ICBO Evaluation Service, Inc.
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EVALUATION REPORT

ER-4627
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Filing Category: FASTENERS—Concrete and Masonry Anchors (066)

KWIK BOLT-II AND POST NUT KWIK BOLT-II CONCRETE ANCHORS

HILTI, INC.
5400 SOUTH 122ND EAST AVENUE
TULSA, OKLAHOMA 74146

1.0 SUBJECT

Kwik Bolt-II and Post Nut Kwik Bolt-II Concrete Anchors.

2.0 DESCRIPTION

2.1 Kwik Bolt-II:

Kwik Bolt-II (KB-II) concrete anchors consist of a stud, wedge, nut and washer. The stud is manufactured from a carbon or stainless steel material. The carbon steel Kwik Bolt-II stud is made from AISI 1038 or AISI 1144 materials. The wedges are made of AISI 1010 steel, except that KB-II $^3/_4$-by-12, KB-II 1-by-6, KB-II 1-by-9 and KB-II 1-by-12 anchors have AISI 304 (stainless steel) wedges. All carbon steel components are zinc-plated. Each component of the stainless steel Kwik Bolt-II anchor is made from either AISI 304 or AISI 316 material.

The stud consists of a high-strength steel rod threaded at the upper end. A normal threaded KB-II has a thread length equal to or less than three bolt diameters, while a long threaded KB-II has a thread length greater than three bolt diameters. The tapered mandrel has an increasing diameter toward the anchor base, and is enclosed by a three-section wedge which freely moves around the mandrel. In the vertical direction, the wedge movement is restrained by the mandrel taper at the bottom and by a collar at the top of the mandrel. When subjected to torque, the wedge is forced against the wall of the predrilled hole to provide the anchorage. Allowable tension and shear values in normal-weight concrete are shown in Tables 3 and 4 for the carbon steel and stainless steel anchors, respectively. Allowable tension and shear values for lightweight concrete are shown in Tables 5 and 8. The anchors are illustrated in Figure 1.

2.2 Post Nut Kwik Bolt-II:

Post Nut Kwik Bolt-II concrete anchors consist of a carbon (AISI 1144) or stainless (Type 304) steel stud and post nut. The threaded end of the stud is fabricated to accept a threaded post nut with an outside diameter equal to the nominal diameter of the stud. The post nut has a countersunk-head configuration. Allowable tension and shear values for carbon and stainless anchors in 3,000 psi (20.7 MPa) normal-weight concrete are shown in Table 7. The anchors are illustrated in Figure 2.

2.3 Installation:

2.3.1 Kwik Bolt-II: Holes are drilled into the concrete using carbide-tipped masonry drill bits complying with ANSI B212.15-1994. The drill bit diameter must be the same as that of the anchors. The drilled holes must exceed the depth of anchor embedment by at least two anchor diameters, to permit overdriving of anchors and to provide a dust-free area. The anchor must be hammered into the predrilled hole until at least six threads are below the surface. The nut must be tightened against the washer until the torque values specified in Table 1 are attained. Minimum embedment depths, edge distance and spacing requirements are set forth in Tables 1 and 2.

2.3.2 Post Nut Kwik Bolt-II: Holes are drilled into the concrete using carbide-tipped masonry drill bits complying with ANSI B212.15-1994. The drill bit diameter must be the same as that of the anchors. The drilled holes must exceed the depth of anchor embedment by approximately two anchor diameters, to permit overdriving and to provide a dust-free area. The anchor is tapped into the hole until the post-nut head touches the material to be fastened. The post nut is then loosened by two complete turns and the anchor is again tapped until the post nut is again in contact with fastened material. The post nut is then hand-tightened with a screwdriver. Minimum embedment depths, edge distance and spacing requirements are set forth in Tables 1 and 2.

2.4 Special Inspection:

Where special inspection is required, compliance with Section 1701.5 of the code is necessary. The special inspector must be on the jobsite continuously during anchor installation to verify anchor type, anchor dimensions, concrete type, concrete compressive strength, predrilled hole dimensions, anchor spacing, edge distances, slab thickness, anchor embedment and tightening torque.

2.5 Design:

2.5.1 General: Allowable shear and tension loads are as set forth in Tables 3, 4, 5, 7 and 8.

2.5.2 Combined Loading for Kwik Bolt-II Anchors in Normal-weight Concrete: Allowable loads for Kwik Bolt-II anchors subjected to combined shear and tension loads in normal-weight concrete noted in Tables 3 and 4 are determined by the following equation:

$$(P_s/P_t)^{5/3} + (V_s / V_t)^{5/3} \leq 1$$

where:

P_s = applied service tension load.
P_t = allowable service tension load.
V_s = applied service shear load.
V_t = allowable service shear load.

2.6 Identification:

The anchors are identified in the field by dimensional characteristics and packaging. The packaging label indicates the manufacturer's name and address and the size and type of anchor, the name of the quality control agency (Underwriters Laboratories Inc.) and the ICBO ES report number (ICBO ES

ER-4627). A length identification code letter is stamped on the threaded end of the bolt. See the length identification system in Table 6.

3.0 EVIDENCE SUBMITTED

Data in accordance with the ICBO ES Acceptance Criteria for Expansion Anchors in Concrete and Masonry Elements (AC01), dated January 2001.

4.0 FINDINGS

That the Kwik Bolt-II and Post Nut Kwik Bolt-II concrete anchors described in this report comply with the 1997 *Uniform Building Code*™, subject to the following conditions:

4.1 Installation dimensions and installation torques are as noted in Tables 1 and 2.

4.2 Allowable tension and shear values are as noted in Tables 3, 4, 5 and 7.

4.3 Calculations justifying that the applied loads comply with this report are submitted to the building official for approval.

4.4 Special inspection is provided as set forth in Section 2.4 of this report.

4.5 Anchors are limited to installation in uncracked concrete. Cracking occurs where $f_t \geq f_r$ due to service loads or deformations. Examples of when cracking may occur include, but are not limited to, anchor location in tension zone as the concrete member, anchor location in settling a concrete member, and anchors subjected to seismic loads, wind loads or moving loads.

4.6 Allowable tension and shear values for Kwik Bolt-II anchors in normal-weight concrete noted in Tables 3 and 4, and sand-lightweight concrete over metal profile deck noted in Table 8, may be increased $33^1/_3$ percent for short-term loading due to wind or seismic forces. Use of the Kwik Bolt-II anchor in lightweight concrete, and use of the Post Nut Kwik Bolt-II anchor in resisting wind and seismic forces, are beyond the scope of this report.

4.7 Use of the anchors in resisting vibratory or shock loads, such as those present in supports for reciprocating engines or crane loads, is beyond the scope of this report.

4.8 Use of the anchors is limited to nonfire-resistive construction unless appropriate data are submitted to demonstrate anchor performance is maintained in fire conditions.

4.9 Use of the carbon steel anchors is limited to dry, interior locations. Use of the stainless steel anchors is permitted in exterior-exposure or damp environments.

4.10 Anchors are manufactured by Hilti, Inc., at 5400 South 122nd East Avenue, Tulsa, Oklahoma, with quality control inspections by Underwriters Laboratories Inc. (AA-668).

This report is subject to re-examination in two years.

TABLE 1—INSTALLATION SPECIFICATIONS

SETTING DETAILS		ANCHOR SIZE											
		$^1/_4$ inch		$^3/_8$ inch		$^1/_2$ inch		$^5/_8$ inch		$^3/_4$ inch		1 inch	
Drill bit size = anchor diameter (inches)		$^1/_4$		$^3/_8$		$^1/_2$		$^5/_8$		$^3/_4$		1	
Depth of embedment (minimum/standard) (inches)		$1^1/_8$	2	$1^3/_8$	$2^1/_2$	$2^1/_4$	$3^1/_2$	$2^3/_4$	4	$3^1/_4$	$4^3/_4$	$4^1/_2$	6
Wedge clearance hole (inches)		$^5/_{16}$		$^7/_{16}$		$^9/_{16}$		$^{11}/_{16}$		$^{13}/_{16}$		$1^1/_8$	
Anchor length (min./max.) (inches)		$1^1/_4$	$4^1/_2$	$2^1/_8$	7	$2^1/_4$	7	$3^1/_2$	10	$4^1/_2$	12	6	12
Thread length std./extra thread length (inches)		$^3/_4$	3	$^7/_8$	4	$1^1/_4$	4	$1^1/_2$	$4^1/_2$	$1^1/_2$	$4^1/_2$	$2^1/_4$	$4^1/_2$
Installation: Torque guide values[1] (ft. lb.)	Stainless steel	4		20		30		75		150		200	
	Carbon steel: Min. embedment	4		20		30		75		150		200	
	Carbon steel: Std. embedment	7		25		45		95		225		325	
Min. base material thickness (inches)		3 or 1.3 × embedment depth, whichever is greater											

For **SI:** 1 inch = 25.4 mm, 1 lbf = 4.45 N.

[1]Installation torques are applicable for all anchor installations unless noted otherwise in this report.

TABLE 2—ANCHOR SPACING AND EDGE DISTANCE REQUIREMENTS, NORMAL-WEIGHT CONCRETE[1,2,3,4,5,6,7]

DESCRIPTION			ANCHOR SIZE											
			$^1/_4$ inch		$^3/_8$ inch		$^1/_2$ inch		$^5/_8$ inch		$^3/_4$ inch		1 inch	
Embedment: minimum/standard (inches)			$1^1/_8$	2	$1^5/_8$	$2^1/_2$	$2^1/_4$	$3^1/_2$	$2^3/_4$	4	$3^1/_4$	$4^3/_4$	$4^1/_2$	6
S_{cr}	Spacing required to obtain maximum working load (inches)		$2^1/_4$	4	$3^1/_4$	5	$4^1/_2$	7	$5^1/_2$	8	$6^1/_2$	$9^1/_2$	9	12
S_{min}	Minimum allowable spacing between anchors (inches)		$1^1/_8$	2	$1^5/_8$	$2^1/_2$	$2^1/_4$	$3^1/_2$	$2^3/_4$	4	$3^1/_4$	$4^3/_4$	$4^1/_2$	6
M_{cr}	Edge distance required to obtain maximum working load (inches)	Shear	$3^3/_8$	$3^3/_8$	$4^7/_8$	$4^7/_8$	$6^3/_4$	$6^3/_4$	$8^1/_4$	$8^1/_4$	$9^3/_4$	$9^3/_4$	$13^1/_2$	$13^1/_2$
		Tension	$1^3/_4$	3	$2^1/_2$	$3^3/_4$	$3^3/_8$	$5^1/_4$	$4^1/_8$	6	$4^7/_8$	$7^1/_8$	$6^3/_4$	9
M_{min}	Minimum allowable edge distance (inches)	Shear	$1^3/_4$	$1^3/_4$	$2^1/_2$	$2^1/_2$	$3^3/_8$	$3^3/_8$	$4^1/_8$	$4^1/_8$	$4^7/_8$	$4^7/_8$	$6^3/_4$	$6^3/_4$
		Tension	$1^1/_8$	2	$1^5/_8$	$2^1/_2$	$2^1/_4$	$3^1/_2$	$2^3/_4$	4	$3^1/_4$	$4^3/_4$	$4^1/_2$	6

For **SI:** 1 inch = 25.4 mm, 1 lbf = 4.45 N.

[1]Data in this table and the footnotes apply to all anchors covered in this report.

[2]When using M_{min} for a load that is shear, reduce the allowable load by 50 percent.

[3]When using M_{min} for a load that is tension, reduce the allowable load by 20 percent.

[4]For S and M of anchors with actual embedments between the listed embedments, use linear interpolation.

[5]For S and M of anchors with embedments greater than the deepest embedment listed in this table, use the value for the deepest embedment listed.

[6]When using S_{min}, reduce the allowable tension load by 30 percent.

[7]When using S_{min}, reduce the allowable shear load by 30 percent.

TABLE 3—CARBON STEEL KWIK BOLT-II ALLOWABLE TENSION AND SHEAR VALUES (in pounds), NORMAL-WEIGHT CONCRETE[1,2]

ANCHOR DIAMETER (inch)	ANCHOR DEPTH (inches)	f_c' = 2,000 psi			f_c' = 3,000 psi			f_c' = 4,000 psi			f_c' = 6,000 psi		
		Tension			Tension			Tension			Tension		
		With Sp. Insp.	Without Sp. Insp.	Shear	With Sp. Insp.	Without Sp. Insp.	Shear	With Sp. Insp.	Without Sp. Insp.	Shear	With Sp. Insp.	Without Sp. Insp.	Shear
1/4	1 1/8[3]	245	120	400	300	150	400	350	175	400	430	215	400
	2	525	265	400	550	280	400	590	295	400	625	315	400
	3 3/4	625	315	400	625	315	400	625	315	400	625	315	400
3/8	1 5/8[3]	500	250	925	605	300	975	710	355	1,025	800	400	1,025
	2 1/2	1,125	565	1,100	1,210	605	1,100	1,290	645	1,100	1,450	725	1,100
	4 1/4	1,190	595	1,100	1,235	615	1,100	1,285	640	1,100	1,450	725	1,100
1/2	2 1/4[3]	860	430	1,810	960	480	1,840	1,065	530	1,840	1,625	815	1,840
	3 1/2	1,750	875	1,840	2,000	1,000	1,840	2,250	1,125	1,840	2,625	1,315	1,840
	6	1,950	975	1,840	2,165	1,080	1,840	2,375	1,190	1,840	2,625	1,315	1,840‘
5/8	2 3/4[3]	1,425	710	2,875	1,685	845	2,875	1,950	975	2,875	2,500	1,250	2,875
	4	2,180	1,125	3,125	2,670	1,335	3,125	3,090	1,545	3,125	3,925	1,965	3,125
	7	3,000	1,500	3,125	3,250	1,625	3,125	3,500	1,750	3,125	3,925	1,965	3,125
3/4	3 1/4[3]	1,850	925	3,875	2,175	1,090	3,875	2,500	1,250	3,875	3,000	1,500	3,875
	4 3/4	2,750	1,375	4,225	3,625	1,940	4,225	4,500	2,250	4,225	5,060	2,530	4,225
	8	3,750	1,875	4,225	4,625	2,315	4,225	5,500	2,750	4,225	5,925	2,965	4,225
1	4 1/2[3]	2,930	1,465	6,625	3,650	1,825	7,125	4,375	2,190	7,625	4,360	2,180	8,625
	6	3,990	1,995	8,625	5,310	2,655	8,625	6,625	3,315	8,625	7,875	3,940	8,625
	9	6,040	3,020	8,625	7,050	3,525	8,625	8,055	4,025	8,625	10,000	5,000	8,625

For **SI:** 1 inch = 25.4 mm, 1 psi = 6.9 kPa, 1 lb. = 4.45 N.

[1]See Table 2 footnotes.

[2]Allowable loads may be increased by 33 1/3 percent for short-term loading due to wind or seismic forces.

[3]Only the long-threaded style KB-II anchor installed at this embedment depth is permitted to be used to resist shear due to wind or seismic forces. Long threaded style KB-II anchors have a thread length greater than three bolt diameters.

TABLE 4—STAINLESS STEEL KWIK BOLT-II ALLOWABLE TENSION AND SHEAR VALUES (in pounds), NORMAL-WEIGHT CONCRETE[1,2]

ANCHOR DIAMETER (inch)	ANCHOR DEPTH (inches)	f_c' = 2,000 psi.			f_c' = 3,000 psi			f_c' = 4,000 psi			f_c' = 6,000 psi		
		Tension			Tension			Tension			Tension		
		With Sp. Insp.	Without Sp. Insp.	Shear	With Sp. Insp.	Without Sp. Insp	Shear	With Sp. Insp.	Without Sp. Insp.	Shear	With Sp. Insp.	Without Sp. Insp.	Shear
1/4	1 1/8[3]	170	85	525	230	115	540	245	120	550	350	175	550
	2	425	210	550	500	250	550	500	250	550	520	260	550
	3 3/4	520	260	550	520	260	550	520	260	550	520	260	550
3/8	1 5/8[3]	400	200	825	460	230	950	515	260	1,075	625	315	1,150
	2 1/2	875	440	1,250	1,025	515	1,250	1,175	590	1,250	1,350	675	1,250
	4 1/4	1,000	500	1,250	1,145	625	1,250	1,350	675	1,250	1,350	675	1,250
1/2	2 1/4[3]	800	400	1,700	1,000	500	1,740	1,200	600	1,775	1,250	625	2,085
	3 1/2	1,250	625	2,085	1,625	815	2,085	2,000	1,000	2,085	2,250	1,125	2,085
	6	1,375	690	2,085	1,765	880	2,085	2,150	1,075	2,085	2,550	1,275	2,085
5/8	2 3/4[3]	1,020	510	2,625	1,250	625	2,875	1,475	735	3,125	1,800	900	3,125
	4	1,730	865	3,125	2,220	1,110	3,125	2,715	1,355	3,125	3,000	1,500	3,125
	7	2,250	1,125	3,125	2,825	1,415	3,125	3,425	1,715	3,125	3,425	1,715	3,125
3/4	3 1/4[3]	1,450	725	2,700	1,825	915	3,100	2,200	1,100	3,500	2,450	1,225	4,500
	4 3/4	2,350	1,175	4,225	2,990	1,495	4,365	3,625	1,815	4,500	4,375	2,190	4,500
	8	2,750	1,375	4,500	3,500	1,815	4,500	4,250	2,125	4,500	4,800	2,400	4,500
1	4 1/2[3]	2,300	1,150	5,700	2,850	1,425	6,350	3,400	1,700	7,000	4,500	2,250	7,000
	6	3,740	1,870	7,000	4,930	2,465	7,000	6,120	3,060	7,000	6,875	3,440	7,000
	9	5,250	2,625	7,000	7,075	3,540	7,000	8,800	4,400	7,000	8,800	4,400	7,000

For **SI:** 1 inch = 25.4 mm, 1 psi = 6.9 kPa, 1 lb. = 4.45 N.

[1]See Table 2 footnotes.

[2]Allowable loads may be increased by 33 1/3 percent for short-term loading due to wind or seismic forces.

[3]Anchors installed at this embedment depth shall not be used to resist shear due to wind or seismic forces.

TABLE 5—KWIK BOLT-II CARBON STEEL ALLOWABLE TENSION AND SHEAR IN LIGHTWEIGHT, EXPANDED SHALE-AGGREGATE CONCRETE[1,2,3]

ANCHOR SIZE (inch)	EMBEDMENT DEPTH (inches)	TORQUE (ft.-lb.)	SHEAR (pounds)	TENSION (lb.) WITH SPECIAL INSPECTION[5]	TENSION (lb.) WITHOUT SPECIAL INSPECTION[4]	TENSION (lb.) WITH SPECIAL INSPECTION[5]	TENSION (lb.) WITHOUT SPECIAL INSPECTION[4]
			$f_c' \geq$ 2,000 psi	f_c' = 2,000 psi		f_c' = 4,000 psi	
1/4	1 1/8	4	400	210	105	360	180
	2	5	400	300	150	450	225
3/8	1 5/8	15	755	380	190	625	310
	2 1/2	15	1,100	630	315	975	485
1/2	2 1/4	25	1,370	685	340	1,100	550
	3 1/2	30	1,840	1,000	500	1,600	800
5/8	2 3/4	65	2,480	1,110	555	1,575	785
	4	75	3,125	1,650	825	2,300	1,150
3/4	3 1/4	135	3,170	1,545	770	2,200	1,100
	4 3/4	150	4,135	2,200	1,100	3,250	1,625

For **SI:** 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1 ft.-lb. = 1.3558 N·m, 1 psi = 6.9 kPa.

[1]The tabulated tension and shear values are for anchors installed in lightweight expanded shale-aggregate concrete having the indicated compressive strength at the time of installation. Concrete aggregate must comply with ASTM C 330-85 and ASTM C 332-83.

[2]Use of the anchors in resisting wind or seismic forces in lightweight concrete is beyond the scope of this report.

[3]Spacing and edge distances noted in Table 2 must be increased by 33 1/3 percent.

[4]These tension values are only applicable when the anchors are installed without special inspection as set forth in Section 1701 of the code.

[5]These tension values are only applicable when the anchors are installed with special inspection as set forth in Section 1701 of the code.

TABLE 6—LENGTH IDENTIFICATION SYSTEM

STAMP ON ANCHOR		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Length of anchor (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	12	13	14	15	16	17	18
	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	13	14	15	16	17	18	18

TABLE 7—POST NUT KB-II ALLOWABLE TENSION AND SHEAR VALUES (pounds), NORMAL-WEIGHT CONCRETE[1,2]

ANCHOR DIAMETER (inches)/MATERIAL	MINIMUM EMBEDMENT DEPTH (inches)	f_c' = 3,000 psi		
		Tension		Shear
		With Special Inspection[3]	Without Special Inspection[4]	
1/4 carbon steel	1 1/8	310	155	330
1/4 stainless steel	1 1/8	305	155	470
3/8 carbon steel	1 5/8	605	300	700
3/8 stainless steel	1 5/8	460	230	1,250

For **SI:** 1 inch = 25.4 mm, 1 lbf = 4.45 N.

[1]The tabulated tension or shear values are for anchors installed in stone-aggregate concrete having the indicated compressive strength at the time of installation.

[2]Use of the anchors in resisting wind or seismic forces is beyond the scope of this report.

[3]These tension values are only applicable when the anchors are installed with special inspection as set forth in Section 1701 of the code.

[4]These tension values are only applicable when the anchors are installed without special inspection as set forth in Section 1701 of the code.

TABLE 8—KWIK BOLT-II CARBON STEEL ALLOWABLE TENSION AND SHEAR IN SAND–LIGHTWEIGHT CONCRETE OVER METAL PROFILE DECK[1, 2, 3, 4]

ANCHOR DIAMETER (inch)	EMBEDMENT DEPTH (inches)	f_c' = 3,000 psi		
		Tension (pounds)		Shear (pounds)
		With Special Inspection	Without Special Inspection	
1/4	2 1/4	560	280	490
3/8	2 1/4	790	395	1,000
1/2	2 1/4	880	440	1,000
5/8	4 1/2	1,675	835	2,575

For **SI:** 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1ft.-lb. = 1.3558 Nm, 1psi = 6.9 kPa.

[1]The tabulated tension and shear values are for anchors installed in lightweight expanded shale-aggregate concrete having the indicated compressive strength at the time of installation. Refer to Figure 3 for minimum dimensions of the composite deck. Concrete aggregate must comply with ASTM C330-85 and ASTM C 332-83.

[2]Space and edge distances noted in Table 2 must be increased by 33 1/3 percent. When anchors are installed in the ridge, the minimum distance measured from the center of the bolt to the edge of the ridge is 2 3/8 inches.

[3]Allowable loads may be increased by 33 1/3 percent for short-term loading due to wind or seismic forces.

[4]Anchors are permitted to be installed in the valley or ridge of the composite steel-deck/concrete-fill assembly.

KWIK BOLT II CONCRETE EXPANSION ANCHOR

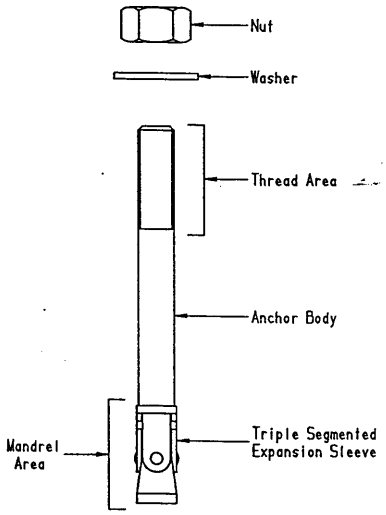

FIGURE 1

HKB II COUNTERSUNK POST NUT ANCHOR

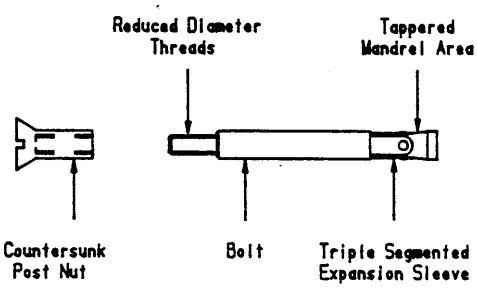

FIGURE 2

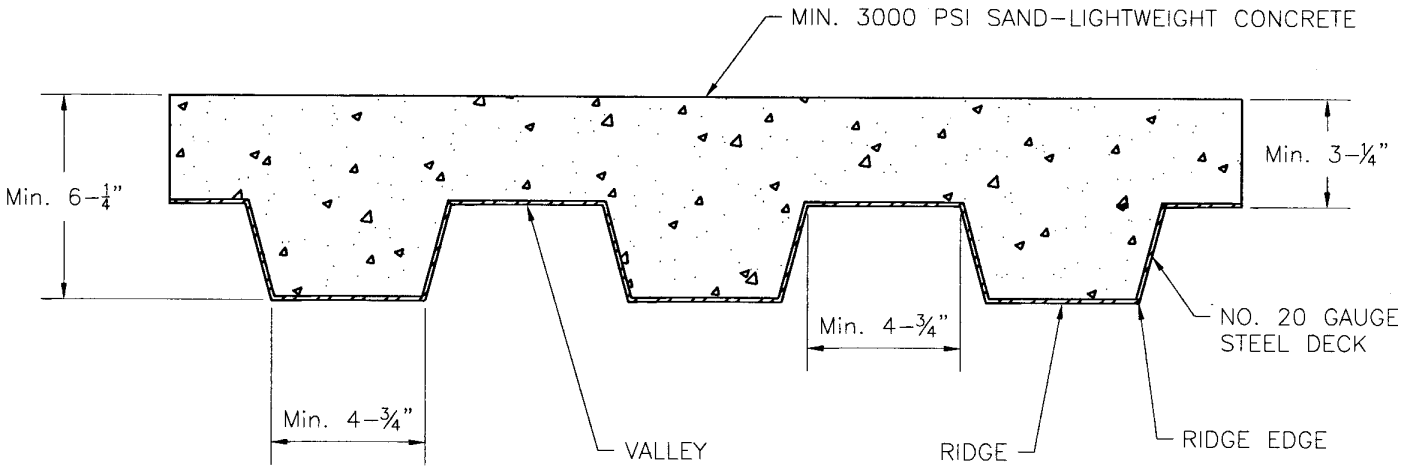

FIGURE 3 – PROFILE OF SAND–LIGHTWEIGHT CONCRETE OVER METAL DECK

Filing Category: FASTENERS—Concrete and Masonry Anchors

KWIK BOLT-II AND POST NUT KWIK BOLT-II CONCRETE ANCHORS

HILTI, INC.
5400 SOUTH 122ND EAST AVENUE
TULSA, OKLAHOMA 94146

1.0 SUBJECT

Kwik Bolt-II and Post Nut Kwik Bolt-II Concrete Anchors. Revise Section 4.6 and Table 5 to add recognition of seismic resistance of Kwik Bolt-II installed in structural lightweight concrete. (Issued September 1, 2001.)

2.0 DESCRIPTION

No change.

3.0 EVIDENCE SUBMITTED

No change.

4.0 FINDINGS

That the changes noted herein comply with the 1997 *Uniform Building Code*™ (UBC), subject to the following conditions:

4.6 Except where specifically noted in the tables, allowable tension and shear values or applied loads for carbon steel and stainless steel Kwik Bolt-II anchors in normal-weight concrete and carbon steel Kwik Bolt-II anchors in structural lightweight concrete, noted in Tables 3, 4, and 5, may be adjusted in accordance with Section 1612.3 of the UBC for short-term loading due to wind or seismic forces. Use of the Post Nut Kwik Bolt-II anchor, in resisting wind and seismic forces, is beyond the scope of this report.

4.7 through 4.10: No change.

Unless specifically noted in this evaluation report supplement, the master report remains valid and unchanged.

This report expires concurrently with the master report dated February 1, 2001.

TABLE 5—KWIK BOLT-II CARBON STEEL ALLOWABLE TENSION AND SHEAR IN LIGHTWEIGHT, EXPANDED SHALE-AGGREGATE CONCRETE[1,2,3]

ANCHOR SIZE (inch)	EMBEDMENT DEPTH (inches)	TORQUE (ft.-lb.)	SHEAR (lbs.)	TENSION (lbs.) WITH SPECIAL INSPECTION[5]	TENSION (lbs.) WITHOUT SPECIAL INSPECTION[4]	TENSION (lbs.) WITH SPECIAL INSPECTION[5]	TENSION (lbs.) WITHOUT SPECIAL INSPECTION[4]
			f'_c $ 2,000 psi	f'_c = 2,000 psi		f'_c = 4,000 psi	
1/4	1 1/8	4	400[6]	210	105	360	180
	2	5	400	300	150	450	225
3/8	1 5/8	15	755[6]	380	190	625	310
	2 1/2	15	1,100	630	315	975	485
1/2	2 1/4	25	1,370[6]	685	340	1,100	550
	3 1/2	30	1,840	1,000	500	1,600	800
5/8	2 3/4	65	2,480[6]	1,110	555	1,575	785
	4	75	3,125	1,650	825	2,300	1,150
3/4	3 1/4	135	3,170[6]	1,545	770	2,200	1,100
	4 3/4	150	4,135	2,200	1,100	3,250	1,625

For **SI:** 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1 ft-lb = 1.3558 N·m, 1 psi = 6.9 kPa.

[1]The tabulated tension and shear values are for anchors installed in lightweight expanded shale-aggregate concrete having the indicated compressive strength at the time of installation. Concrete aggregate must comply with ASTM C 330-85 and ASTM C 332-83.
[2]Except as described in footnote 6, allowable values or applied loads may be adjusted in accordance with Section 1612.3 of the UBC for short-term loading due to wind or seismic forces.
[3]Spacing and edge distances noted in Table 2 must be increased by 33 1/3 percent.
[4]These tension values are only applicable when the anchors are installed without special inspection as set forth in Section 1701 of the code.
[5]These tension values are only applicable when the anchors are installed with special inspection as set forth in Section 1701 of the code.
[6]Anchors installed at this embedment depth shall not be used to resist shear due to wind or seismic forces.