

**HOWARD I. SHAPIRO & ASSOCIATES**

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JOB 06353.00.00 30 W BWAY  
SHEET NO. SK-S21-1 OF \_\_\_\_\_  
CALCULATED BY hrs DATE 9/21/06  
CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_  
SCALE \_\_\_\_\_

SUPPLEMENTAL CALCULATIONS FOR SCOFFOLD TIES

1. ANCHORS TO STEEL HILTI X-DNI (1.45" Ø)  
Base Metal  $\geq 1/2"$  thick A7 STEEL

Tension =  $510^k$  w/ SF = 5

CONNECTION  $510^k \times 4$  Fasteners =  $2040^k$

LOAD 70 SOLID =  $4090$  MESH +  $1090$  SCOFFOLD = 50%  
WIND PRESSURE =  $25$  psf  $\times .75 = 19$  psf  
SPACING =  $12' \times 16' = 192$  FT<sup>2</sup>/TIE

LOAD/TIE =  $192 \times 0.5 \times 19$  psf =  $1824^k$

$1824 < 2040^k \therefore OK$

ADDITIONAL CONSIDERATION

PRYING ACTION

$t_{min} = \sqrt{\frac{4.44 R_t b'}{P F_y}} = 0.16$

$R_t = .51^k \quad b' = 0.83" \quad p=2 \quad F_y=36$

$t_{actual} = .21 > .16 \therefore$  No prying action

2. ANCHORS TO FLOOR  $P = 1824 < 1940^k \therefore OK$

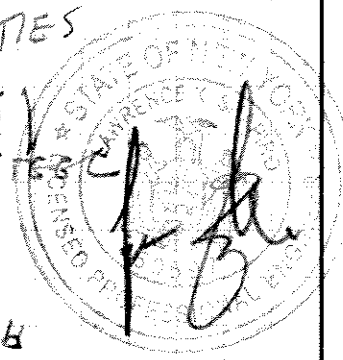
3. STEEL STRENGTH

A7 has min  $F_y = 33$  ksi  $F_u = 60$

As pullout strength is correlated to  $F_u$ , there should be no diminution of capacity for A7 as compared to A36 ( $F_u=58$ )

4. P-D EFFECT

There is neither enough weight or displacement for p-d to be a significant factor. (Scaffolding would have to be in collapse mode.)

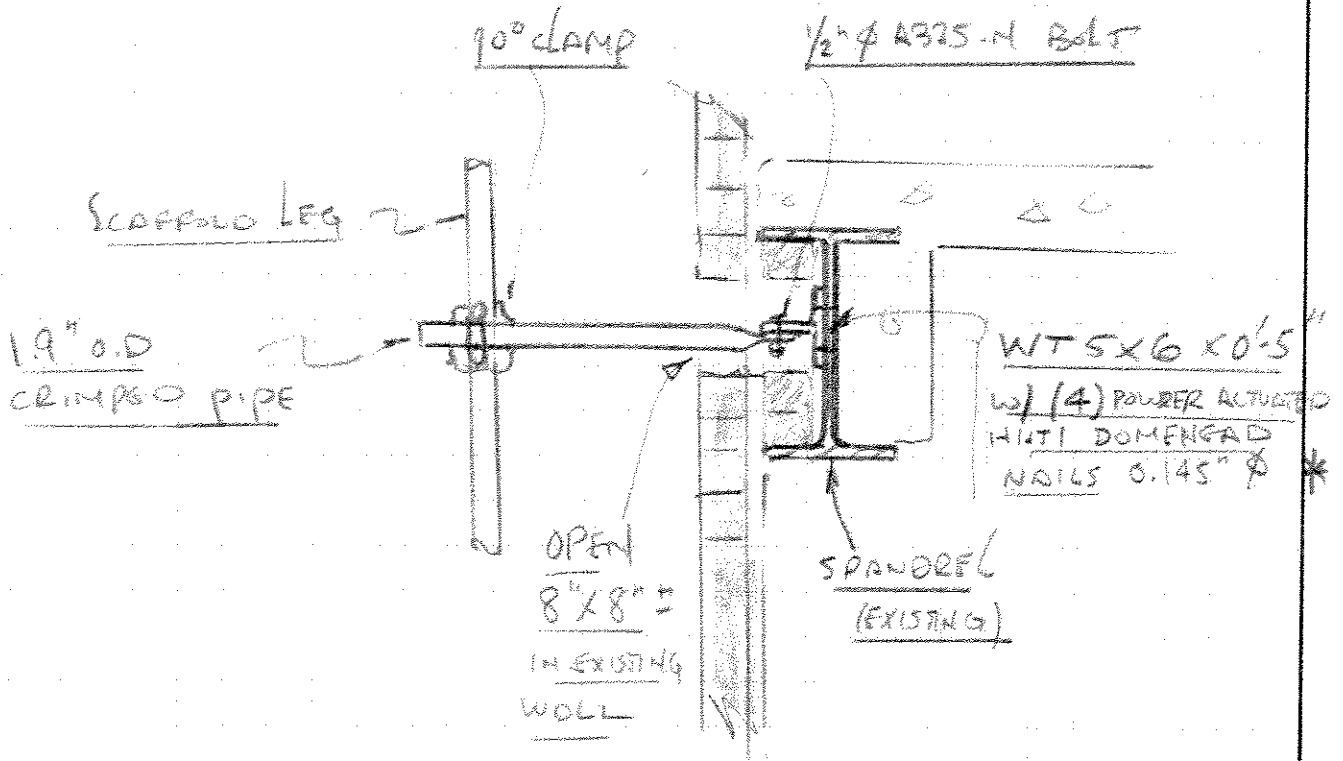


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REV 1 1/15 9/22/06

JOB 06353.00.00 Eagle 30 West Broadway  
SHEET NO. SK-AU26-1 OF \_\_\_\_\_  
CALCULATED BY 1/15 DATE 08/26/06  
CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_  
SCALE \_\_\_\_\_



PROPOSED TIE OFF SPANDRELS



9/22/06

\* HILTI X-DN 1  
9482 2" x 2"

# DX Powder Actuated Fastening System

## Load Tables — Hilti DX Fasteners continued

### Allowable Working Loads in Concrete Blocks (lbs.)

DESCRIPTION	FASTENER TYPE	SHANK DIAM. (in)	MINIMUM EMBED (in)	HOLLOW CMU				GROUTED CMU			
				FACE		MORTAR JOINT		FACE		MORTAR JOINT	
				TENSION	SHEAR	TENSION	SHEAR	TENSION	SHEAR	TENSION	SHEAR
Dome Head Nail	X-DNI	0.145"	1"	35	65	45	70	90	130	150	115
Dome Head Nail	X-ZF	0.138/0.145	1"	35	65	45	70	90	125	120	115
Flat Head Nail	X-CF	0.138"	1"	35	65	45	70	---	---	---	---
1/4"-20 Threaded Stud	W6	0.145"	1"	35	65	45	70	90	130	150	115
Drywall	X-ZF22P8T	0.138"	3/4"	30	60	30	50	75	95	90	105

NOTES: 1. Allowable values are for the fastener only, connected parts must be investigated separately.  
 2. Allowable values are for fasteners installed in concrete masonry units conforming to ASTM C90, Grade N, Type I; Mortar conforming to ASTM C270, Type M.  
 3. Allowable values are based on a safety factor of 8:1.  
 4. Multiple fasteners are recommended for increased reliability.

### Allowable Working Loads in Steel (lbs.)

DESCRIPTION	FASTENER TYPE	SHANK DIAM. (in)	1/8"		3/16"		1/4"		3/8"		1/2"		3/4"	
			TENSION	SHEAR	TENSION	SHEAR	TENSION	SHEAR	TENSION	SHEAR	TENSION	SHEAR	TENSION	SHEAR
Dome Head Nail Knurled Shank	X-EDNI	0.145	110	230	455	425	800	620	810	680	850	605	500	545
Knob-Head Nail Knurled Shank	ENK	0.145	---	---	480	540	550	620	550	665	540	640	---	---
1/4"-20 Thread Stud Knurled Shank	EW6	0.145	---	---	490	540	550	620	550	665	540	640	---	---
Heavy Duty Dome Head Nail Knurled Shank	EDS	0.177	---	---	330	665	670	935	800	970	1030	995	---	---
3/8" -16 Threaded Stud Knurled Shank	EW10	0.205	---	---	800	750	1020	1500	1150	1540	890	1100	---	---
Dome Head Nail Smooth Shank	X-DNI	0.145	---	---	360	490	510	590	670	655	750	690	---	---
Heavy Duty Dome Head Nail Smooth Shank	DS	0.177	---	---	390	795	620	625	780	780	560	810	---	---
Drywall Track Nail Smooth Shank	ESD16P8T	0.145	---	---	250	530	330	575	330	620	270	480	---	---
Dome Head Nail Smooth Shank	X-ZF	0.138/0.145	140	400	240	425	335	480	530	565	---	---	---	---
Knob Head Nail Stainless Steel	X-CR	0.145	300	270	500	450	570	480	560	520	500	520	---	---
Heavy Duty Dome Head Nail Smooth Shank	X-AL-H	.177	---	---	---	---	---	---	640	745	680	940	290	685

NOTES: 1. Allowable values are for the fastener only, connected parts must be investigated separately.  
 2. The fastener point must penetrate thru the steel to obtain allowable values, except as noted (see note 7).  
 3. Allowable values are based on a safety factor of 5:1.  
 4. Multiple fasteners are recommended for increased reliability.  
 5. Refer to "Recommended Fastener Lengths for Steel Base Material" on Page 5 for application limits.  
 6. Loads based on ASTM A36 steel except, X-AL-H data based on ASTM A572 Grade 50 steel.  
 7. Values for 3/4" steel thickness are based on penetration of 1/2".

# Hilti Kwik Bolt II System continued

## Carbon Steel Kwik Bolt II Allowable Tensile Loads (lbs)\*

Dia-meter	Embedment	$f'_c =$ 2000 psi	$f'_c =$ 3000 psi	$f'_c =$ 4000 psi	$f'_c =$ 6000 psi
1/4"	1 1/8"	270	330	380	470
	2"	560	590	630	670
	3 3/4"	670	670	670	670
3/8"	1 5/8"	530	650	750	850
	2 1/2"	1200	1290	1370	1550
	4 1/4"	1330	1390	1440	1550
1/2"	2 1/4"	1170	1310	1450	1730
	3 1/2"	1870	2130	2400	2800
	6"	2080	2310	2530	2800
5/8"	2 3/4"	1600	1870	2130	2670
	4"	2400	2850	3290	4190
	7"	3200	3470	3730	4190
3/4"	3 1/4"	1970	2320	2670	3200
	4 3/4"	2930	4130	4800	5870
	8"	4000	4930	5870	6320
1"	4 1/2"	3330	4050	4670	5070
	6"	4930	6000	7070	8400
	9"	6670	7670	8670	10670

\*Does not apply to Countersunk Kwik Bolt II

## Carbon Steel Kwik Bolt II Allowable Shear Loads (lbs)\*\*\*

Dia-meter	Embedment	$f'_c =$ 2000 psi	$f'_c =$ 3000 psi	$f'_c =$ 4000 psi	$f'_c =$ 6000 psi
1/4"	1 1/8"	430	430	430	430
	≥ 2"*	530	530	530	530
3/8"	1 5/8"	990	1040	1100	1100
	≥ 2 1/2"*	1470	1470	1470	1470
1/2"	2 1/4"	1940	1970	1970	1970
	≥ 3 1/2"*	2450	2450	2450	2450
5/8"	2 3/4"	3070	3070	3070	3070
	≥ 4"***	3840	3840	3840	3840
3/4"	3 1/4"	4140	4140	4140	4140
	≥ 4 3/4"***	5120	5120	5120	5120
1"	4 1/2"	7070	7600	8140	9200
	≥ 6"	9200	9200	9200	9200

\* Values shown are for a shear plane acting through the anchor bolt shank. When the shear plane is acting through the anchor bolt threads, reduce the shear values by 20%.

\*\* Values shown are for a shear plane acting through the anchor bolt shank. When the shear plane is acting through the anchor bolt threads, reduce the shear value by 12%.

All other values shown are for shear plane acting through either body or threads.

\*\*\*Does not apply to Countersunk Kwik Bolt II

**Table 1.1a (Cont'd.)  
Historical Summary of ASTM Specifications for Structural Steel**

<b>Date</b>	<b>Specification</b>	<b>Material</b>	<b>Yield Point, ksi</b>	<b>Tensile Strength<sup>†</sup>, ksi</b>
1949	A6-49T* * Issued as a tentative standard covering delivery requirements for A7 steel.			
	A7-49T	Structural Steel	½ Tensile Str. ≥33	60/72
	A141-49T	Rivet Steel	28	52/62
1958	A373-58T	Structural Steel	32	58-75
1961	A7-61T	Structural Steel		
		All shapes	33	60/75
		Plates/bars to 1½ in.	33	60/72
	Plates/bars over 1½ in.	33	60/75	
1962	A36-62T	Structural Steel		
		All shapes	36	58/80
		Plates to 8 in.	36	58/80
	Bars to 4 in.	36	58/80	
1963	A242-63T	HSLA Steel:		
		Group 1 shapes & plates/bars to ¾ in.	50	70
		Group 2 shapes & plates/bars over ¾ to 1½ in.	46	67
		Group 3 shapes & plates/bars over 1½ to 4 in.	42	63
	A440-63T	High-Strength Steel:		
		Group 1 shapes & plates/bars to ¾ in.	50	70
Group 2 shapes & plates/bars over ¾ to 1½ in.		46	67	
	Group 3 shapes & plates over 1½ to 4 in.	42	63	