

# **BIGGEST BANG FOR YOUR BUCK**

Round 3

**Sponsored by:**

**King County Housing Development Consortium (HDC)**

**Presenters:**

Heather Bunn      RAFN Company

Bob Card              Wetherholt & Associates

Jeff Reibman        Weber Thompson Architects

Becky Bicknell      Bellwether Housing

**Volunteer effort focused on cost-effective,  
quality product decisions for affordable  
multifamily development**

## **2013 Survey Topic**

### **Waterproofing:**

- **Roofing**
- **Apartment Decks & Courtyards**

## Participant Profiles – Owners & Developers

- 11 respondents, primarily Western WA
- Large portfolio organizations (500+ units) with wide range of building ages and roof types

## Participant Profiles – Builders / Designers

- Convened focus group of designers, building envelope consultants and general contractor
- BUILDINGS - Roofing Expo 2013  
*(see end of presentation for details)*

# General Comments – Owners & Developers

What is your highest priority for your roof?

1<sup>st</sup> – Moisture Prevention

2<sup>nd</sup> – Service Life / Durability

3<sup>rd</sup> – Thermal Performance



## General Comments– Owners & Developers

What are your current challenges with regards to roof design and construction?

Adequate slope for drainage

Placement of insulation

Venting

Staying dry during construction

Designing around mechanical equipment

Access

Understand costs & benefits of different options

Establishing staffing and maintenance plan

# Roofing

## Steep Slope vs Low-Slope (Flat)

### Steep slope:

- Generally used in lower density projects with three stories or less
- Focus is water shedding
- External drainage



# Roofing

## Steep Slope vs Low-Slope (Flat)

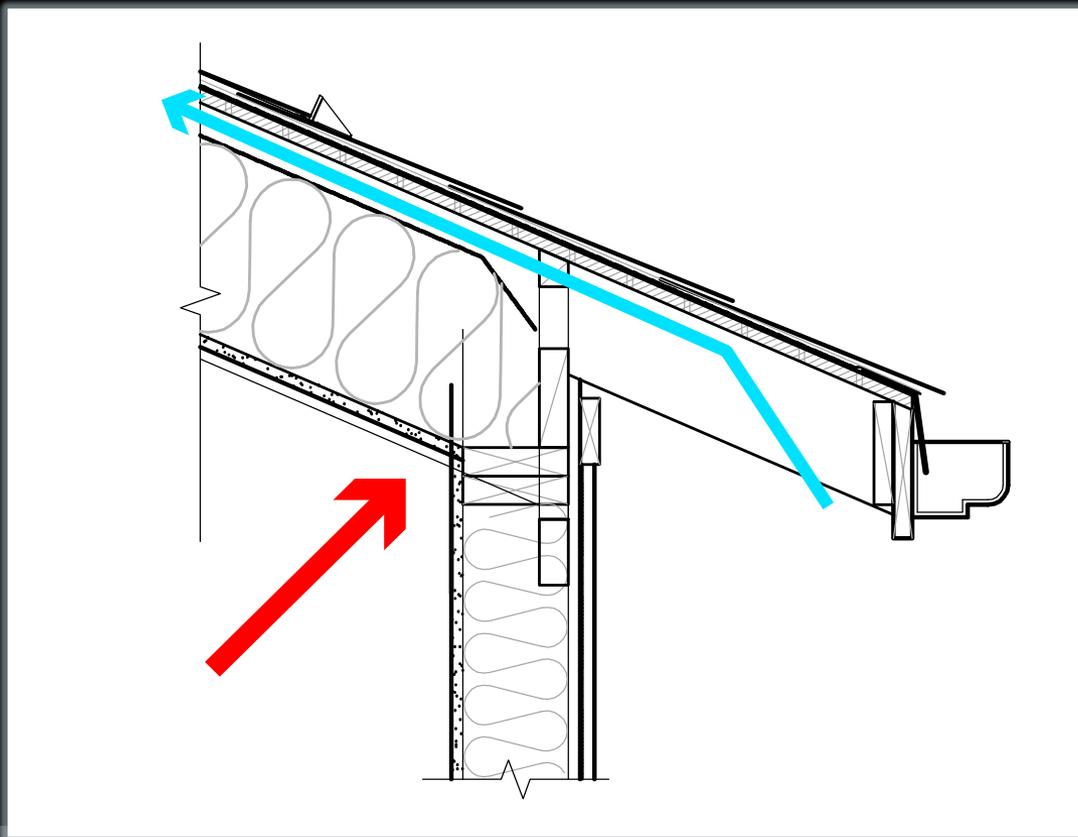
### Low-slope:

- Prominent in urban areas or structures four stories or greater
- Focus is waterproofing
- Internal drainage



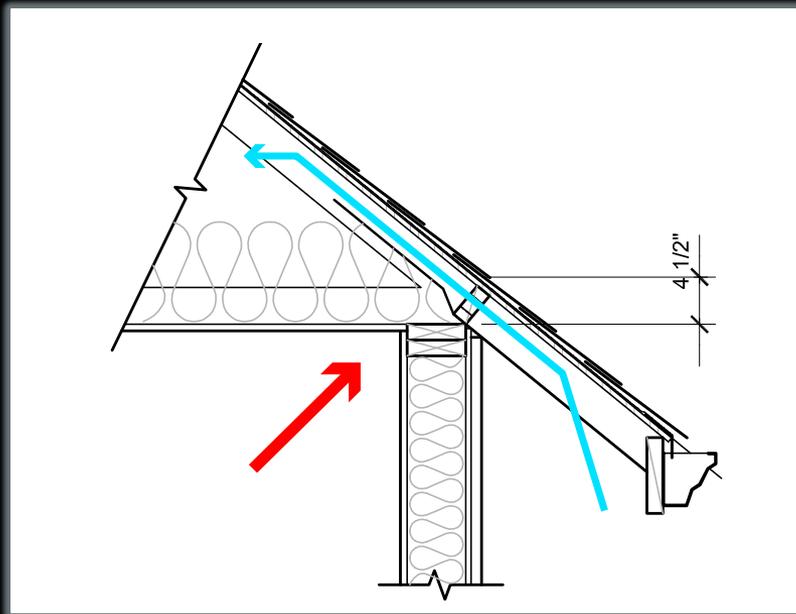
# Roofing Steep Slope Best Practices

Design (stick frame) option:

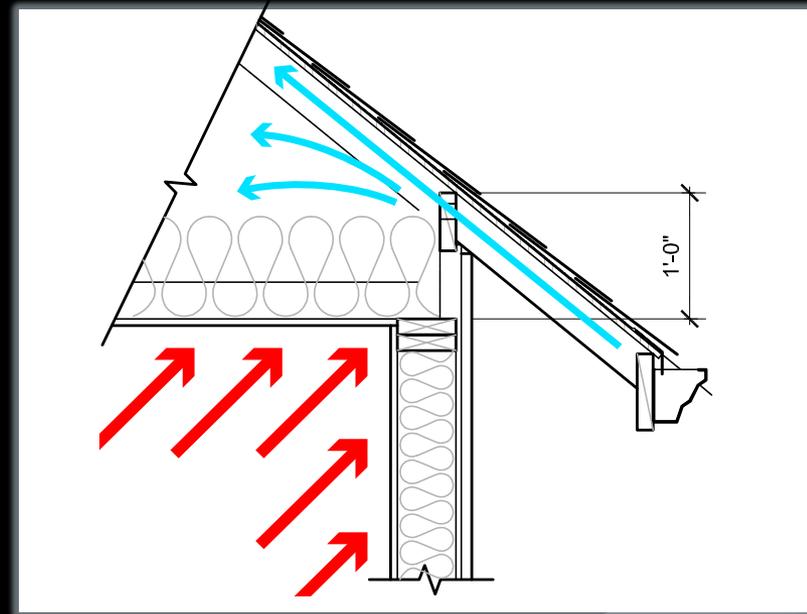


# Roofing Steep Slope Best Practices

Design (truss frame) options:



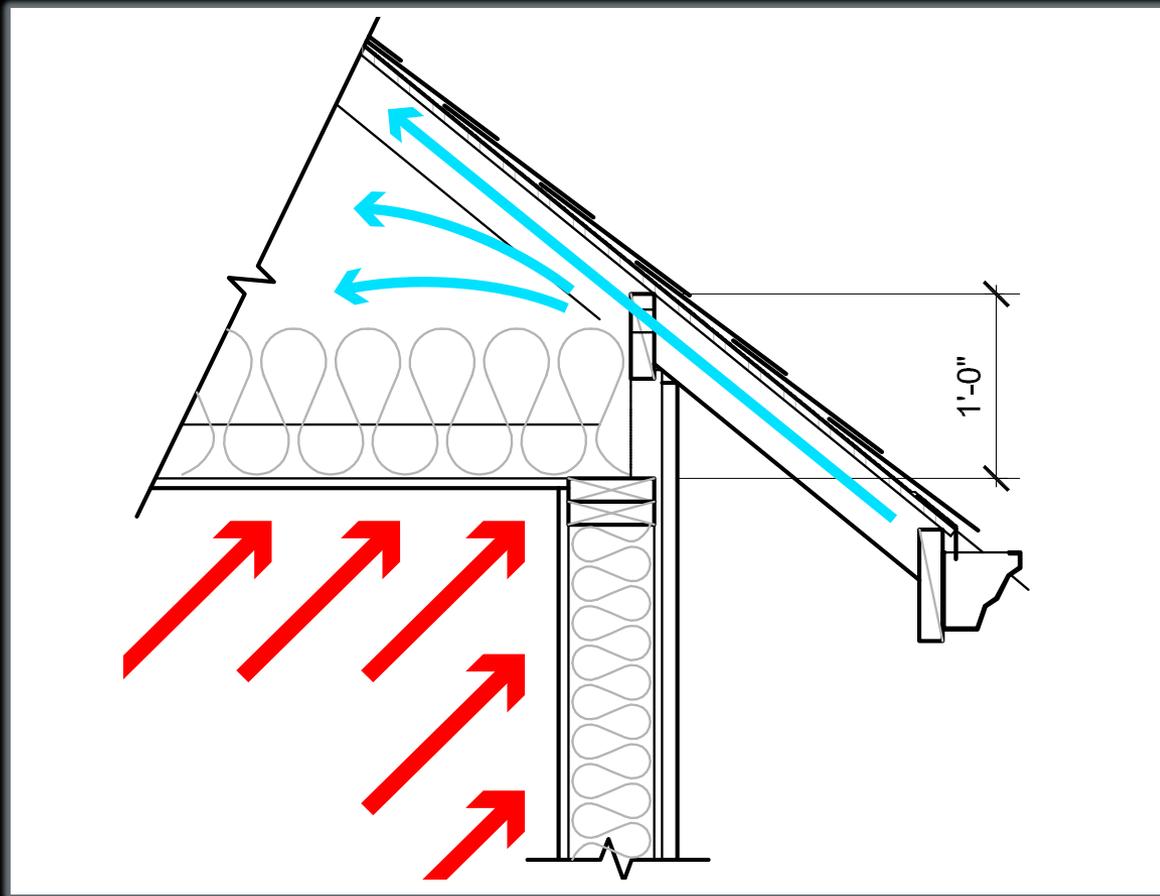
Standard Heel Manufactured Truss



Raised Heel Manufactured Truss

# Roofing

## Steep Slope Preferred Option



Raised Heel Manufactured Truss

# Roofing Steep Slope Cost Benefit Considerations

Material choices:



Asphalt shingles



Metal roofing

# Roofing Steep Slope Cost Benefit Considerations

Venting:



Roof jack



Eave vents



Ridge vent

# Roofing

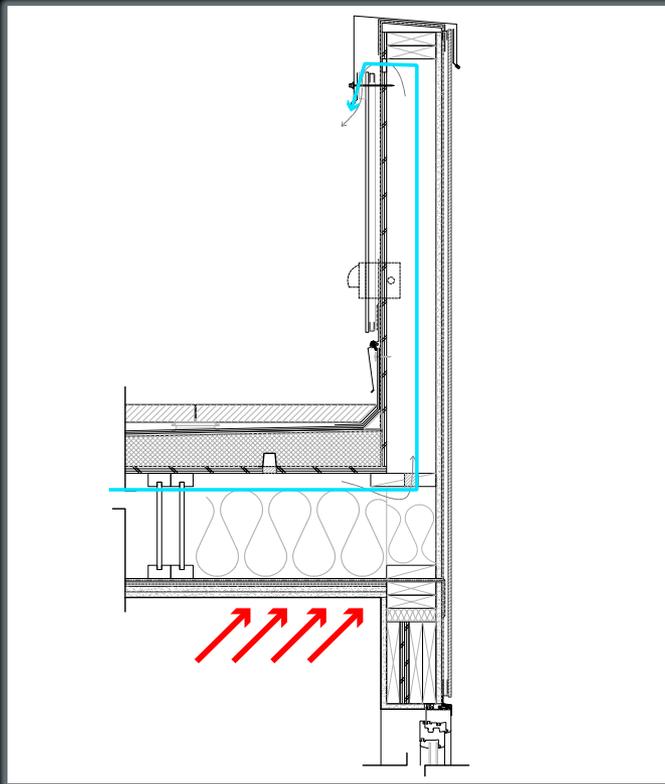
## Steep Slope Best Practices

Advice for nonprofit owners:

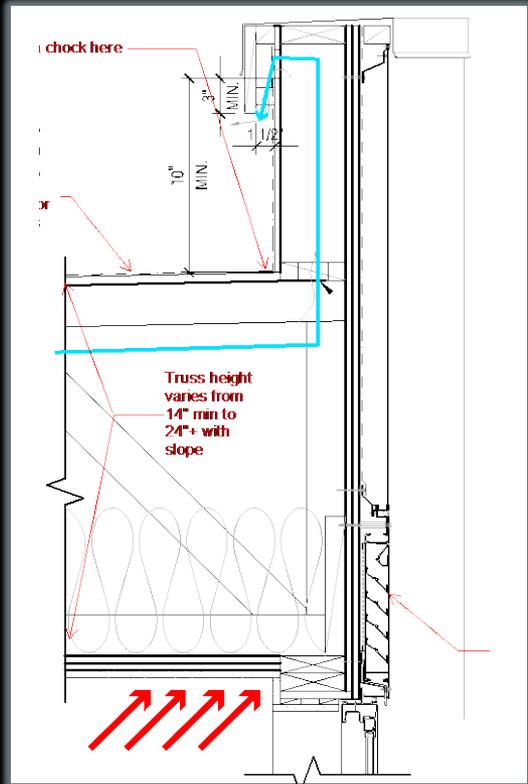
- Simple design
- Venting
- Insulation
- Gutters
- Maintenance tips

# Roofing

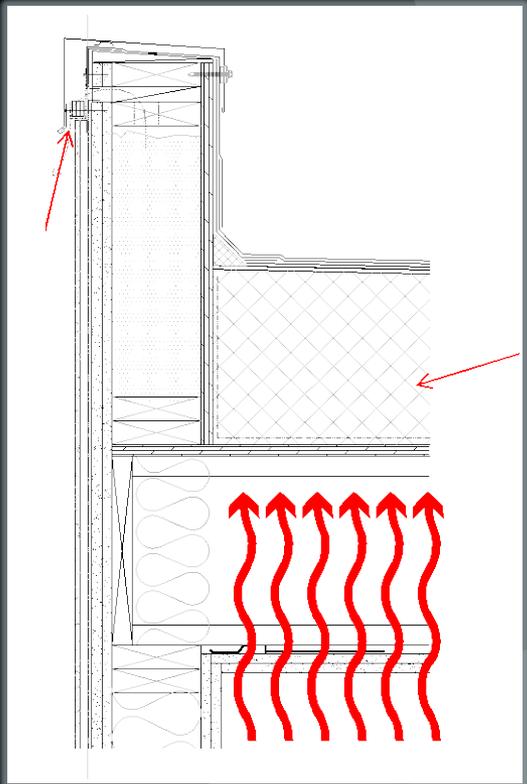
## Low Slope Roofs



Insulated TGI Detail



Open Web Detail



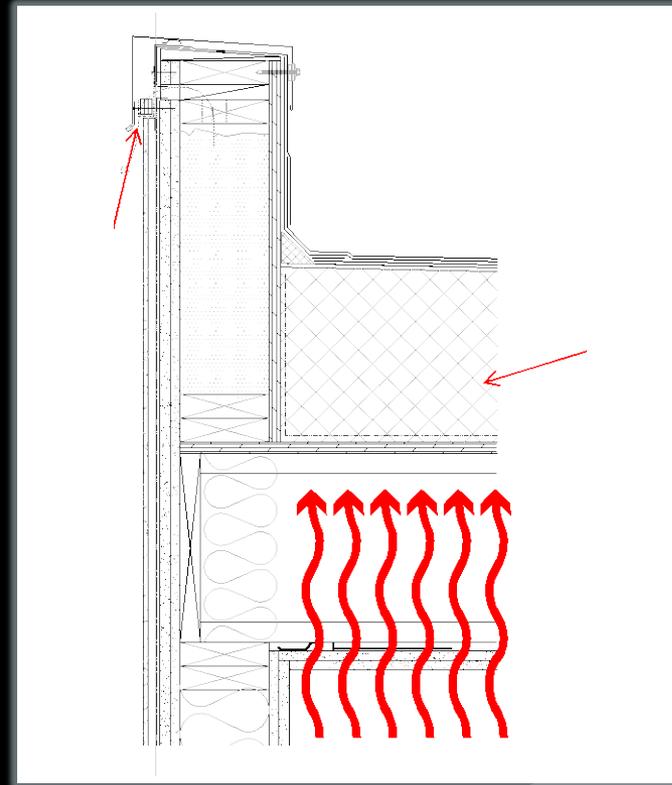
Warm Cavity Detail

# Roofing

## Low Slope Preferred Option

### Warm cavity

- Not vented
  - Tapered insulation or over frame for slope
- or over frame for slope



Warm Cavity Detail

# Roofing Low Slope Pricing

## Flat Roof Assembly Unit Price Analysis

	VENTED			NON-VENTED		
	24" OC truss with batt insulation stuffed	16" OC 11-7/8" Deep Flat TJI over-framed batt insul	Tapered TJI with batt insulation	24" OC truss with rigid insulation	16" OC 11-7/8" Deep Flat TJI over-framed rigid insul	Tapered TJI Rigid insulation
Cost per SF of system	\$6.85	\$8.12	\$9.12	\$9.99	\$10.06	\$11.21
Schedule impact	Baseline	10 days	2 days	2 days	10 days	2 days
Cost of schedule impact assuming \$1000/day and a 12,000 SF roof		\$0.83	\$0.17	\$0.17	\$0.83	\$0.17
	\$6.85	\$8.95	\$9.29	\$10.16	\$10.89	\$11.38
<b>TOTAL Cost assuming a 12,000 SF Roof</b>	<b>\$82,200</b>	<b>\$107,400</b>	<b>\$111,432</b>	<b>\$121,872</b>	<b>\$130,680</b>	<b>\$136,512</b>

# Roofing Low Slope Cost Benefit Considerations

Material choices single-ply:



Installation



Finished

# Roofing Low Slope Cost Benefit Considerations

Material choices built-up roofing:



Installation



Finished

# Roofing

## Low Slope Overall Design

What else are we asking our roofs to do?



# Roofing

## Low Slope Best Practices

- Vents, parapets
- Drains
- Roof Decks
- Maintenance Walkways
- Other attachments : anchors, PVs, cell phone towers



Survey feedback re: roof decks or renewable energy systems: most have done them only recently, but there is skepticism around working around these additions at the time of re-roof.

What do our experts recommend as the current best practices with regards to design and selecting your low-slope roof that will get you the **BIGGEST BANG FOR YOUR BUCK?**

# Warranties

## **Survey feedback:**

Mixed opinions

Some owners buying the extended 30 year warranty, but most feeling like it's not worth it since average roof life is 20-25 years.

## Warranties – recommended practice:

**In lieu of purchasing extended warranty, hire a building envelope consultant to review your roofing installation details and select a contractor and/or architect with experience in building envelope quality control...**

For existing buildings or potential acquisitions, how do you know if you have a bad roof? What are the warning signs? What do you do?

Have a qualified professional inspect for:

- Deflection
- Soft spots
- Ponding areas
- Indoor air quality
- Interior staining

# Roofing – Preventative Maintenance

Average life = 17 years

Goal with preventative maintenance = 20+ years

- fewer replacements over life of building

- less damage to the building under your roof

- more sustainable use of building materials

Schedule: at least twice a year, fall and spring by a qualified professional.

What should your maintenance include?

# Unit decks

## Pros:

Valued by tenants

Amenity space requirements

## Cons:

Adds complexity

Structural failures

Not kid safe

Spillover storage

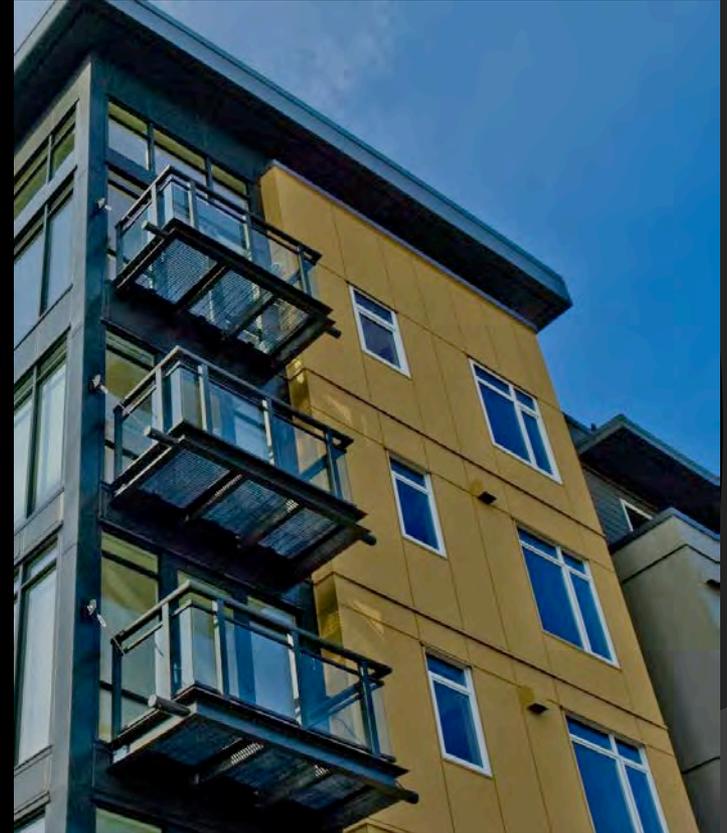
Smoke/cigarette damage

# Unit decks Wood Framed



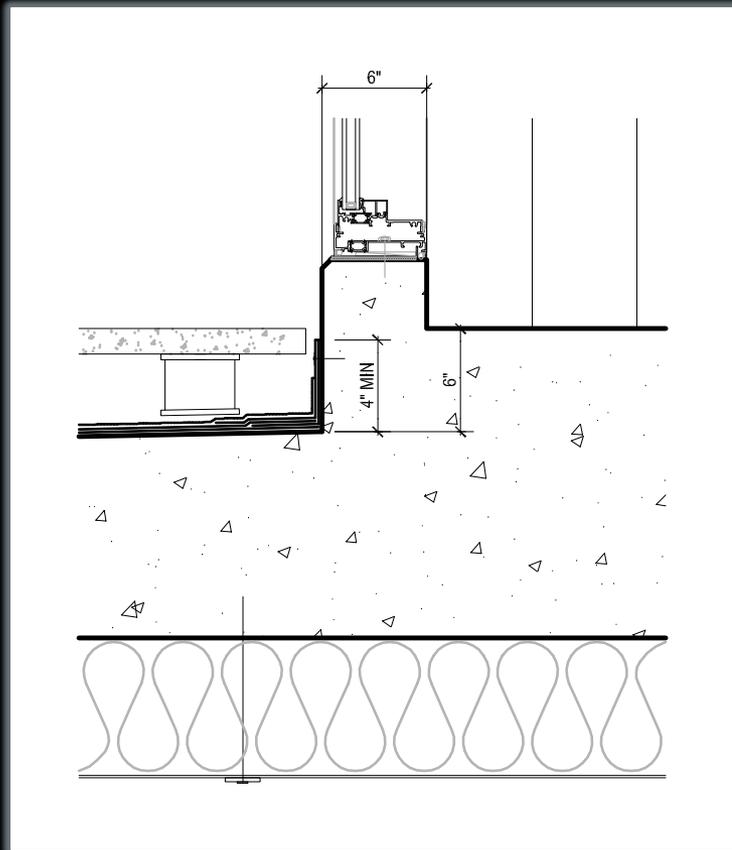
# Unit decks

## Steel Bolt-on



# Courtyards, podium decks

## Protected Membrane



# Courtyards, podium decks

## Planters & Irrigation



# Concluding advice

- Simplify design
- Hire qualified professionals
- Consider complete systems
- Keep life-cycle costs in mind
- Develop maintenance program

**Thank you survey respondents  
& industry professionals!**

*Questions / Comments ??*

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# Resources

[www.housingconsortium.org](http://www.housingconsortium.org)

[www.buildinggreen.com](http://www.buildinggreen.com)

[www.roofingcenter.org](http://www.roofingcenter.org)