CADDY SEISMIC HANDBOOK - FM

SUPPORTO ALLA PROGETTAZIONE E INSTALLAZIONE DI SISTEMI DI PROTEZIONE ANTISISMICA PER IMPIANTI SPRINKLER SECONDO L'FM GLOBAL PROPERTY LOSS PREVENTION DATA SHEET 2-8 *PROTEZIONE DA TERREMOTI PER IMPIANTI DI SPEGNIMENTO AD ACQUA*

September 28, 2017

AGENDA

- Introduzione
- Organizzazione del CADDY Seismic Handbook
- Legenda dell’Handbook
- Struttura dell’Handbook (da panoramica a dettagli)

INTRODUZIONE

OBIETTIVO

CADDY ha collaborato con gli esperti dell'Università di Udine per creare un SEISMIC HANDBOOK:

- Pensato per essere di supporto alla progettazione e installazione dei sistemi di protezione antisismica per gli impianti sprinkler

- Sviluppato secondo quanto previsto in FM Global Property Loss Prevention Data Sheet 2-8: *Earthquake Protection for Water-based Fire Protections Systems*

(E' attualmente in fase di sviluppo l'HANDBOOK conforme ai requisiti di *NFPA 13: Standard for the Installation of Sprinkler Systems*)

Supporto alla progettazione e installazione

OBIETTIVO

Il CADDY SEISMIC HANDBOOK è stato concepito:

- **Per applicazioni in strutture/edifici:**
  - *Situati in zone sismiche da 50 a 500 anni secondo* FM Global Data Sheet 1-2, *Earthquakes*
  - Localizzati in zone sismiche di rilievo per le Autorità Aventi Competenza
- **Per essere di aiuto a:**
  - *PROGETTISTI* di impianti sprinkler
  - *INSTALLATORI* di impianti sprinkler
  - *ISPETTORI* di impianti sprinkler
- **… E in aggiunta a:**
  - *PROJECT MANAGERS* di lavori che prevedano impianti sprinkler
  - *RESPONSABILI* di strutture/edifici con impianti sprinkler
  - *PROPRIETARI* di strutture/edifici con impianti sprinkler

Supporto alla progettazione e installazione

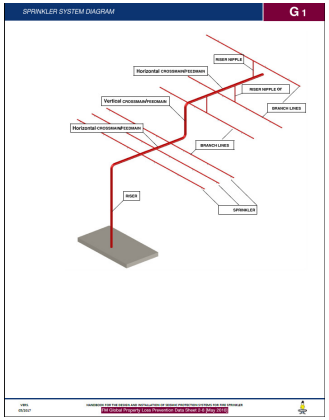
CADDY SEISMIC HANDBOOK

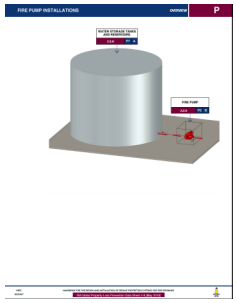
ORGANIZZAZIONE

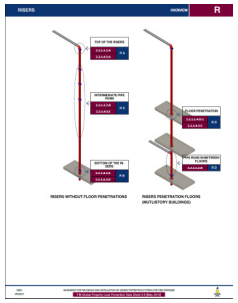
ORGANIZZAZIONE DELL'HANDBOOK

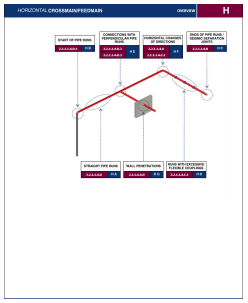
IL CADDY SEISMIC HANDBOOK E' DIVISO IN SEZIONI,

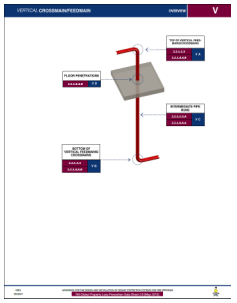
DALLA RISERVA IDRICA FINO ALLE TESTINE SPRINKLER

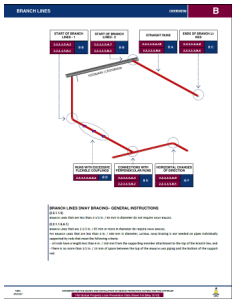


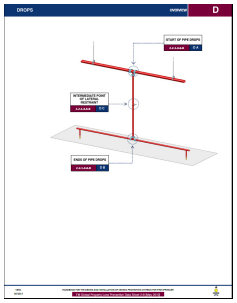


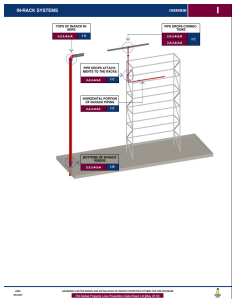






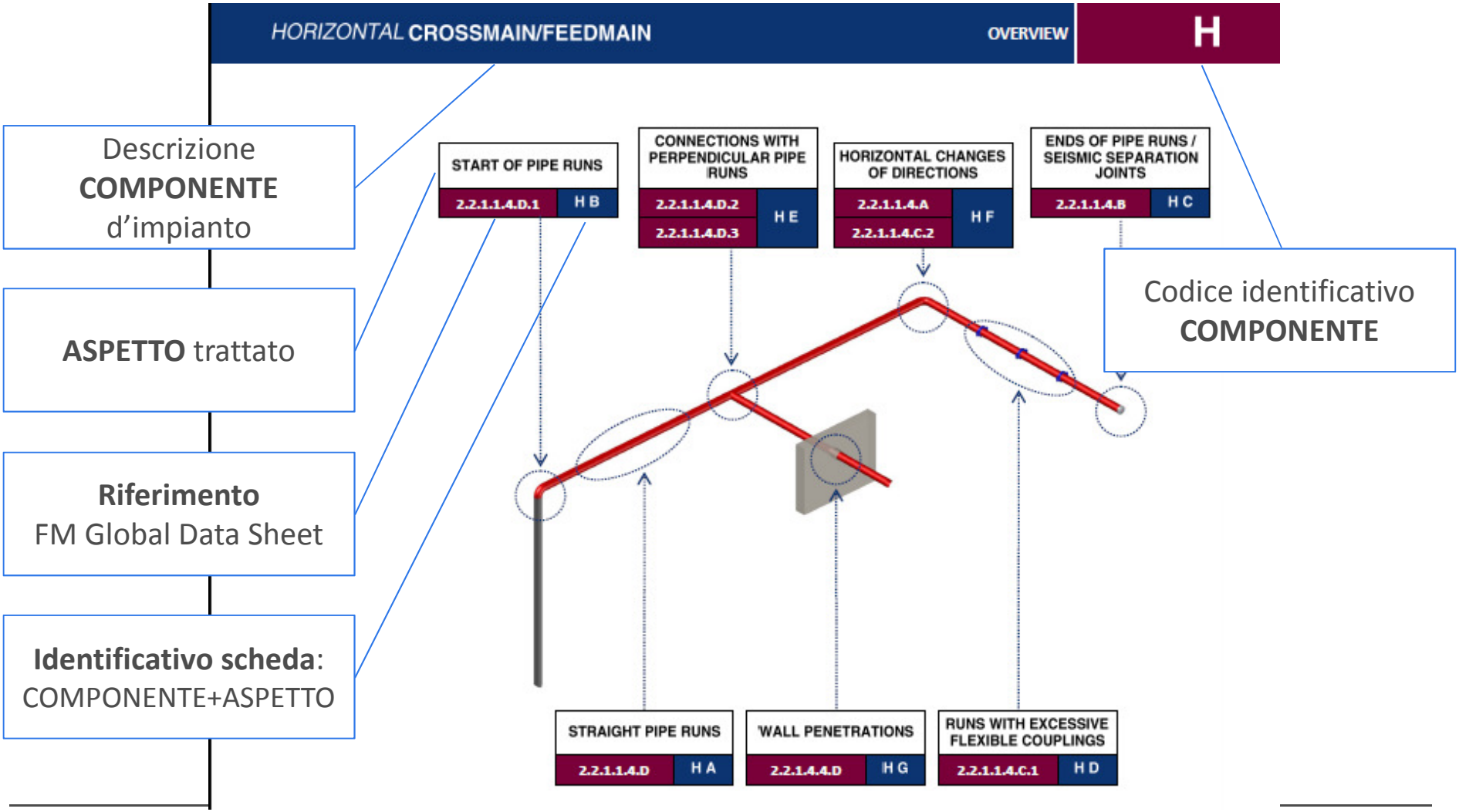






Coinvolge l'intero impianto sprinkler, dall'inizio alla fine

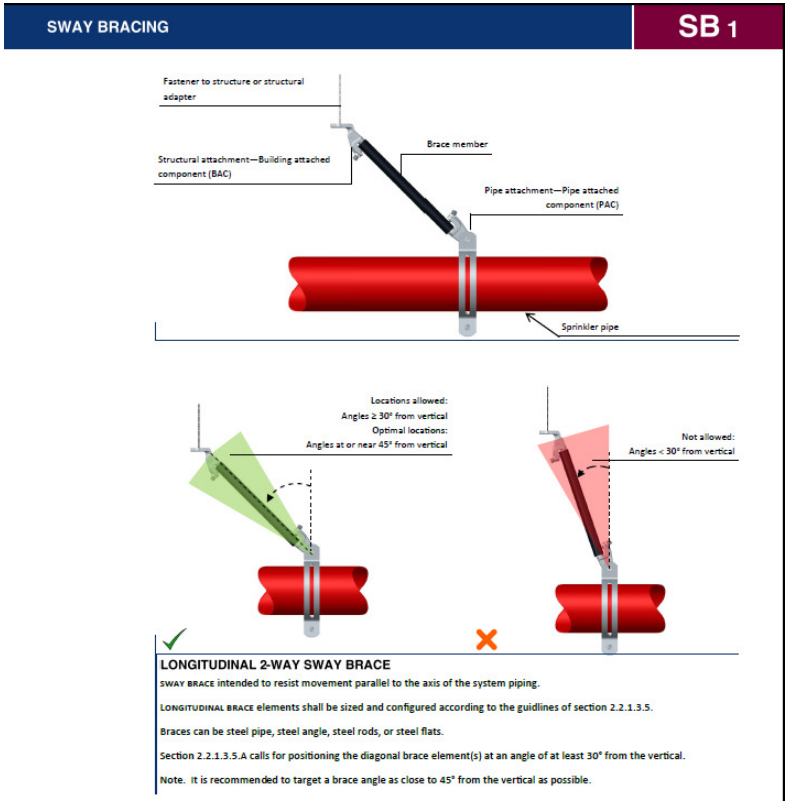
ORGANIZZAZIONE DELLE SEZIONI DELL'HANDBOOK

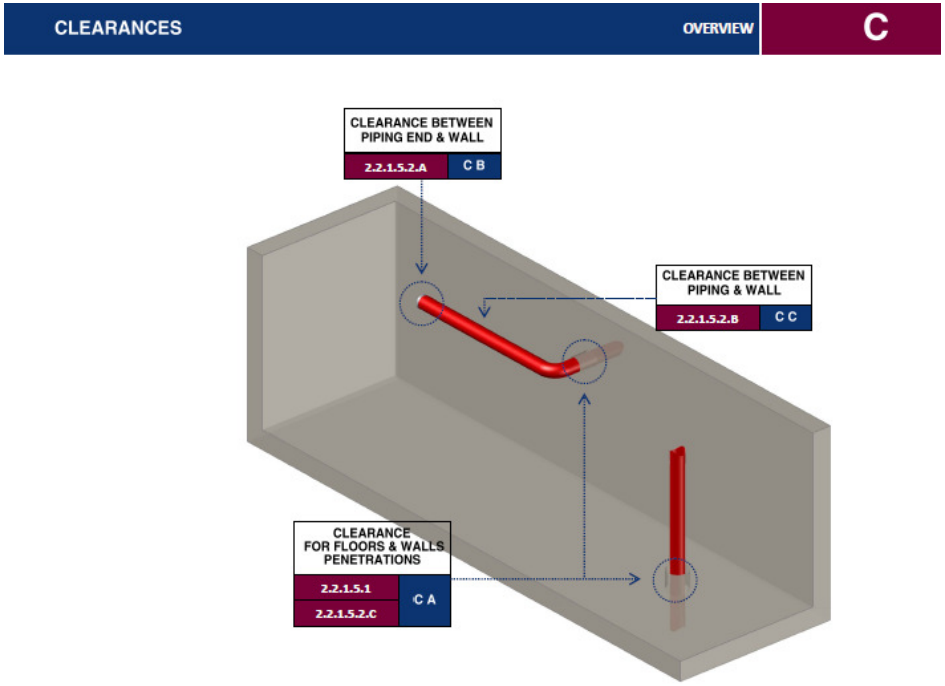


Ogni sezione è introdotta da uno schema riassuntivo

CONTENUTI ADDIZIONALI

ALL'INIZIO E' PRESENTE UN BREVE TUTORIAL SUI PRINCIPI DI FUNZIONAMENTO DI SWAY BRACES E CLEARANCES





Impiego dei giunti rigidi/flessibili: DESCRITTO

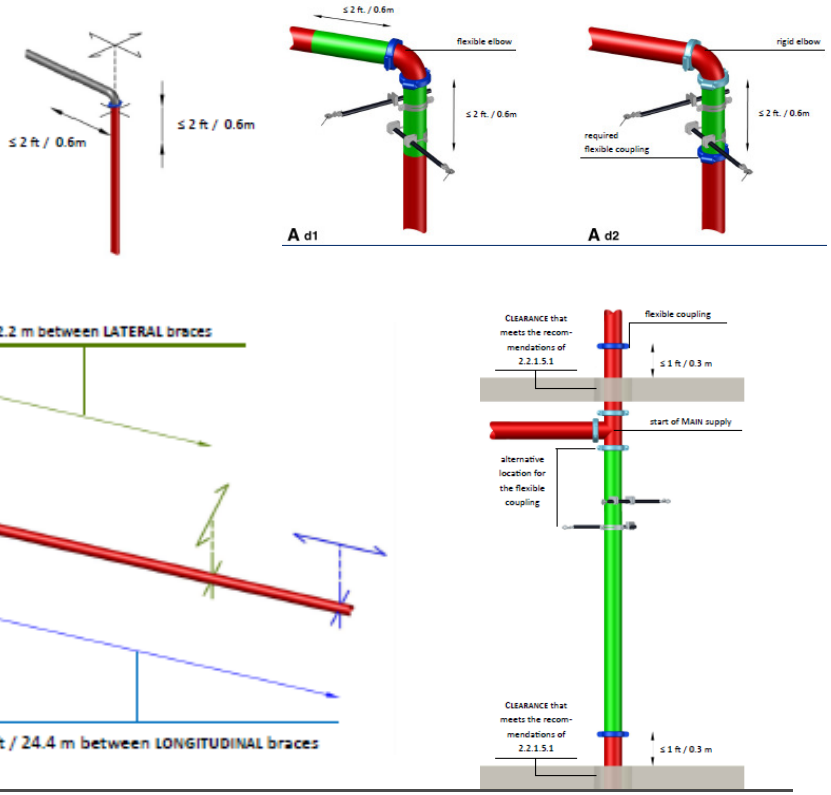
Installazione dei supporti gravitazionali: NON DESCRITTA

RAPPRESENTAZIONE GRAFICA DELLE SITUAZIONI

I REQUISITI PER GLI IMPIANTI ANTINCENDIO SONO ***RAPPRESENTATI GRAFICAMENTE***

LE ILLUSTRAZIONI INCLUDONO:

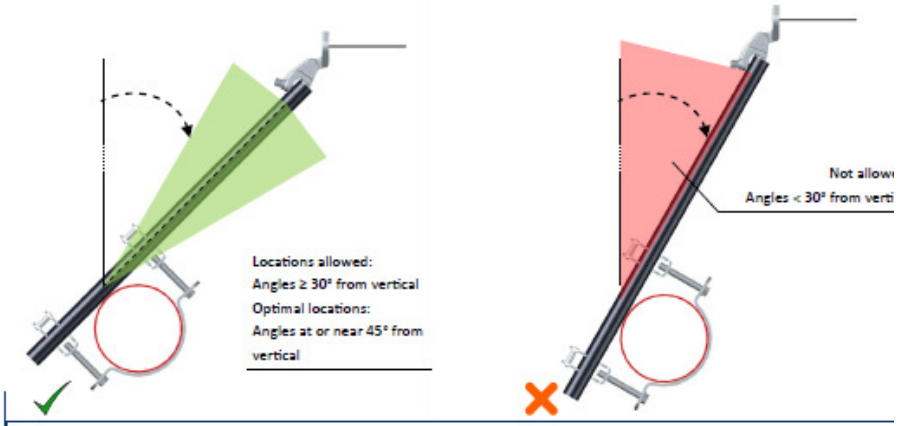
- Posizionamento degli sway braces
- Massima distanza tra sway braces
- Tipologie di giunti richiesti



Rappresentazioni grafiche

ILLUSTRAZIONI

- Sono riportati i capitoli di FM Global Data Sheet 2-8 riferiti alla situazione descritta
- Sono accompagnate da commenti che riassumono i requisiti descritti



LATERAL 2-WAY SWAY BRACE

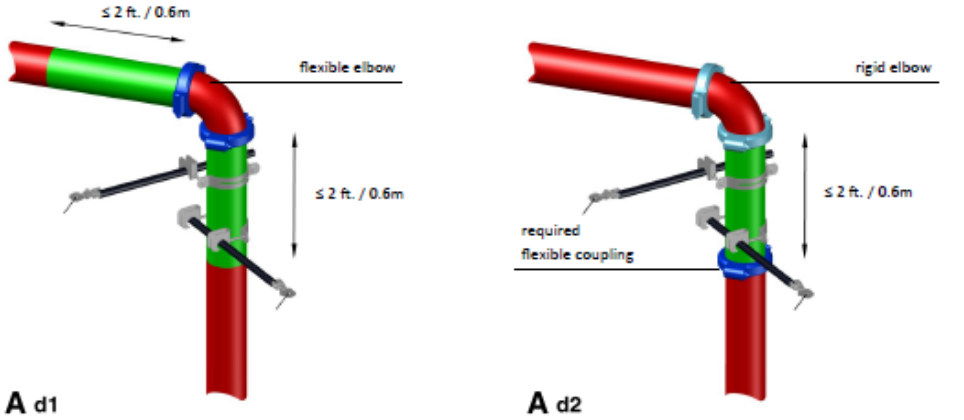
SWAY BRACE intended to resist movement perpendicular to the axis of the system piping.

LATERAL BRACE elements shall be sized and configured according to the guidlines of section 2.2.1.3.5.

Braces can be steel pipe, steel angle, steel rods, or steel flats.

Section 2.2.1.3.5.A calls for positioning the diagonal element(s) at an angle of at least 30° from vertical.

Note. It is recommended to target a brace angle as close to 45° from the vertical as possible.



BRACE WITH FLEXIBLE OR RIGID COUPLINGS AT TOP OF THE RISER

(2.2.1.1.2.A; 2.2.1.4.3.A)

Provide a FOUR-WAY sway brace within 2 ft / 0.6 m of the top of the RISER. The FOUR-WAY brace may be located either on the RISER or on the main (see green pipe location in A1).

For risers directly connected to underground piping, provide a flexible coupling within 2 ft / 0.6 m of the top of each individual RISER. This applies to risers located outside and inside buildings.

Generally speaking a FOUR-WAY brace goes within 2 ft / 0.6 m from a flexible coupling on the RISER.

Gli errori più frequenti vengono evidenziati di volta in volta

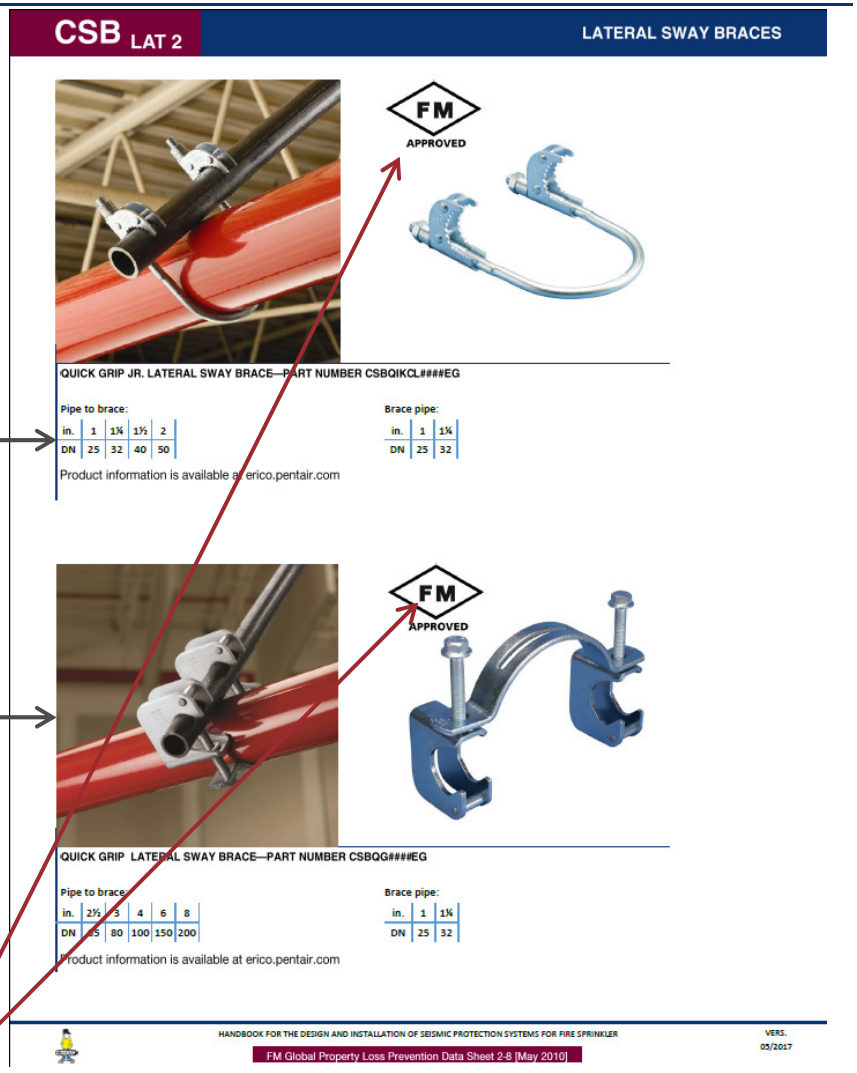
Requisiti citati e spiegati

SEZIONE RELATIVA AI PRODOTTI CADDY

E’ PRESENTATA LA GAMMA
DEGLI SWAY BRACES DI CADDY

Tabelle con dimensionali tubi incluse

Immagini di applicazioni

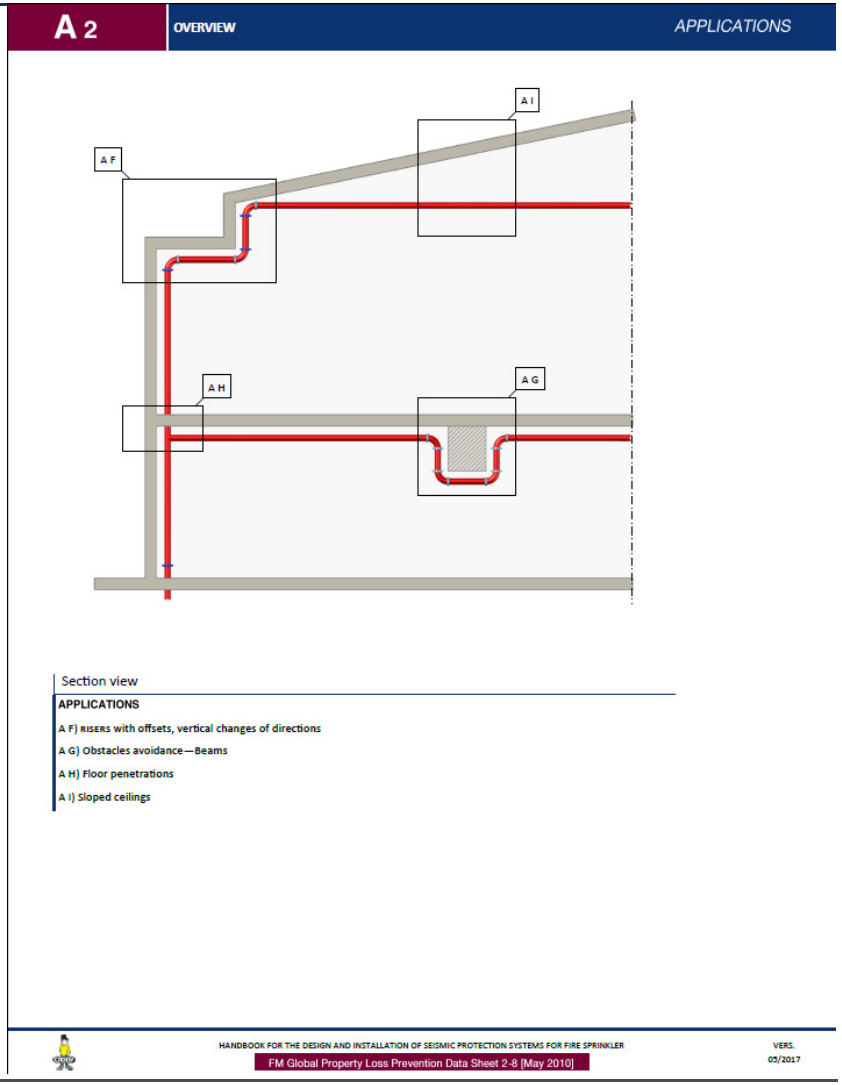


Prodotti CADDY approvati FM descritti per ogni applicazione

SITUAZIONI RICORRENTI

SONO INCLUSE SOLUZIONI PRATICHE PER LE SITUAZIONI PIU' COMUNI

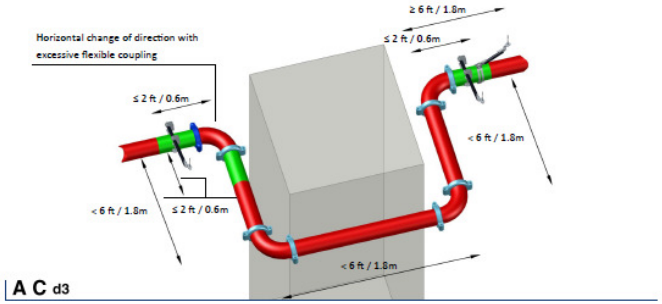
- Superamento di ostacoli
- Passaggi attraverso muri o solai
- Attraversamenti di giunti strutturali
- Cambi di direzione
- Soffitti inclinati
- ...



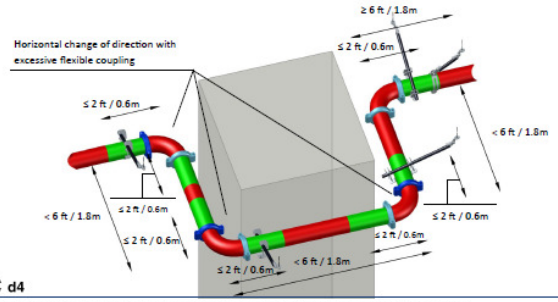
Schemi riassuntivi in pianta e sezione delle situazioni descritte

SUGGERIMENTI DI POSIZIONAMENTO/INSTALLAZIONE

VERTICAL OBSTACLES AVOIDANCE **A C 3**



A C d3



A C d4

HORIZONTAL CHANGES OF DIRECTION, USE OF FLEXIBLE COUPLINGS, OFFSET LESS THAN 6 FT / 1.8 M

When horizontal CROSSMAINS or FEEDMAINS need to avoid an obstacle (e.g. a pillar, a stairwell, elevator, or distribution systems), the instructions for horizontal CROSSMAINS or FEEDMAINS per 2.2.1.1.4.A and 2.2.1.1.4.C may be applied.
When pipe runs adjacent to a horizontal change of direction are less than 6 ft / 1.8m, LATERAL and LONGITUDINAL sway bracing is not required as long as flexible couplings are not present in the change of direction. Conversely, when pipe runs adjacent to a horizontal change of direction are 6 ft / 1.8m long or more, both LATERAL and LONGITUDINAL sway bracing is required within 2 ft / 0.6m of the change of direction.

When flexible couplings are present within the changes of directions, for each flexible coupling present an additional LATERAL sway brace is to be located within 2 ft / 0.6m of the change of direction, no matter what is the length of the pipe run adjacent to the change of direction. When the piping diameter remains the same on both ends of the change of direction, the LATERAL sway brace may be indiferently located on one of the two runs as long as it is within 2 ft / 0.6m of the change of direction. On the other hand, when there is a change in piping diameter, place the LATERAL sway brace on the pipe run with the largest diameter.

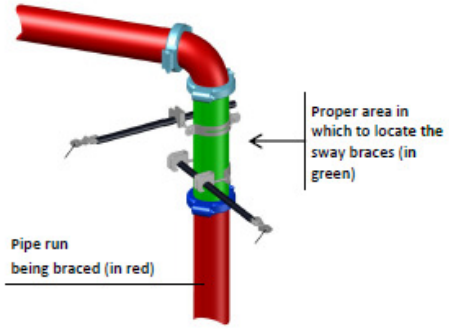
Presentazione di soluzioni basate su istruzioni contenute nei diversi capitoli di FM Global Data Sheet 2-8

LEGENDA

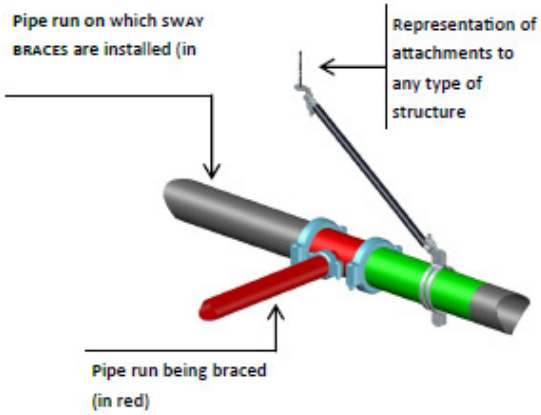
SPIEGAZIONI

POSIZIONAMENTO CORRETTO DEI RINFORZI

AREA CORRETTA DI POSIZIONAMENTO DEL BRACE IN **VERDE**
TUBAZIONE DA RINFORZARE IN **ROSSO**



QUALORA LE TUBAZIONI SU CUI I BRACES SONO APPLICATI NON SIANO QUELLE DA RINFORZARE, SONO RAPPRESENTATE IN **GRIGIO**

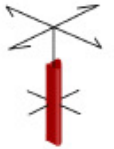


Rappresentazione visiva e tramite codici colore

GRAFICHE E SIMBOLI UTILIZZATI

GRAPHICS AND SYMBOLS LEGEND

Sway braces



FOUR-WAY SWAY BRACE symbol and location

FOUR-WAY SWAY BRACE

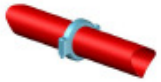
LATERAL SWAY BRACE symbol and location

LATERAL SWAY BRACE

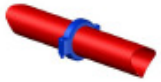
LONGITUDINAL SWAY BRACE symbol and location

LONGITUDINAL SWAY BRACE

Couplings



Rigid coupling

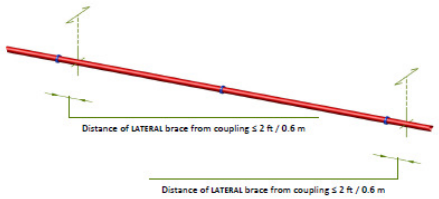


Flexible coupling

Per sway braces e giunti scanalati

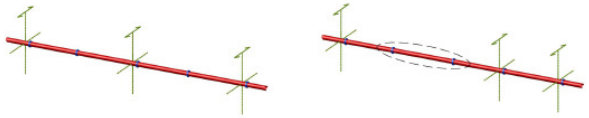
INDIVIDUAZIONE DI ERRORI DI INSTALLAZIONE RICORRENTI

ESEMPI DI SOLUZIONI NON CORRETTE EVIDENZIATI



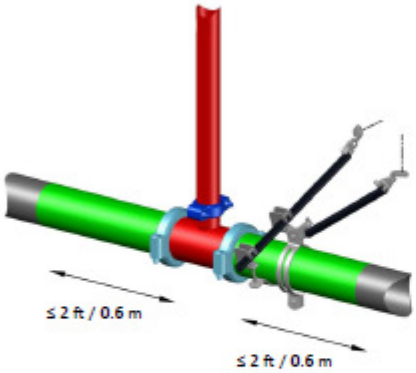
D1

RUNS WITH EXCESSIVE FLEXIBLE COUPLINGS
(2.2.1.1.4.C.1)
When more flexible couplings than recommended are installed on feedmains or crossmains, install an additional LATERAL brace at every other flexible coupling within 2 ft / 0.6 m of the flexible coupling.

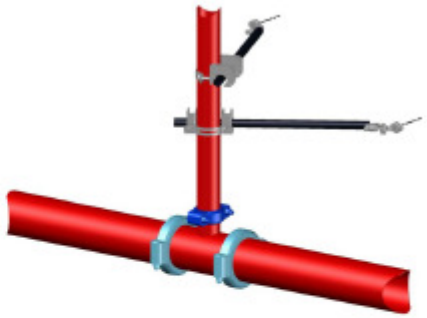


D2 ✓ **D3** ✗

RUNS WITH EXCESSIVE FLEXIBLE COUPLINGS
(2.2.1.1.4.C.1)
Correct solution (D_2) and incorrect solution (D_3).



B1 d1 - B3 d1 - B4 d1



B1 d2 - B3 d2 - B4 d2 ✗

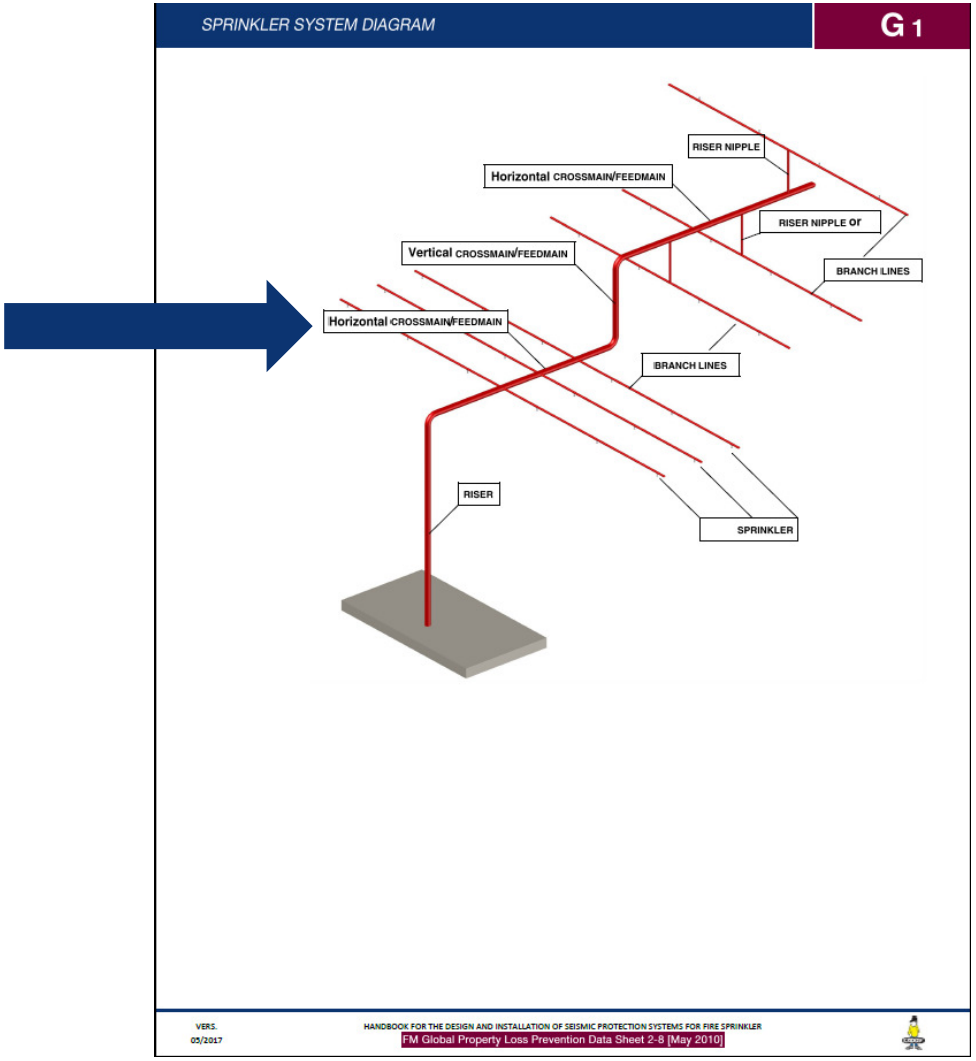
Note: Locating the FOUR-WAY on the smaller pipe is acceptable if the larger pipe load is not included in the zone of influence and the larger pipe is braced independently.

Ispezione semplificata

COME USARE IL CADDY SEISMIC HANDBOOK

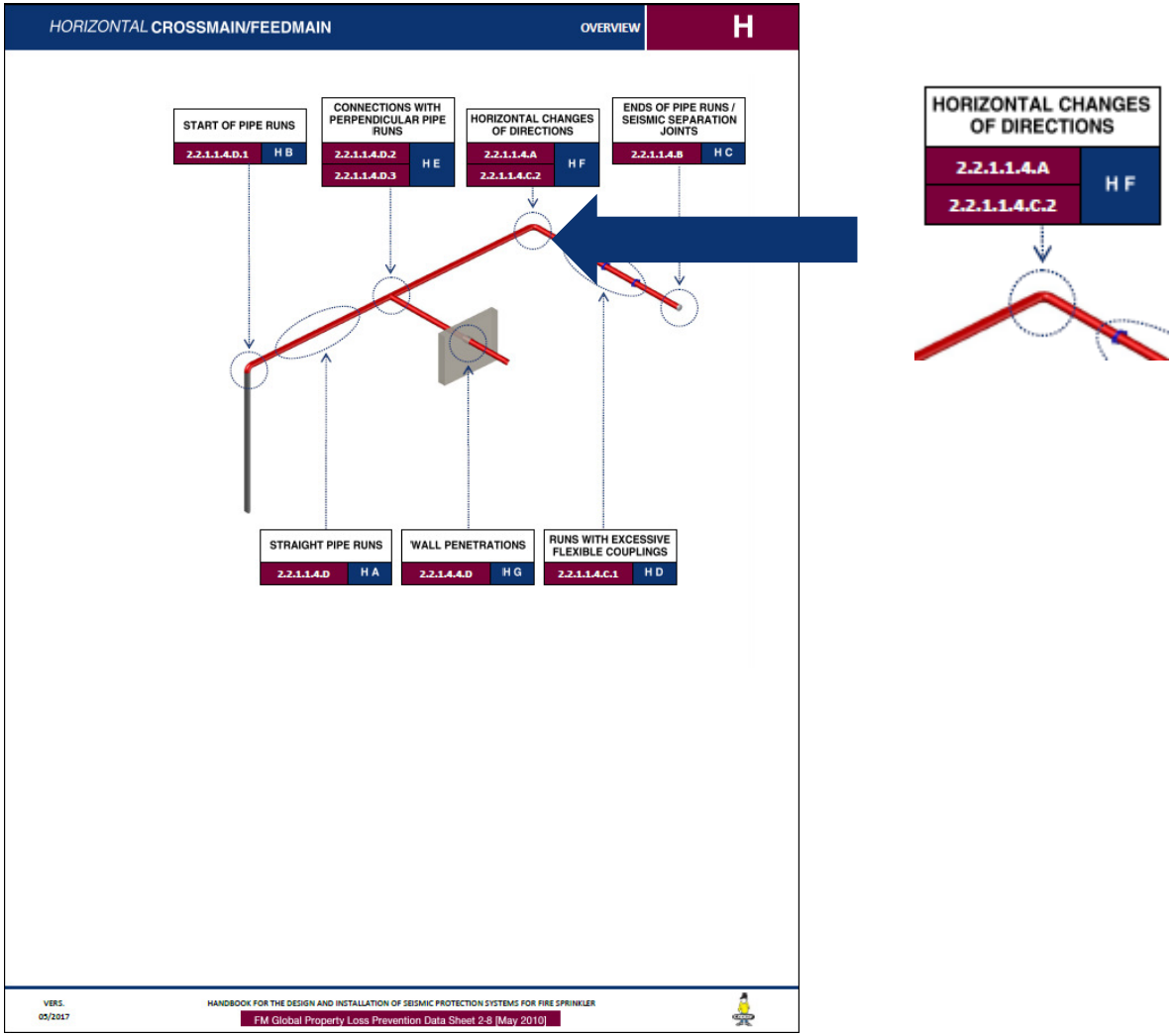
MANUALE UTENTE

MANUALE UTENTE



STEP 1: identificazione della sezione di interesse

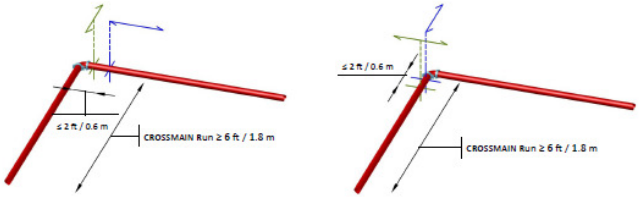
DALLE PAGINE DI INSIEME...



STEP 2: identificazione dell’aspetto da approfondire

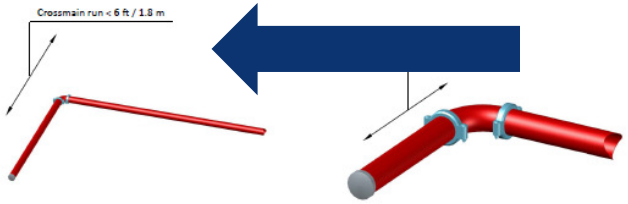
… ALLE PAGINE DELL'AREA DI INTERESSE…

HORIZONTAL CROSSMAIN/FEEDMAIN **H F1**



F1 **F2**

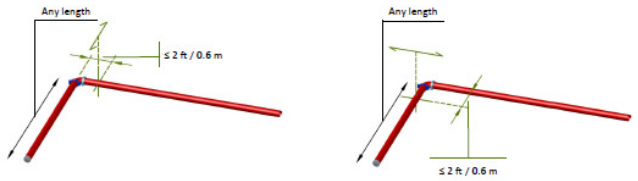
RUN ADJACENT TO THE CHANGE OF DIRECTION ≥ 6 ft. / 1.8 m
(2.2.1.1.4.A)
At a horizontal change of direction, when the CROSSMAIN run adjacent to the change of direction is 6 ft / 1.8 m or longer, a LATERAL and a LONGITUDINAL sway braces are required within 2 ft / 0.6 m of the change of direction.



F3

RUN ADJACENT TO THE CHANGE OF DIRECTION < 6 ft. / 1.8 m
(2.2.1.1.4.A)
When the CROSSMAIN/FEEDMAIN runs adjacent to the horizontal direction change are shorter than 6 ft / 1.8 m, additional SWAY BRACE at the change of direction are not required.

H F2 **HORIZONTAL CROSSMAIN/FEEDMAIN**



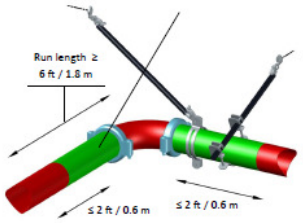
F4 **F5**

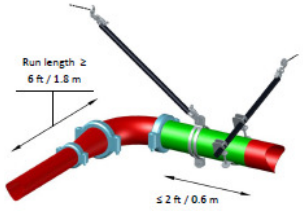
FLEXIBLE COUPLING USED AT CHANGE OF DIRECTION
(2.2.1.1.4.A; 2.2.1.1.4.C.2)
When flexible couplings are present at a horizontal change of direction, an **additional** LATERAL sway brace must be installed within 2 ft / 0.6 m of the change of direction, regardless of the length of the pipe run adjacent to the change in direction.

STEP 3: identificazione dell'aspetto trattato

…ALLE PAGINE DI DETTAGLIO

H F3 — *HORIZONTAL* **CROSSMAIN/FEEDMAIN**

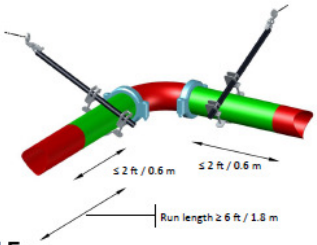




F1 d1 **F1 d2**

HORIZONTAL CHANGES OF DIRECTION: CONSTANT AND CHANGING MAIN SIZE
(2.2.1.1.4.A)

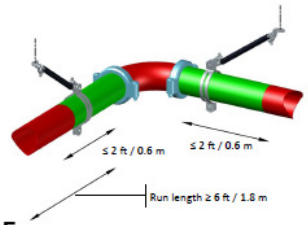
The CROSSMAIN/FEEDMAIN runs longer than 6 ft / 1.8 m adjacent to changes of direction are required to have a LATERAL and a LONGITUDINAL sway braces within 2 ft / 0.6 m of the change of direction.
If the CROSSMAIN/FEEDMAIN diameter decreases at the change of direction, locate the SWAY BRACES on the run with the larger diameter.



F1 d3

HORIZONTAL CHANGES OF DIRECTION: ALTERNATIVE SOLUTIONS
(2.2.1.1.4.A)

Alternative solutions made with two LATERAL braces, one of which works as a LONGITUDINAL brace for the perpendicular run.

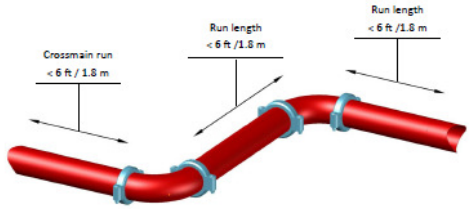


F1 d4

HORIZONTAL CHANGES OF DIRECTION: ALTERNATIVE SOLUTIONS
(2.2.1.1.4.A)

Alternative solutions made with two LONGITUDINAL braces, one of which works as a LATERAL brace for the perpendicular run.

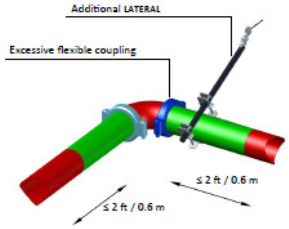
H F4 — *HORIZONTAL* **CROSSMAIN/FEEDMAIN**

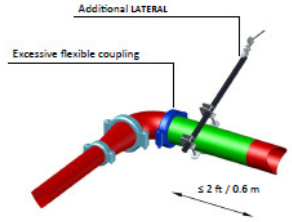


F3 d1

RUNS LESS THAN 6 FT. / 1.8m ADJACENT TO HORIZONTAL CHANGES OF DIRECTION
(2.2.1.1.4.A and 2.2.1.1.4.C.2)

When the CROSSMAIN/FEEDMAIN runs adjacent to horizontal direction changes are shorter than 6 ft / 1.8 m, additional SWAY BRACES at the changes of direction are not required.





F4 d1 **F4 d2**

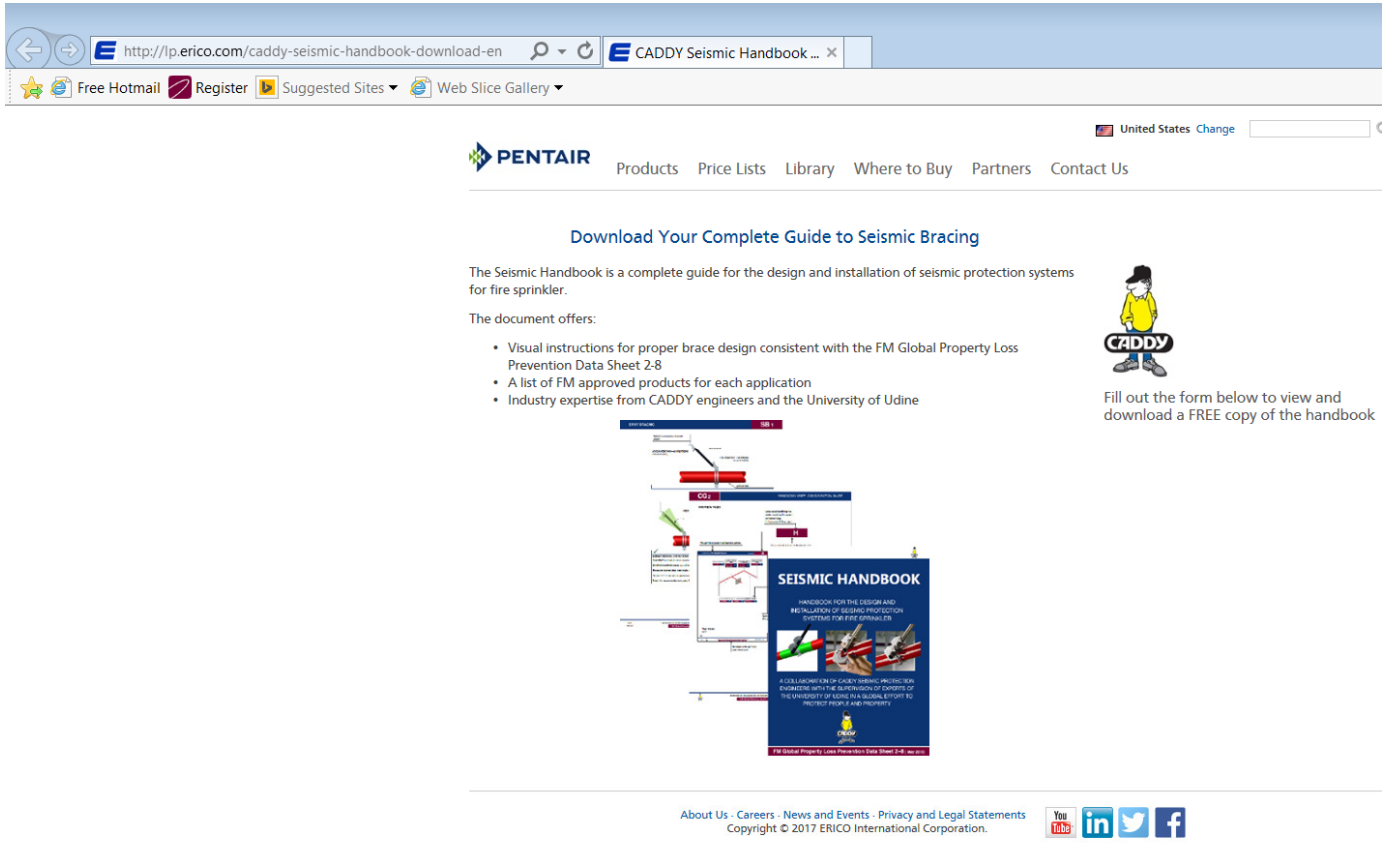
HORIZONTAL CHANGES OF DIRECTION: ACCEPTABLE SOLUTIONS WHEN FLEXIBLE COUPLING AT ELBOW
(2.2.1.1.4.A e 2.2.1.1.4.C.2)

When the pipe connection at changes in direction is made using flexible couplings, an **additional** LATERAL brace must be inserted within 2 ft / 0.6 m of the change of direction, regardless of the length of the adjacent pipe run. If there is no change in pipe diameter at the change of direction, the LATERAL brace can be indifferently located on either of the two runs as long as it is within 2 ft / 0.6 m limit from the change of direction. On the other hand, if there is a change in pipe diameter, then the LATERAL brace must be located on the pipe with the larger diameter.

STEP 4: visualizzazione del dettaglio da approfondire

COME RICHIEDERLO

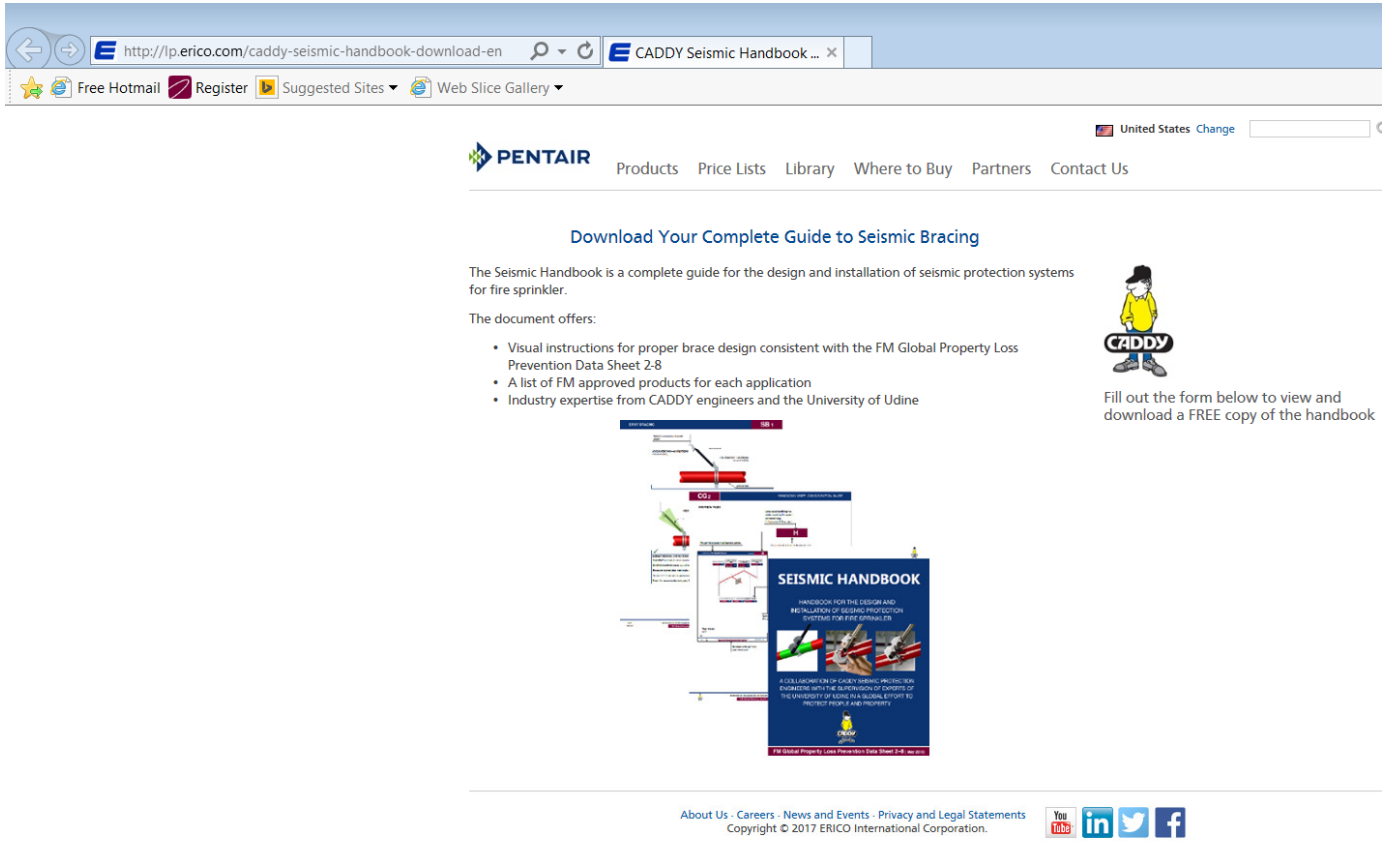
VERSIONE IN ITALIANO



La versione in italiano del CADDY SEISMIC HANDBOOK si scarica al seguente link:
http://lp.erico.com/caddy-seismic-handbook-fm-it

Le copie stampate vanno ordinate

VERSIONE IN INGLESE



La versione in inglese del CADDY SEISMIC HANDBOOK si scarica al seguente link:
http://lp.erico.com/caddy-seismic-handbook-fm-en

Attualmente in fase di traduzione la versione in spagnolo

GRAZIE