**DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION**
**FACILITIES DEVELOPMENT DIVISION**

# APPLICATION FOR HCAI PREAPPROVAL OF MANUFACTURER'S CERTIFICATION (OPM)

OFFICE USE ONLY

**APPLICATION #: OPM-0700**

## HCAI Preapproval of Manufacturer's Certification (OPM)

**Type:** [X] New [ ] Renewal/Update

## Manufacturer Information

Manufacturer: Cannon Fabriacation, Inc.

Manufacturer's Technical Representative: Mac McClintock

Mailing Address: 182 Granite St STE 101, Corona, CA 92879

Telephone: (800) 232-2632 Email: mac@canfab.com



## Product Information

Product Name: DB Curbs

Product Type: Seismic Isolated and Non-Isolated Curbs

Product Model Number: DB5200, DB5000

General Description: Seismic Isolated and Non-Isolated Curbs

## Applicant Information

Applicant Company Name: VMC Group

Contact Person: John Giuliano

Mailing Address: Main Street, Bloomingdale, NJ 07403

Telephone: (973) 838-1780 Email: john.giuliano@thevmcgroup.com

Title: VMC Group

## Registered Design Professonal Preparing Engineering Recommendations

Company Name: THE VMC GROUP

Name: Kenneth Tarlow California License Number: S2851

Mailing Address: 980 9th Street, 16th Floor, Sacramento, CA 95814

Telephone: (832) 627-2214 Email: ken.tarlow@thevmcgroup.com

## HCAI Special Seismic Certification Preapproval (OSP)

☐ Special Seismic Certification is preapproved under OSP OSP Number:

## Certification Method

Testing in accordance with: ☒ ICC-ES AC156 ☐ FM 1950-16

☐ Other(s) (Please Specify):

*Use of criteria other than those adopted by the California Building Standards Code, 2022 (CBSC 2022) for component supports and attachments are not permitted. For distribution system, interior partition wall, and suspended ceiling seismic bracings, test criteria other than those adopted in the CBSC 2022 may be used when approved by HCAI prior to testing.

☐ Analysis

☐ Experience Data

☐ Combination of Testing, Analysis, and/or Experience Data (Please Specify):



## HCAI Approval

Date: 11/1/2023

Name: Timothy Piland Title: Senior Structural Engineer

Condition of Approval (if applicable):

VMC GROUP

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# THE VMC GROUP
# OPM-0700-22

## Seismic Isolated and Non-Isolated Curbs



1. General Notes and Seismic Capacity Determination
   a. HCAI Pre-Approval of Manufacturer's Certification (OPM) is based on the 2022 California Building Code (CBC).
   b. The $S_{DS}$ level from an HCAI approved component shake table test is the basis for determining the seismic demands and limiting curb capacities.
   c. Per ASCE 7-16 (ASCE7) Chp 13 equations, lateral and vertical seismic demands are applied at curb vertical supports and are calculated as follows:
      i. Horizontal Force, $F_p$ (§13.3.3.1 Equation 13.3-1)

$$F_p = \frac{0.4 a_p S_{DS} W_p}{\left(\frac{R_p}{I_p}\right)} \left(1 + 2\frac{z}{h}\right)$$


Where per ASCE7 Table 13.6-1 for isolated applications*:
Amplification factor ($a_P$) = 2.5
Component Response Modification factor ($R_P$) = 2.0
Component importance factor ($I_P$) = 1.5
Component operating weight ($W_P$) = Dead load plus operating contents
*non-isolated components vary according to ASCE7 Tables 13.5-1 and 13.6-1

      ii. Vertical Force, $F_v$ (§13.3.1.2)
$F_v = \pm 0.2 S_{DS} D$
      iii. Overstrength factor ($\Omega_0$) is not pertinent to supports (only concrete attachments) and was not included in the demand calculations.
      iv. Utilizing ASCE7 §2.3.6 Basic Combinations with Seismic Load Effects:
LRFD Load Combination 6. $1.2D + E_v + E_h$
LRFD Load Combination 7. $0.9D - E_v + E_h$
Where:
D = Dead Load
$E_v = F_v$
$E_h = F_p$
      v. Component seismic demands applied at the center of gravity (CG), relative to the center of rigidity (CR), using the basic principles of structural mechanics, P/A ± Mc/I in all orthogonal directions are resisted by the curb vertical supports (see 2a.ii) to determine the curb vertical and lateral demands.
Where (if applicable):
$I = I_0 + Ad^2$ (Parallel Axis Theorem for rotation about edge of component)

   d. Curb capacities are limited to the maximum calculated demands from 1c.
   e. It is the responsibility of the Registered Design Professional (RDP) in responsible charge to submit to the Structural Engineer of Record (SEOR) the following:
      i. Project specific curb demands ≤ OPM listed capacities.
      ii. Component attachment to the curb and curb attachment to the structure are in compliance with CBC and corresponding anchor attachments ICC-ES Reports.
      iii. Component assembly installation, e.g., component, curb, and attachments are in compliance with CBC and details within the OPM.
   f. Environmental factors, e.g., wind, snow, rain/floods, etc., are beyond the scope of the OPM.

2. General Curb Design Procedure
   a. The curb selection process is as follows:
      i. Based on the component's weight (lbs) and perimeter length (ft), select a curb that meets the Vertical Static Perimeter Capacity (lbs/ft) from Table in Note 4.
      ii. Lateral and vertical seismic demands are resisted per *curb vertical supports:* Curb Vertical Supports are as follows:
         1. Isolators for isolated curbs
         2. Vertical stanchion supports, for housing isolators for non-isolated curbs.
      iii. Calculate the seismic demands for each isolator/vertical stanchion support within curb per 1c.
      iv. Select an isolated or non-isolated curb whose tested seismic capacities per vertical support >= the maximum calculated lateral and vertical seismic demands using the interaction force equation:
      $(T_U/T_S)^2 + (V_U/V_S)^2 \leq 1.0$
      Where:
      $T_U$ = Maximum Tension Demand
      $T_S$ = Tested Tension Capacity
      $V_U$ = Maximum Shear Demand
      $V_S$ = Tested Shear Capacity
   b. The total lateral and vertical curb capacity is the summation of the total number of vertical supports, with each individual vertical support capacity >= demand.

3. Anchorage and Attachment Requirements
   a. It is the responsibility of the Registered Design Professional (RDP) in responsible charge to submit to the Structural Engineer of Record (SEOR) the following:
      i. Equipment attachment to the curb.
      ii. Anchorage of the curb to building structure.

4. Tested Curb, Bracing Requirements, and Lateral and Vertical Capacities

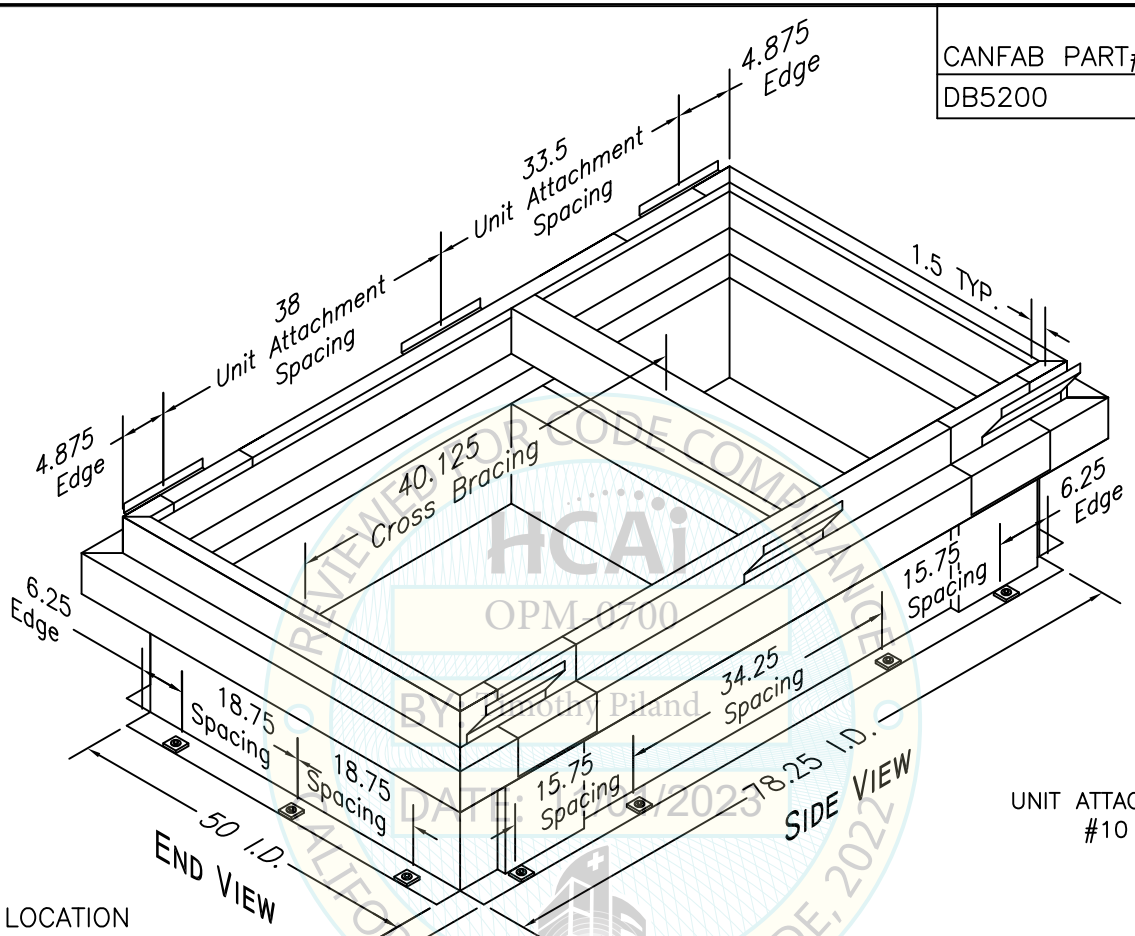
| ***Isolated Curb Properties and Seismic and Vertical Static Perimeter Capacities (lbs, inches, lbs/ft)*** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Model No. | Height | Isolator Support Spacing | | Maximum Cross Brace Spacing Longitudinal | Vertical Static Perimeter Capacity | LRFD Seismic Capacity per Isolator | | |
| | | Long | Trans | | | Shear | Tension | Comp |
| DB5200 | 28 | 48 | N/A | 40.1 | 50.5 plf | 1520 lbs | 2225 lbs | 2795 lbs |

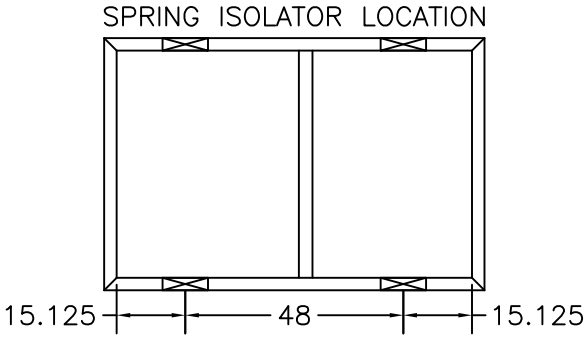
| ***Non-Isolated Curb Properties and Seismic and Vertical Static Perimeter Capacities (lbs, inches, lbs/ft)*** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Model No. | Height | Anchor Bolt Spacing | | Maximum Cross Brace Spacing Longitudinal | Vertical Static Perimeter Capacity | LRFD Seismic Curb Capacity | | |
| | | Long | Trans | | | Shear (1) | Tension (2) | Comp (2) |
| DB5000 | 14 | See Drawings | | 40.1 | 50.5 plf | 2025 lbs | 445 lbs | 825 lbs |

1) Curb lateral shear capacity in each orthogonal direction.

2) Curb uplift tension/compression capacity per attachment clip.

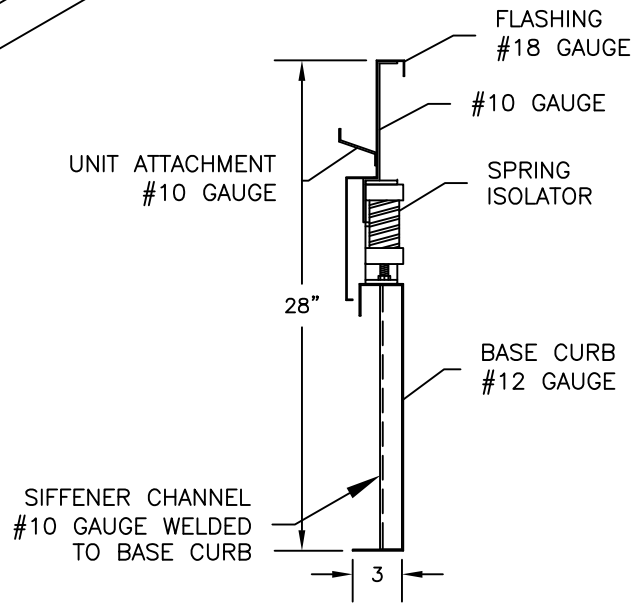
| CANFAB PART# | BASE CURB HEIGHT | APPROXIMATE SHIPPING WEIGHT |
|---|---|---|
| DB5200 | 14" | 530 |
| | | REV. 1 |




Attachment to Structure
14 – ½" Bolts
W/ 2x2x⅜" Plate Washer

(All Dimensions =/– ¼")




REGISTERED PROFESSIONAL ENGINEER KENNETH TARLOW S 2851 EXP 6/30/24 STRUCTURAL STATE OF CALIFORNIA



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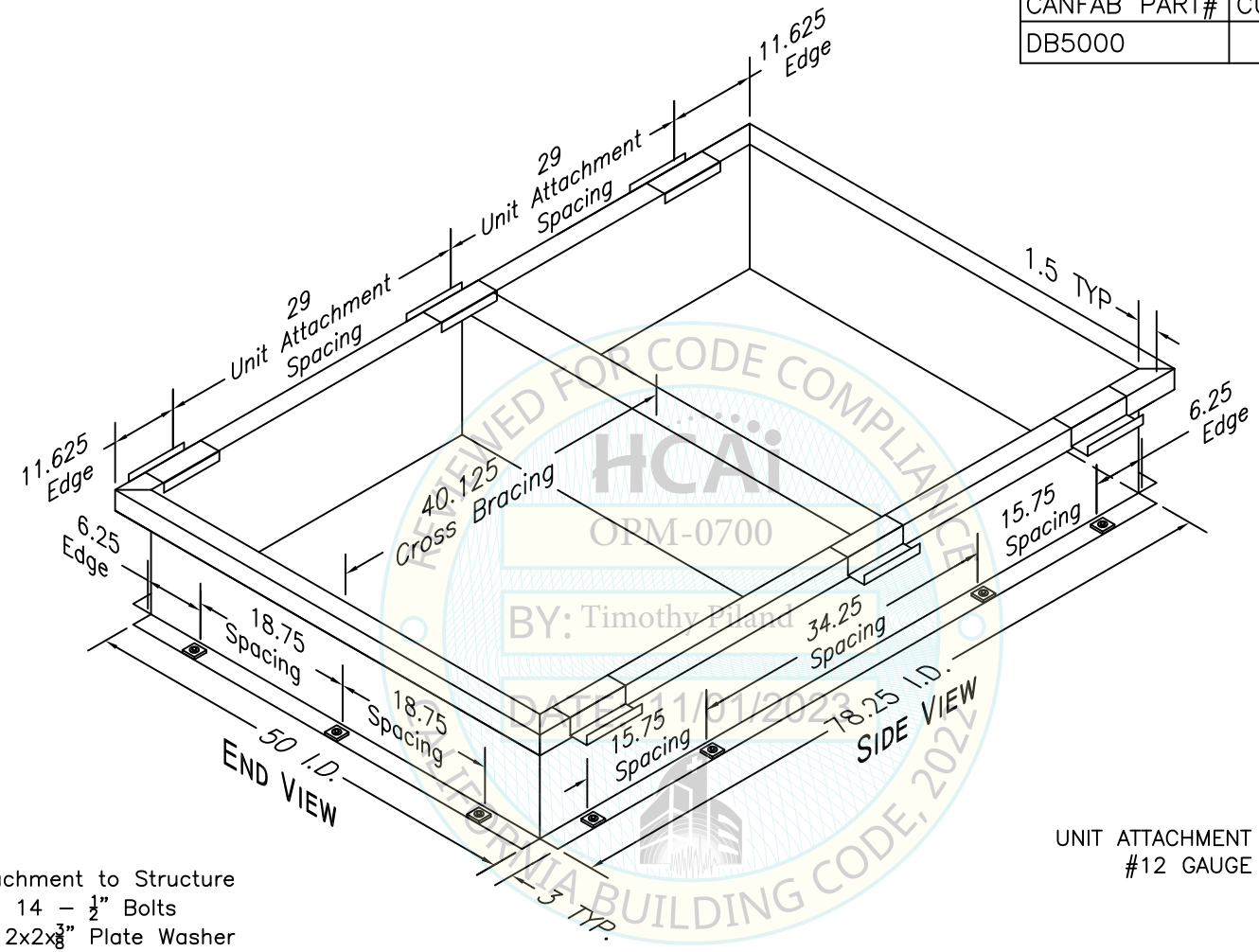
| | |
|---|---|
| FOR: | |
| PART NO: DB5200 – ISOLATED CURB | PROJECT: |
| ENGINEER: | DISTRIBUTOR: |
| DRAWING NO: | DATE: 08.15.2023 |
| APPROVED BY: | DATE: / / |

| CANFAB PART# | BASE CURB HEIGHT | APPROXIMATE SHIPPING WEIGHT |
|---|---|---|
| DB5000 | 14" | 160 |
| | | REV. 1 |

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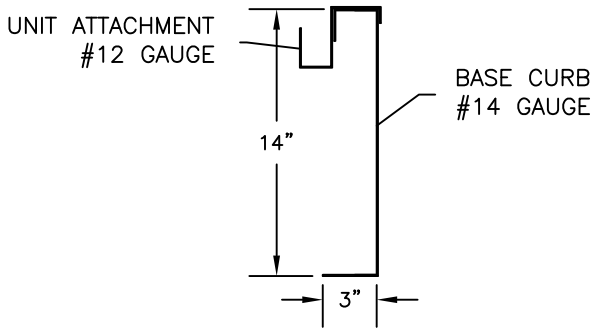




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| | |
|---|---|
| FOR: | |
| PART NO: DB5000 – NON–ISOLATED | PROJECT: |
| ENGINEER: | DISTRIBUTOR: |
| DRAWING NO: | DATE: 08.15.2023 |
| APPROVED BY: | DATE: / / |