



ADOPTION OF 2009 CONSTRUCTION CODES

CURRENT ADOPTED CODES

- **2006 INTERNATIONAL BUILDING CODE (IBC)**
- **2006 INTERNATIONAL RESIDENTIAL CODE (IRC)**
- **2006 INTERNATIONAL FIRE CODE (IFC)**
- **2006 UNIFORM PLUMBING CODE (UPC)**
- **2006 UNIFORM MECHANICAL CODE (UMC)**
- **2005 NATIONAL ELECTRICAL CODE (NEC)**
- **2009 INTERNATIONAL ENERGY
CONSERVATION CODE (IECC)**
- **2006 SOUTHERN NEVADA POOL CODE**

National Code Development Organizations

- International Code Council (ICC)
(Building, Residential, Energy Codes)
- National Fire Protection Association (NFPA)
(Fire and Energy Codes)
- International Association of Plumbing and Mechanical Officials (IAPMO)
(Plumbing and Mechanical Codes)

WHY ADOPT UPDATED CODES?

- They provide a higher degree of protection from natural hazards (earthquakes, floods and high winds)
- They contain state-of-the-art fire provisions addressing improved fire and life safety, energy conservation and accessibility
- They facilitate the use of new state-of-the art materials



SOUTHERN NEVADA BUILDING OFFICIALS (SNBO)

- **CITY OF BOULDER CITY**
- **CLARK COUNTY**
- **CITY OF HENDERSON**
- **CITY OF LAS VEGAS**
- **CITY OF MESQUITE**
- **CITY OF NORTH LAS VEGAS**
- **PAHRUMP REGIONAL PLANNING DISTRICT**
- **CLARK COUNTY SCHOOL DISTRICT**

SNBO 2009 CODE ADOPTION PROCESS

- **BUILDING OFFICIALS MET WITH INDUSTRY REPRESENTATIVES TO DISCUSS ADOPTION OF THE 2009 CODES**
- **BUILDING OFFICIALS REFERRED CODES TO ONE OF 7 STANDING TECHNICAL COMMITTEES THAT REVIEWED THE CODES AND DRAFTED LOCAL AMENDMENTS**
- **BUILDING OFFICIALS REVIEWED, REVISED AND APPROVED THE DRAFT LOCAL AMENDMENTS**

SNBO 2009 CODE ADOPTION PROCESS (Continued)

- **DRAFT AMENDMENTS WERE DISTRIBUTED TO INDUSTRY ASSOCIATIONS AND POSTED ON THE WEB**
- **INDUSTRY MEETINGS WERE HELD ON EACH CODE TO RECEIVE ADDITIONAL INPUT AND FEEDBACK ON CODES AND THE PROPOSED AMENDMENTS**
- **BASED UPON INDUSTRY FEEDBACK AND INPUT, BUILDING OFFICIALS FINALIZED THE SOUTHERN NEVADA AMENDMENTS**

SNBO 2009 CODE ADOPTION PROCESS (Continued)

- **ADOPTING ORDINANCES ARE NOW BEING PRESENTED TO ELECTED OFFICIALS FOR ADOPTION**

EFFECTIVE DATE

JULY 5, 2011*

- * 2009 SOUTHERN NEVADA POOL
CODE WILL BECOME EFFECTIVE
UPON ADOPTION**

2009 INTERNATIONAL RESIDENTIAL CODE (IRC)

NEW SECTION R313.2

An automatic residential fire sprinkler system shall be installed in one- and two- family dwellings.

Exception: Addition/alterations to existing homes that do not already have fire-sprinklers

RESIDENTIAL FIRE-SPRINKLERS

COST ASSUMPTIONS

Sprinkler Cost Per Square Foot	\$1.62
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New Home Size in Square Feet (2009 & 2010 Actual Average)	2,220
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TRACT HOMES RESIDENTIAL FIRE-SPRINKLERS COST IMPACTS

Model Homes

Cost of Sprinklers (\$1.62 x 2,220 square feet) \$ 3,596

Cost of RFM Meter (One-Time Charge) \$ 215

Cost of Sprinkler Plan Review

(Model Homes) \$ 383

Cost of Sprinkler Inspections \$ 765

Total Cost for Average Model Home \$ 4,959

Cost Per Square Foot \$ 2.23

TRACT HOMES RESIDENTIAL FIRE-SPRINKLERS COST IMPACTS (Continued)

Production Homes

Cost of Sprinklers (\$1.62 x 2,220square feet)	\$ 3,596
Cost of RFM Meter (One-Time Charge)	\$ 215
Cost of As-Built Plan Review	\$ 153
Cost of Sprinkler Inspections	\$ <u>765</u>
Total Cost Per Production Home	\$ 4,729
Cost Per Square Foot	\$ 2.13

TRACT HOMES RESIDENTIAL FIRE-SPRINKLERS COST SUMMARY

Model Homes

Total Cost for Average Model Home	\$ 4,959
Cost Per Square Foot	\$ 2.23

Production Homes

Total Cost Per Production Home	\$ 4,729
Cost Per Square Foot	\$ 2.13

Other Jurisdictions

North Las Vegas: Deleted Requirement

Las Vegas: Seeking stakeholder input on costs and issues; has not been heard by City Council

Other Jurisdictions

Clark County:

1. Deleted requirement from 2009 IRC
2. Directed County staff to work with stakeholders group to:
 - a. Try to get agreement on costs
 - b. Explore addressing existing homes and mobile homes
 - c. Reduce costs of other requirements
(i.e. landscaping, etc.) to off-set cost of sprinklers
 - d. Look at a possible 2012 effective date
3. Report due to Commission in 6 months

RESIDENTIAL FIRE-SPRINKLERS

FIRE LIFE-SAFETY IMPACTS

Fire Chief Doug Stevens

The Problem: Fires Today

- Burn hotter.
- Spread faster.
- Produce more smoke.
- Smoke is more toxic.
- Why? Plastics, other synthetics (petroleum products).
- Why? More combustible materials in homes today (more stuff).
- Why? Open floor plans.
- New homes not necessarily safer: occupants and contents.
- Residential fires up 50% in the past 6 months in Henderson.

The Fire Problem

Escape Time is Decreasing

1975

17 minutes

2006

3 minutes

Need for Residential Sprinklers

- 400,000 home fires (per NFPA in 2007).
- 84% of fire deaths occur in the home.
- Approx. 3,000 civilian fire deaths in home fires annually.
 - Equivalent of 34 MGM Grand fires annually (87 deaths).
 - 30,000 deaths each decade.
- 13,600 civilian injuries annually.
- \$7.4 Billion in property loss annually.
- COH: 5 year period, 3 deaths in home fires.
- UMC: In 2009, 237 Inpatient burns to HN residents, 56% occurred in the home.

Fire Deaths

- 30% of fire deaths occurred in homes with working smoke alarms.
- Of those deaths, victims were asleep 37% of the time.

Citizens at Risk

- Those who cannot hear smoke alarms.
- Those who cannot self evacuate.
 - Children, especially infants and toddlers.
 - Elderly.
 - People with mental and physical challenges.
 - Bedridden, permanently or temporarily.
 - Wheelchair bound.
 - People under the influence of alcohol and drugs (legal and illegal).
- Current building and fire codes provide protection for able-bodied citizens with good hearing who can self-evacuate.
- Gap: protection for our most vulnerable citizens.

Life Safety Challenge: Aging Society

- Baby Boomers are aging.
- Number of seniors in our population are increasing at a significant rate.
- Dilemma families are faced with: How long can Mom and Dad safely live at home?
- Risk of fire is a significant consideration.
- People try to mitigate the risk of fire by contracting with alarm monitoring companies (desire for an “automatic” fire suppression response).

Demonstration Video







FD Response

Fire response times include:

- Burn time before 911 notified.
- Call taker obtains information.
- Dispatcher notifies fire crews.
- Reaction time: get to vehicle, don protective clothing, map the route.
- Drive from station to a hydrant near the house on fire.
- Stop at hydrant, connect large diameter supply hose.
- Drive to home.
- Deploy attack hose line.
- Mask up.
- Force entry (if needed)
- Ventilate before or during fire attack.
- Fire attack and ventilation usually have to occur before search and rescue.

Manual vs. Automatic

- Manual Fire Suppression: Rule of thumb: 10 minutes to water on the fire

VS.

- Automatic Fire Suppression: 15 to 90 seconds for a sprinkler head response.

Alarm Monitoring vs. Sprinklers

- Do monitored alarms solve the problem?
 - Do little to reduce fire suppression response times.
 - Monitoring stations often out of state.
 - Over 99% of alarms transmitted are false.
 - Do not reduce exposure to smoke and fire.
- Sprinklers offer reliable protection and are 2 to 5 times cheaper (monthly basis).

Sprinkler System Mechanics

- Pipes: same water lines feeding sinks, toilets, showers or separate pipes (tied to master bath). No pumps or appliances to maintain.
- Sprinkler heads.
 - Cosmetically appealing covers.
 - Recessed above the ceiling.
 - Operate at temperatures between 135-170 degrees.
 - Soldered connections melt away at a predetermined temperature. Sprinkler head drops down, water flows (18 to 26 GPM).
 - Are not set off by smoke or smoke detectors.
 - 90% of fires contained by only one sprinkler head.
 - Reliable: 1 in 16,000,000 failure rate.
- May be maintained by the homeowner.
- Pose no significant water infrastructure issues in Henderson.

Benefits of Residential Sprinklers

- Save lives.
- Fewer victims suffering smoke inhalation and burn injuries.
 - Reduce pain and suffering.
 - Reduce health care costs.
 - Reduce financial impact on the UMC Burn Unit.
 - Reduce financial impact on taxpayers.
- Reduce property damage:
 - \$2,200 vs \$45,000 (Scottsdale).
 - Protect items that cannot be replaced (heirlooms, pets, photos, etc).
 - Protect renters who often do not purchase fire insurance.
- Reduce fire insurance premiums.
 - Discounts of up to 12%.

Benefits Continued

- Reduced risks to Firefighters.
 - Line of duty deaths.
 - Injuries.
 - Exposures to hazardous chemicals present in smoke.
 - Lead to cancer.
 - Damage to organs: lungs, kidneys, liver, brain, heart.
- Reduced impact on fire/EMS response system.
- Reduce air pollution:
 - Carbon emissions.
 - Greenhouse gas emissions.
 - Toxic chemical emissions.
- Reduced water pollution/runoff.
- Reduced water use.

Burn Injuries

- Transported to UMC Burn Center.
- Summary of hospital bills July 2009 to June 2010:
 - Average: \$94,422
 - Lowest: \$1,226
 - Highest: \$1,426,210
- Medicare, Medicaid, and Private Insurance only pay 10 to 15% of the bill.
- Taxpayers in Clark County pay the rest.
- Uninsured patients: CC taxpayers pay 100% of costs.

Henderson Case Study #1

3 year old male

Resident of Henderson, NV

Date of Injury: December 6, 2006 (2 days before his 3rd birthday).

Mechanism of injury: he and 2 siblings play “campfire” in a bedroom/closet

Burn Injury: 80% of total body surface area (2nd and 3rd degree)

OR visits: 9 (burn debridement)

Length of stay: 26 days

ICU days: 26 days

Vent. Support days: 26 days

Disposition : Death (died on New Years Day)

Hospital Bill: \$701,397

Insurance: Medicaid

Henderson Case Study #2

35 year old female

Resident of Henderson, NV

Date of Injury: April 18, 2010

Mechanism of Injury: Cooking fire in the home.

Burn Injury: 30% total body surface area (2nd and 3rd degree)

OR visits: 5 (burn debridement and skin grafts)

Length of stay: 69 days

ICU days: 25 days

Vent Support days: 20 days

Disposition: discharge home

Hospital bill: \$906, 863

Insurance: Uninsured

Pain and Suffering

- During the fire.
- Months on end in the hospital.
- Debridement treatments: peeling and scrubbing away burnt skin.
- Procedures scrub nerve endings raw.
- Relief cuts in the skin to accommodate swelling.
- Skin grafts.
 - Healthy skin is harvested from unburned area using a dermatome (like a cheese slicer).
 - Body rejects 50% of skin grafts.
 - Grafted skin does not grow. Children must receive new grafts every 3 to 4 years.
- Victims scarred for life.
- Warning: graphic photos

Burn Injuries



Reduced Risk to FFs

- On average, 23 FFs die each year en-route to and during fighting fires operations in residential fires.
- FFs sustain over 32,000 injuries on the fire ground each year.
- FFs are exposed to toxic chemicals at every fire.
 - Cyanide gas
 - Carbon monoxide
 - Phosgene
 - Benzene
 - Volatile Organic Chemicals
 - Nitrogen oxide
 - Fine particulates
 - Other known and unknown

Henderson Case Studies

- 5 employees disabled due to exposure related diseases in past 5 years.
- 2009: 57 y/o FF died of ocular/liver cancer.
- 2010: 54 y/o FF (18 months retired) inflicted with rare cancer of the heart.
- Cancer and cardiovascular disease rates in FFs are high and are considered job related injuries.
- Residential sprinklers will reduce the severity of fires and resulting toxic chemical exposures to FFs.
- Fewer injuries and deaths result in reduced costs to taxpayers.

Dangers of Lightweight Construction

- Homes today are constructed of lightweight construction
 - Engineered to utilize less lumber.
 - Trusses connected with metal gusset plates that fail rapidly when involved in fire.
- Safe until a home catches fire.
 - Roof assemblies today fail 1/3 to 2/3 faster than homes constructed of sawn dimensional lumber.
- Homes today pose a greater threat to firefighters.
- Residential sprinklers can extinguish a fire before it spreads to the roof assembly.

Why not make sprinklers “optional”?

- Homeowners occupy a home an average of 6 to 12 years.
- Dozens of families will occupy the average home over its lifespan.
- An “optional” fire sprinkler system could be priced at a point where it is cost prohibitive.
- Only the original home buyer will have the choice.
- Renters would not have a choice.
- Risks to FFs are not reduced.
- Costs associated with treating burn victims still born by taxpayers.
- Air pollution, water pollution issues not addressed.

Safety Not Optional

- Seat belts
- Air bags
- Motorcycle helmets
- Smoke detectors
- Pool alarms/barriers
- GFI electrical circuits
- Sprinkler systems in hotels, commercial occupancies.

Net Monthly Cost of Residential Sprinklers

- 1,000 sq. ft. home: approximately \$10/mo.
- 2,000 sq ft home: \$20/mo.
- 3,000 sq ft home: \$30/mo
- Assuming a 30 year loan and a modest 5% insurance reduction.
- Assuming 100% of cost passed on to home buyers.

COH: Sprinkler Cost Off-Sets

- Code allowances:
 - Reduction in required fire flow by 50%.
 - Increased fire hydrant spacing from 500 ft to 600 ft.
- Tradeoffs permitted on a case-by-case basis:
 - Narrower streets and fire access roads.
 - Reduced distance between homes.
 - Increased distance from the home to the nearest fire access point (typical in hillside development).
 - One fire access road instead of two: over 20 units with dead-end access road over 600 ft.

RESIDENTIAL FIRE-SPRINKLERS

- 80% of new homes in Henderson already require fire-sprinklers:
 - Inspirada - 14,500 units
 - Cadance (formerly Landwell) – 13,250 units
 - Ascaya (formerly Crystal Ridge) – 313 units
 - Lake Las Vegas (except South Shore)
 - Homes over 5,000 square feet
 - Homes built in hillside developments

Future of Our Community

- Current population of 260,000
- Estimated population at build-out: 490,000
- Impact to 230,000 residents.
- Need to address homes in the 1,000 to 2,200 sq ft range: most vulnerable citizens.

Decision to Adopt

Cost

- Net cost of:
 - \$10 to \$30 per month

Benefit

- Fewer deaths.
- Fewer injuries.
- Reduced pain and suffering.
- Reduced health care costs.
- Reduced property damage.
- Reduced air pollution.
- Reduced water pollution.
- Reduced water use.
- Reduced risk to FFs.
- FD resources available for other emergencies.

Decision to Adopt

- The residential sprinkler requirement is in the IRC Base Code.
- To not adopt in the COH requires specific action to remove the code provision.
- Several states have mandated residential sprinklers statewide:
 - Pennsylvania, Maryland, Iowa, California, New Hampshire, New Jersey, South Carolina.

Communities Requiring Residential Sprinklers

Scottsdale, AZ

Montpelier, VT

Portland, MN

Chandler, AZ

Baltimore (City), MD

Cobb County, GA

Prince George's County, MD

Frederick County, MD

Addison, TX

Long Grove, IL

Fenton, MI

Wheeling, IL

Baltimore County, MD

Rockville, MD

COH Vision

- To Be America's Premier Community.
- Strategic Plan Goal 1: Safety
- Supporting Strategy: Ensure timely response to emergencies.
- Innovation: leverage engineering and technology to reduce fire suppression response from 10 minutes to 15 to 90 seconds.