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SVCS-100
SEISMIC
SPECIFICATION
APPLICATION
DRAWINGS

SVCSA

SVCSA-110-1 BULLETIN

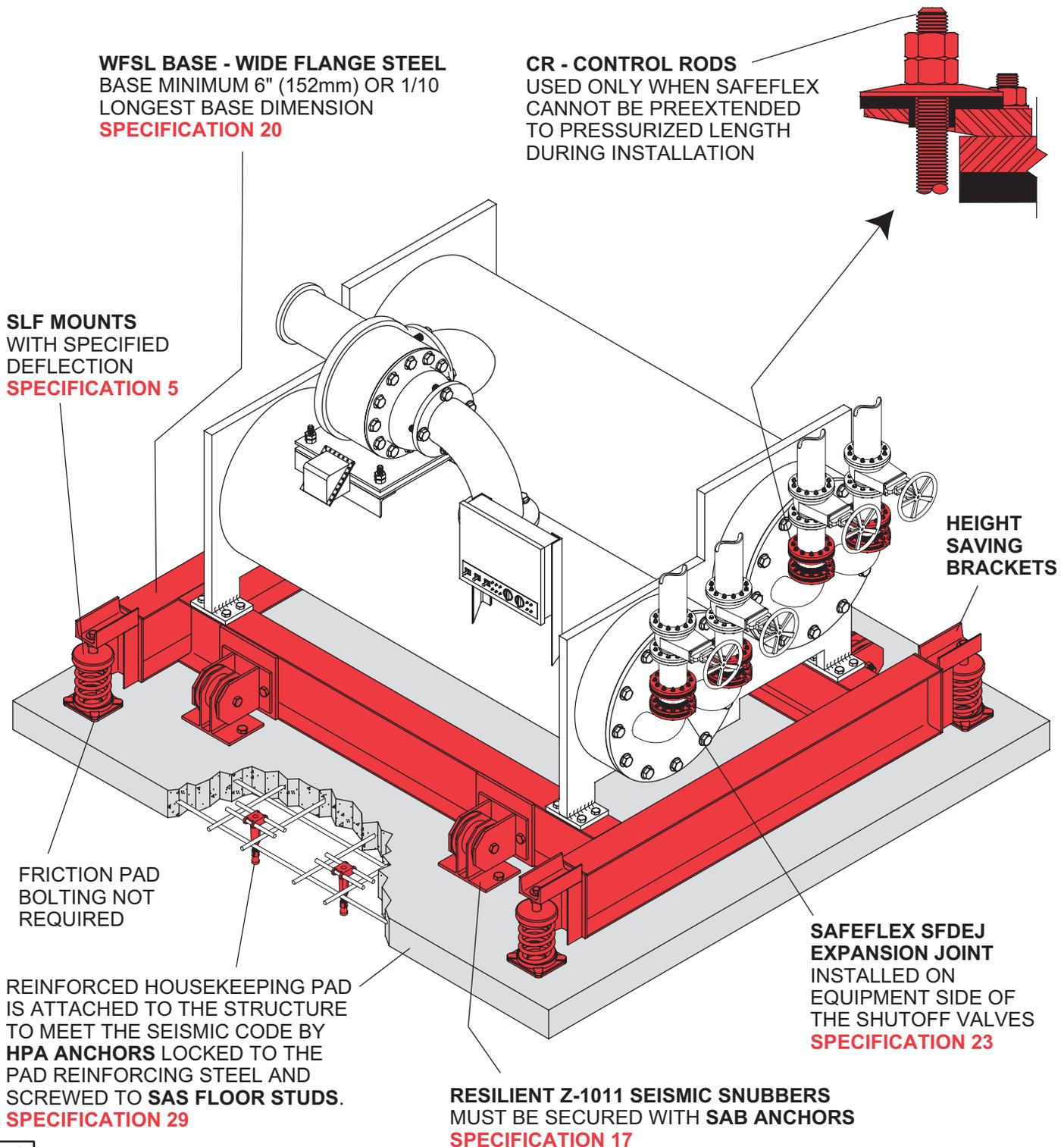
Seismic Applications are basically the same as Non Seismic but complicated by the need to keep equipment in place. Whenever we show our Z-1011 heavily cushioned snubbers, the input to the equipment will not exceed 4 G. All mountings, hanger-cables or snubbers are designed to resist the seismic force in any zone or specification. Many of the mountings

and hangers are the same as in static locations but designated by numbers in the Selection Guide rather than letters to distinguish the two applications. We hope these illustrations will help.

Page	Equipment	Isolation Description
2S	Centrifugal Chiller	Steel Base with Height Saving Brackets, High Deflection Springs and Seismic Restraints
3S	Centrifugal Chiller	Seismically Rated Twin Sphere Air Spring Mounts
4S	Reciprocating Direct Drive Compressor	Height Saving Brackets, High Deflection Springs and Seismic Restraints
5S	Steam Generator	Directly mounted on Restrained Spring Mounts
6S	Double Suction Pump	Concrete Filled Base with Height Saving Brackets, High Deflection Springs and Seismic Restraints
7S	End Suction Pump	Steel Base with Height Saving Brackets, High Deflection Springs and Seismic Restraints
8S	End Suction Pump	Steel Base with Height Saving Brackets, Air Springs and Seismic Restraints
9S	HVAC Unit	Suspended from Hangers and restrained by Cable Assemblies in four corners
10S	HVAC Unit	Steel Base with Height Saving Brackets, High Deflection Springs and Seismic Restraints
11S	HVAC Unit	Directly mounted on 1" Deflection Springs
12S	Vertical Tank Type Compressor	Concrete Filled Base, 1" Deflection Springs and Seismic Restraints
13S	Horizontal Tank Type Compressor	Directly mounted on Restrained Spring Mounts
14S	Direct Drive Blower	Bolted to Steel Base supported by Restrained Spring Mounts
15S	Utility Blower	Directly mounted on Seismically Restrained Mounts
16S	Centrifugal Blower	Concrete Filled Base with Height Saving Brackets, High Deflection Springs and Seismic Snubbers
17S	Centrifugal Blower	Concrete Filled Base with 1" Deflection Springs, Built In Corners and Seismic Snubbers
18S	Axial Blower	Steel Base with Height Saving Brackets, High Deflection Springs and Thrust Restraints.
19S	Axial Blower	Suspended by Hangers, restrained by Cable Assemblies and Thrust Restraints
20S	Large Multi-sectioned Cooling Tower	Steel Base and Beam Supports using Restrained Air Spring Mounts
21S	Large Multi-sectioned Cooling Tower	Steel Base and Beam Supports using High Deflection Steel Spring Restrained Mounts
22S	Packaged HVAC Cooling Tower	Steel Base with Restrained Twin Sphere Air Spring Mounts
23S	Rooftop Packaged HVAC Cooling Tower	Steel Base and Restrained Spring Mounts
24S	Large Transformer	Steel Base supported by Air Spring Mounts and Seismic Restraints

NOTE: All floor mounted systems are on seismically attached Housekeeping Pads.
 All pipelines include Safeflex expansion joints to allow seismic movement.

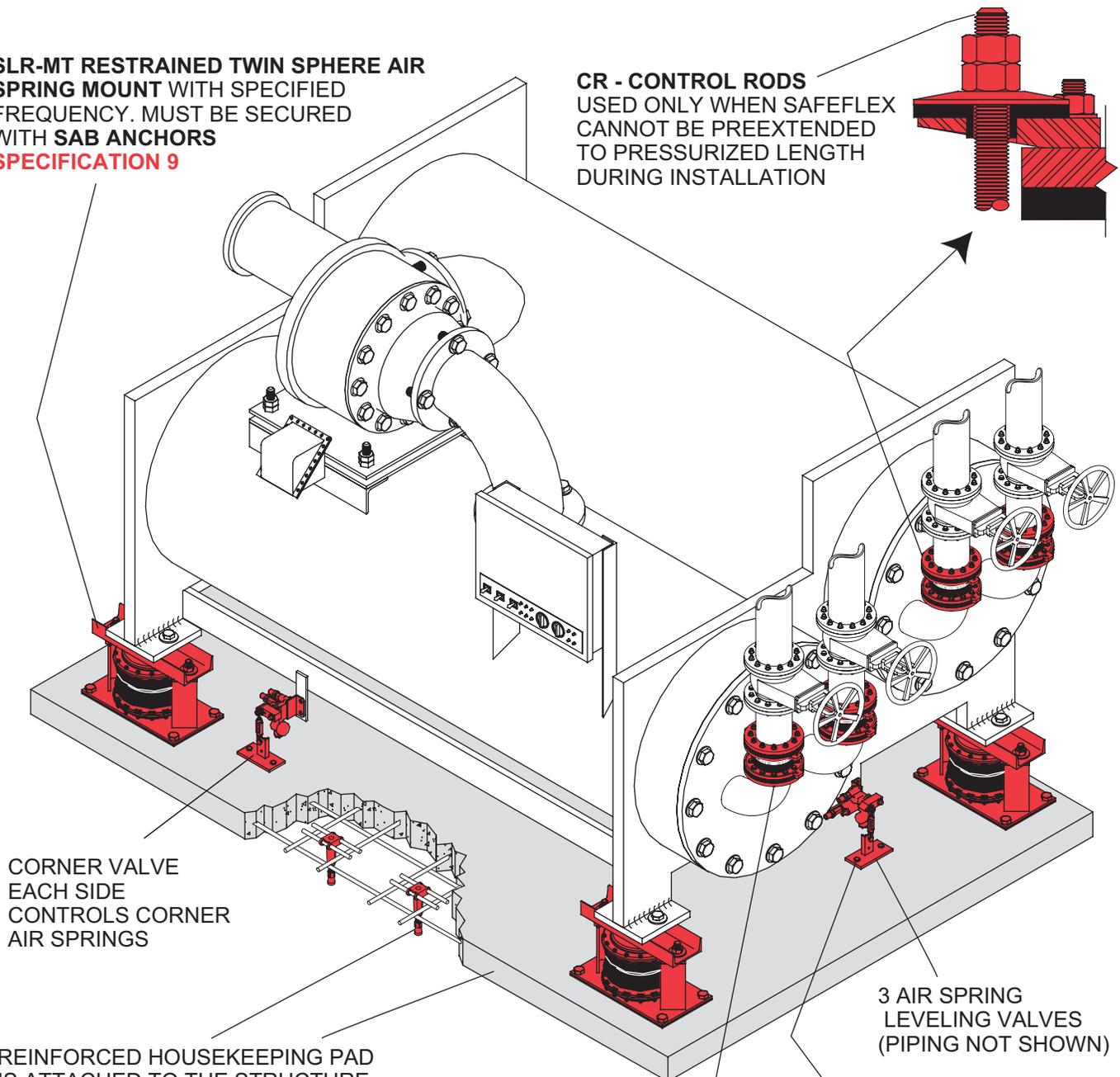
CENTRIFUGAL CHILLER on **WFSL** Base with height saving brackets and high deflection **SLF** Mounts and **Z-1011** Seismic Restraints. Reinforced housekeeping pad secured by **HPA** Anchors. **SAFEFLEX** Expansion Joints are installed in pipelines to reduce blade frequency vibration and noise and to allow for seismic displacement.



CENTRIFUGAL CHILLER directly mounted on seismically rated **SLR-MT** Restrained Twin Sphere Air Spring Mounts. Reinforced housekeeping pad secured by **HPA** Anchors. **SAFEFLEX** Expansion Joints are installed in pipelines to reduce blade frequency vibration and noise and to allow for seismic displacement.

SLR-MT RESTRAINED TWIN SPHERE AIR SPRING MOUNT WITH SPECIFIED FREQUENCY. MUST BE SECURED WITH **SAB** ANCHORS **SPECIFICATION 9**

CR - CONTROL RODS USED ONLY WHEN SAFEFLEX CANNOT BE PREEXTENDED TO PRESSURIZED LENGTH DURING INSTALLATION



CORNER VALVE EACH SIDE CONTROLS CORNER AIR SPRINGS

REINFORCED HOUSEKEEPING PAD IS ATTACHED TO THE STRUCTURE TO MEET THE SEISMIC CODE BY **HPA ANCHORS** LOCKED TO THE PAD REINFORCING STEEL AND SCREWED TO **SAS FLOOR STUDS**. **SPECIFICATION 29**

SAFEFLEX SFDEJ EXPANSION JOINT INSTALLED ON EQUIPMENT SIDE OF THE SHUTOFF VALVES **SPECIFICATION 23**

CONTROLS 2 END AIR SPRINGS

3 AIR SPRING LEVELING VALVES (PIPING NOT SHOWN)

RECIPROCATING DIRECT DRIVE COMPRESSOR with height saving brackets on high deflection **SLF Mounts** and **Z-1011 Seismic Restraints**. Reinforced housekeeping pad secured by **HPA Anchors**.

SLF SPRING MOUNTS
WITH SPECIFIED DEFLECTION
SPECIFICATION 5

**HEIGHT SAVING
BRACKET**

FRICTION PAD
BOLTING NOT
REQUIRED

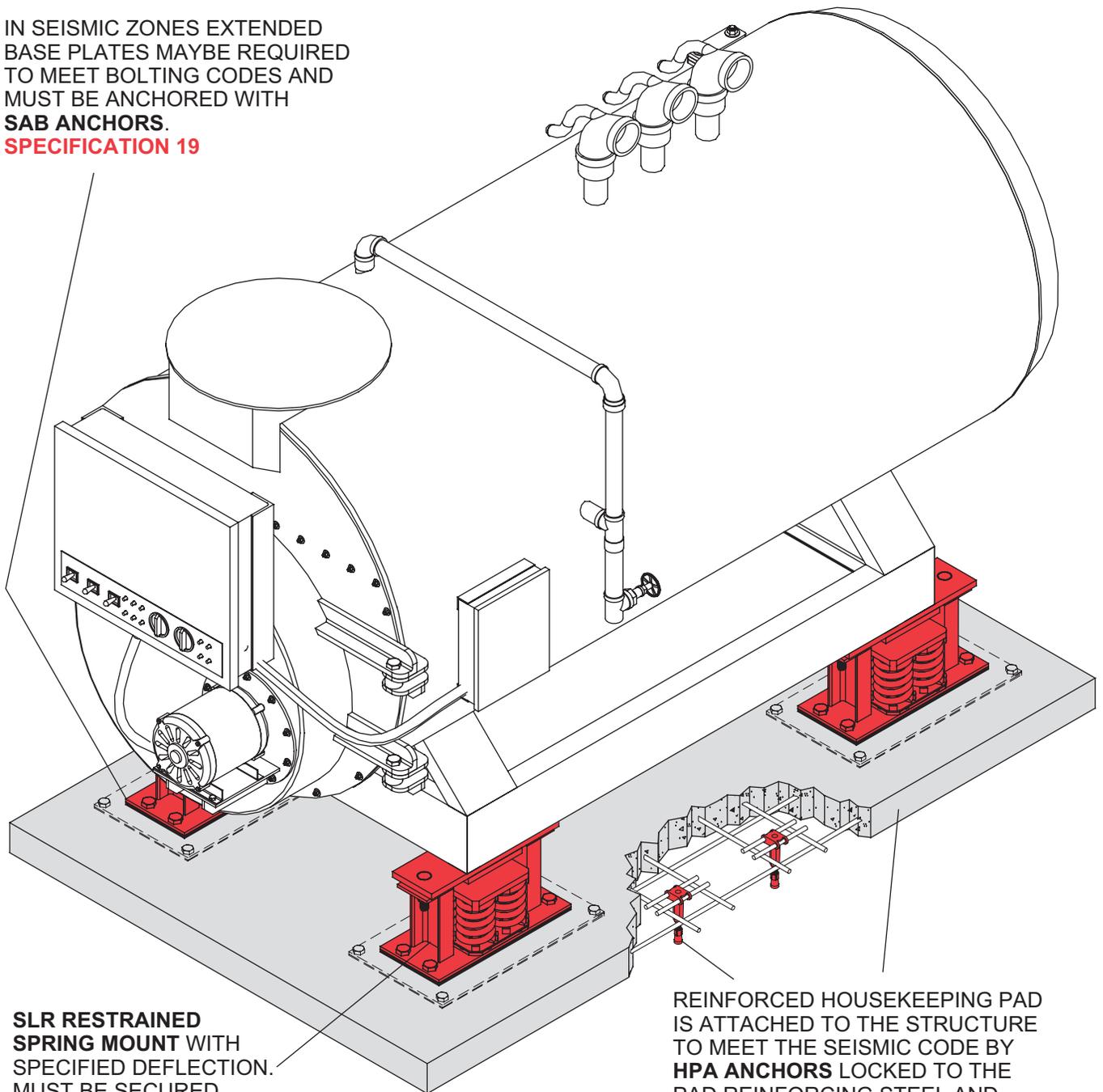
COMPRESSOR MANUFACTURERS
BASE MUST HAVE SUFFICIENT
INTEGRITY TO ACCEPT MOUNTING
AND SNUBBER LOADING

REINFORCED HOUSEKEEPING PAD
IS ATTACHED TO THE STRUCTURE
TO MEET THE SEISMIC CODE BY
HPA ANCHORS LOCKED TO THE
PAD REINFORCING STEEL AND
SCREWED TO **SAS FLOOR STUDS**.
SPECIFICATION 29

**RESILIENT Z-1011
SEISMIC SNUBBERS**
MUST BE SECURED
WITH **SAB ANCHORS**
SPECIFICATION 17

STEAM GENERATOR directly mounted on **SLR** Restrained Spring Mounts. Reinforced housekeeping pad secured by **HPA** Anchors.

IN SEISMIC ZONES EXTENDED
BASE PLATES MAYBE REQUIRED
TO MEET BOLTING CODES AND
MUST BE ANCHORED WITH
SAB ANCHORS.
SPECIFICATION 19



**SLR RESTRAINED
SPRING MOUNT** WITH
SPECIFIED DEFLECTION.
MUST BE SECURED
WITH **SAB ANCHORS**
SPECIFICATION 9

REINFORCED HOUSEKEEPING PAD
IS ATTACHED TO THE STRUCTURE
TO MEET THE SEISMIC CODE BY
HPA ANCHORS LOCKED TO THE
PAD REINFORCING STEEL AND
SCREWED TO **SAS FLOOR STUDS**.
SPECIFICATION 29

DOUBLE SUCTION PUMP on concrete filled **BMK** Base with height saving brackets, high deflection **SLF** Spring Mounts and **Z-1011** Seismic Restraints. Reinforced housekeeping pad secured by **HPA** Anchors. **SAFEFLEX** Expansion Joints are installed in pipelines to reduce blade frequency vibration and noise and to allow for seismic displacement.

CR - CONTROL RODS
USED ONLY WHEN SAFEFLEX
CANNOT BE PREEXTENDED
TO PRESSURIZED LENGTH
DURING INSTALLATION

SAFEFLEX SFDEJ EXPANSION JOINT
INSTALLED ON EQUIPMENT SIDE OF
THE SHUTOFF VALVES
SPECIFICATION 23

FILL PUMP BASE
WITH GROUT IF
CALLED FOR BY
PUMP MANUFACTURER

RESILIENT Z-1011
SEISMIC SNUBBERS
MUST BE SECURED
WITH **SAB ANCHORS**
SPECIFICATION 17

HEIGHT SAVING
BRACKETS

FRICTION PAD
BOLTING NOT
REQUIRED

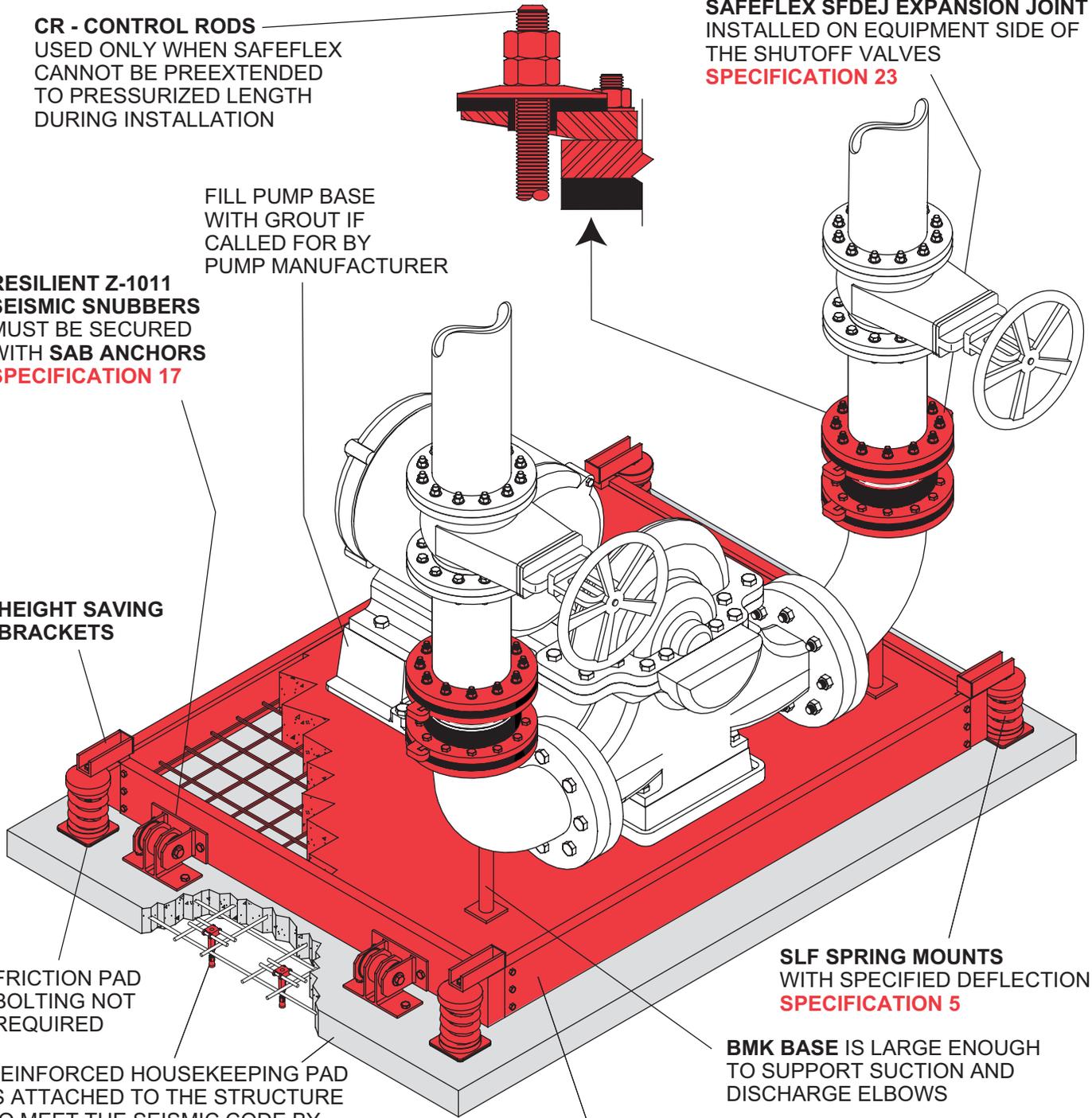
SLF SPRING MOUNTS
WITH SPECIFIED DEFLECTION
SPECIFICATION 5

BMK BASE IS LARGE ENOUGH
TO SUPPORT SUCTION AND
DISCHARGE ELBOWS

REINFORCED HOUSEKEEPING PAD
IS ATTACHED TO THE STRUCTURE
TO MEET THE SEISMIC CODE BY
HPA ANCHORS LOCKED TO THE
PAD REINFORCING STEEL AND
SCREWED TO **SAS FLOOR STUDS**.

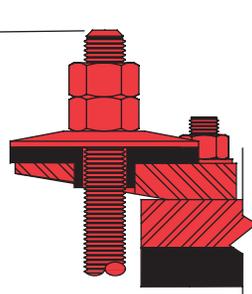
BMK FLOATING CONCRETE BASE
MINIMUM 6" (150mm) OR
1/12 LONGEST BASE DIMENSION
SPECIFICATION 21

6S SPECIFICATION 29



END SUCTION PUMP on **WFSL** Base with height saving brackets, high deflection **SLF** Mounts and **Z-1011** Seismic Restraints. Reinforced housekeeping pad secured by **HPA** Anchors. **SAFEFLEX** Expansion Joints are installed in pipelines to reduce blade frequency vibration and noise and to allow for seismic displacement.

CR - CONTROL RODS
USED ONLY WHEN SAFEFLEX CANNOT BE PREEXTENDED TO PRESSURIZED LENGTH DURING INSTALLATION



WFSL BASE - WIDE FLANGE STEEL
BASE MINIMUM 6" (152mm) OR 1/10 LONGEST BASE DIMENSION
SPECIFICATION 20

HEIGHT SAVING BRACKETS

SAFEFLEX SFDEJ EXPANSION JOINT
INSTALLED ON EQUIPMENT SIDE OF THE SHUTOFF VALVES
SPECIFICATION 23

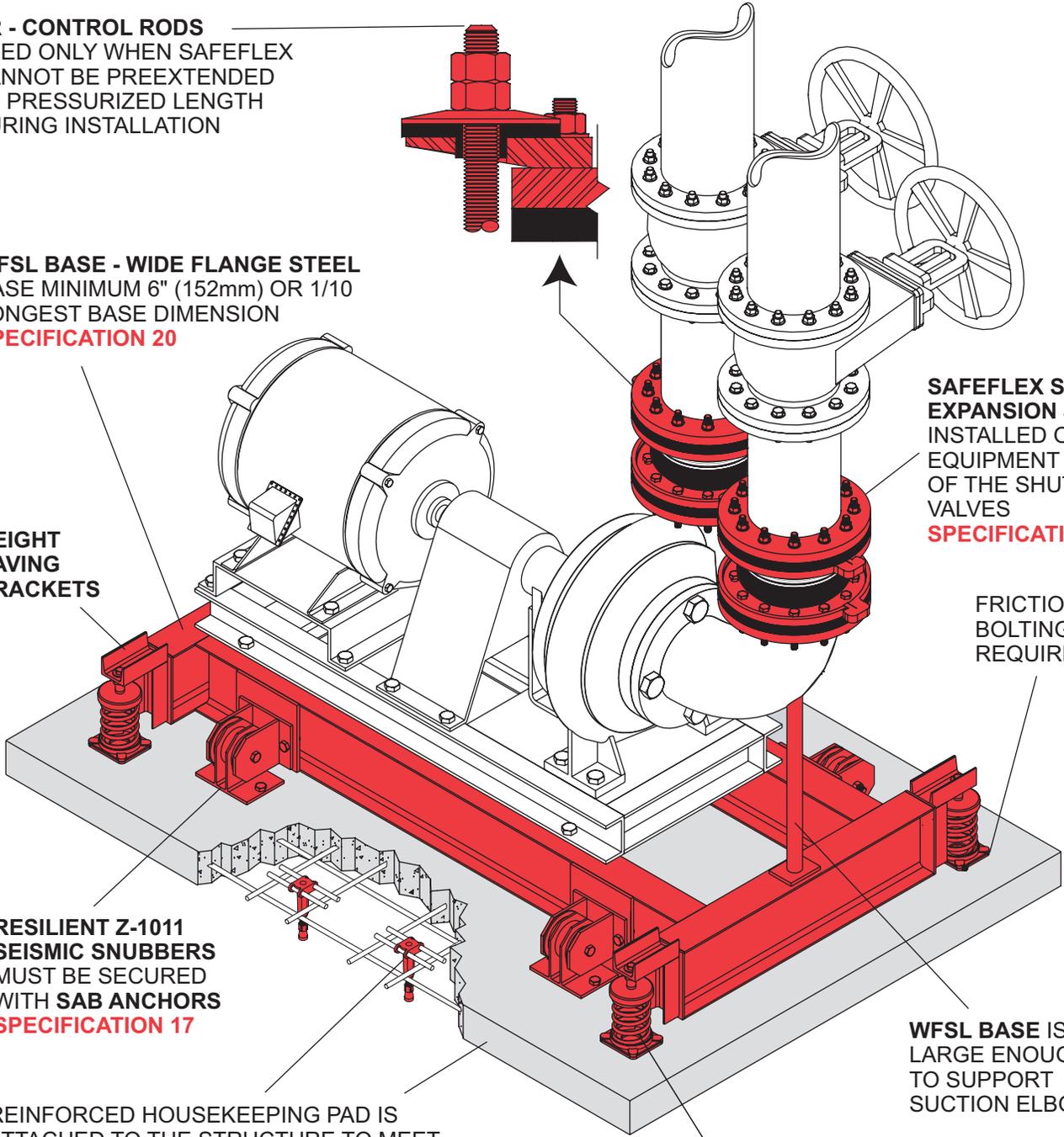
FRICTION PAD BOLTING NOT REQUIRED

RESILIENT Z-1011 SEISMIC SNUBBERS
MUST BE SECURED WITH **SAB** ANCHORS
SPECIFICATION 17

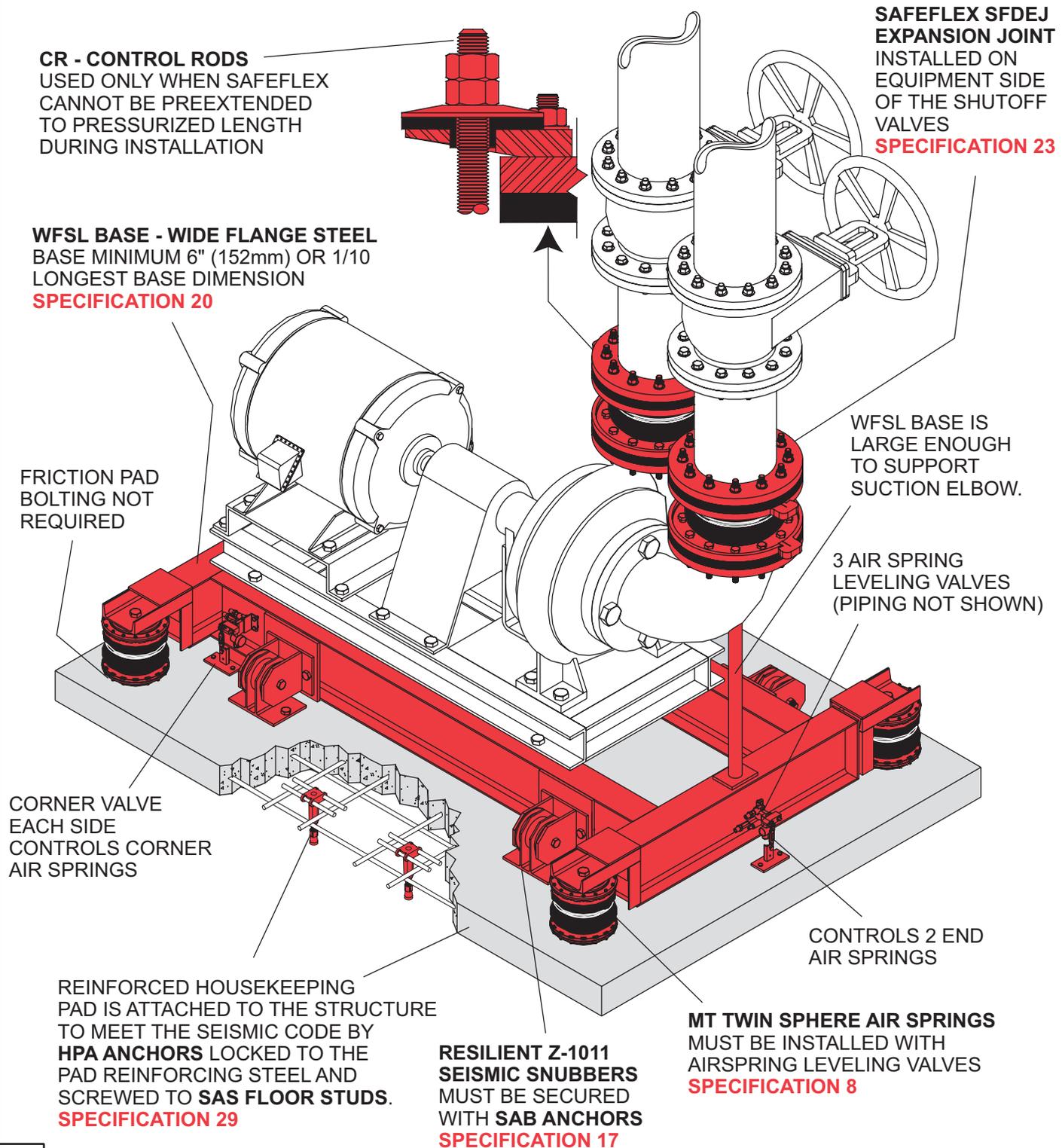
REINFORCED HOUSEKEEPING PAD IS ATTACHED TO THE STRUCTURE TO MEET THE SEISMIC CODE BY **HPA ANCHORS** LOCKED TO THE PAD REINFORCING STEEL AND SCREWED TO **SAS FLOOR STUDS**.
SPECIFICATION 29

WFSL BASE IS LARGE ENOUGH TO SUPPORT SUCTION ELBOW

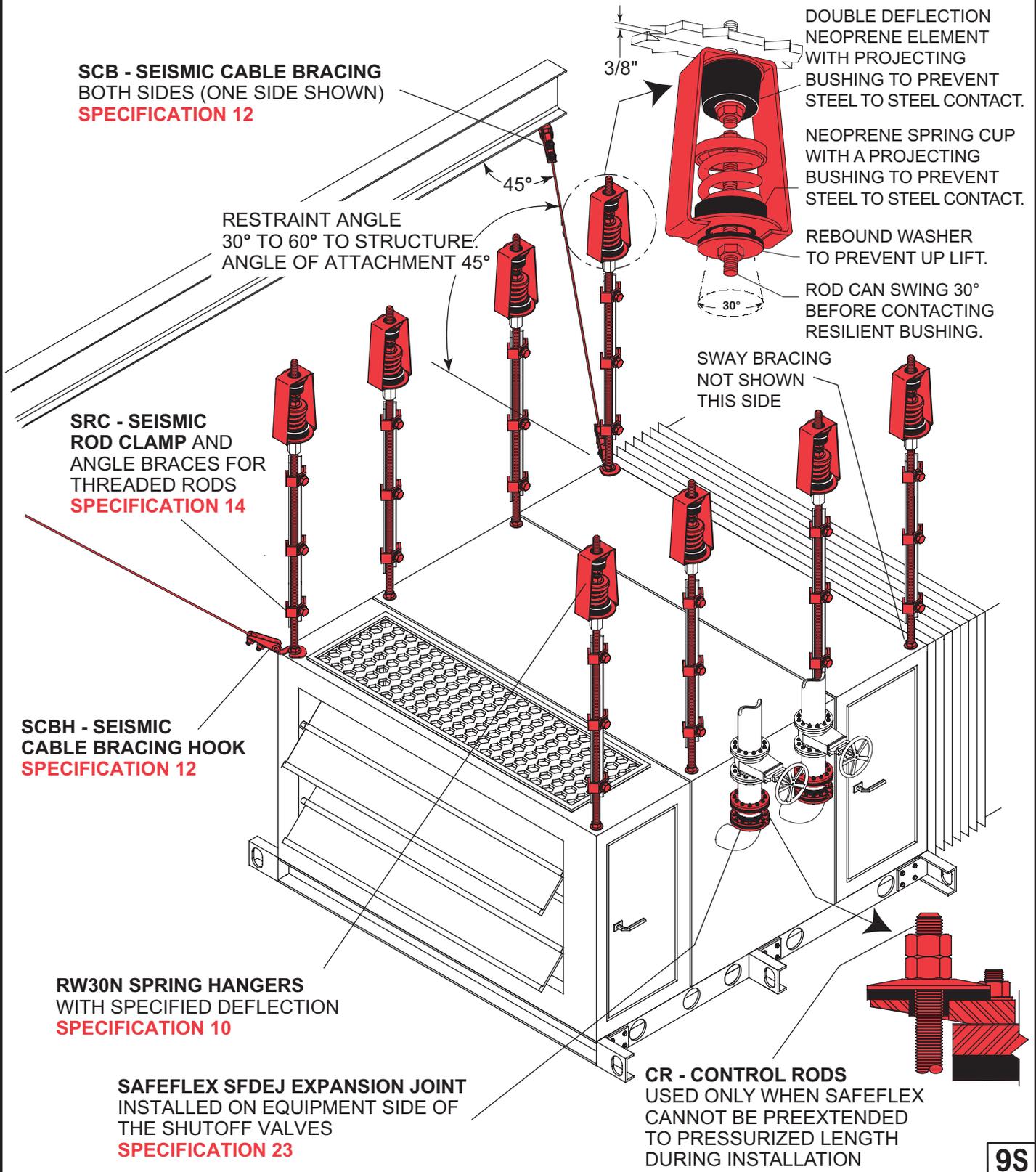
SLF SPRING MOUNTS
WITH SPECIFIED DEFLECTION
SPECIFICATION 5



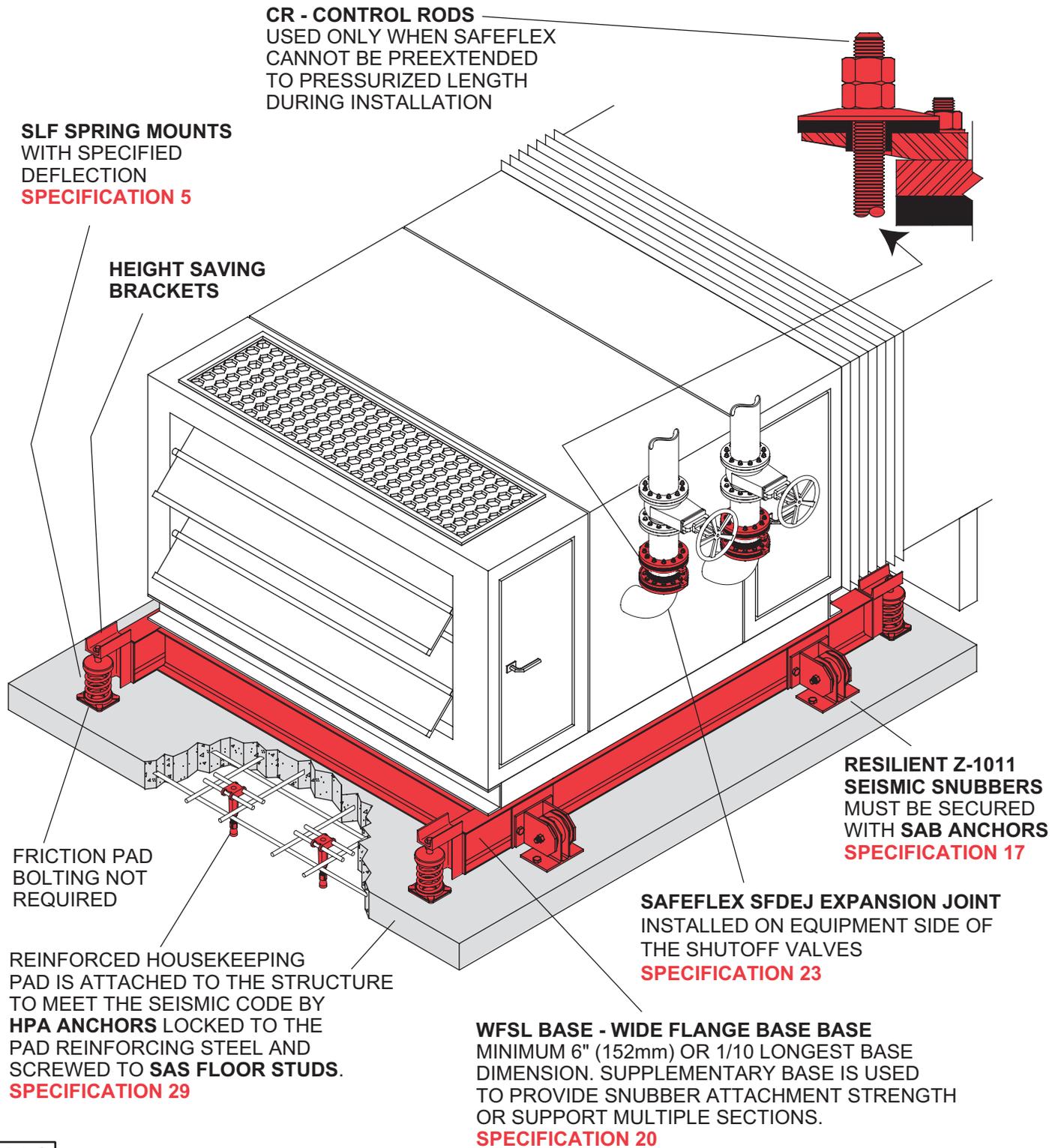
END SUCTION PUMP on **WFSL** Base with height saving brackets, **MT** Air Springs and **Z-1011** Seismic Restraints. Reinforced housekeeping pad secured by **HPA** Anchors. **SAFEFLEX** Expansion Joints are installed in pipelines to reduce blade frequency vibration and noise and to allow for seismic displacement.



HVAC UNIT suspended from **RW30N Hangers** and restrained by **SCB Cable Assemblies** in four corners. **SAFEX** Expansion Joints are installed in pipelines to reduce blade frequency vibration and noise and to allow for seismic displacement.



HVAC UNIT on steel base with height saving brackets, high deflection **SLF Spring Mounts** and **Z-1011 Seismic Restraints**. Reinforced housekeeping pad secured by **HPA Anchors**. **SAFEFLEX** Expansion Joints are installed in pipelines to reduce blade frequency vibration and noise and to allow for seismic displacement.



CR - CONTROL RODS
USED ONLY WHEN SAFEFLEX
CANNOT BE PREEXTENDED
TO PRESSURIZED LENGTH
DURING INSTALLATION

SLF SPRING MOUNTS
WITH SPECIFIED
DEFLECTION
SPECIFICATION 5

**HEIGHT SAVING
BRACKETS**

FRICTION PAD
BOLTING NOT
REQUIRED

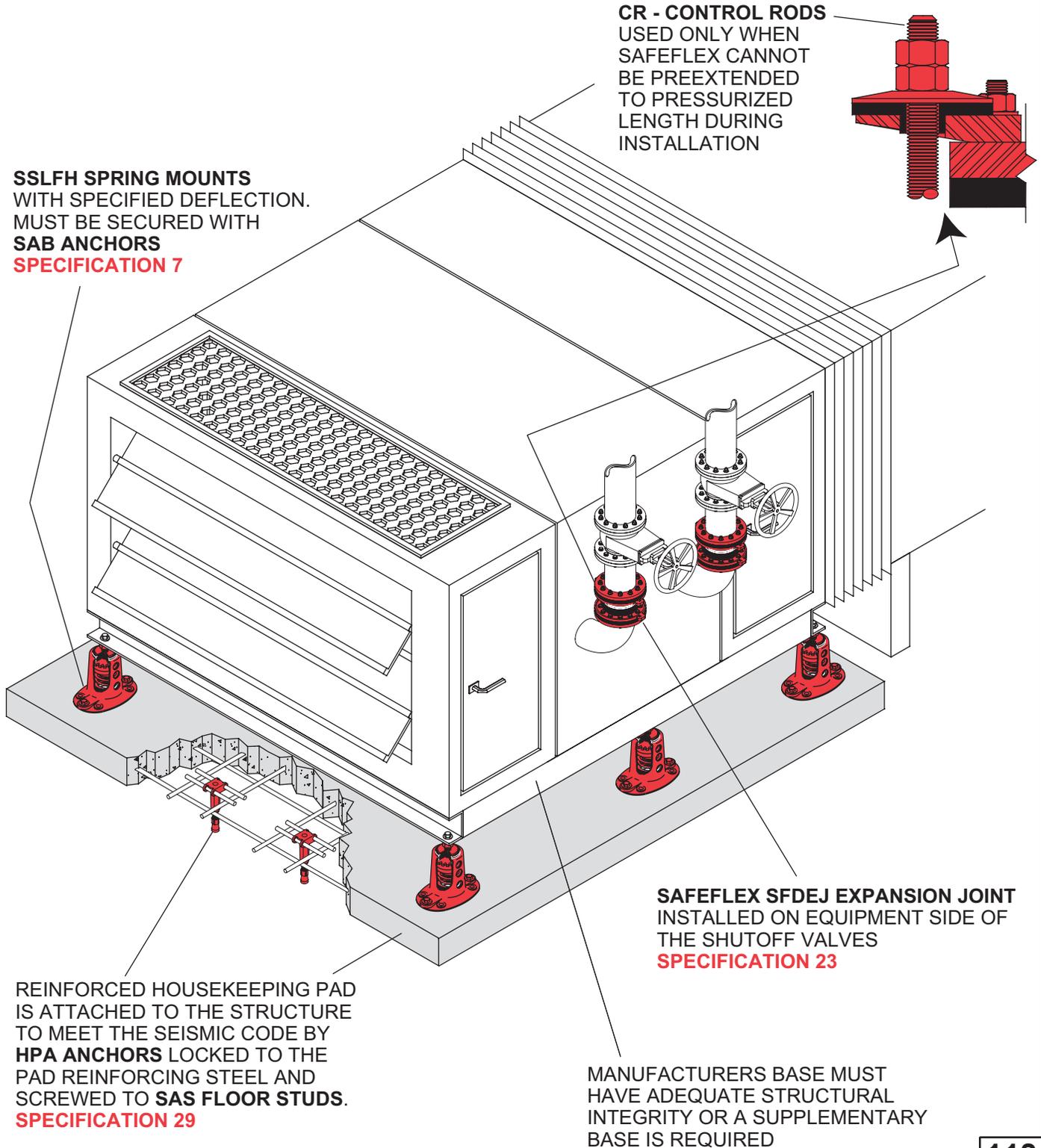
REINFORCED HOUSEKEEPING
PAD IS ATTACHED TO THE STRUCTURE
TO MEET THE SEISMIC CODE BY
HPA ANCHORS LOCKED TO THE
PAD REINFORCING STEEL AND
SCREWED TO **SAS FLOOR STUDS**.
SPECIFICATION 29

**RESILIENT Z-1011
SEISMIC SNUBBERS**
MUST BE SECURED
WITH **SAB ANCHORS**
SPECIFICATION 17

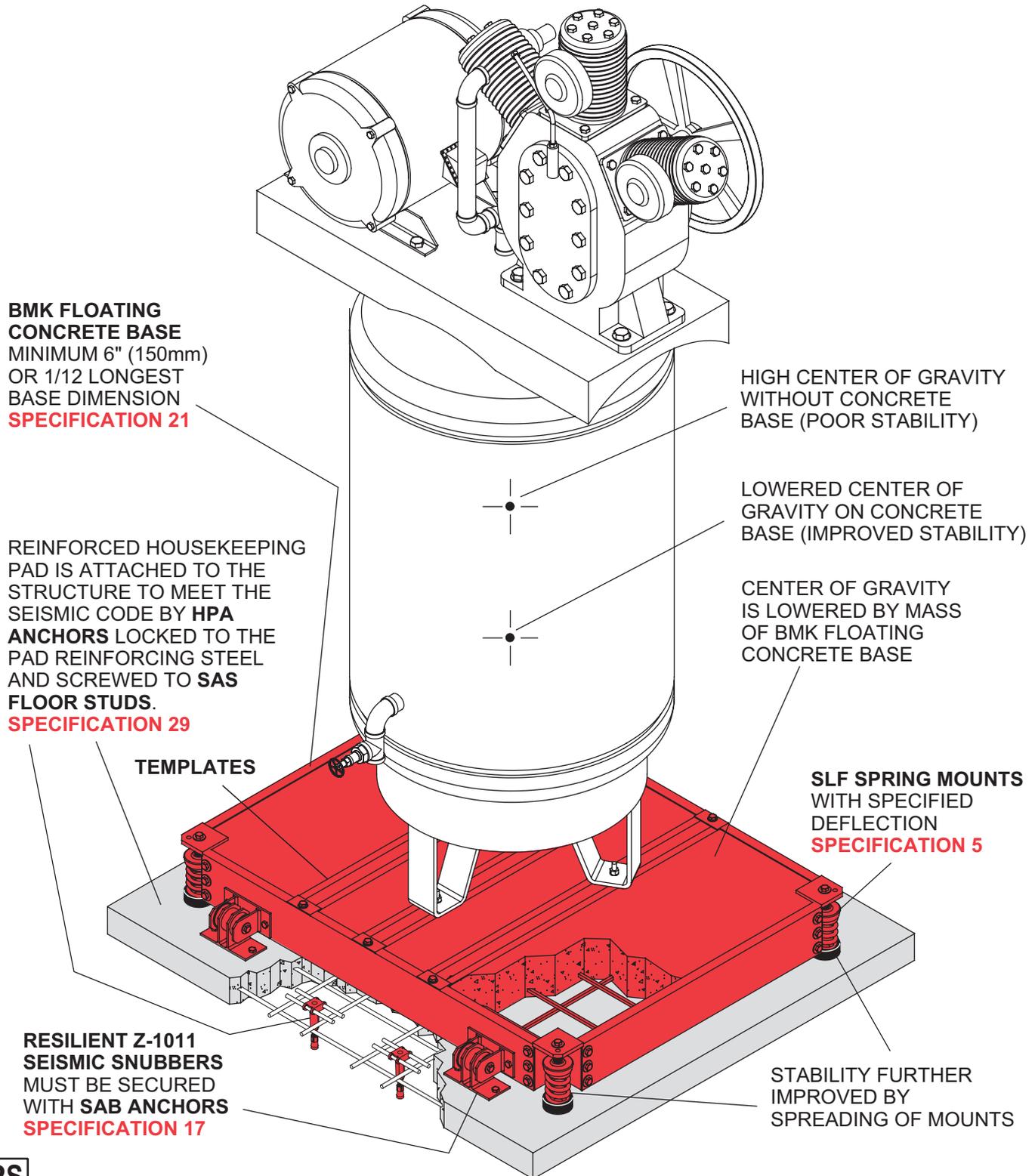
SAFEFLEX SFDEJ EXPANSION JOINT
INSTALLED ON EQUIPMENT SIDE OF
THE SHUTOFF VALVES
SPECIFICATION 23

WFSL BASE - WIDE FLANGE BASE
MINIMUM 6" (152mm) OR 1/10 LONGEST BASE
DIMENSION. SUPPLEMENTARY BASE IS USED
TO PROVIDE SNUBBER ATTACHMENT STRENGTH
OR SUPPORT MULTIPLE SECTIONS.
SPECIFICATION 20

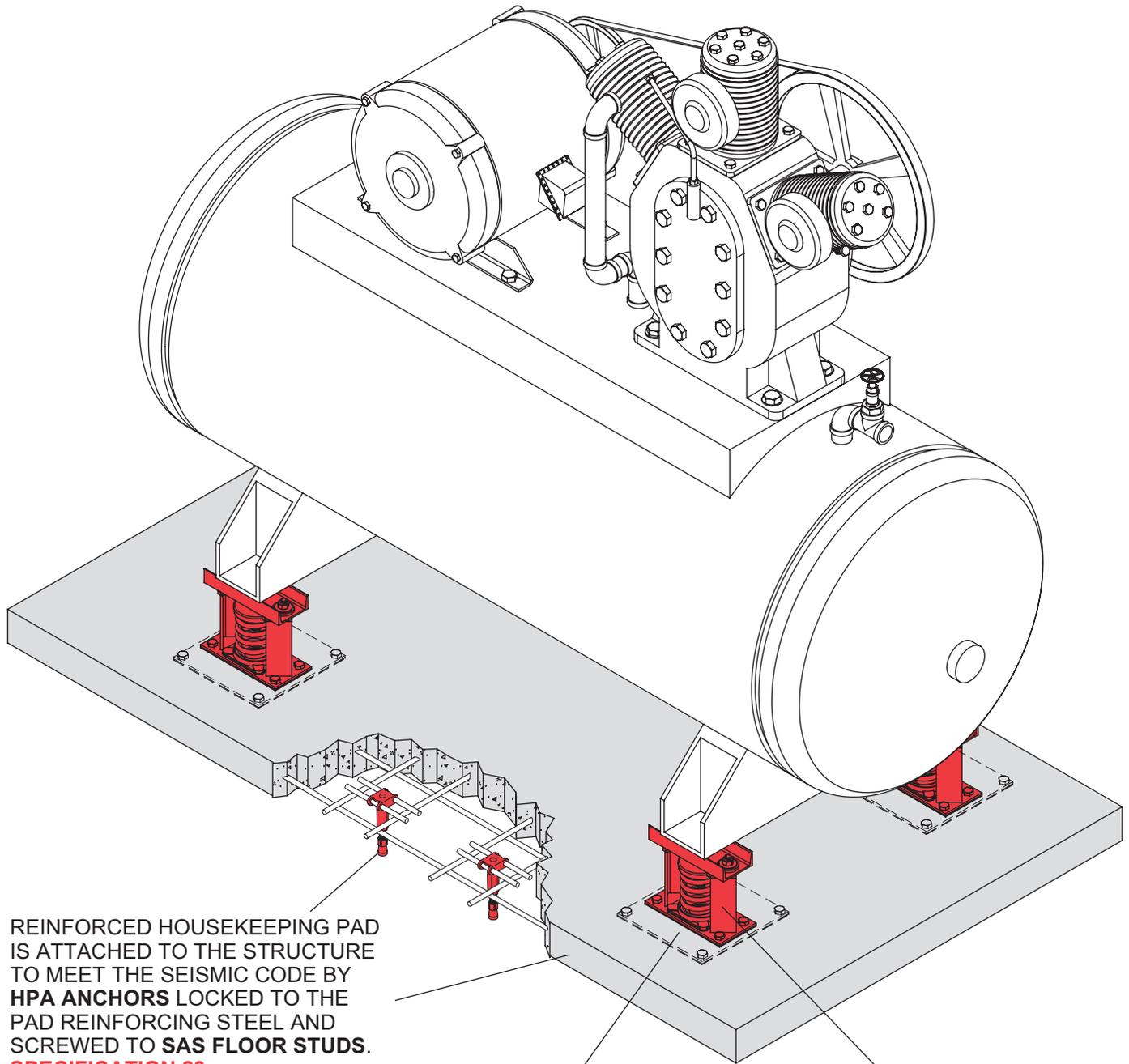
HVAC UNIT directly mounted on 1" deflection **SSLFH** Spring Mounts. Reinforced housekeeping pad secured by **HPA** Anchors. **SAFEFLEX** Expansion Joints are installed in pipelines to reduce blade frequency vibration and noise and to allow for seismic displacement.



VERTICAL TANK TYPE COMPRESSOR directly mounted on **BMK Concrete Filled Base**, 1" deflection **SLF Mounts** and **Z-1011 Seismic Restraints**. Reinforced housekeeping pad secured by **HPA Anchors**.



HORIZONTAL TANK TYPE COMPRESSOR
 directly mounted on **SLR Restrained Spring Mounts**.
 Reinforced housekeeping pad secured by **HPA Anchors**.



REINFORCED HOUSEKEEPING PAD IS ATTACHED TO THE STRUCTURE TO MEET THE SEISMIC CODE BY **HPA ANCHORS** LOCKED TO THE PAD REINFORCING STEEL AND SCREWED TO **SAS FLOOR STUDS**.
SPECIFICATION 29

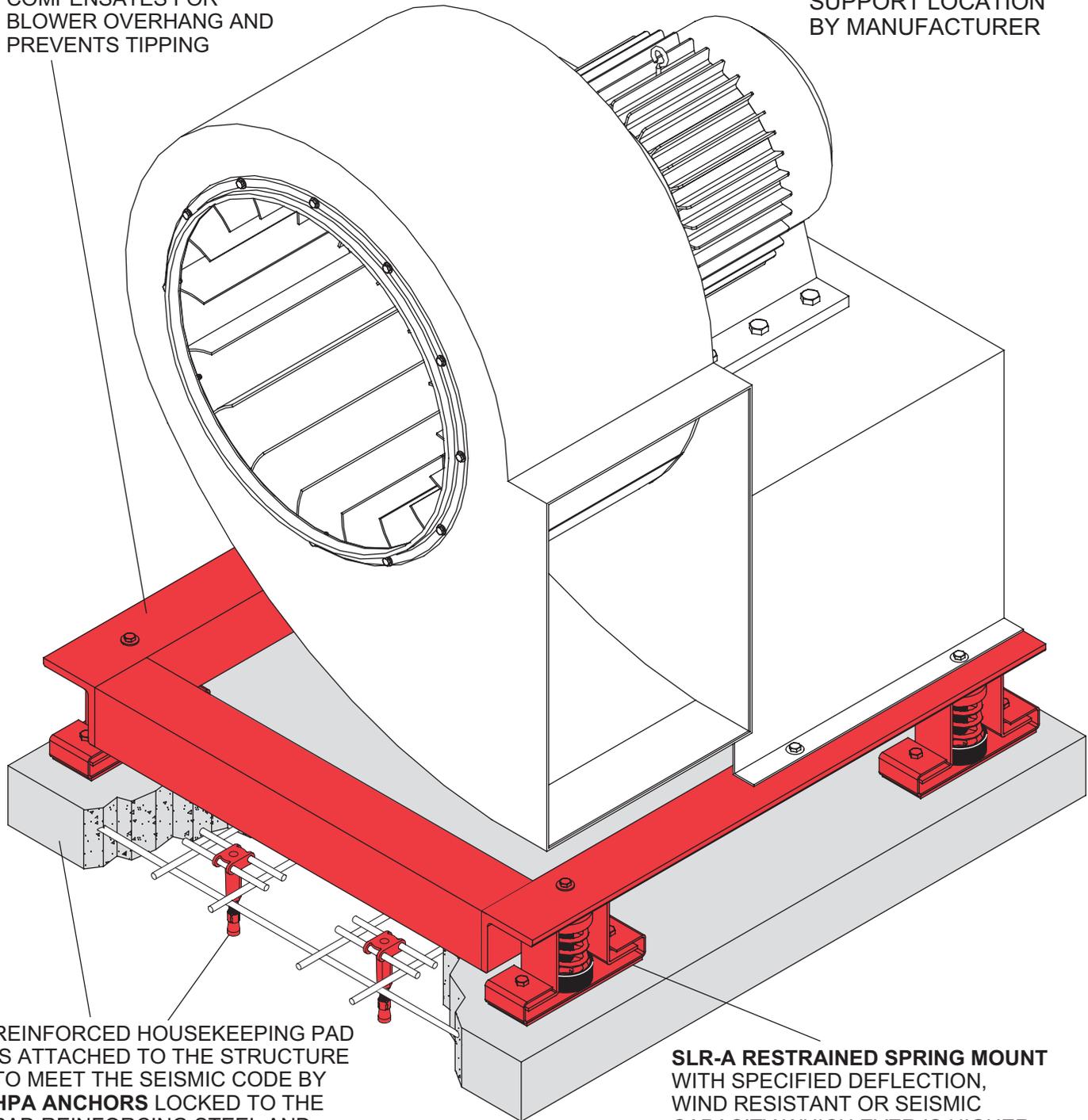
IN SEISMIC ZONES EXTENDED BASE PLATES MAYBE REQUIRED TO MEET BOLTING CODES AND MUST BE ANCHORED WITH **SAB ANCHORS**.
SPECIFICATION 19

SLR RESTRAINED SPRING MOUNT WITH SPECIFIED FREQUENCY. MUST BE SECURED WITH **SAB ANCHORS**
SPECIFICATION 9

DIRECT DRIVE BLOWER bolted to **MS-SLR Steel Angle Base** supported by **SLR-A Restrained Spring Mounts**. Reinforced housekeeping pad secured by **HPA Anchors**.

MS-SLR - STEEL ANGLE BASE
COMPENSATES FOR
BLOWER OVERHANG AND
PREVENTS TIPPING

**NOTE: NO OUTBOARD
SUPPORT LOCATION
BY MANUFACTURER**



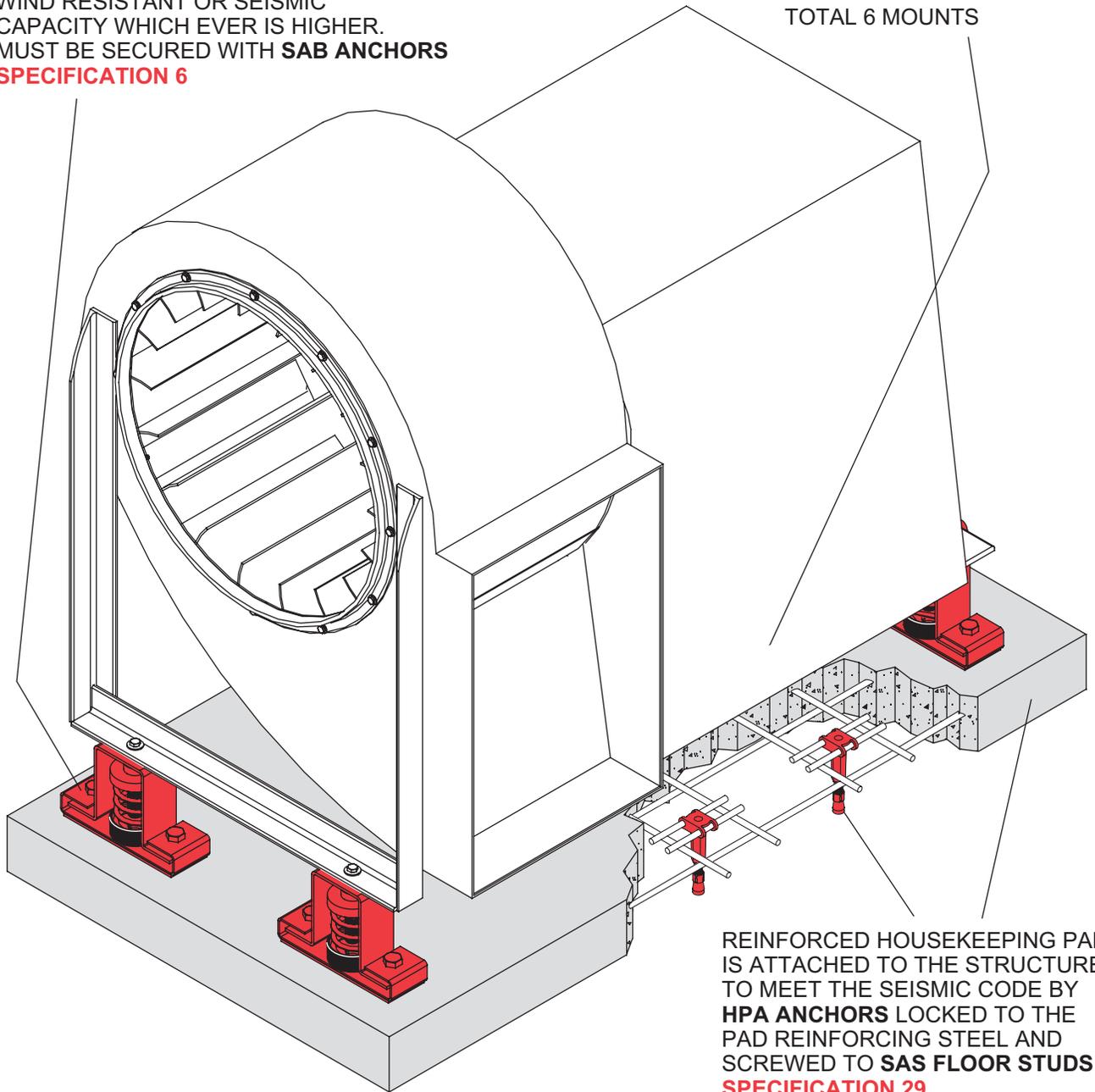
REINFORCED HOUSEKEEPING PAD IS ATTACHED TO THE STRUCTURE TO MEET THE SEISMIC CODE BY **HPA ANCHORS** LOCKED TO THE PAD REINFORCING STEEL AND SCREWED TO **SAS FLOOR STUDS**.
SPECIFICATION 29

SLR-A RESTRAINED SPRING MOUNT WITH SPECIFIED DEFLECTION, WIND RESISTANT OR SEISMIC CAPACITY WHICH EVER IS HIGHER. MUST BE SECURED WITH **SAB ANCHORS**
SPECIFICATION 6

UTILITY BLOWER directly mounted on seismically restrained **SLR-A Mounts**. Reinforced housekeeping pad secured by **HPA Anchors**. Also useful for non seismic outdoor windy locations.

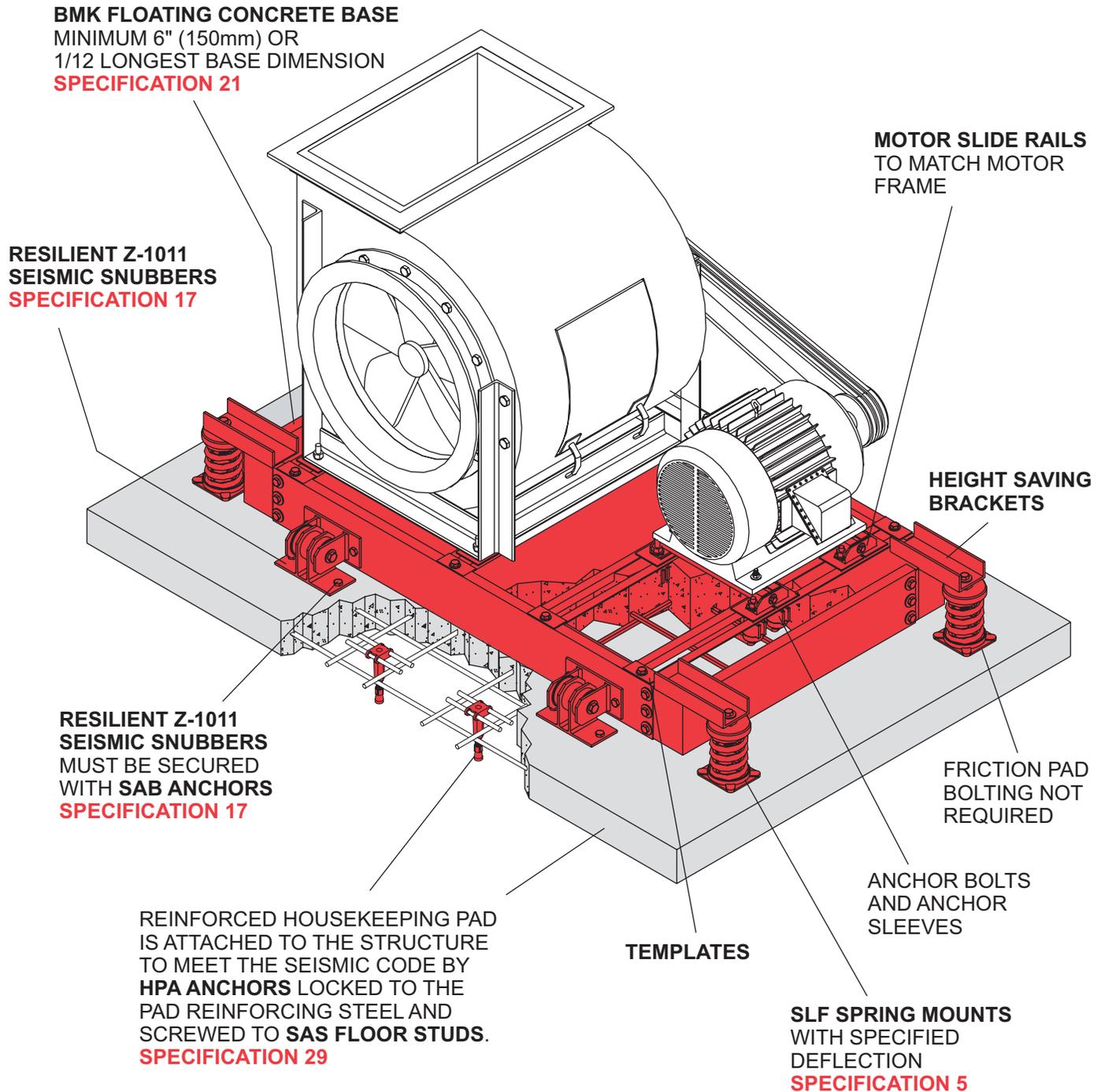
SLR-A SPRING MOUNT WITH SPECIFIED DEFLECTION, WIND RESISTANT OR SEISMIC CAPACITY WHICH EVER IS HIGHER. MUST BE SECURED WITH **SAB ANCHORS**
SPECIFICATION 6

NOTE: MOUNT LOCATION OMITTED BECAUSE OF SECTION TOTAL 6 MOUNTS



REINFORCED HOUSEKEEPING PAD IS ATTACHED TO THE STRUCTURE TO MEET THE SEISMIC CODE BY **HPA ANCHORS** LOCKED TO THE PAD REINFORCING STEEL AND SCREWED TO **SAS FLOOR STUDS**.
SPECIFICATION 29

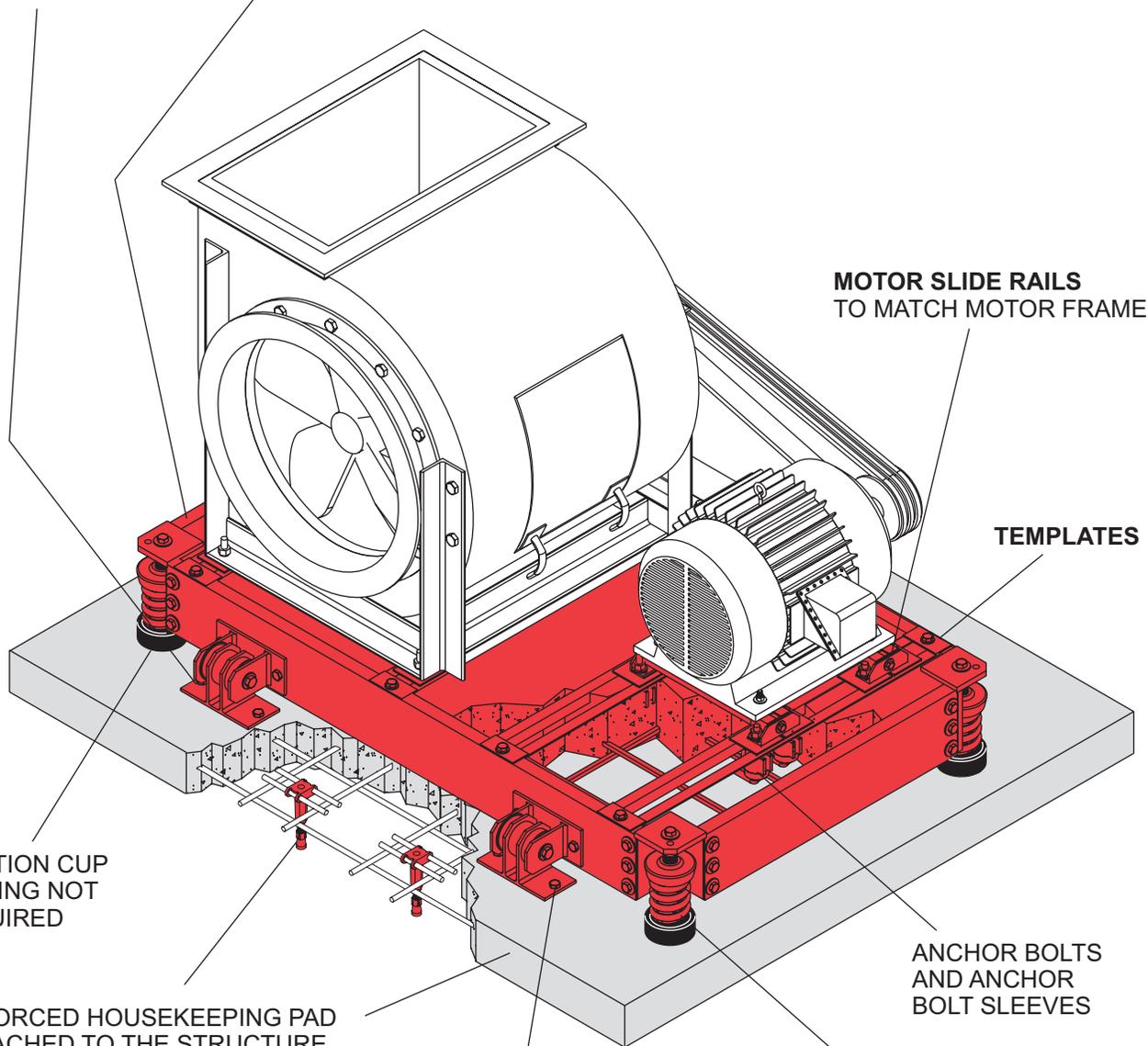
CENTRIFUGAL BLOWER on concrete filled **BMK** Base with height saving brackets, high deflection **SLF** Spring Mounts and **Z-1011** Seismic Snubbers. Reinforced housekeeping pad secured by **HPA** Anchors.



CENTRIFUGAL BLOWER on concrete filled **BMK** Base with built in corners, 1" deflection **SLF** Spring Mounts and **Z-1011** Seismic Restraints. Reinforced housekeeping pad secured by **HPA** Anchors.

RESILIENT Z-1011
SEISMIC SNUBBERS
SPECIFICATION 17

BMK FLOATING CONCRETE BASE
MINIMUM 6" (150mm) OR
1/12 LONGEST BASE DIMENSION
SPECIFICATION 21



MOTOR SLIDE RAILS
TO MATCH MOTOR FRAME

TEMPLATES

FRICION CUP
BOLTING NOT
REQUIRED

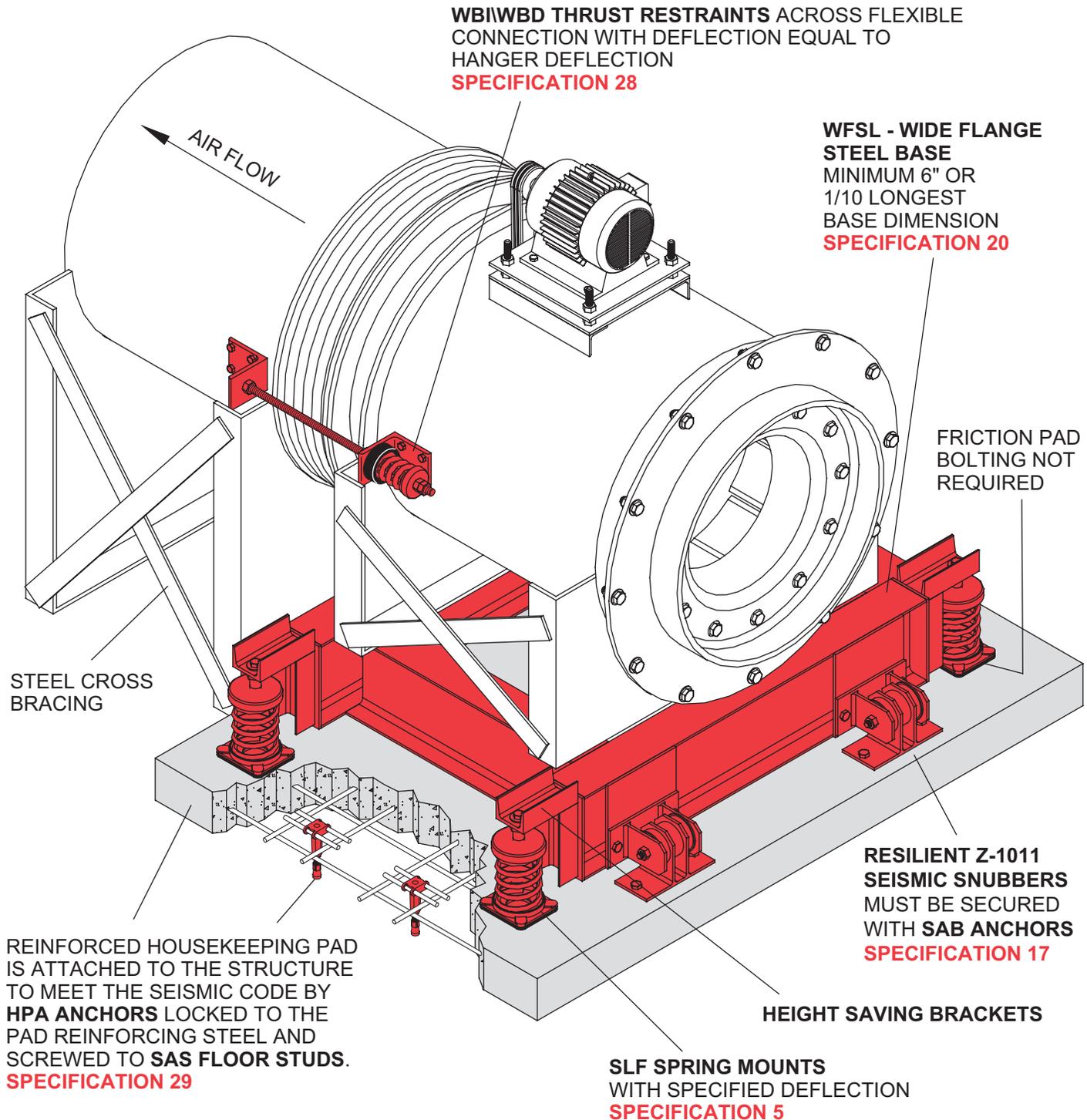
REINFORCED HOUSEKEEPING PAD
IS ATTACHED TO THE STRUCTURE
TO MEET THE SEISMIC CODE BY
HPA ANCHORS LOCKED TO THE
PAD REINFORCING STEEL AND
SCREWED TO **SAS FLOOR STUDS**.
SPECIFICATION 29

RESILIENT Z-1011
SEISMIC SNUBBERS
MUST BE SECURED
WITH **SAB ANCHORS**
SPECIFICATION 17

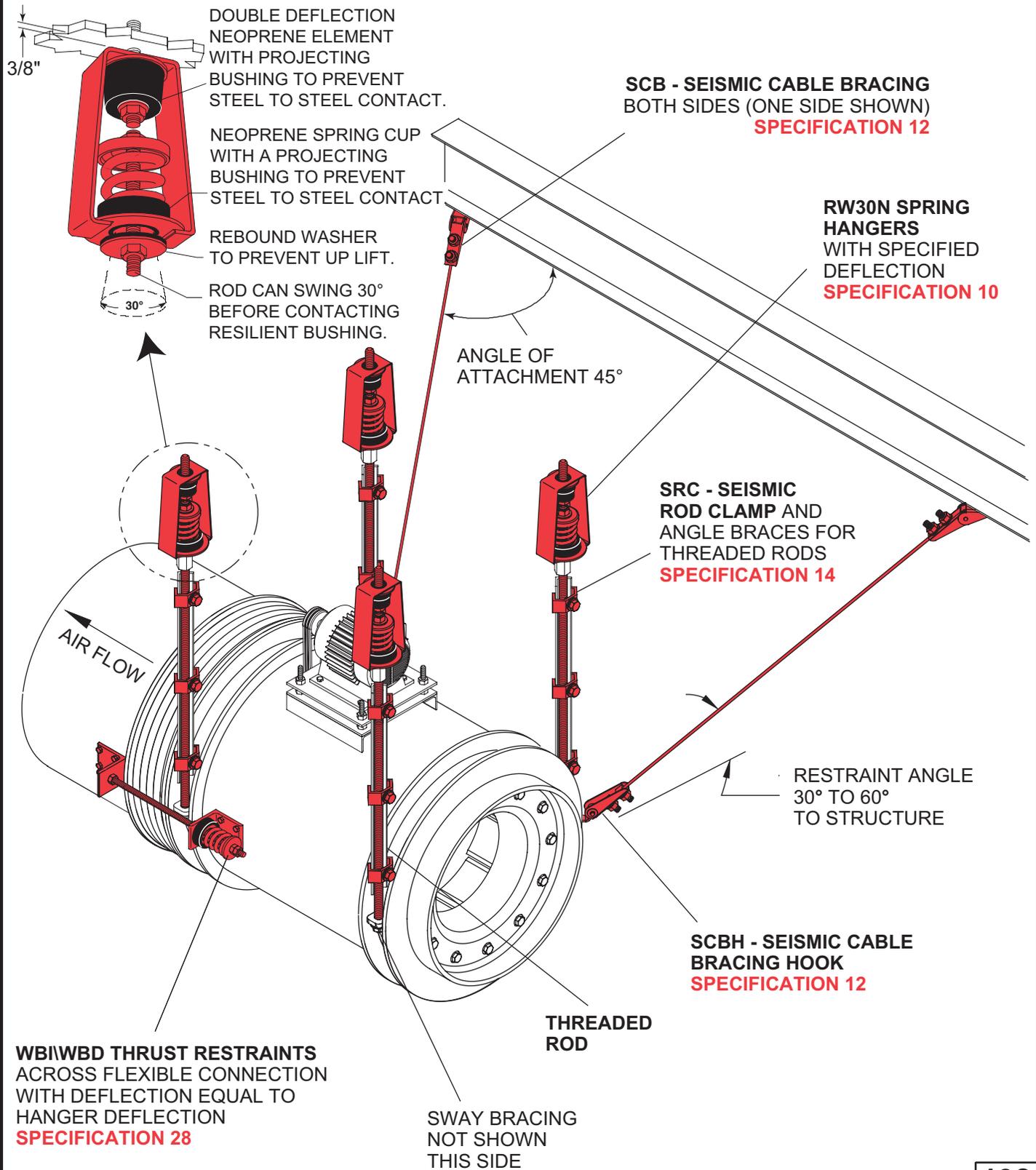
ANCHOR BOLTS
AND **ANCHOR**
BOLT SLEEVES

SLF SPRING MOUNTS
WITH SPECIFIED DEFLECTION
SPECIFICATION 5

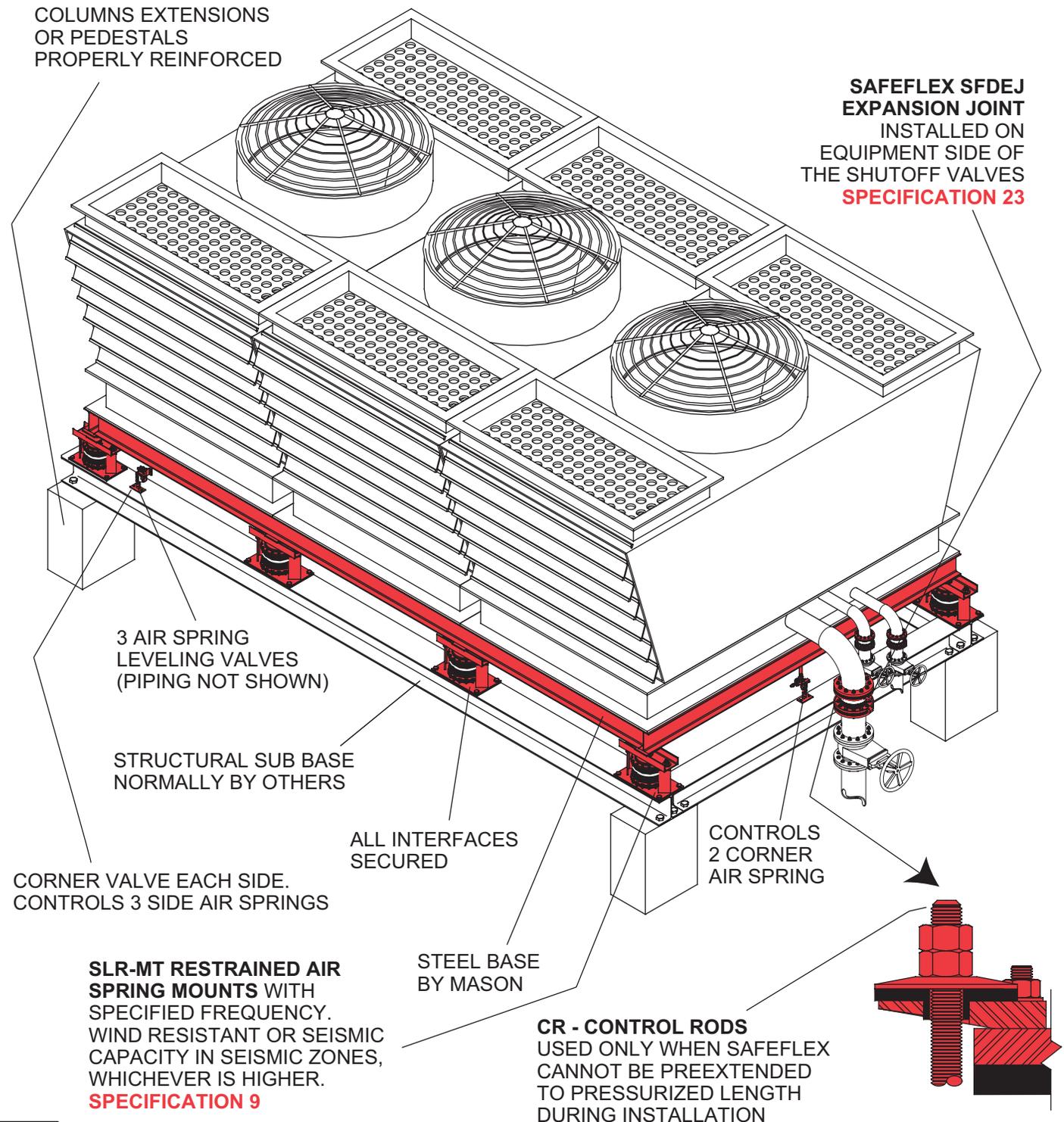
AXIAL BLOWER with **WBI/WBD** Thrust Restraints mounted on **WFSL** Base with height saving brackets, high deflection **SLF** Mounts and **Z-1011** Seismic Restraints. Reinforced housekeeping pad secured by **HPA** Anchors.



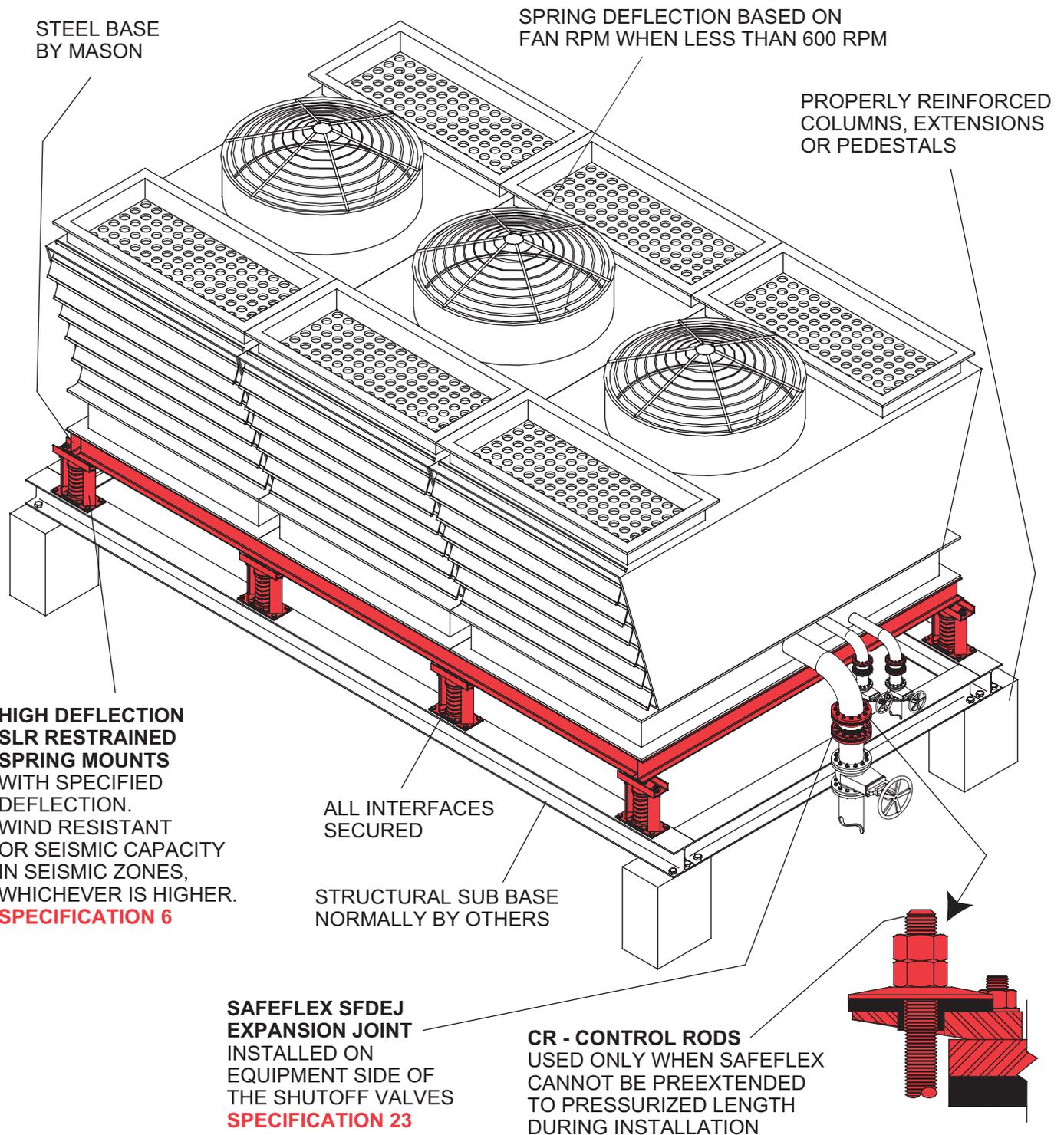
AXIAL BLOWER with WBI/WBD Thrust Restraints suspended by RW30N Hangers and restrained by SCB Cable Assemblies



LARGE MULTI-SECTIONED COOLING TOWER secured to steel base and beam supports using **SLR-MT Restrained Air Spring Mounts**. **SAFEFLEX** Expansion Joints are installed in pipelines to reduce blade frequency vibration and noise and to allow for seismic displacement.



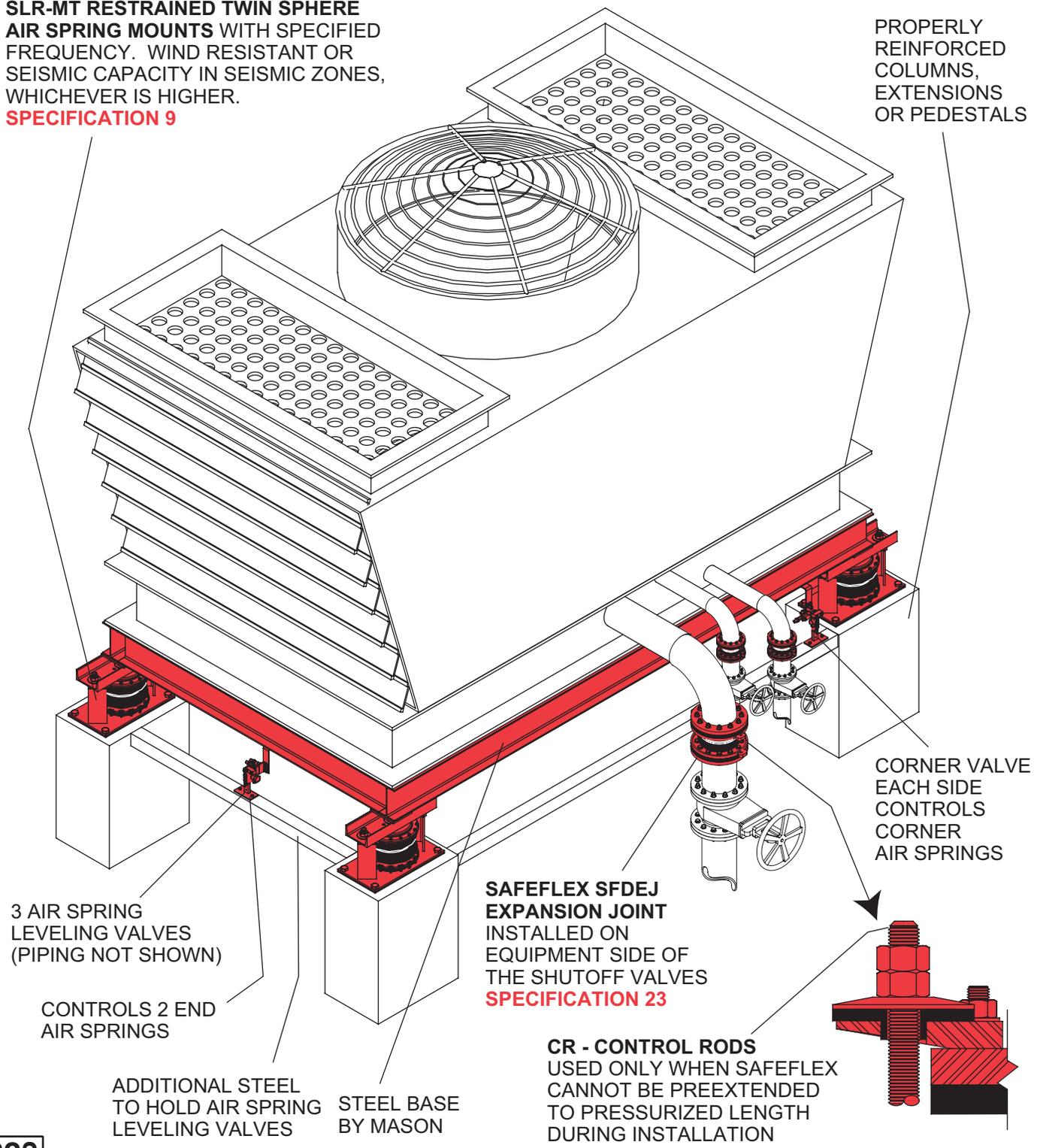
LARGE MULTI-SECTIONED COOLING TOWER secured to steel base and beam supports using high deflection **SLR Restrained Spring Mounts**. **SAFEFLEX** Expansion Joints are installed in pipelines to reduce blade frequency vibration and noise and to allow for seismic displacement.



PACKAGED HVAC COOLING TOWER on steel base with **SLR-MT Restrained Twin Sphere Air Spring Mounts**. **SAFEFLEX** Expansion Joints are installed in pipelines to reduce blade frequency vibration and noise and to allow for seismic displacement.

SLR-MT RESTRAINED TWIN SPHERE AIR SPRING MOUNTS WITH SPECIFIED FREQUENCY. WIND RESISTANT OR SEISMIC CAPACITY IN SEISMIC ZONES, WHICHEVER IS HIGHER. **SPECIFICATION 9**

PROPERLY REINFORCED COLUMNS, EXTENSIONS OR PEDESTALS



3 AIR SPRING LEVELING VALVES (PIPING NOT SHOWN)

CONTROLS 2 END AIR SPRINGS

ADDITIONAL STEEL TO HOLD AIR SPRING LEVELING VALVES

STEEL BASE BY MASON

SAFEFLEX SFDEJ EXPANSION JOINT INSTALLED ON EQUIPMENT SIDE OF THE SHUTOFF VALVES **SPECIFICATION 23**

CR - CONTROL RODS USED ONLY WHEN SAFEFLEX CANNOT BE PREEXTENDED TO PRESSURIZED LENGTH DURING INSTALLATION

CORNER VALVE EACH SIDE CONTROLS CORNER AIR SPRINGS

ROOFTOP PACKAGED HVAC COOLING TOWER

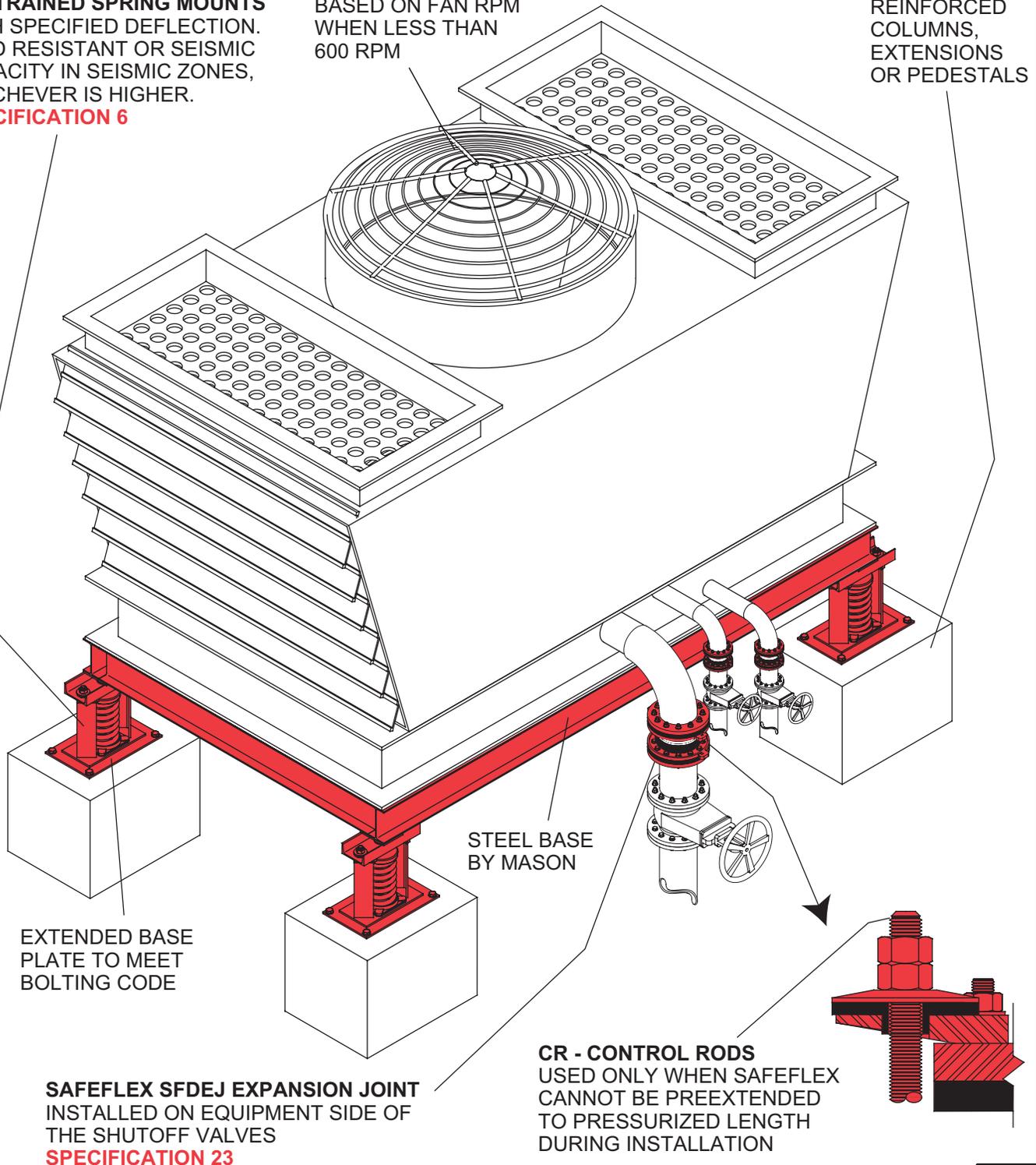
on steel base and **SLR** Restrained Spring Mounts.

SAFEFLEX Expansion Joints are installed in pipelines to reduce blade frequency vibration and noise and to allow for seismic displacement.

HIGH DEFLECTION SLR RESTRAINED SPRING MOUNTS WITH SPECIFIED DEFLECTION. WIND RESISTANT OR SEISMIC CAPACITY IN SEISMIC ZONES, WHICHEVER IS HIGHER.
SPECIFICATION 6

SPRING DEFLECTION BASED ON FAN RPM WHEN LESS THAN 600 RPM

PROPERLY REINFORCED COLUMNS, EXTENSIONS OR PEDESTALS



LARGE TRANSFORMER mounted on a **WFSL** or **KSL** Base supported by **MT Air Spring Mounts** and **Z-1011 Seismic Restraints**. Reinforced housekeeping pad secured by **HPA Anchors**. Schematic Only—Final installation to meet all safety regulations as well as electrical and other codes.

WFSL BASE - WIDE FLANGE STEEL
 BASE MINIMUM 6" (152mm) OR 1/10
 LONGEST BASE DIMENSION
SPECIFICATION 20

CORNER VALVE
 EACH SIDE
 CONTROLS
 CORNER
 AIR SPRINGS

FRICITION PAD
 BOLTING NOT
 REQUIRED

3 AIR SPRING
 LEVELING VALVES
 (PIPING NOT SHOWN)

CONTROLS 2 END
 AIR SPRINGS

**RESILIENT Z-1011
 SEISMIC SNUBBERS**
 MUST BE SECURED
 WITH **SAB ANCHORS**
SPECIFICATION 17

MT TWIN SPHERE AIR SPRINGS
 MUST BE INSTALLED WITH AIR
 SPRING LEVELING VALVES
SPECIFICATION 8

REINFORCED HOUSEKEEPING PAD
 IS ATTACHED TO THE STRUCTURE
 TO MEET THE SEISMIC CODE BY
HPA ANCHORS LOCKED TO THE
 PAD REINFORCING STEEL AND
 SCREWED TO **SAS FLOOR STUDS**.
SPECIFICATION 29

KSL BASE - STEEL CHANNEL
 REINFORCED AND FILLED WITH
CONCRETE. BASE MINIMUM 6" (152mm)
 OR 1/12 LONGEST BASE DIMENSION
SPECIFICATION 21

ALL OTHER CALLOUTS ABOVE APPLY HERE