50		
4 1/2	1.00	0.54		
4 3/4	1.00	0.59		
5	1.00	0.64		
5 1/4	1.00	0.69		
5 1/2	1.00	0.74		
5 3/4	1.00	0.79		
6	1.00	0.84	0.54	
6 1/4	1.00	0.89	0.58	
6 1/2	1.00	0.94	0.61	
6 3/4	1.00	1.00	0.65	
7	1.00	1.00	0.69	
7 1/4	1.00	1.00	0.72	
7 1/2	1.00	1.00	0.76	
7 3/4	1.00	1.00	0.80	
8	1.00	1.00	0.84	
8 1/4	1.00	1.00	0.88	
8 1/2	1.00	1.00	0.92	
8 3/4	1.00	1.00	0.96	
9	1.00	1.00	1.00	0.59
9 1/4	1.00	1.00	1.00	0.62
9 1/2	1.00	1.00	1.00	0.64
9 3/4	1.00	1.00	1.00	0.67
10	1.00	1.00	1.00	0.69
10 1/4	1.00	1.00	1.00	0.72
10 1/2	1.00	1.00	1.00	0.75
10 3/4	1.00	1.00	1.00	0.77
11	1.00	1.00	1.00	0.80
11 1/4	1.00	1.00	1.00	0.83
11 1/2	1.00	1.00	1.00	0.86
11 3/4	1.00	1.00	1.00	0.88
12	1.00	1.00	1.00	0.91
12 1/4	1.00	1.00	1.00	0.94
12 1/2	1.00	1.00	1.00	0.97
12 3/4	1.00	1.00	1.00	1.00

MINIMUM SPACING DISTANCE

Spacing Distances, in.	Anchor Diameter, in.			
	3/8	1/2	5/8	3/4
2 1/2	0.56			
2 3/4	0.61			
3	0.67	0.50		
3 1/4	0.72	0.54		
3 1/2	0.78	0.58		
3 3/4	0.83	0.62	0.50	
4	0.89	0.65	0.53	
4 1/4	0.94	0.69	0.57	
4 1/2	1.00	0.73	0.60	
4 3/4	1.00	0.77	0.63	
5	1.00	0.81	0.67	0.56
5 1/4	1.00	0.85	0.70	0.58
5 1/2	1.00	0.88	0.73	0.61
5 3/4	1.00	0.92	0.77	0.64
6	1.00	0.96	0.80	0.67
6 1/4	1.00	1.00	0.83	0.69
6 1/2	1.00	1.00	0.87	0.72
6 3/4	1.00	1.00	0.90	0.75
7	1.00	1.00	0.93	0.78
7 1/4	1.00	1.00	0.97	0.81
7 1/2	1.00	1.00	1.00	0.83
7 3/4	1.00	1.00	1.00	0.86
8	1.00	1.00	1.00	0.89
8 1/4	1.00	1.00	1.00	0.92
8 1/2	1.00	1.00	1.00	0.94
8 3/4	1.00	1.00	1.00	0.97
9	1.00	1.00	1.00	1.00
9 1/4	1.00	1.00	1.00	1.00
9 1/2	1.00	1.00	1.00	1.00
9 3/4	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00
10 1/4	1.00	1.00	1.00	1.00
10 1/2	1.00	1.00	1.00	1.00
10 3/4	1.00	1.00	1.00	1.00
11	1.00	1.00	1.00	1.00
11 1/4	1.00	1.00	1.00	1.00
11 1/2	1.00	1.00	1.00	1.00
11 3/4	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00
12 1/4	1.00	1.00	1.00	1.00
12 1/2	1.00	1.00	1.00	1.00
12 3/4	1.00	1.00	1.00	1.00

[1] See instructions for use of tables on the last page of this document

BRIGHTON BEST, INC.
US ANCHOR ULTRAWEDGE+ WEDGE ANCHORS - ENGINEERING DATA SHEET
Allowable Stress Design Values for Anchorages in Normal-Weight Concrete

Instructions for use of Table Reduction Factors

There are two table options each for tension and shear: Option 1 - Maximum Edge and Minimum Spacing or Option 2 - Minimum Edge and Maximum Spacing. Choose Option 1 or Option 2 depending on the edge and/or spacing distances required. The same option must be used for the required edge and spacing distances. Shaded areas with no reduction factors cannot be used for those sizes and distances. .

If only edge or spacing are applicable, use only the reduction factor from the edge or spacing distance option table. If both edge and spacing distances are applicable, determine the reduction factor for each and multiply them together to determine the combined reduction factor. Multiply the applicable reduction factor times the allowable load from the applicable allowable load table on Pages 4 through 6.

The following example is provided.

Anchor size 3/8"; Edge distance 2 3/4"; Spacing distance 5 3/4"; Concrete strength 3000 psi; 100% dead load

Option 1 must be used for tension and shear (minimum edge distance is 4" for Option 2 so it cannot be used)

Tension: Edge factor 0.96; Spacing factor 0.98; Combined factor 0.94 (0.96 x 0.98)
Reduced allowable load is 1440 lbs. (1532 from tension 100% dead load table x 0.94)

Shear: Edge factor 0.52; Spacing factor 1.00; Combined factor 0.52 (0.52 x 1.00)
Reduced allowable load is 605 lbs. (1164 from shear 100% dead load table x 0.52)

For anchors installed close to a corner, an additional reduction factor of 0.50 must be applied to the tension allowable load in addition to any edge and spacing reductions. The following table shows the minimum distances to a corner and the range of distances to a corner that requires the 0.50 additional reduction. For anchors installed less than the minimum distances to a corner, allowable load values are not assigned by the procedures in this document.

ANCHOR DIAMETER (inches)	DISTANCES TO CORNER (inches)	
	MINIMUM	APPLY 0.50 REDUCTION FACTOR FOR THESE DISTANCES TO A CORNER
3/8	3	3 to 5
1/2	3 3/4	3 3/4 to 8
5/8	4 1/2	4 1/2 to 13
3/4	5 1/4	5 1/4 to 11

Using the example above with distance to the corner of 4 inches, the reduced tension allowable load would be 720 lbs. (1440 x 0.50). The shear allowable remains the same since the corner reduction is only applicable to tension.

Allowable loads are for concrete thicknesses equal to or greater than the the minimums shown in the table below.

ANCHOR DIAMETER (inches	MINIMUM CONCRETE THICKNESS (inches)
3/8	6
1/2	6
5/8	6 1/2
3/4	6 1/2