

ICC-ES Evaluation Report

ESR-4565

Reissued December 2023

This report also contains:


- CBC Supplement

Subject to renewal December 2025

- LABC Supplement

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<p>DIVISION: 22 00 00— PLUMBING</p> <p>Section: 22 63 00— Medical Gas Systems</p> <p>DIVISION: 23 00 00— HEATING, VENTILATION AND AIR CONDITIONING</p> <p>Section: 23 11 00— Facility Fuel Piping</p> <p>DIVISION: 23 00 00— HEATING, VENTILATION AND AIR CONDITIONING</p> <p>Section: 23 12 00— Natural Gas Piping</p>	<p>REPORT HOLDER: OMEGAFLEX, INC.</p>	<p>EVALUATION SUBJECT: MEDITRAC®, TRACPIPE®, COUNTERSTRIKE®, TRACPIPE® PS-II AND DOUBLETRAC® FLEXIBLE PIPING SYSTEMS</p>	
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1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021 and 2018 [International Building Code® \(IBC\)](#)
- 2021 and 2018 [International Residential Code® \(IRC\)](#)
- 2021 and 2018 [International Fire Code® \(IFC\)](#)
- 2021 and 2018 [International Mechanical Code® \(IMC\)](#)
- 2021 and 2018 [International Fuel Gas Code® \(IFGC\)](#)
- 2021 and 2018 Uniform Mechanical Code (UMC)
- 2021 and 2018 Uniform Plumbing Code (UPC)

Compliance with the following code referenced standards:

- 2021 and 2018 Health Care Facilities Code® (NFPA 99)
- 2021 Flammable and Combustible Liquids Code® (NFPA 30)

For evaluation for compliance with codes adopted by Los Angeles Department of Building and Safety (LADBS), see [ESR-4565 LABC, LAPC and LAMC Supplement](#).

For evaluation for compliance with codes adopted by California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see [ESR-4565 CBC, CPC, and CMC Supplement](#).

Property evaluated:

- Structural—Seismic Performance

2.0 USES

The flexible piping systems described in this report are used for distribution of medical gas, fuel gas and combustible/flammable liquid, as applicable, both underground and in structures having a component importance factor, I_p of 1.5 and located in Seismic Design Categories C, D, E and F when evaluated in accordance with Section 13.2.5 of ASCE/SEI 7-16.

3.0 DESCRIPTION

3.1 General:

The flexible piping systems are composed of corrugated metal tubing material with a protective jacket, tubing fittings and pipe supports (vertical and bracing). See [Figure 1](#) for product depictions.

3.2 MediTrac[®]: MediTrac[®] is a flexible corrugated medical gas piping system consisting of a corrugated copper alloy tubing with external polymer jacket and axially swaged brass fittings equipped with a stainless-steel anti-temper sleeve and copper tube stub. The tubing comes in diameters ranging from ½-inch to 2-inch (12.7 to 51 mm).

3.3 TracPipe[®] CounterStrike[®]: TracPipe[®] CounterStrike[®] is a flexible fuel-gas piping system for natural or propane gas consisting of corrugated stainless-steel tubing with external polyethylene jacket, and proprietary mechanical fittings. The tubing comes in diameters ranging from 3/8-inch to 2-inches (9.5 to 51 mm). TracPipe[®] CounterStrike[®] is listed in PMG-1046.

3.4 TracPipe[®] PS-II: TracPipe[®] PS-II is a factory-assembled encasement system, for below grade applications, consisting of TracPipe[®] CounterStrike[®] and fittings inside a ribbed polyethylene sleeve with gas tight end caps to capture any fuel gas escaping from the tubing. TracPipe[®] PS-II is listed in PMG-1052.

3.5 DoubleTrac[®]: DoubleTrac[®] is a flexible combustible/flammable liquid piping system which consists of corrugated stainless steel - tubing with external polymer fuel-containment system, and stainless-steel fittings. The pipe comes in diameters ranging from 1-inch to 2 inches (25.4 to 51 mm).

3.6 Pipe Supports:

3.6.1 Vertical: The vertical pipe hangers and supports must comply with Section 308 of the IPC, Section 305 of the IMC, Section 407 of the IFGC, Section 313 of the UMC, Section 313 of the UPC, NFPA 99 and NFPA 30, as applicable. The IPC is referenced in Section 2901 of the IBC. The IMC and IFGC is referenced in Section 2801 of the IBC. NFPA 99 is referenced in Sections 407.11, 422.6 and 425.1 of the IBC. NFPA 30 is referenced in Sections 415.6 and 507.8 of the IBC.

3.6.2 Seismic Bracing: Transverse and longitudinal seismic bracing systems must comply with the Bracing for Piping Systems: Seismic-Wind-Dynamic Design, Selection and Application (MSS SP- 127-2014a) or as determined by a registered design professional and authority having jurisdiction in accordance with Section 308.2 of the IPC, Section 301.18 of the IMC, Section 301.12 of the IFGC and Section 1613 of the IBC.

4.0 DESIGN AND INSTALLATION

4.1 Design:

The vertical and bracing support systems installed with the flexible piping systems must be designed by a registered design professional in accordance with Sections 13.6.7 and 13.6.7.1 of ASCE/SEI 7-16 and must comply with the provisions indicated in [Table 1](#) of this report. The horizontal seismic design force determined in accordance with Section 13.3 of ASCE 7 may be reduced by 10 percent when using the seismic design parameters noted in [Table 1](#) of this report.

4.2 Installation:

Installation of the flexible piping systems must be in accordance with this report, the approved plans and the manufacturer's published installation instructions. In the event of a conflict between this report, the approved plans and the manufacturer's published installation instructions, the more restrictive requirement governs.

4.2.1 Interior Application:

For interior installations, the maximum spacing of vertical supports must be determined in accordance with Section 3.5.1 of this report. The maximum spacing of transverse and longitudinal bracing must not exceed 40 feet (12.2 m) and must be determined by a registered design professional and approved by the authority having jurisdiction. The minimum clearance between OmegaFlex flexible piping systems and critical building systems (e.g. fire sprinkler systems) must be 15 inches (381 mm) for every 20 feet (6.1 m) of unbraced length. For bracing lengths between 20 to 40 feet (6.1 to 12.2 m), extrapolation must be used to determine the clearance distance. See [Figures 2](#) and [3](#) for typical installation details.

4.2.2 Below Grade Application:

Below grade installations include direct burial under soil, under pavement or concrete slab and beneath buildings either as single run or multiple runs of piping as permitted by the code. In addition, the following requirements apply:

TracPipe[®]: When installed below grade, TracPipe[®] CounterStrike[®] may be used and must be installed inside a watertight non-metallic conduit, or as an integral part of a listed encasement system such as TracPipe[®] PS-II. The conduit shall be designed or specified to withstand the imposed load.

MediTrac[®]: When installed below grade, MediTrac[®] may be used and must be installed inside a watertight non-metallic conduit designed or specified to withstand the imposed load.

DoubleTrac[®]: DoubleTrac[®] is listed as a metallic/non-metallic composite piping system that includes a secondary containment for installation underground without the need for a separate watertight non-metallic conduit.

4.3 Special Inspection:

Periodic special inspection is required in accordance with IBC Section 1705.13.6. The special inspector must conduct periodic inspections during installation of the flexible piping system connections, verification of components supplied by others and adherence to the manufacturer's published installation instructions.

5.0 CONDITIONS OF USE:

The MediTrac[®], TracPipe[®] CounterStrike[®], TracPipe[®] PS-II and DoubleTrac[®] flexible piping systems described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 The flexible piping systems must be manufactured, - marked and installed in accordance with this report, the applicable listing standard(s), and the manufacturer's published installation instructions. A copy of the instructions must be available at the jobsite at all times during installation.
- 5.2 The vertical and bracing supports must comply with Sections 3.5 and 4.1 of this evaluation report.
- 5.3 The scope of this evaluation report is for the installation of OmegaFlex flexible piping systems in Seismic Design Categories C, D, E and F and structures assigned an I_p of 1.5.
- 5.4 The MediTrac[®] flexible piping system must comply with the applicable provisions of the NFPA 99, UPC and IPC. The TracPipe[®] CounterStrike[®] and TracPipe[®] PS-II flexible piping system must comply with the applicable provisions of the IMC, IFGC, UPC and UMC. The DoubleTrac[®] must comply with applicable provisions of IFC, IMC, UMC and NFPA 30.
- 5.5 Special inspection must be conducted in accordance with Section 4.3.
- 5.6 The MediTrac[®], TracPipe[®] CounterStrike[®], TracPipe[®] PS-II and DoubleTrac[®] flexible piping systems are manufactured under an approved quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

- 6.1 Data in accordance with [ICC-ES Acceptance Criteria for Seismic Certification by Shake-Table Testing of Nonstructural Components \(AC156\)](#), approved October 2010 (editorially revised December 2020).
- 6.2 Analysis of shake table test data.
- 6.3 Quality control documentation.

7.0 IDENTIFICATION

- 7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-4565) along with the name, registered trademark, or registered logo of the report holder must be included in the product label.

7.2 In addition, the MediTrac[®], TracPipe[®] CounterStrike[®], TracPipe[®] PS-II and DoubleTrac[®] flexible piping systems described in this report must be marked with the model number and the company name and the ICC-ES evaluation report number (ESR-4565). The manufacturer may include the following optional marking: Seismically Qualified per ICC-ES AC156 Testing Protocol.

7.3 The report holder’s contact information is the following:

OMEGAFLEX, INC.
213 COURT STREET SUITE 1001
MIDDLETOWN, CONNECTICUT 06457
(860) 704-6820
www.omegaflex.com

TABLE 1—FLEXIBLE PIPING SYSTEMS SEISMIC DESIGN PARAMETERS

Maximum Design Spectral Acceleration, S_{DS} (g)	Maximum Height Factor Ratio, z/h	In-structure Component Amplification Factor, a_p	Component Response Modification Factor, R_p ^{1,2}
2.0	1	2 1/2	6 or 12
2.5	0	2 1/2	6 or 12

¹ R_p of 6 applies for installation of flexible piping systems with mechanical or welded connections between two braced points (40 feet [12.2 m] or less).

² R_p of 12 applies for installation of flexible piping systems without mechanical or welded connections between two points restrained by transverse seismic braces (40 feet [12.2 m] or less).



MEDITRAC[®] TUBING



TRACPIPE[®] COUNTERSTRIKE[®] TUBING

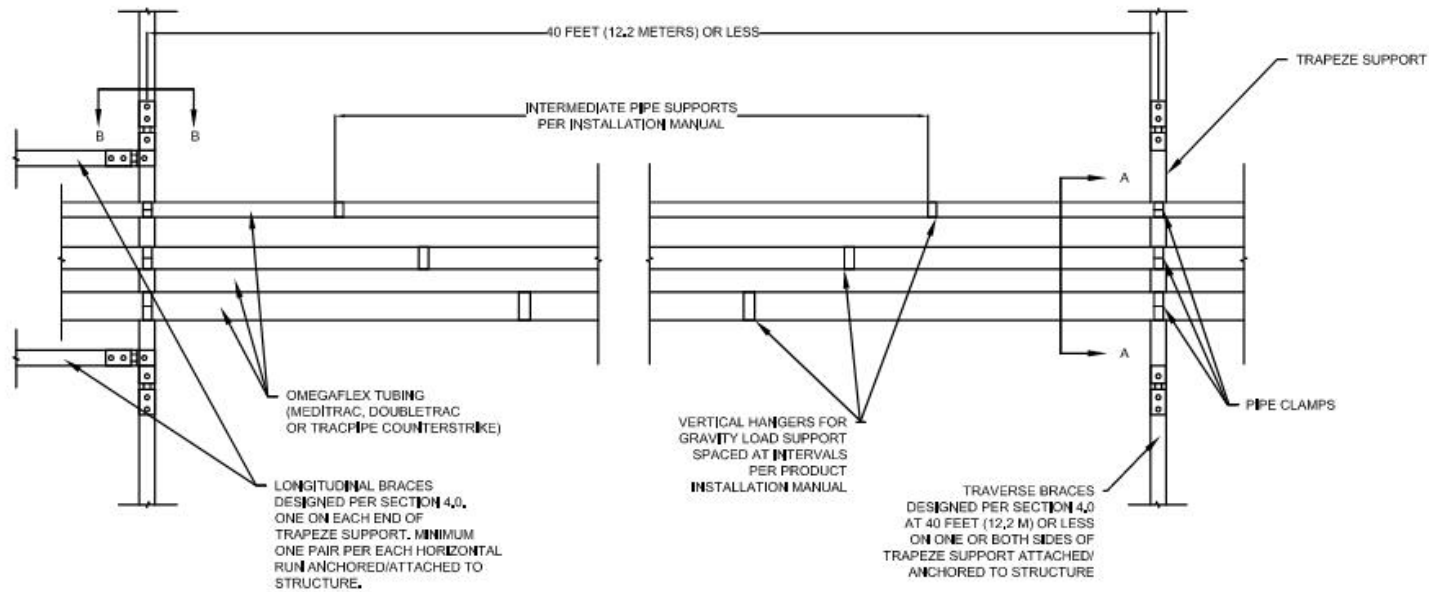


TRACPIPE[®] PS-II TUBING

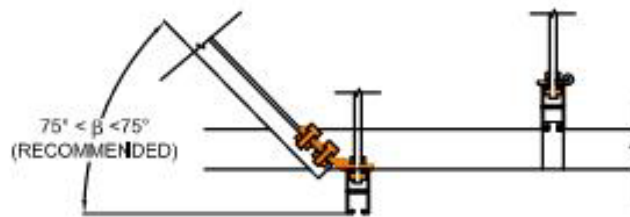


DOUBLETRAC[®] TUBING

FIGURE 1—MEDITRAC[®], TRACPIPE[®] COUNTERSTRIKE[®] AND DOUBLETRAC[®] FLEXIBLE PIPING SYSTEMS

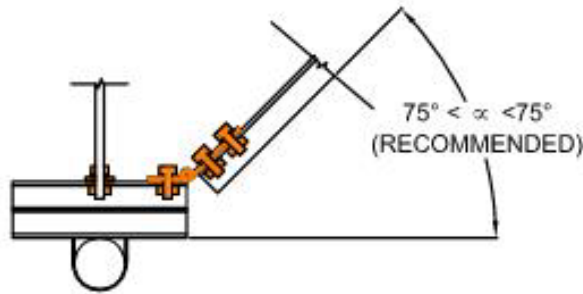
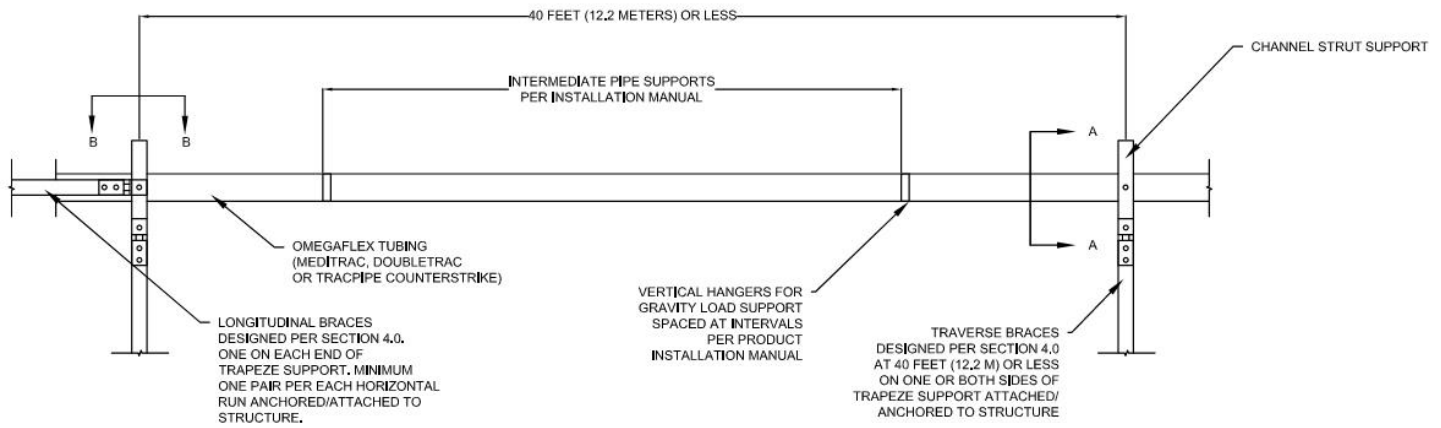


SECTION A-A

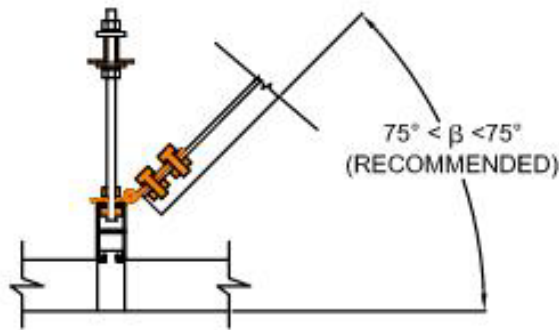


SECTION B-B

FIGURE 2—TYPICAL MULTIPLE FLEXIBLE PIPE INSTALLATION (TRANSVERSE AND LATERAL BRACING SUPPORTS)



SECTION A-A



SECTION B-B

FIGURE 3- TYPICAL SINGLE FLEXIBLE PIPE INSTALLATION (TRANSVERSE AND LATERAL BRACING SUPPORTS)

ICC-ES Evaluation Report ESR-4565 LABC, LAPC and LAMC Supplement

Reissued December 2023

This report is subject to renewal December 2025.

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DIVISION: 22 00 00—PLUMBING
Section: 22 63 00—Medical Gas Systems

DIVISION: 23 00 00—HEATING, VENTILATION AND AIR CONDITIONING
Section: 23 11 00—Facility Fuel Piping

DIVISION: 23 00 00—HEATING, VENTILATION AND AIR CONDITIONING
Section: 23 12 00—Natural Gas Piping

REPORT HOLDER:

OMEGAFLEX, INC.

EVALUATION SUBJECT:

MEDITRAC®, TRACPIPE® COUNTERSTRIKE®, TRACPIPE® PS-II AND DOUBLETRAC® FLEXIBLE PIPING SYSTEMS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the flexible piping systems, described in ICC-ES evaluation report [ESR-4565](#), have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code edition(s):

- 2023 *City of Los Angeles Building Code* (LABC)
- 2023 *City of Los Angeles Plumbing Code* (LAPC)
- 2023 *City of Los Angeles Mechanical Code* (LAMC)

2.0 CONCLUSIONS

The flexible piping systems, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4565](#), comply with the LABC, LAPC and LAMC and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE:

The flexible piping systems, described in the evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-4565](#).
- The design, installation, condition of use and identification of the flexible piping systems are in accordance with the 2021 International Building Code (IBC), 2021 IAPMO *Uniform Plumbing Code*® (IAPMO UPC) and 2021 IAPMO *Uniform Mechanical Code*® (IAPMO UMC) provisions noted in the evaluation report [ESR-4565](#).
- The design, installation, and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, LAPC and LAMC, as applicable.

This supplement expires concurrently with the evaluation report, reissued December 2023.

DIVISION: 22 00 00—PLUMBING**Section: 22 63 00—Medical Gas Systems****DIVISION: 23 00 00—HEATING, VENTILATION AND AIR CONDITIONING****Section: 23 11 00—Facility Fuel Piping****DIVISION: 23 00 00—HEATING, VENTILATION AND AIR CONDITIONING****Section: 23 12 00—Natural Gas Piping****REPORT HOLDER:****OMEGAFLEX, INC.****EVALUATION SUBJECT:****MEDITRAC®, TRACPIPE® COUNTERSTRIKE®, TRACPIPE® PS-II AND DOUBLETRAC® FLEXIBLE PIPING SYSTEMS**

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the flexible piping systems, described in ICC-ES evaluation report [ESR-4565](#), have also been evaluated for compliance with the codes noted below.

Applicable code edition(s):

- 2022 California Building Code (CBC)
- 2022 California Plumbing Code (CPC)
- 2022 California Mechanical Code (CMC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

2.0 CONCLUSIONS

2.1 CBC:

The flexible piping systems, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4565](#), comply with CBC Chapters 16, provided the design and installation are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapter 16 and 17, as applicable.

2.1.1 OSHPD:

The flexible piping systems, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4565](#), comply with CBC, provided the design and installation are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements in CBC amended Chapter 16 and 17 [OSHPD 1R, 2 and 5] and CBC Chapters 16A and 17A [OSHPD 1 and 4], as applicable.

2.1.2 DSA:

The flexible piping systems, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4565](#), comply with CBC, provided the design and installation are in accordance with the 2021 *International Building Code*[®] (IBC) provisions noted in the evaluation report and the additional requirements in CBC amended Chapter 16 [DSA-SS/CC], CBC Chapter 16A [DSA-SS] and CBC Chapter 17A [DSA-SS and DSA-SS/CC], as applicable.

2.2 CPC:

The flexible piping systems, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4565](#), comply with Chapter 3 of the CPC, provided the design and installation are in accordance with the 2021 *Uniform Plumbing Code*[®] (UPC) provisions noted in the evaluation report and the additional requirements in CBC Chapters 16 and 17 and CPC Chapter 3, as applicable.

2.2.1 OSHPD:

The flexible piping systems, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4565](#), comply with amended Chapter 3 of the CPC, provided the design and installation are in accordance with the 2021 *Uniform Plumbing Code*[®] (UPC) provisions noted in the evaluation report and the additional requirements in CBC amended Chapters 16 and 17 [OSHPD 1R, 2 and 5], CBC Chapters 16A and 17A [OSHPD 1 and 4] and CPC amended Chapter 3, as applicable.

2.2.2 DSA:

The flexible piping systems, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4565](#), comply with amended Chapter 3 of the CPC, provided the design and installation are in accordance with the 2021 *Uniform Plumbing Code*[®] (UPC) provisions noted in the evaluation report and the additional requirements in CBC amended Chapters 16 and 17 [DSA-SS/CC], CBC Chapters 16A [DSA-SS], CBC Chapter 17A [DSA-SS and DSA-SS/CC] and CPC amended Chapter 3, as applicable.

2.3 CMC:

The flexible piping systems, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4565](#), comply with Chapter 3 of the CMC, provided the design and installation are in accordance with the 2021 *Uniform Mechanical Code*[®] (UMC) provisions noted in the evaluation report and the additional requirements in CBC Chapters 16 and 17 and CMC Chapter 3, as applicable.

2.3.1 OSHPD:

The flexible piping systems, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4565](#), comply with amended Chapter 3 of the CMC, provided the design and installation are in accordance with the 2021 *Uniform Mechanical Code*[®] (UMC) provisions noted in the evaluation report and the additional requirements in CBC amended Chapters 16 and 17 [OSHPD 1R, 2 and 5], CBC Chapters 16A and 17A [OSHPD 1 and 4] and CMC amended Chapter 3, as applicable.

2.3.2 DSA:

The flexible piping systems, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4565](#), comply with amended Chapter 3 of the CMC, provided the design and installation are in accordance with the 2021 *Uniform Mechanical Code*[®] (UMC) provisions noted in the evaluation report and the additional requirements in CBC amended Chapters 16 and 17 [DSA-SS/CC], CBC Chapters 16A [DSA-SS], CBC Chapter 17A [DSA-SS and DSA-SS/CC] and CMC amended Chapter 3, as applicable.

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