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Earthquake
Fire Sprinkler Damage

FIRE INSPECTOR BART MEINHARDT
ANCHORAGE FIRE DEPARTMENT
907-267-4992
BART.MEINHARDT@ANCHORAGEAK.GOV
Effective Codes

2012 INTERNATIONAL FIRE CODE
2012 INTERNATIONAL BUILDING CODE
2010 NFPA 13 STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS
Estimated 200+ Fire Sprinkler System Damaged
6 inch underground watermain bent

Code required 4 inch annular space in place
Cracking of fitting
1 inch pipe snapped at the fitting
Ceiling movement against the fire sprinkler head
Sprinkler head broken off by hitting structural member.
Concealed sprinkler head damage
Failed Hangers
Sprinkler head sheared off
Ceiling failure causing fire sprinkler damage
Flexible sprinkler heads when installed properly had no damage.
What worked

Flexible sprinkler drops
Earthquake bracing the past 15 years
Branch line restraints
What did not work

Sprinkler piping requiring no branch line restraints when installed on rods 6 inch or less.
Thin wall threaded pipe
Long drops from the roof to lower ceilings
Cloud ceilings
Areas of improvement.

USGS Earthquake site updates for Anchorage. Currently all areas of Anchorage at a Ss1.5 value. Branch line restraint Cp in NFPA 13 is .70. 2018 Anchorage code adoption is going to required a Cp of .72 minimum, which will allow for closer branch line restraint requirements.

Branch lines on less than 6 inch rods need to be evaluated in the future, because of damage from structural members.

Cloud ceilings and sprinkler piping need to be tied together to move a one.
Questions and Comments