PEDESTRIAN GUARDRAIL BARRIER
EAST BRIDGE
PARAGON STAR SPORTS COMPLEX
LEE'S SUMMIT, MISSOURI
PROJECT NO. 2120521

DECEMBER 06, 2021
STRUCTURAL CALCULATIONS

12-06-21

MICHAEL LANCEY, P.E.
ENGINEER OF RECORD

Wallace Engineering
Structural Consultants, Inc.
1741 McGee Street
Kansas City, Missouri 64108
816.421.8282, Fax 816.421.8338
www.wallacesc.com

Date 9/13/21 Sheet No. of

Job EAST BRIDGE

Subject FENCE ANCHORAGE

DESIGN BASE CONNECTION FOR GUARDRAIL:

HSS 4x4x1/4 POST @ 8'-0" O.C.

∴ LATERAL LL = 8'(50#/') = 400# @ h = 42"

DL = 8'(121#) = 970#

FACTORED LATERAL: $V_u = 400(1.6) = 640\#$

$M_u = 400(3.5')(1.6) = 2.3^{k\text{-}'} = 27^{k\text{-}''}$

RE: HILTI PROFIS ANALYSIS

USE 10"x10" BASE PLATE w/ 3" EDGE DISTANCE

(4) 3/4" DIA HILTI HAS-E RODS w/ HIT-HY 200, EMBED = 6"

∴ CURB WIDTH = 12"

Company:		Page:	1
Address:		Specifier:	
Phone I Fax:	|	E-Mail:	
Design:	2021-09-13 Guardrail Base	Date:	9/13/2021
Fastening point:			

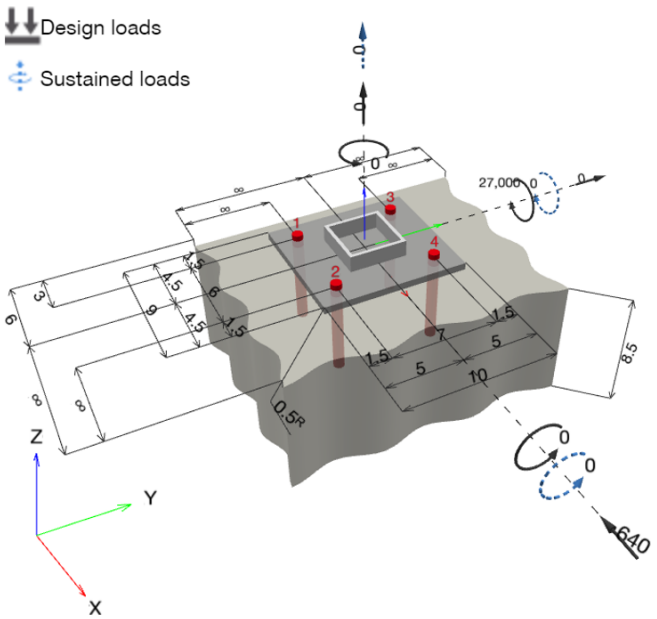
Specifier's comments:

1 Input data

Anchor type and diameter:	**HIT-HY 200 + HAS-V-36 (ASTM F1554 Gr.36) 3/4**
Item number:	2198029 HAS-V-36 3/4"x8" (element) / 2022793 HIT-HY 200-R (adhesive)
Effective embedment depth:	$h_{ef,act}$ = 6.000 in. ($h_{ef,limit}$ = - in.)
Material:	ASTM A 1554 Grade 36
Evaluation Service Report:	ESR-3187
Issued I Valid:	5/1/2021 | 3/1/2022
Proof:	Design Method ACI 318-14 / Chem
Stand-off installation:	e_b = 0.000 in. (no stand-off); t = 0.500 in.
Anchor plate[R] :	l_x x l_y x t = 9.000 in. x 10.000 in. x 0.500 in.; (Recommended plate thickness: not calculated)
Profile:	Square HSS (AISC), HSS4X4X.25; (L x W x T) = 4.000 in. x 4.000 in. x 0.250 in.
Base material:	cracked concrete, 2500, f_c' = 2,500 psi; h = 8.500 in., Temp. short/long: 32/32 °F
Installation:	**hammer drilled hole, Installation condition: Dry**
Reinforcement:	tension: condition B, shear: condition B; no supplemental splitting reinforcement present edge reinforcement: none or < No. 4 bar

[R] - The anchor calculation is based on a rigid anchor plate assumption.

Geometry [in.] & Loading [lb, in.lb]



Company:		Page:	2
Address:		Specifier:	
Phone I Fax:	|	E-Mail:	
Design:	2021-09-13 Guardrail Base	Date:	9/13/2021
Fastening point:			

1.1 Design results

Case	Description	Forces [lb] / Moments [in.lb]	Seismic	Max. Util. Anchor [%]
1	Combination 1	N = 0; V_x = -640; V_y = 0; M_x = 0; M_y = 27,000; M_z = 0; N_{sus} = 0; $M_{x,sus}$ = 0; $M_{y,sus}$ = 0;	no	67

Company:		Page:	3
Address:		Specifier:	
Phone I Fax:	|	E-Mail:	
Design:	2021-09-13 Guardrail Base	Date:	9/13/2021
Fastening point:			

2 Proof I Utilization (Governing Cases)

		Design values [lb]		Utilization	
Loading	**Proof**	**Load**	**Capacity**	**β_N / β_V [%]**	**Status**
Tension	Concrete Breakout Failure	3,986	6,015	67 / -	OK
Shear	Concrete edge failure in direction x-	640	2,910	- / 22	OK

Loading	**β_N**	**β_V**	**ζ**	**Utilization $\beta_{N,V}$ [%]**	**Status**
Combined tension and shear loads	0.663	0.220	5/3	59	OK

3 Warnings

- Please consider all details and hints/warnings given in the detailed report!

Fastening meets the design criteria!

Company:		Page:	4
Address:		Specifier:	
Phone I Fax:	|	E-Mail:	
Design:	2021-09-13 Guardrail Base	Date:	9/13/2021
Fastening point:			

4 Remarks; Your Cooperation Duties

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