



**APAC-Kansas, Inc.**

A subsidiary of Ashland Paving And Construction, Inc.  
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January 10, 2007

Mr. Brian K. Iles, P.E.  
Resident Engineer  
Missouri Department of Transportation  
201 Wollard Blvd.  
Richmond, Missouri 64085

Re: Contract ID's 061027-401  
Job No. J4P1099  
Route 69, Clay Co.

Dear Sir:

We are requesting permission to substitute Hilti  $\frac{3}{4}$ " x  $4\frac{1}{2}$ " Coil Anchor Bolts in lieu of drop in anchors as specified in the Standards for attaching temporary barrier tie down straps to the bridge deck.

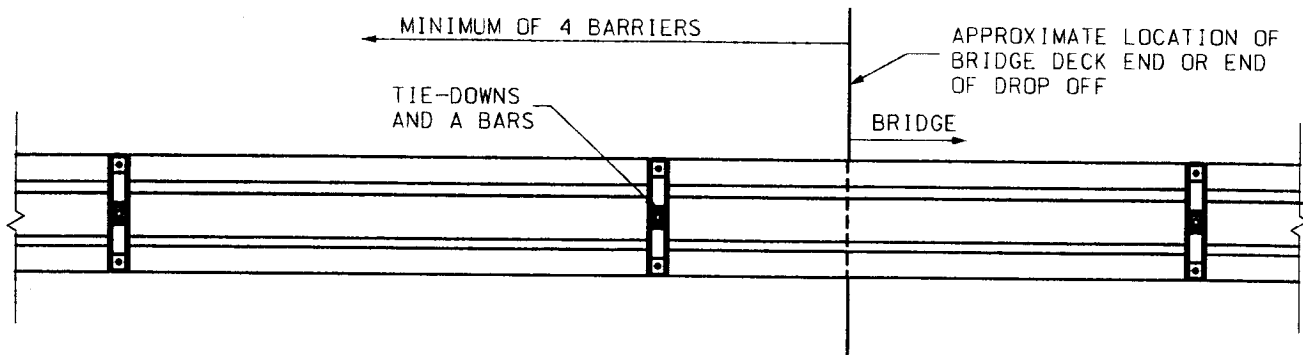
Published shear valve of the coil anchor is very nearly the same as the published shear valve as the drop-in anchor, however, the published valves for the drop-in anchor assume that the top of the anchor is flush with the concrete surface. Recessing the anchor the 1 inch to allow for patching will significantly reduce shear resistance while increasing the tension. The  $\frac{3}{4}$ " x  $4\frac{1}{2}$ " coil anchor used in this application will have an embedment depth of 4 inches. The shear and tension allowable loads more closely approximate the testing performed on the  $\frac{3}{4}$ " x 6 coil anchor at a  $4\frac{1}{2}$ " inch embedment depth. These valves are significantly greater than the drop-in anchor.

Additionally the coil anchors allow for a minimum 3" of patching material cover versus the 1" for the drop in anchors.

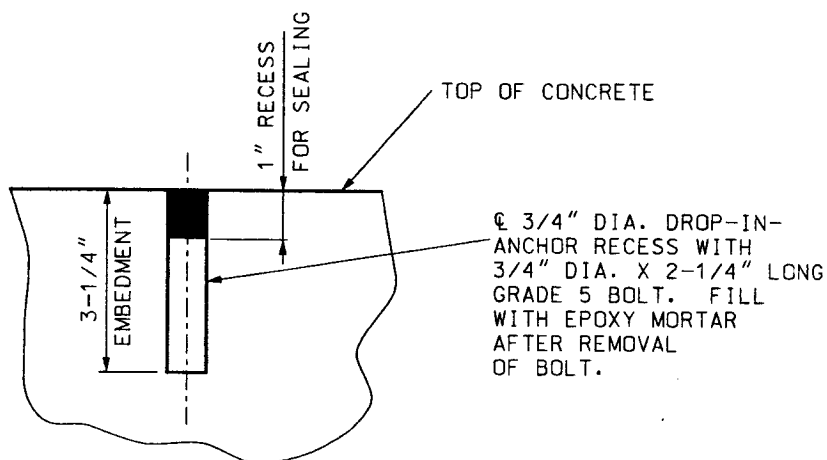
Sincerely,

A handwritten signature in black ink, appearing to read "Wm. T. Dugan". The signature is fluid and cursive, with a large, sweeping "D" and "G".

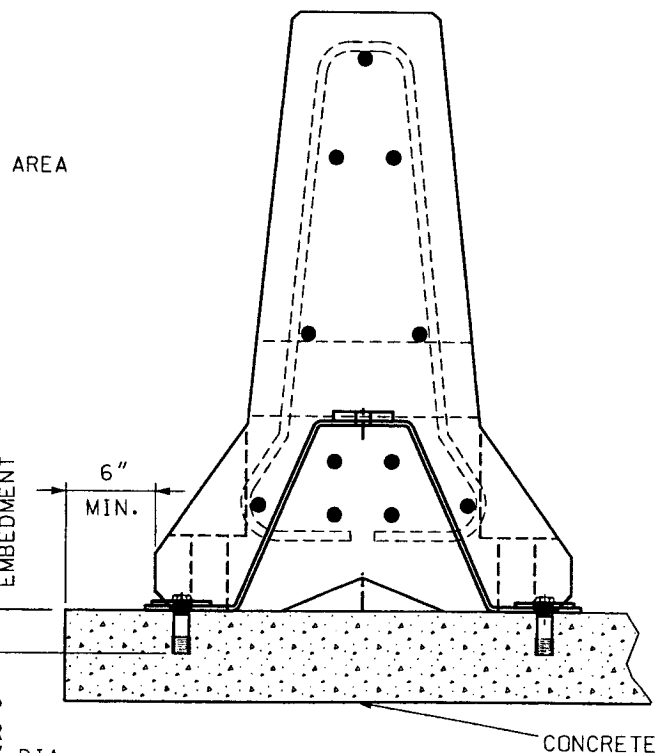
Wm. T. Dugan  
Project Engineer



PLAN OF TRANSITION FOR FREE-STANDING BARRIER  
TO TIE-DOWN BARRIER



DETAIL SHOWING SEALING OF HOLES  
AFTER REMOVAL OF TIE-DOWN BOLTS



SECTION NEAR PIN ASSEMBLY

GENERAL NOTES:

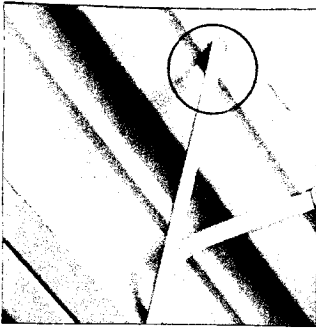
CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN FIELD  
BEFORE ORDERING NEW MATERIAL.

COST OF FURNISHING AND INSTALLING THE TIE-DOWN SYSTEM  
COMPLETE-IN-PLACE WILL BE CONSIDERED INCIDENTAL TO  
OTHER PAY ITEMS.

SEE OTHER SHEETS FOR DETAILS NOT SHOWN.

TIE-DOWN STRAP:  
BARRIERS SHALL BE PULLED TIGHT DURING INSTALLATION  
TO REMOVE SLACK AND PROVIDE LONGITUDINAL TENSION  
DURING IMPACT.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION			
	<b>TEMPORARY CONCRETE TRAFFICE BARRIER TIE-DOWN STRAP</b>		
	DATE: <u>3/4/04</u>	EFFECTIVE: 07-01-2004	<b>617.20B</b>
			5 6



### HDI

## Drop-In Anchor

- Anchor, setting tool and Hilti drill bit form a matched tolerance system to provide reliable fastening
- Below surface setting for easy patchwork
- Allows for shallow embedment without sacrificing performance

### Technical Data

#### Base material

- Non-cracked concrete
- Lightweight concrete
- Lightweight concrete over metal deck

#### Anchor material

- HDI Carbon Steel material meets the requirements of AISI 1110M or AISI 1010 for the 1/4", 3/8" and 1/2" HDI's and AISI 12L14 for the 5/8" and 3/4" HDI's.
- Carbon Steel HDI plated with a zinc finish for corrosion protection in accordance with ASTM B633, Sc. 1, Type III.
- HDI Stainless Steel material meets the requirements of AISI 303.

#### Listings/Approvals

UL (Underwriter Laboratories)	Control No. 767G
FM (Factory Mutual)	Serial No. 22765
ICC-ES (International Code Council)	ER Report No. 2895 — Seismic Data
COLA (City of Los Angeles)	Report No. 23709
Meets the description in Federal Specification	FF-S-325, Group VIII, Type I



### Carbon Steel

Item No.	Qty	Master Carton Item No.	Qty	Description	Hole Dia.	Embed & Anchor Length	Useable Thread Length	Internal Thread Size	Allowable Loads 4000 psi concrete <sup>1</sup>	
									Tension (lb)	Shear (lb)
336425	100	3001507	1200	HDI 1/4"	3/8"	1"	7/16"	1/4"	570	625
336426	50	3001508	600	HDI 3/8"	1/2"	1-9/16"	5/8"	3/8"	1115	1250
336427	50	3001509	300	HDI 1/2"	5/8"	2"	11/16"	1/2"	1785	2125
336428	25	258540	100	HDI 5/8"	27/32"	2-9/16"	7/8"	5/8"	2920	3250
336429	25	258541	100	HDI 3/4"	1"	3-3/16"	1-3/8"	3/4"	4065	5000

### Stainless Steel

Item No.	Qty	Master Carton Item No.	Qty	Description	Hole Dia.	Embed & Anchor Length	Useable Thread Length	Internal Thread Size	Allowable Loads 4000 psi concrete <sup>1</sup>	
									Tension (lb)	Shear (lb)
336430	100	339617	1200	HDI 1/4" (SS 303)	3/8"	1"	7/16"	1/4"	480	600
336431	50	339618	600	HDI 3/8" (SS 303)	1/2"	1-9/16"	5/8"	3/8"	1040	1230
336432	50	339619	300	HDI 1/2" (SS 303)	5/8"	2"	11/16"	1/2"	1840	2760
336433	25	339620	100	HDI 5/8" (SS 303)	27/32"	2-9/16"	7/8"	5/8"	2630	4510
336434	25	339621	100	HDI 3/4" (SS 303)	1"	3-3/16"	1-3/8"	3/4"	3830	5580

<sup>1</sup> See Hilti Product Technical Guide for complete performance data

### HDI-L

## Flush Drop-In Anchor

- Lip provides flush installation, consistent anchor depth, and easy rod alignment
- Intelligent expansion sections adapts to the base material and reduces number of hammer blows up to 50%
- Lip allows accurate flush surface setting, independent of hole depth and ideal for repetitive fastenings with threaded rods of equal length

### Technical Data

#### Base material

- Non-cracked concrete
- Lightweight concrete

#### Anchor material

- Carbon steel, zinc plated for corrosion protection in accordance with ASTM B633, Sc 1 Type III

#### Listings/Approvals

UL (Underwriter Laboratories)	Control No. 767G
FM (Factory Mutual)	Serial No. 22765
Meets the description in Federal Specification	FF-S-325, Group VIII, Type I



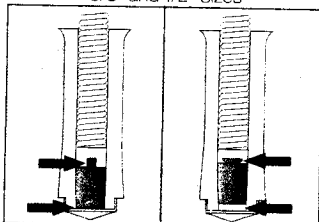
### Carbon Steel

Item No.	Qty	Master Carton Item No.	Qty	Description	Hole Dia.	Embed & Anchor Length	Useable Thread Length	Internal Thread Size	Allowable Loads 4000 psi concrete <sup>1</sup>	
									Tension (lb)	Shear (lb)
283608	100	3001510	1200	HDI-L 1/4"	3/8"	1"	7/16"	1/4"	570	625
283609	50	3001511	600	HDI-L 3/8"	1/2"	1-9/16"	5/8"	3/8"	1115	1250
283610	50	3001512	300	HDI-L 1/2"	5/8"	2"	11/16"	1/2"	1785	1940

<sup>1</sup> See Hilti Product Technical Guide for complete performance data

### Hilti Exclusive Intelligent Expansion Section

3/8" and 1/2" Sizes



Low-strength base material (fully set)

High-strength base material (fully set)

### Reusable Coil Anchor

- Hex head bolt style enables low profile fastenings to be made (separate washer included)
- Significant cost savings as result of multiple-use design
- Stud type coil anchors make through-type fastenings a snap
- Coil anchors are preassembled units to keep production fastenings moving quickly

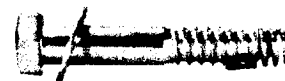
#### Technical Data

##### Base material

- Concrete

##### Anchor material

- Carbon steel, case hardened, zinc plated



Item No.	Qty	Master Carton Item No.	Qty	Description	Hole Dia.	Min. Emb. Depth	Max. Fixture Thickness at Min. Emb.	Install Torque ft-lb	Allowable Loads, 4000 psi Concrete <sup>1</sup>		
									Std. Emb. Depth	Tension (lb)	Shear (lb)
252000	100	339622	1000	HCA 1/4" x 1-3/4"	1/4"	3/4"	5/8"	10	3/4"	325	330
252002	100	339623	1000	HCA 1/4" x 2-1/2"	1/4"	3/4"	1-3/8"	10	1"	500	535
252003	100	339624	600	HCA 1/4" x 3-1/2"	1/4"	3/4"	2-3/8"	10	1"	500	535
252004	100	339625	500	HCA 3/8" x 2-1/4"	3/8"	1-1/2"	1/8"	40	1-1/2"	920	1205
252005	100	339626	500	HCA 3/8" x 3"	3/8"	1-1/2"	7/8"	40	2"	1420	1965
252007	50	339628	250	HCA 3/8" x 5"	3/8"	1-1/2"	2-7/8"	40	2"	1420	1965
252010	50	339629	250	HCA 1/2" x 3"	1/2"	2"	3/8"	80	2"	1420	2145
252011	50	339630	250	HCA 1/2" x 4"	1/2"	2"	1-3/8"	80	3"	2605	4270
252012	25	339631	125	HCA 1/2" x 5-1/2"	1/2"	2"	2-7/8"	80	3"	2605	4270
252013	25	339632	125	HCA 1/2" x 7"	1/2"	2"	4-3/8"	80	3"	2605	4270
252014	25	339633	125	HCA 5/8" x 3-1/2"	5/8"	2-3/8"	3/8"	130	2-3/8"	1835	3075
252015	25	339634	100	HCA 5/8" x 5"	5/8"	2-3/8"	1-7/8"	130	3-7/8"	3825	7070
252016	20	339635	80	HCA 5/8" x 8"	5/8"	2-3/8"	4-7/8"	130	3-7/8"	3825	7070
252017	20	339636	80	HCA 3/4" x 4-1/2"	3/4"	3-1/4"	1/4"	180	3-1/4"	2940	5540
252018	10	339637	40	HCA 3/4" x 6"	3/4"	3-1/4"	1-3/4"	180	4-1/2"	4790	9630
252019	10	339638	40	HCA 3/4" x 10"	3/4"	3-1/4"	5-3/4"	180	4-1/2"	4790	9630

<sup>1</sup> See Hilti Product Technical Guide for complete performance data

### HCT Replacement Coil for HCA Coil Anchor

Item No.	Qty	Master Carton Item No.	Qty	Description
255985	100	339639	3000	HCT 1/4"
255987	100	339640	2500	HCT 3/8"
255988	100	339641	2000	HCT 1/2"
255989	100	339642	1500	HCT 5/8"
255990	50	339643	1000	HCT 3/4"