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

OFFICE USE ONLY

APPLICATION #: OPM-0680

HCAI Preapproval of Manufacturer's Certification (OPM)

Type: [X] New [ ] Renewal/Update

Manufacturer Information

Manufacturer: VMC Group

Manufacturer's Technical Representative: John Giuliano

Mailing Address: 113 Main Street, Bloomingdale, NJ 07403

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

Product Information

Product Name: VMA Spring Isolated and Non-Isolated Curbs

Product Type: Equipment Curbs

Product Model Number: See Attachments

General Description: Seismic Rated Spring Isolated and Non-Isolated Equipment Curbs

Applicant Information

Applicant Company Name: VMC Group

Contact Person: John Giuliano

Mailing Address: 113 Main Street, Bloomingdale, NJ 07403

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

Title: President

Registered Design Professonal Preparing Engineering Recommendations

Company Name: THE VMC GROUP

Name: Nathaniel Deibler California License Number: C86676

Mailing Address: 113 Main Street, Bloomingdale, NJ 07403

Telephone: (973) 838-1780 Email: nate.deibler@thevmcgroup.com

HCAI Special Seismic Certification Preapproval (OSP)

[X] Special Seismic Certification is preapproved under OSP OSP Number: OSP-0535, OSP-0725

Certification Method

Testing in accordance with: [X] 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

[X] Combination of Testing, Analysis, and/or Experience Data (Please Specify): Testing and Analysis

HCAI Approval

Date: 6/26/2023

Name: Timothy Piland Title: Senior Structural Engineer

Condition of Approval (if applicable):

VMC GROUP

THE POWER OF TOGETHER™

THE VMC GROUP
OPM-0680-022

Seismic Rated Isolated and Non-Isolated Curbs

LICENSED PROFESSIONAL ENGINEER
NATHANIEL M. DEIBLER
C 86676
Exp. 3/25
CIVIL
STATE OF CALIFORNIA

Nathaniel Deibler, PE
2023.06.26 09:42:48-07'00'

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 (Ω_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.

LICENSED PROFESSIONAL ENGINEER NATHANIEL M. DEIBLER III C 86676 Exp. 3/25 CIVIL STATE OF CALIFORNIA

Nathaniel Deibler, PE
2023.06.26 09:42:52-07'00'

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

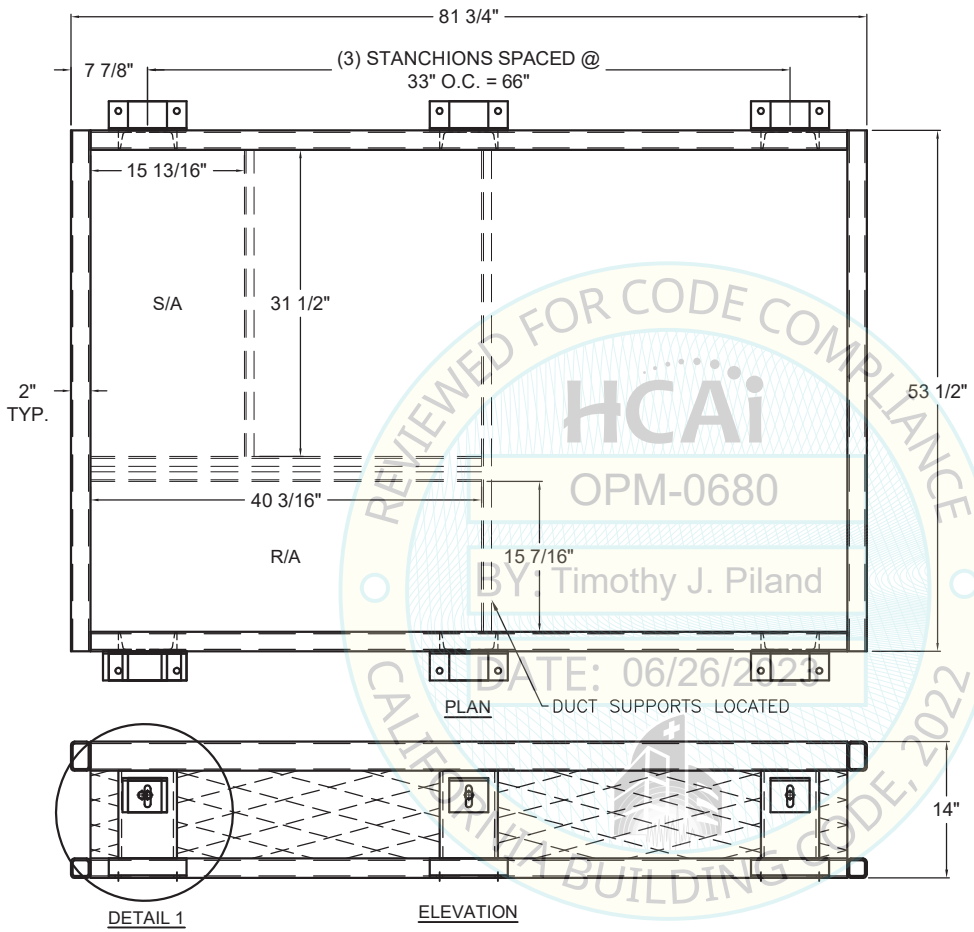
Curb Properties, Cross Bracing Spacing*, and Seismic and Vertical Static Perimeter Capacities (lbs, inches, lbs/ft)

Model No.	Height	Vertical Support Spacing		Max Cross Brace Spacing Longitudinal	Vertical Static Perimeter Capacity	LRFD Seismic Capacity per Vertical Support		
		Long	Trans			Shear	Tension	Comp
P6000 Curb	14	33	0	41 Upper, 54 Lower	55 lbs/ft	950 lbs	1090 lbs	1535 lbs
P6000S Curb	14	42	0	42 Upper, 84 Lower	260 lbs/ft	4775 lbs	6515 lbs	8925 lbs
P6000S Ext Ht	36	30	30	In-Plane Corner Diagonals EWEF	235 lbs/ft	2185 lbs	3285 lbs	4340 lbs
P6200 Curb	20	38	42	47 Upper	115 lbs/ft	2220 lbs	2735 lbs	3650 lbs
P6300 Curb	22	43	67	43 Upper, 86 Lower	280 lbs/ft	4310 lbs	3850 lbs	6720 lbs

*Condenser Rail X-Bracing required with Condenser Rails - See VMA-49202-02 Rev B Dwg

REV.	DESCRIPTION	DATE	BY
A	INITIAL RELEASE	09/01/17	RJG

CURB DATA
TOTAL CURB WEIGHT: 200 LBS.
QUANTITY: 1 SHIPPED IN 1 SECTION(S)
LOWER RAIL O.A. DIMENSIONS: 81 3/4"X53 1/2"
CURB HT: 14" CURB LINEAL FOOTAGE: 22 1/2'



OPTIONS

YES	NO	
☒	☐	SEISMIC/WIND CONSIDERATION
☐	☒	SOUND BARRIER PKG.
☐	☒	CONDENSING UNIT RAIL PER DWG. _____
☒	☐	DUCT SUPPORT PKG.

OTHER MATERIALS, COMPOUNDS, OR FINISHES WITH EQUAL OR SUPERIOR PROPERTIES MAY BE SUBSTITUTED AS THEY BECOME AVAILABLE.

LICENSED PROFESSIONAL ENGINEER
NATHANIEL M. DEIBLER
No. C 86676
Exp. 3/25
CIVIL
STATE OF CALIFORNIA

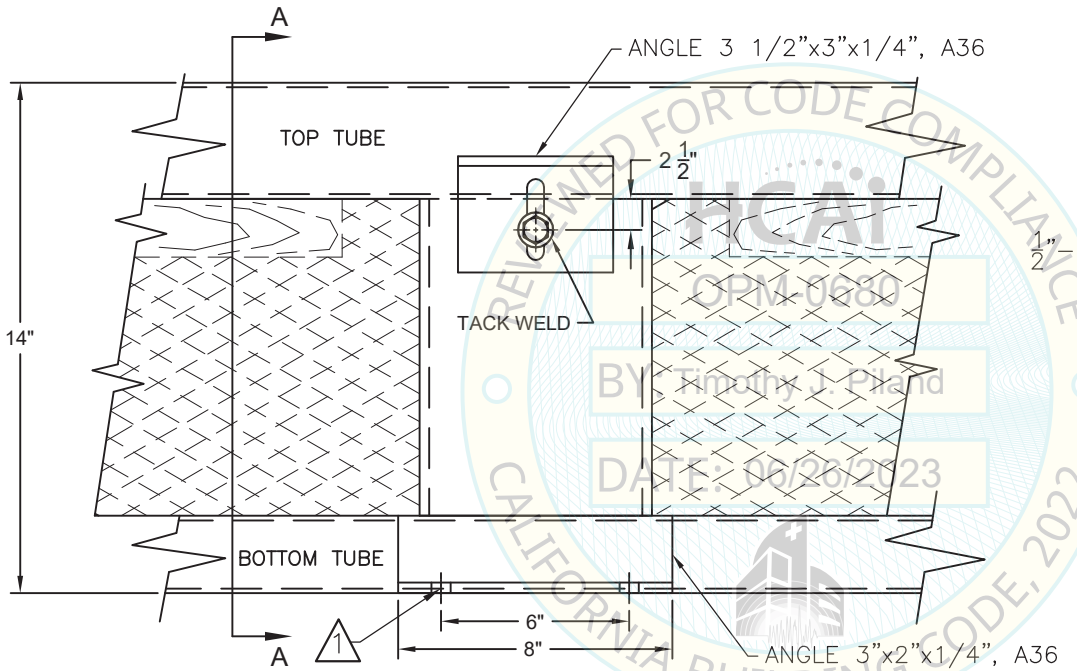
Nathaniel Deibler, PE
2023.06.26 09:43:03-07'00'

P-6000 NON-ISOLATED SEISMIC/WIND RESTRAINT ROOF CURB

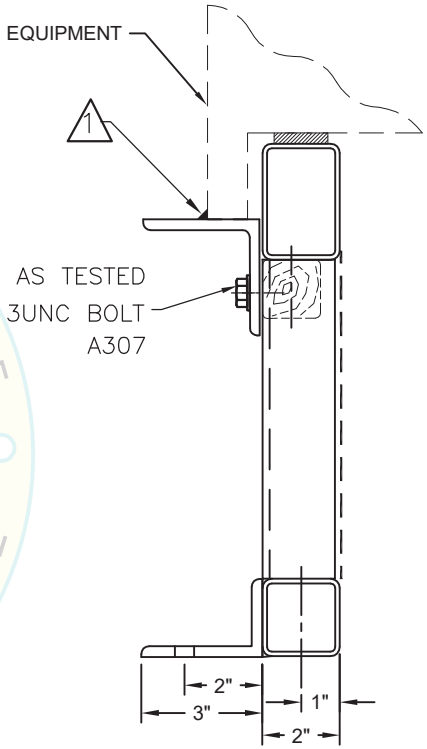
THE VMC GROUP
The Power of Together
Bloomingdale, NJ 07403
Houston, TX 77041

SCALE: NONE
SHEET: 1 OF 1
Member VISCMA
DRAWING NO.: VMA-51410C
REVISION: A

REV.	DESCRIPTION	DATE	BY
A	INITIAL RELEASE	09/01/17	RJG



DETAIL 1



SECTION A

1 RDP RESPONSIBLE FOR AHU TO ANGLE WELDMENT AND CURB TO STRUCTURE ATTACHMENT

OTHER MATERIALS, COMPOUNDS, OR FINISHES WITH EQUAL OR SUPERIOR PROPERTIES MAY BE SUBSTITUTED AS THEY BECOME AVAILABLE.

LICENSED PROFESSIONAL ENGINEER — NATHANIEL M. DEIBLER — EXP. 3/31 — CIVIL — STATE OF CALIFORNIA

Nathaniel Deibler, PE
2023.06.26
09:43:09-07'00'

P-6000 NON-ISOLATED SEISMIC/WIND RESTRAINT ROOF CURB DETAILS AND SECTIONS

THE VMC GROUP
The Power of Together
Bloomingdale, NJ 07403
Houston, TX 77041

SCALE: NONE

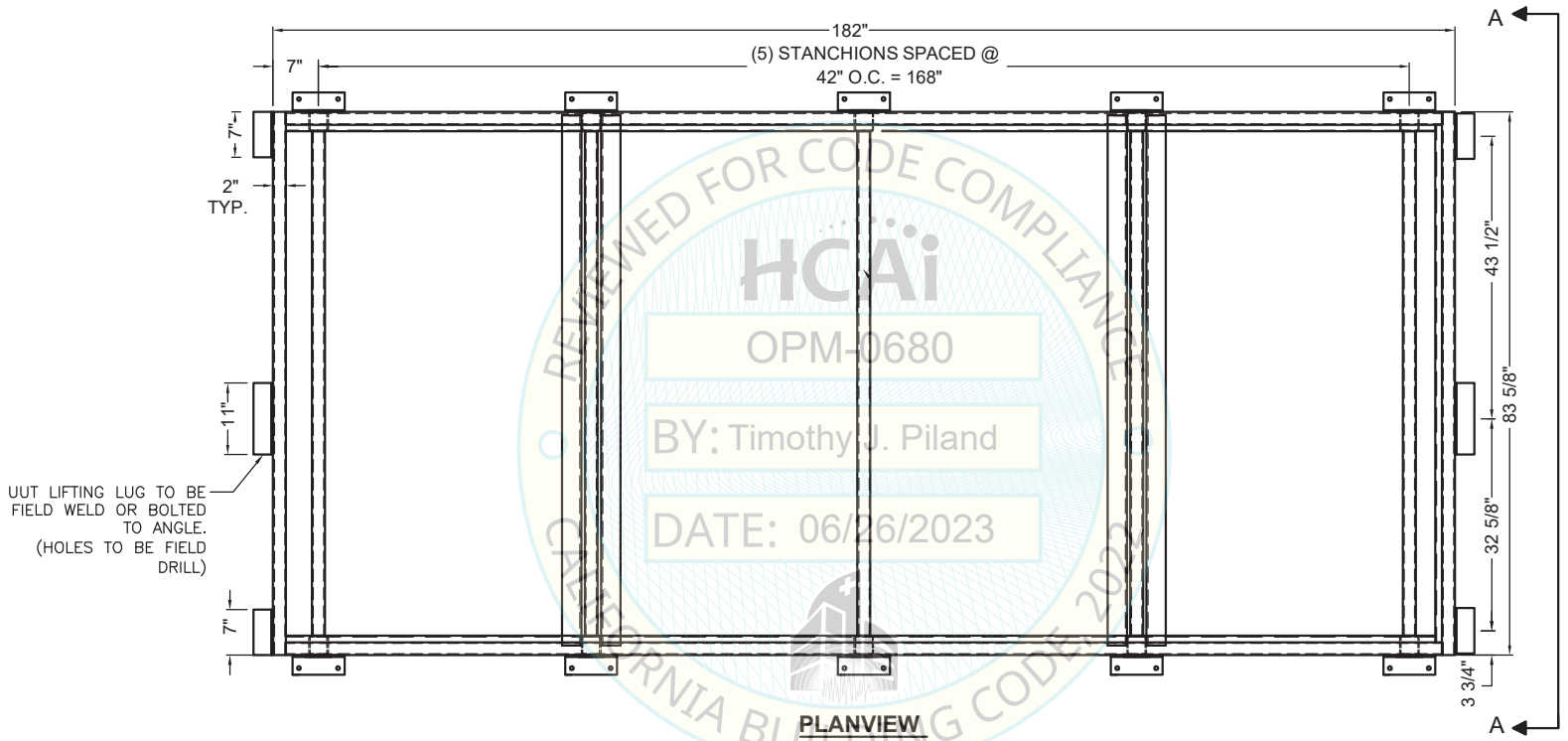
SHEET: 1 OF 1

Member VISCMA

DRAWING NO.: VMA-51410E

REVISION: A

REV.	DESCRIPTION	DATE	BY
A	INITIAL RELEASE	3/31/20	KP



PLANVIEW

OTHER MATERIALS, COMPOUNDS, OR FINISHES WITH EQUAL OR SUPERIOR PROPERTIES MAY BE SUBSTITUTED AS THEY BECOME AVAILABLE.

LICENSED PROFESSIONAL ENGINEER
NATHANIEL M. DEIBLER
C 86076
Exp. 3/25
CIVIL
STATE OF CALIFORNIA

Nathaniel Deibler, PE
2023.06.26 09:43:16-07'00'

P-6000S NON-ISOLATED SEISMIC/WIND RESTRAINT ROOF CURB

THE VMC GROUP
The Power of Together
Bloomingdale, NJ 07403
Houston, TX 77041

SCALE: NONE

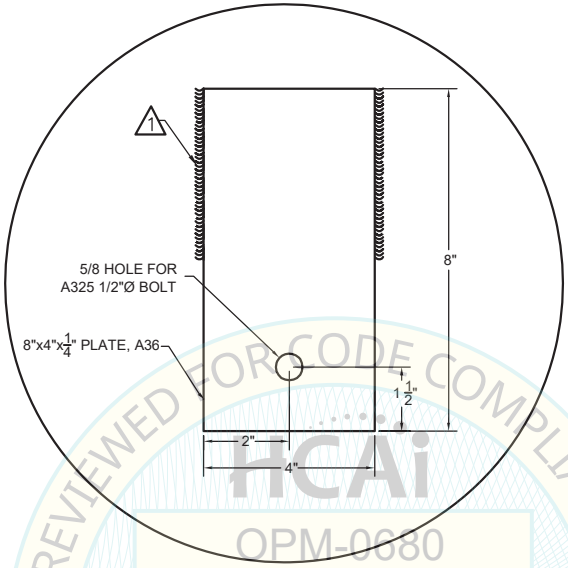
SHEET: 1 OF 3

Member VISCMA

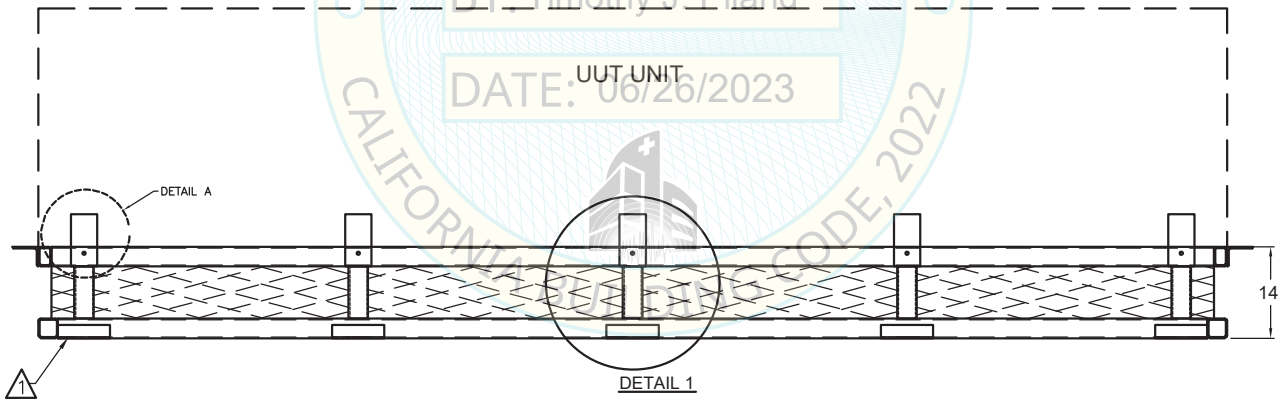
DRAWING NO.: VMA-48642A

REVISION: A

REV.	DESCRIPTION	DATE	BY
A	INITIAL RELEASE	3/31/20	KP



DETAIL-A
(10 REQ'D)



ELEVATION VIEW

1 RDP RESPONSIBLE FOR AHU TO CURB WELDMENT AND CURB TO STRUCTURE ATTACHMENT

OTHER MATERIALS, COMPOUNDS, OR FINISHES WITH EQUAL OR SUPERIOR PROPERTIES MAY BE SUBSTITUTED AS THEY BECOME AVAILABLE.

LICENSED PROFESSIONAL ENGINEER — NATHANIEL M. DEIBLER — EXP. 6-30-24 — CIVIL — STATE OF CALIFORNIA

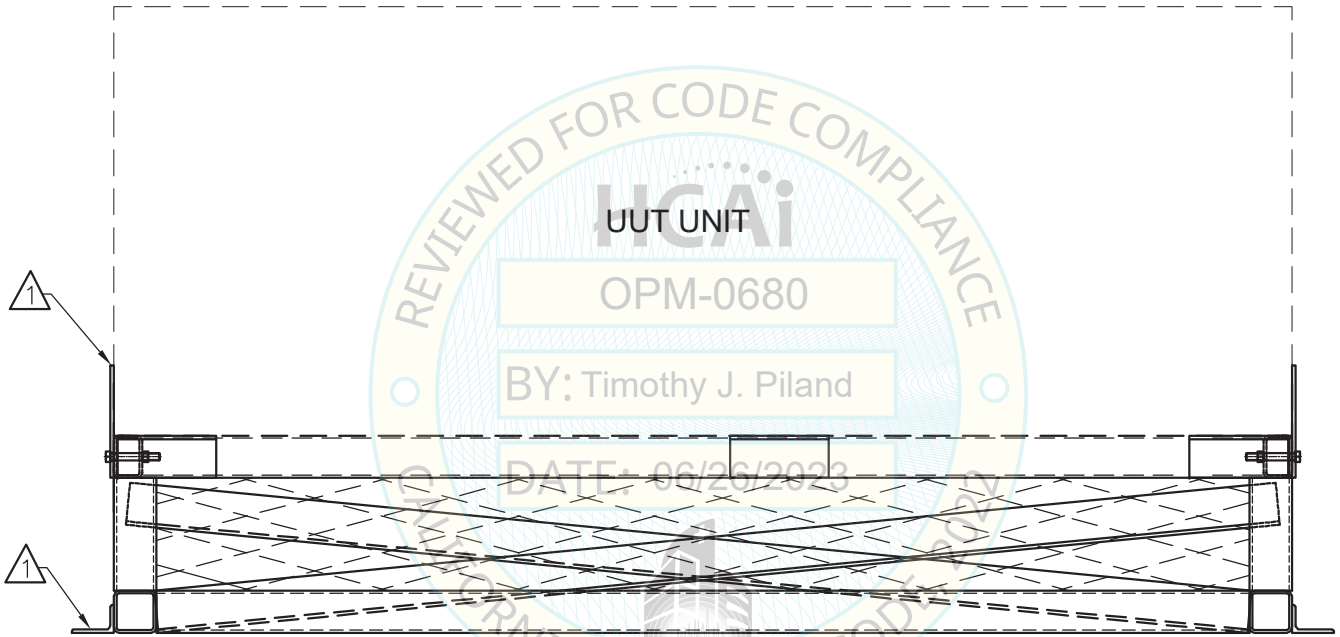
Nathaniel Deibler, PE
2023.06.26
09:43:21-07'00'

P-6000S NON-ISOLATED SEISMIC/WIND RESTRAINT ROOF CURB

THE VMC GROUP
The Power of Together
Bloomingdale, NJ 07403
Houston, TX 77041

SCALE: NONE
SHEET: 2 OF 3
Member VISCMA
DRAWING NO.: VMA-48642A
REVISION: A

REV.	DESCRIPTION	DATE	BY
A	INITIAL RELEASE	3/31/20	KP



VIEW A-A

1 RDP RESPONSIBLE FOR AHU TO CURB WELDMENT AND CURB TO STRUCTURE ATTACHMENT

OTHER MATERIALS, COMPOUNDS, OR FINISHES WITH EQUAL OR SUPERIOR PROPERTIES MAY BE SUBSTITUTED AS THEY BECOME AVAILABLE.

LICENSED PROFESSIONAL ENGINEER — NATHANIEL M. DEIBLER — C 88626 — CIVIL — STATE OF CALIFORNIA

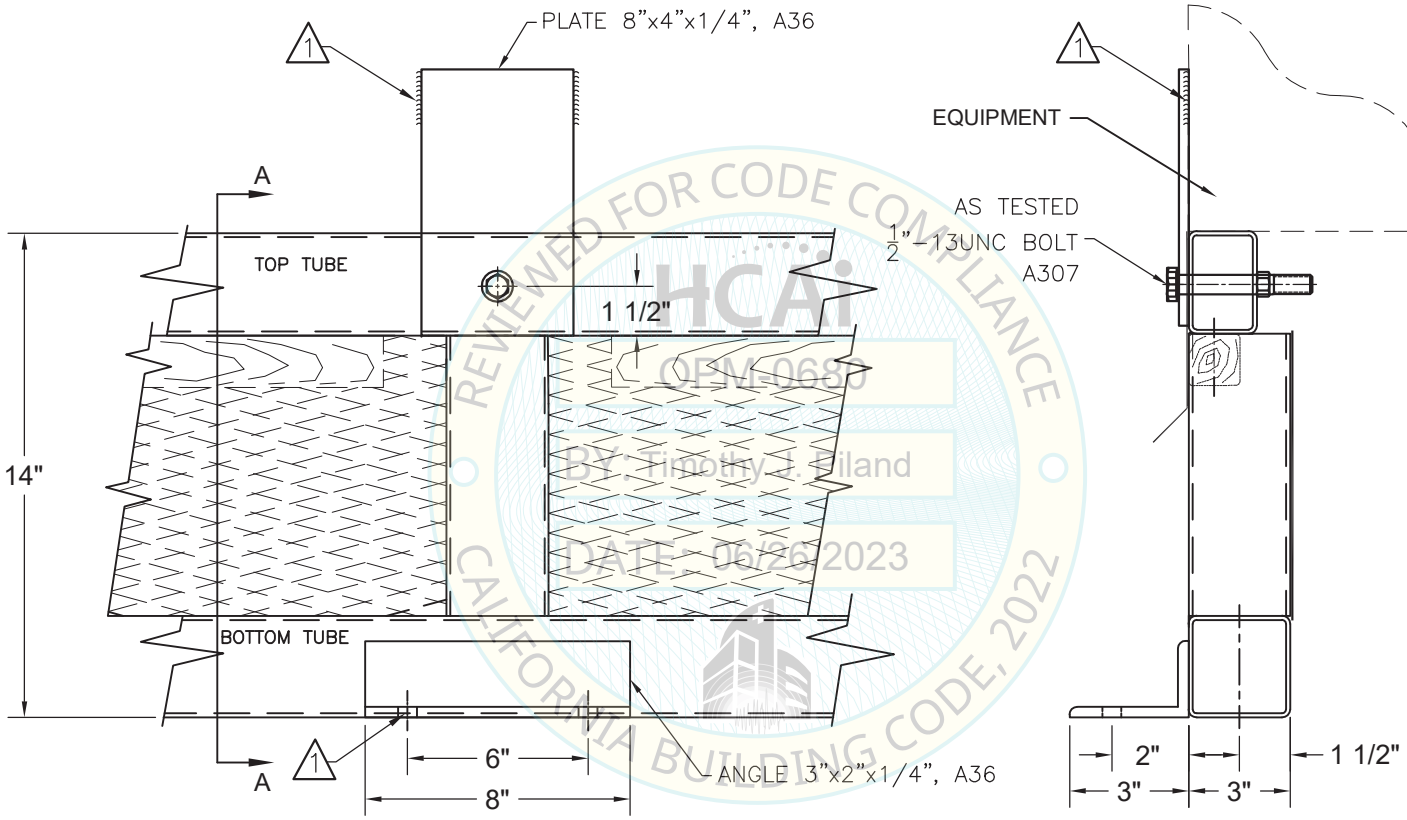
Nathaniel Deibler, PE
2023.06.26
09:43:26-07'00'

P-6000S NON-ISOLATED
SEISMIC/WIND RESTRAINT
ROOF CURB

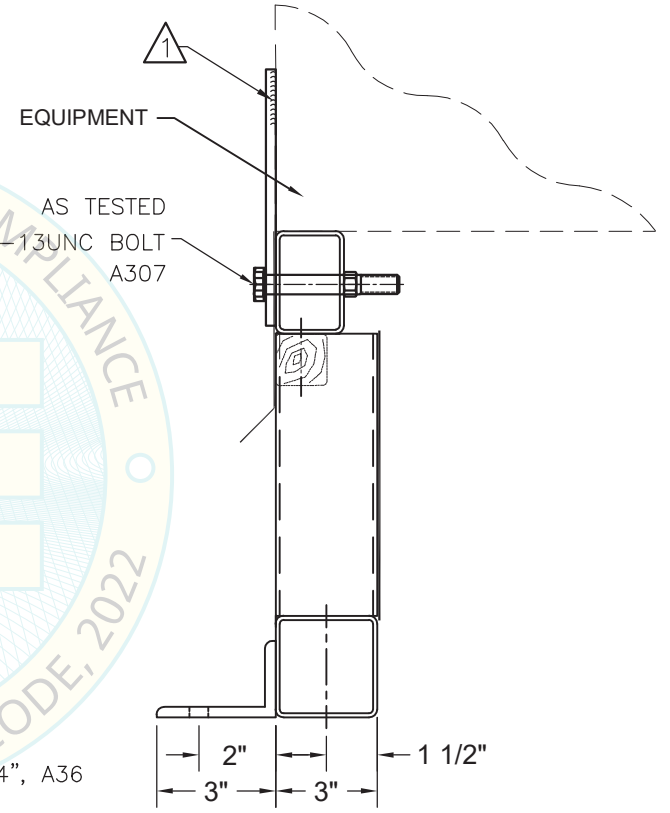
THE VMC GROUP
The Power of Together
Bloomingdale, NJ 07403
Houston, TX 77041

SCALE: NONE
SHEET: 3 OF 3
Member VISCMA
DRAWING NO.: VMA-48642A
REVISION: A

REV.	DESCRIPTION	DATE	BY
A	INITIAL RELEASE	3/31/20	KP



DETAIL 1



SECTION A

1 RDP RESPONSIBLE FOR AHU TO CURB WELDMENT AND CURB TO STRUCTURE ATTACHMENT

OTHER MATERIALS, COMPOUNDS, OR FINISHES WITH EQUAL OR SUPERIOR PROPERTIES MAY BE SUBSTITUTED AS THEY BECOME AVAILABLE.

LICENSED PROFESSIONAL ENGINEER — NATHANIEL M. DEIBEL — C 88676 — EXP. 3/20 — CIVIL — STATE OF CALIFORNIA

Nathaniel Deibel, PE
2023.06.26
09:43:32-07'00'

P-6000S NON-ISOLATED SEISMIC/WIND RESTRAINT ROOF CURB DETAILS AND SECTIONS

THE VMC GROUP
The Power of Together
Bloomingdale, NJ 07403
Houston, TX 77041

SCALE: NONE

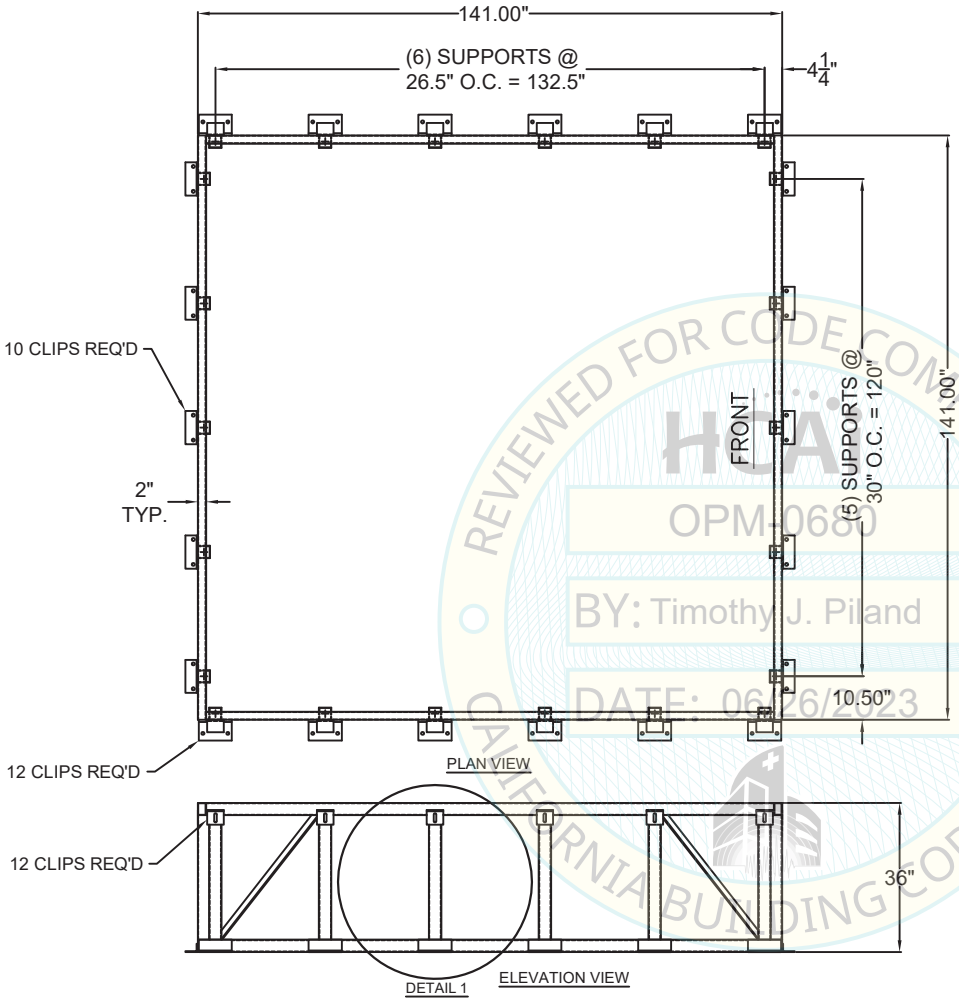
SHEET: 1 OF 1

Member VISCMA

DRAWING NO.: VMA-48642B

REVISION: A

REV.	DESCRIPTION	DATE	BY
A	INITIAL RELEASE	10/13/11	MC
B	REVISED LOWER ATTACHMENT ANGLE	10/17/11	MC



CURB DATA

TOTAL CURB WEIGHT: 560#
QUANTITY: 1 SHIPPED IN 2 SECTION(S)
LOWER RAIL O.A. DIMENSIONS: 141" x 141"
CURB HT: 36" COND. RAIL HT: –
CURB LINEAL FOOTAGE: 46.5'

OPTIONS

YES	NO	
☒	☐	SEISMIC/WIND CONSIDERATION
☐	☒	SOUND BARRIER PKG.
☐	☒	CONDENSING UNIT RAIL PER DWG. _____
☐	☒	DUCT SUPPORT PKG.

LICENSED PROFESSIONAL ENGINEER
NATHANIEL M. DEIBLER
C 88676
CIVIL
STATE OF CALIFORNIA

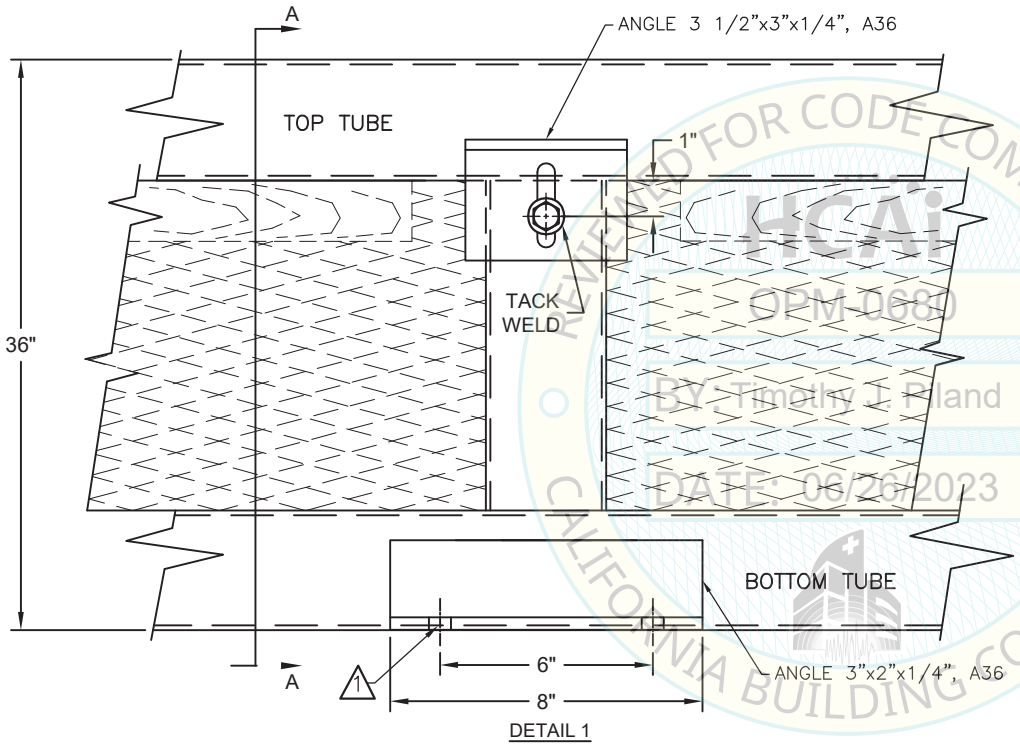
Nathaniel Deibler, PE
2023.06.28
09:43:38-07'00'

P-6000S EXT. HT. NON-ISOLATED SEISMIC/WIND RESTRAINT ROOF CURB

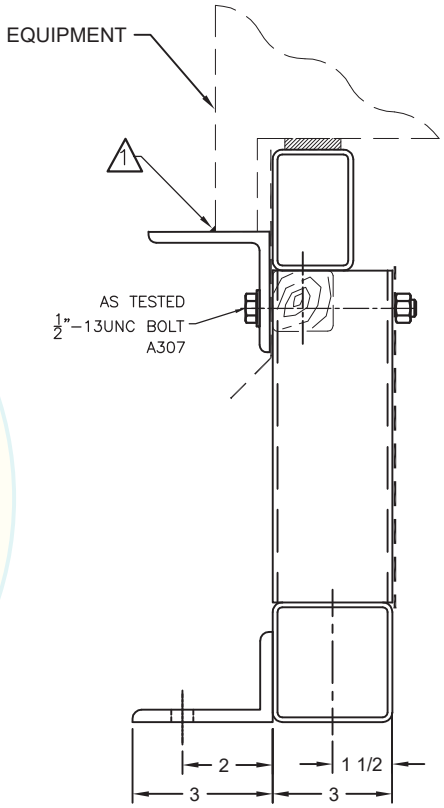
THE VMC GROUP
The Power of Together
Bloomingdale, NJ 07403
Houston, TX 77041

SCALE: NONE
SHEET: 2 OF 5
Member VISCMA
DRAWING NO.: VMA-46483
REVISION: B

REV.	DESCRIPTION	DATE	BY
A	INITIAL RELEASE	10/13/11	MC



DETAIL 1



SECTION A

1 RDP RESPONSIBLE FOR AHU TO ANGLE WELDMENT AND CURB TO STRUCTURE ATTACHMENT

OTHER MATERIALS, COMPOUNDS, OR FINISHES WITH EQUAL OR SUPERIOR PROPERTIES MAY BE SUBSTITUTED AS THEY BECOME AVAILABLE.

LICENSED PROFESSIONAL ENGINEER NATHANIEL M. DEIBLER 23806 EXP. 12/31/24 CIVIL STATE OF CALIFORNIA

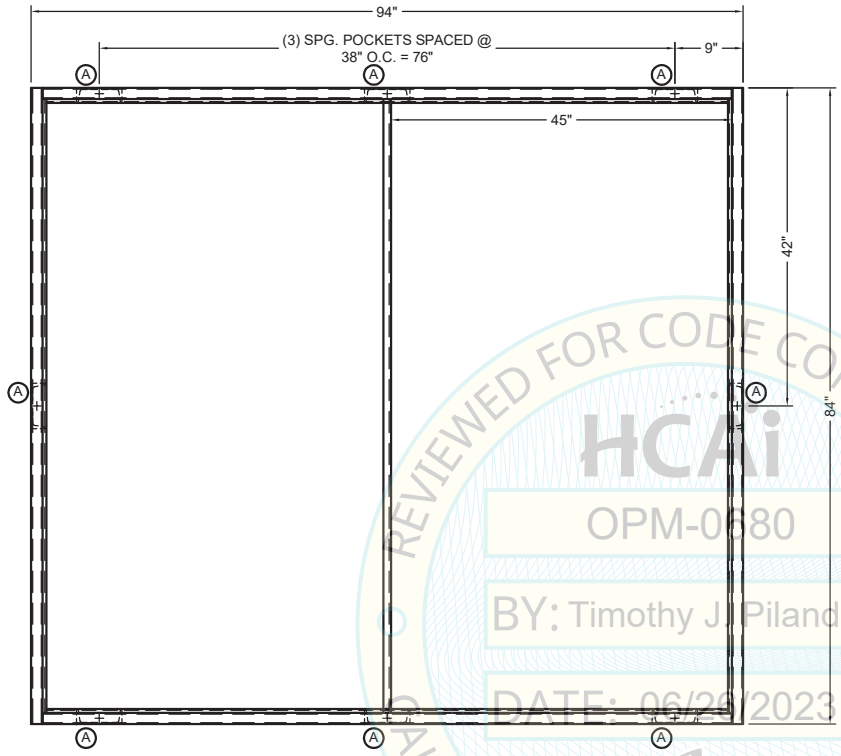
Nathaniel Deibler, PE
2023.06.26
09:43:43-07'00'

P-6000S EXT. HT. NON-ISOLATED SEISMIC/WIND RESTRAINT ROOF CURB DETAILS AND SECTIONS

VMC GROUP
THE POWER OF TOGETHER
Bloomingdale, NJ 07403
Houston, TX 77041

SCALE: NONE
SHEET: 1 OF 1
Member VISCMA
DRAWING NO.: VMA-46483B
REVISION: A

REV.	DESCRIPTION	DATE	BY
A	INITIAL RELEASE	03/23/10	RJG



CURB DATA

TOTAL CURB WEIGHT: 415 LBS.
QUANTITY: 1
SHIPPED IN 1 SECTION(S)
LOWER RAIL O.A. DIMENSIONS: 94"x84"
CURB HEIGHT: 20"
CURB LINEAL FOOTAGE: 29 3/4'

SPRING POCKET LOCATION	SPRING IDENT. NO.	MAX. STATIC SPRING LOAD PER POCKET	MAX. DEFL. (IN.)
A	T2Q-340	680#	2.0

OPTIONS

YES	NO	
☒	☐	SEISMIC/WIND CONSIDERATION
☐	☒	SOUND BARRIER PKG.
☐	☒	CONDENSING UNIT RAIL PER DWG. NO. _____
☐	☒	DUCT SUPPORT PKG.

OTHER MATERIALS, COMPOUNDS, OR FINISHES WITH EQUAL OR SUPERIOR PROPERTIES MAY BE SUBSTITUTED AS THEY BECOME AVAILABLE.

LICENSED PROFESSIONAL ENGINEER
NATHANIEL M. DEIBLER
C 88676
EXP. 6-30-25
CIVIL
STATE OF CALIFORNIA

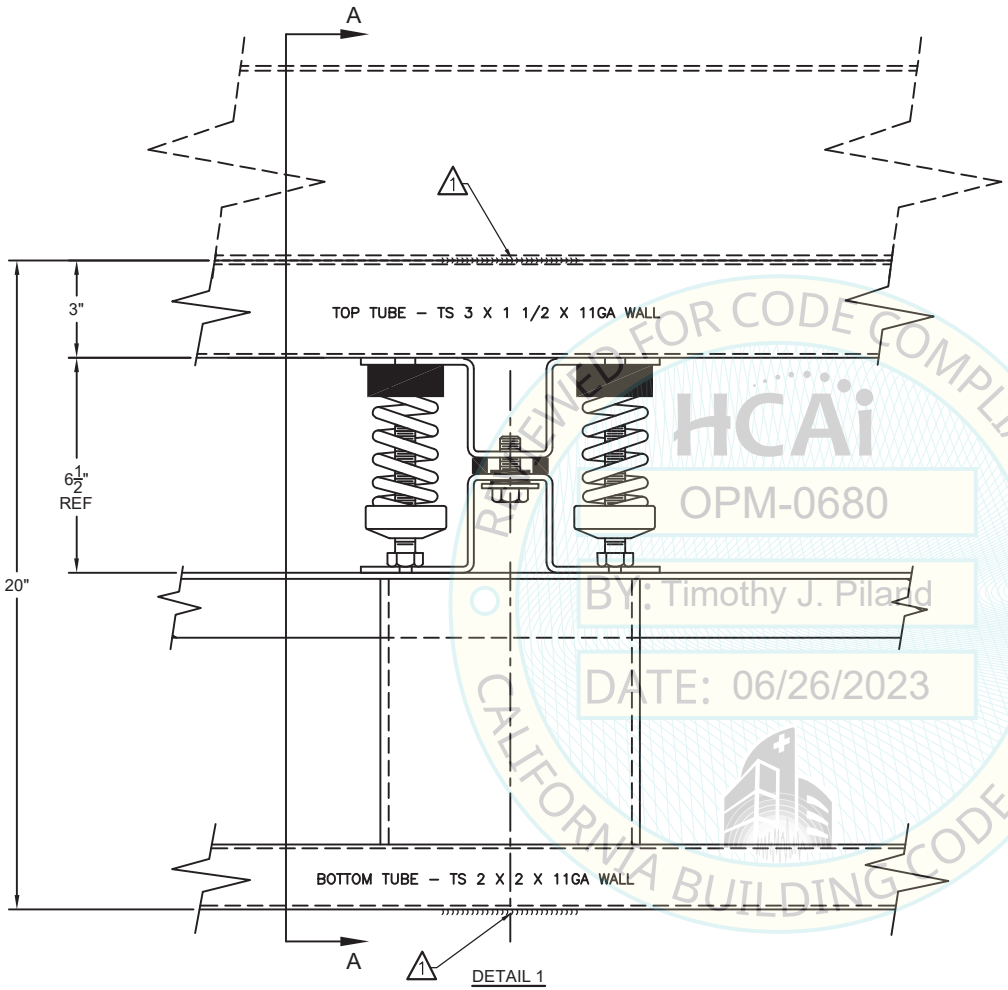
Nathaniel Deibler, PE
2023.06.26
09:43:47-07'00'

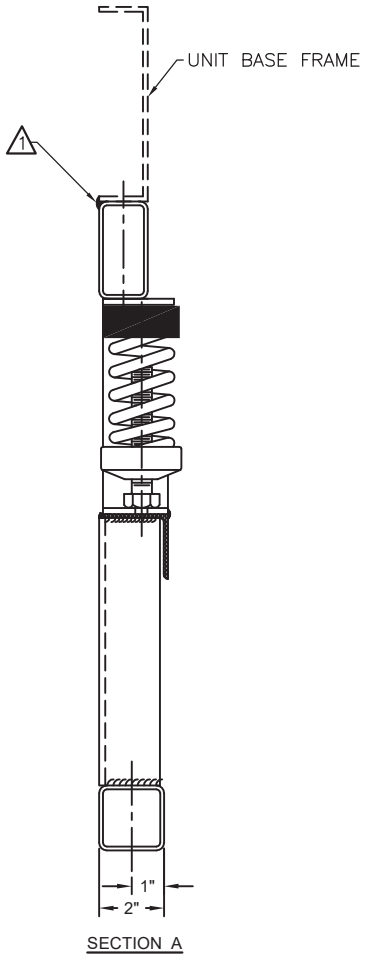
P-6200 ISOLATED SEISMIC/WIND RESTRAINT ROOF CURB

THE VMC GROUP
The Power of Together
Bloomingdale, NJ 07403
Houston, TX 77041

SCALE: NONE
SHEET: 1 OF 1
Member VISCMA
DRAWING NO.: VMA-45860A
REVISION: A

REV.	DESCRIPTION	DATE	BY
A	INITIAL RELEASE	03/23/10	RJG





1 RDP RESPONSIBLE FOR AHU TO CURB WELDMENT AND CURB TO STRUCTURE ATTACHMENT

OTHER MATERIALS, COMPOUNDS, OR FINISHES WITH EQUAL OR SUPERIOR PROPERTIES MAY BE SUBSTITUTED AS THEY BECOME AVAILABLE.

LICENSED PROFESSIONAL ENGINEER — NATHANIEL M. DEIBLER — 38626 — Exp. 6/30 — CIVIL — STATE OF CALIFORNIA

Nathaniel Deibler, PE
2023.06.26
09:45:11 07'00'

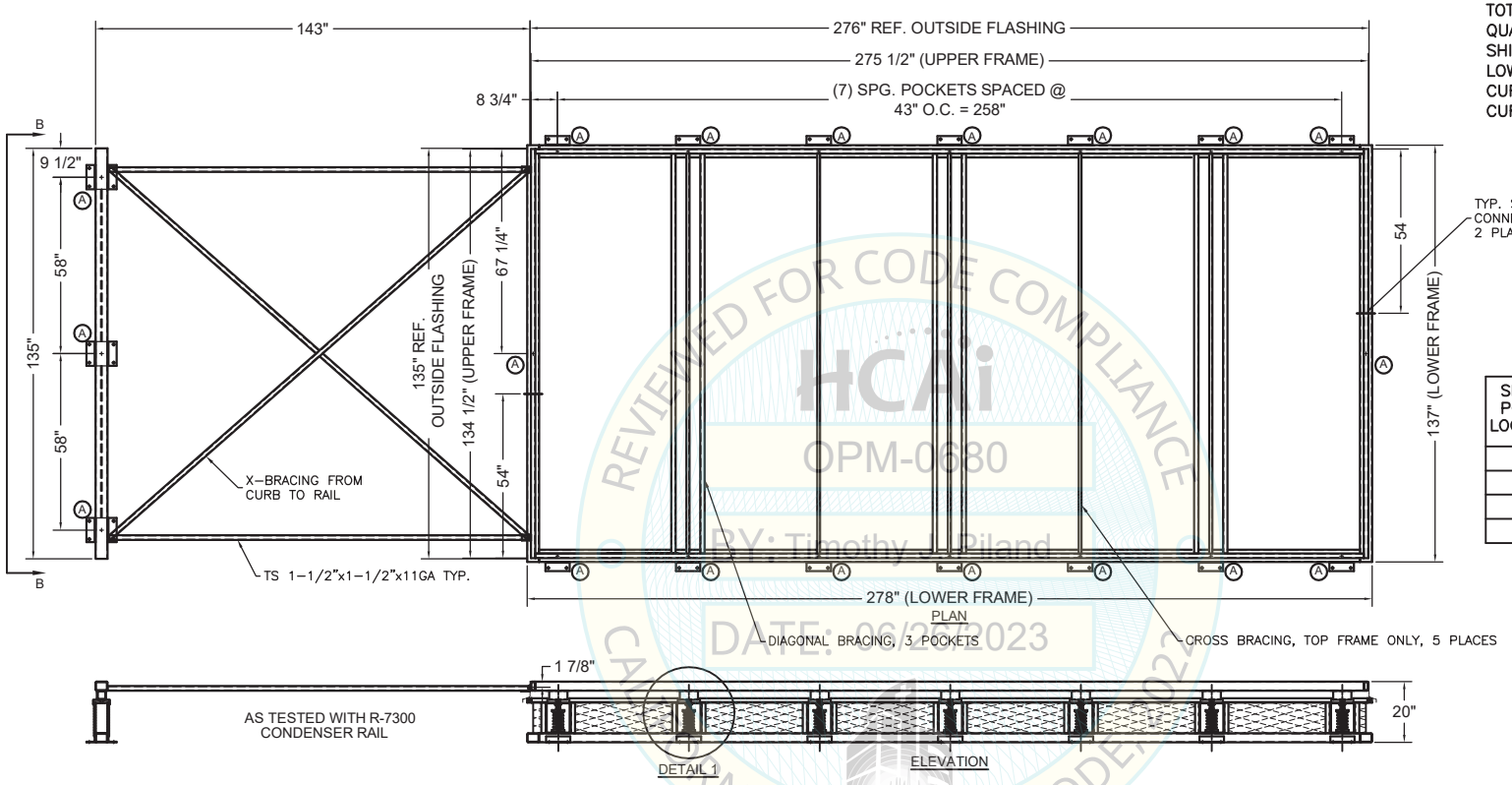
P-6100 / P-6200 ISOLATED SEISMIC/WIND RESTRAINT ROOF CURB DETAILS AND SECTIONS

THE VMC GROUP
The Power of Together
Bloomingdale, NJ 07403
Houston, TX 77041

SCALE: NONE
SHEET: 1 OF 1
DRAWING NO.: VMA-45860B
REVISION: A

Member VISCMA

REV.	DESCRIPTION	DATE	BY
A	INITIAL RELEASE	02/25/14	RJG
B	CHANGED CURB HEIGHT	04/28/14	RJG



CURB DATA

TOTAL CURB WEIGHT: 1275 LBS.
QUANTITY: 1
SHIPPED IN 2 SECTION(S)
LOWER RAIL O.A. DIMENSIONS: 278"X137"
CURB HEIGHT: 20" RAIL HEIGHT: 20"
CURB LINEAL FOOTAGE: 79 3/4'

SPRING POCKET LOCATION	SPRING IDENT. NO.	MAX. STATIC SPRING LOAD PER POCKET	MAX. DEFL. (IN.)
A	T3Q–1500N	1500#	3.0

OPTIONS

YES	NO	
☒	☐	SEISMIC CONSIDERATION
☐	☒	CONDENSING UNIT RAIL PER DWG. NO. _____
☐	☒	SOUND BARRIER PKG.
☒	☐	DUCT SUPPORT PACKAGE

Nathaniel Deibler PE
2023.06.26
09:43:57-07'00'

LICENSED PROFESSIONAL ENGINEER
NATHANIEL M. DEIBLER
No. 23686
Exp. 3/25
CIVIL
STATE OF CALIFORNIA

CERTIFIED FOR:

JOB NAME: YPAL AHU TESTING
CUSTOMER : JCI
CUSTOMER P.O.:
SALES ORDER:

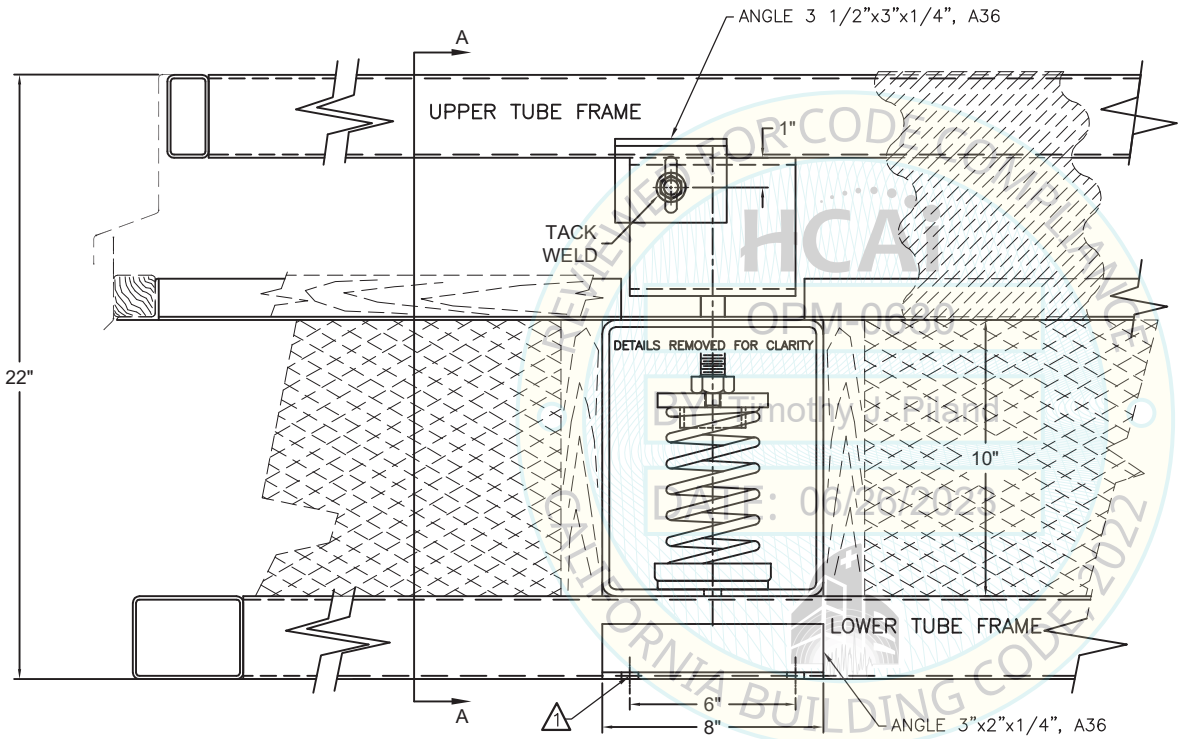
P-6300 ISOLATED SEISMIC/WIND RESTRAINT ROOF CURB

THE VMC GROUP
The Power of Together
Bloomingdale, NJ 07403
Houston, TX 77041

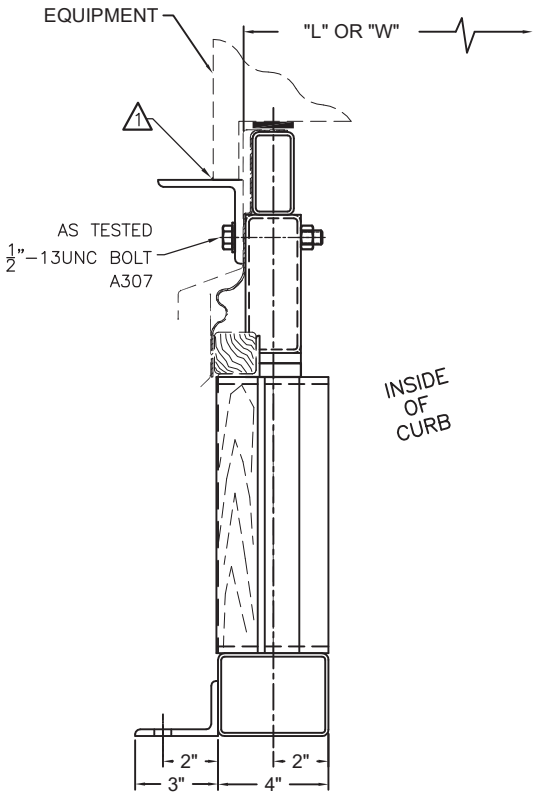
SCALE: NONE
SHEET: 1 OF 1
DRAWING NO.: VMA-49202-02
REVISION: B

Member VISCMA

REV.	DESCRIPTION	DATE	BY
A	INITIAL RELEASE	02/25/14	RJG



DETAIL 1



SECTION A

1 RDP RESPONSIBLE FOR AHU TO ANGLE WELDMENT AND CURB TO STRUCTURE ATTACHMENT

OTHER MATERIALS, COMPOUNDS, OR FINISHES WITH EQUAL OR SUPERIOR PROPERTIES MAY BE SUBSTITUTED AS THEY BECOME AVAILABLE.

Nathaniel Deibler, PE
2023.06.28
09:44:02-07'00'

P-6300 ISOLATED SEISMIC/WIND RESTRAINT ROOF CURB DETAILS AND SECTIONS

THE VMC GROUP
The Power of Together
Bloomingdale, NJ 07403
Houston, TX 77041

SCALE: NONE

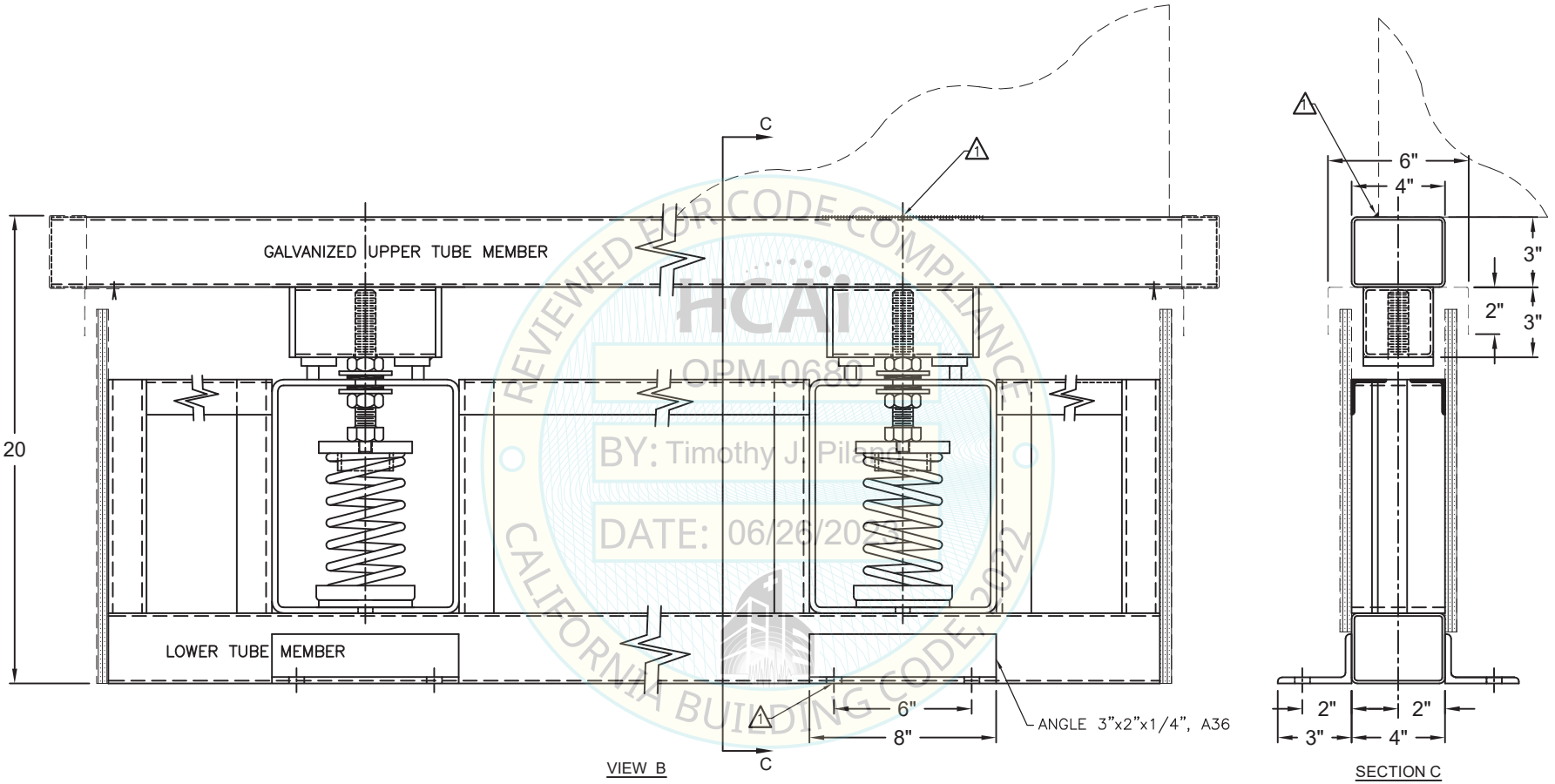
SHEET: 2 OF 2

Member VISCMA

DRAWING NO.: VMA-49202-05

REVISION: A

REV.	DESCRIPTION	DATE	BY
A	INITIAL RELEASE	03/25/14	RJG



1 RDP RESPONSIBLE FOR AHU TO CURB WELDMENT AND CURB TO STRUCTURE ATTACHMENT

OTHER MATERIALS, COMPOUNDS, OR FINISHES WITH EQUAL OR SUPERIOR PROPERTIES MAY BE SUBSTITUTED AS THEY BECOME AVAILABLE.

LICENSED PROFESSIONAL ENGINEER — NATHANIEL M. DEIBLER — PE 28676 — CIVIL — STATE OF CALIFORNIA

Nathaniel Deibler, PE
2023.06.26
09:44:08-07'00'

P-6300 (R-7300) SEISMIC/WIND RESTRAINT SPRING ISOLATED RAIL DETAILS & SECTIONS

THE VMC GROUP
The Power of Together
Bloomingdale, NJ 07403
Houston, TX 77041

SCALE: NONE
SHEET: 2 OF 2
DRAWING NO.: VMA-49202-06
REVISION: A

Member VISCMA