WEAVER GENERAL CONSTRUCTION COMPANY
3679 S. Huron St., Suite 404
Englewood, CO 80110
Phone: (303) 789-4111 FAX: (303) 789-4310

SUBMITTAL TRANSMITAL

September 27, 2010
WGC Submittal No: 03300-007

PROJECT: **Harold Thompson Regional WRF**
Birdsall Rd.
Fountain, CO 80817
Job No. 2908

ENGINEER: **GMS, Inc.**
611 No. Weber St., #300
Colorado Springs, CO 80903
719-475-2935 Roger Sams

OWNER: **Lower Fountain Metropolitan Sewage Disposal District**
901 S. Santa Fe Ave.
Fountain, CO 80817
719-382-5303 James Heckman

CONTRACTOR: **Baker Concrete Construction**
1904 Jasper Street
Aurora, CO 80011
937-536-9000 Nick Dewald

SUBJECT: Expansion Anchors – Hilti Kwik Bolts

SPEC SECTION: 03300 – Cast-In-Place Concrete

PREVIOUS SUBMISSION DATES: None

DEVIATIONS FROM SPEC: ___ YES _X_ NO

CONTRACTOR'S STAMP: This submittal has been reviewed by Weaver General Construction and approved with respect to the means, methods, techniques, & safety precautions & programs incidental thereto. Weaver General Construction also warrants that this submittal complies with contracted documents and comprises on deviations thereto:

Contractor's Stamp:	Engineer's Stamp:
Date: 9/27/10 Reviewed by: H.C. Myers (X) Reviewed Without Comments ( ) Reviewed With Comments	

ENGINEER'S COMMENTS:_____

Letter of Transmittal/Submittal

FROM:

Baker Concrete Construction
1904 Jasper Street
Aurora, CO 80011
303.367.8111
Nick Dewald 937.536.9000

TO: *Bruce Herman*
Weaver General Construction Co.
3679 South Huron St., Suite 404
Englewood, CO 80110

DATE	*09/23/10*
JOB NUMBER	*9921*
ATTENTION	*Bruce Herman*
RE:	*Harold Thompson Regional WRF*
TR#	*9921-007*
SM#	*03300-007*

We are sending you: *ATTACHED* via *EMAIL* the following: *SPECIFICATION*

COPIES	DATE	PAGES	Description
1	*9/23/2010*	*4*	*Expansion Anchors - Hilti Kwik Bolts*

THESE ARE TRANSMITTED as noted below:

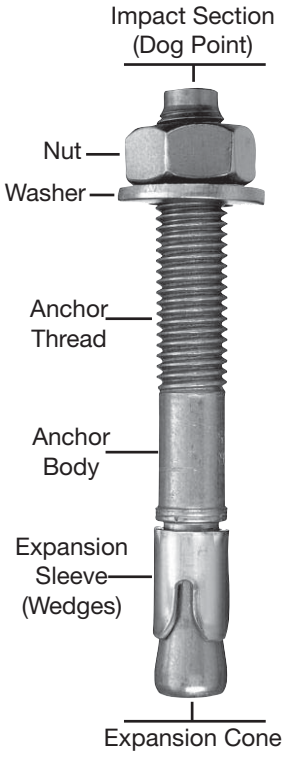
REMARKS

COPY TO

SIGNED:
Baker Concrete Construction, Inc.

If enclosures are not as noted, kindly notify us at once

4.3.5 Kwik Bolt 3 Expansion Anchor



Listings/Approvals

ICC-ES (International Code Council)
ESR-1385 Seismically recognized under AC01 dated April 2002

City of Los Angeles (COLA)
Underwriters Laboratories (UL)

UL (Underwriters Laboratories)
UL 203 Pipe Hanger Equipment for Fire Protection Services (3/8" - 3/4")

Factory Mutual (FM)
Pipe Hanger Components for Automatic Sprinkler (3/8" - 3/4")

Metro-Dade County
Approval pending
Qualified under an NQA-1 Nuclear Quality Program

*Please refer to the reports to verify that the type and diameter specified is included

4.3.5.1 Product Description

The Kwik Bolt 3 (KB3) is a torque controlled expansion anchor, which provides consistent performance for a wide range of mechanical anchor applications. This anchor series is available in carbon steel with zinc electroplated coating, carbon steel with hot-dip galvanized coating, 304 stainless steel and 316 stainless steel versions.The threaded stud version of the anchor is available in a variety of diameters ranging from 1/4 in. to 1in. depending on the steel and coating type. Applicable base materials include normal-weight concrete, structural lightweight concrete, lightweight concrete over metal deck, and grout filled concrete masonry.

Guide Specifications

Torque controlled expansion anchors shall be Kwik Bolt 3 supplied by Hilti meeting the description in Federal specification A-A 1923A, Type 4. The anchor bears a length identification mark embossed into the impact section (dog point) of the anchor identifying the anchor as a Hilti Kwik Bolt 3 in the installed condition. Anchors are manufactured to meet one of the following conditions:

1. The carbon steel anchor body, nut and washer have an electroplated zinc coating conforming to ASTM B 633 to a minimum thickness of 5 µm.
2. The carbon steel hot-dip galvanized anchor body, nut, and washer conform to ASTM A 153. The expansion sleeve conforms to AISI 316.
3. The anchor body, nut, and washer conform to AISI 304. The expansion sleeve conforms to AISI 316.
4. The anchor body, nut, washer, and expansion sleeve conform to AISI 316.

Product Features

- Length identification code facilitates quality control and inspection after installation.
- Through fixture installation and variable thread lengths improve productivity and accommodate various base plate thicknesses.
- Raised impact section (Dog Point) prevents thread damage during installation.
- Anchor size is same as drill bit size for easy installation. For temporary applications anchors may be driven into drilled holes after usage.
- Mechanical expansion allows immediate load application.

Installation

Drill hole in concrete, structural lightweight concrete, or grout filled concrete masonry using a Hilti carbide tipped drill bit and a Hilti rotary hammer drill. Remove dust from the hole with oil free compressed air or vacuum. Alternately for 1/2, 5/8, 3/4, and 1 inch diameter Kwik Bolt 3 anchors, the hole may be drilled using a matched tolerance Hilti DD-B or DD-C wet diamond core bit for anchoring applications. The slurry must be flushed from the diamond cored hole prior to anchor installation. The minimum hole depth must exceed the anchor embedment prior to torquing by one hole, diameter. Drive the anchor into the hole using a hammer. A minimum of six threads must be below the surface of the fixture. Tighten the nut to the recommended installation torque.

4.3.5.2 Material Specifications

Carbon steel with electroplated zinc

All Carbon Steel Kwik Bolt 3, Long Thread Kwik Bolt 3 and Rod Coupling Anchors, excluding the 3/4 x 12 and 1 inch diameter sizes, have the tabulated minimum tensile bolt fracture loads:

Anchor Diameter (in.)	Min. Fracture[1] Load (lb)
1/4	2900
3/8	7200
1/2	12400
5/8	19600
3/4	28700

All 3/4 x 12 and 1 inch diameter sizes and countersunk Kwik Bolt 3 anchors have anchor bodies manufactured from AISI 11L41

AISI 11L41	
Min. Tensile Strength (ksi)	Min. Yield Strength (ksi)
88	75

Carbon steel anchor components plated in accordance with ASTM B 633 to a minimum thickness of 5 µm.

Nuts conform to the requirements of ASTM A 563, Grade A, Hex.

Washers meet the requirements of ASTM F 844.

Expansion sleeves (wedges) are manufactured from carbon steel, except the following anchors have stainless steel wedges:
- All 1/4 inch diameter anchors
- KB3 3/4x12
- All 1 inch diameter anchors
- All countersunk Kwik Bolt 3

Carbon steel with hot-dip galvanized coating

Anchor bodies manufactured from carbon steel have the tabulated minimum tensile bolt fracture loads:

Anchor Diameter (in.)	Min. Fracture[1] Load min. (lb)
1/2	12400
5/8	19600
3/4	28700

Carbon steel anchor components hot-dip galvanized according to ASTM A 153, Class C (43 µm min.).

Nuts conform to the requirements of ASTM A 563, Grade A, Hex.

Washers meet the requirements of ASTM F 844.

Expansion sleeves (wedges) are manufactured from stainless steel.

Stainless steel

Anchor bodies smaller than 3/4 inch, excluding all countersunk Kwik Bolt 3 anchors, are produced from AISI 304 or 316 stainless steel have tha tabulated minimum bolt fracture loads:

Anchor Diameter (in.)	Min. Fracture[1] Load min. (lb)
1/4	2900
3/8	7200
1/2	12400
5/8	21900

Anchor bodies 3/4 inch and larger, and all stainless steel post nut series anchor bodies, are produced from AISI 304 or 316 stainless steel have the tabulated minimum mechanical properties:

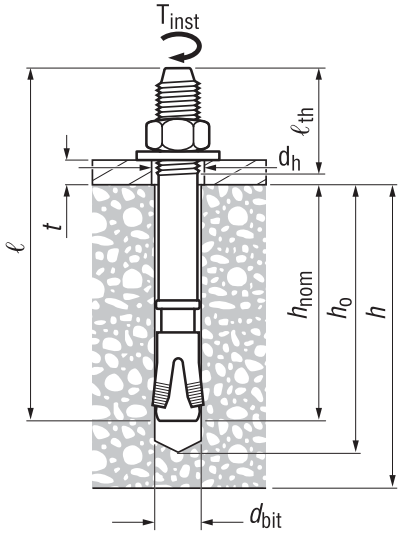
Anchor Diameter (in.)	Min. Tensile Strength (ksi)	Min. Yield Strength (ksi)
≤ 5/8	90	76
≥ 3/4	76	64

Nuts meet the dimensional requirements of ASTM F 594.

Washers meet the dimensional requirements of ANSI B18.22.1, Type A, plain.

Expansion Sleeve for AISI 304 and 316 anchors are made from AISI 316. All nuts and washers for AISI 304 and 316 anchors are manufactured from AISI 304 and 316, respectively.

1 Bolt fracture loads are determined by test in jig as part of product QC. These loads are not intended for design purposes.



Combined Shear and Tension Loading

$$\left(\frac{N_d}{N_{rec}}\right)^{5/3} + \left(\frac{V_d}{V_{rec}}\right)^{5/3} \leq 1.0$$ (Ref. Section 4.1.2.7 of 2005 Hilti Product Technical Guide)

- Refer to Kwik Bolt 3 Specification table under Section 1.3, for a listing and specification of anchor specific and installation variables.
- See Kwik Bolt 3 anchor product line table under Section 1.5 for full list of anchor length (ℓ) and thread length (ℓ_{th}) configurations.

4.3.5 Kwik Bolt 3 Expansion Anchor

4.3.5.3 Technical Data

Table 1 - Kwik Bolt 3 Specifications[1]

Details \ Bolt Size			in. (mm)	1/4 (6.4)			3/8 (9.5)			1/2 (12.7)		
d_{bit}	nominal bit diameter[2]		in.	1/4			3/8			1/2		
$h_{min}/h_{nom}/h_{deep}$	depth of embedment		in. (mm)	1-1/8 (29)	2 (51)	3 (76)	1-5/8 (41)	2-1/2 (64)	3-1/2 (89)	2-1/4 (57)	3-1/2 (89)	4-3/4 (121)
h_o	minimum/standard/deep hole depth		in. (mm)	1-3/8 (35)	2-1/4 (57)	3-1/4 (83)	2 (51)	2-7/8 (73)	3-7/8 (89)	2-3/4 (70)	4 (102)	5-1/4 (133)
d_h	wedge clearance hole in fixture		in. (mm)	5/16 (8)			7/16 (11)			9/16 (14)		
T_{inst} Recommended Installation Torque	Normal weight & Lightweight Concrete	Carbon Steel HDG	ft-lb (Nm)	4 (5)			20 (27)			40 (54)		
		Stainless Steel	ft-lb (Nm)	6 (8)			20 (27)			40 (54)		
	Grout Filled Block	Carbon Steel	ft-lb (Nm)	4 (5)			15 (20)			25 (34)		
h	min. base material thickness		in.	3 inch (76 mm) or 1.3 times embedment, whichever number is greater								

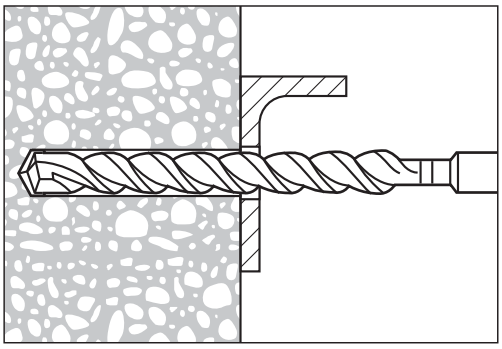
Details \ Bolt Size			in. (mm)	5/8 (15.9)			3/4 (19.1)			1 (25.4)		
d_{bit}	nominal bit diameter[2]		in.	5/8			3/4			1		
$h_{min}/h_{nom}/h_{deep}$	minimum/standard/deep depth of embedment		in. (mm)	2-3/4 (70)	4 (102)	5-1/2 (140)	3-1/4 (83)	4-3/4 (121)	6-1/2[3] (165)	4-1/2 (114)	6 (152)	9 (229)
h_o	minimum/standard/deep hole depth		in. (mm)	3-3/8 (86)	4-5/8 (117)	6-1/8 (156)	4 (102)	5-1/2 (140)	6-4/5 (173)	5-1/2 (140)	7 (178)	10 (254)
d_h	wedge clearance hole in fixture		in. (mm)	11/16 (17)			13/16 (21)			1-1/8 (29)		
T_{inst} Recommended Installation Torque	Normal weight & Lightweight Concrete	Carbon Steel HDG	ft-lb (Nm)	85 (115)			150 (203)			250 (339)		
		Stainless Steel	ft-lb (Nm)	85 (115)			150 (203)			235 (319)		
	Grout Filled Block	Carbon Steel	ft-lb (Nm)	65 (88)			120 (1663)			-		
h	min. base material thickness		in.	3 inch (76 mm) or 1.3 times embedment, whichever number is greater								

1 See Kwik Bolt 3 anchor product line table under section 1.5 for full list of anchor length (ℓ) and thread length (ℓ_{th}) configurations.

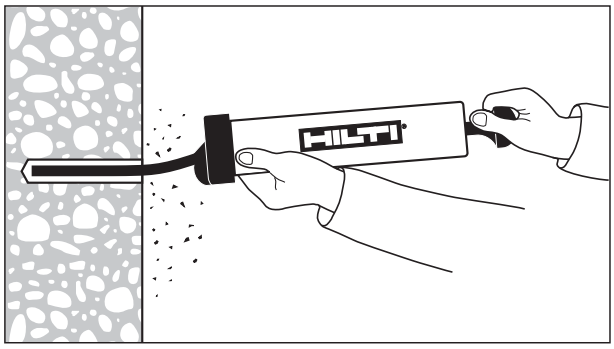
2 Loads for Kwik Bolt 3 are applicable for both carbide drill bits (see Section 8.4.1) and matched tolerance Hilti DD-B or DD-C diamond core bits in sizes ranging from 1/2 inch to 1 inch .

3 Deep embedment depth for stainless steel Kwik Bolt 3 anchor is 8 inch (203 mm).

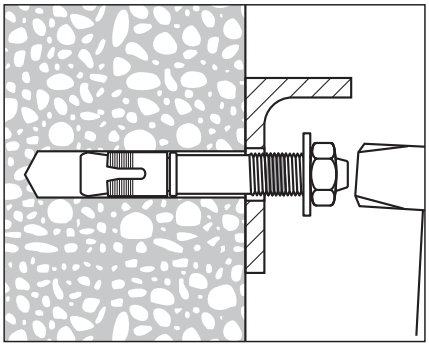
4.3.5.4 Installation Instructions



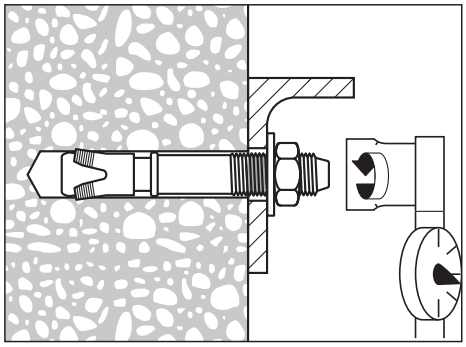
1. Hammer drill a hole to the same nominal diameter as the Kwik Bolt 3. The hole depth must exceed the anchor embedment by at least one diameter. The fixture may be used as a drilling template to ensure proper anchor location.



2. Clean hole.



3. Drive the Kwik Bolt 3 into the hole using a hammer. The anchor must be driven until at least six threads are below the surface of the fixture.



4. Tighten the nut to the recommended installation torque.