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Client Risk Solutions (CRS)

NACWIR Meeting 1 2017

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Proposals for more resilient commercial construction

1. Increase design safety factors (SF) of roof perimeters, or at least the corner zones, to 3.
2. Simplify wind related codes and construction practices.
3. Incentivize better workmanship.
4. Incentivize warranties to be more meaningful.
5. Close the gaps between testing, codes, and insurance claims and coverage.
6. Incentivize more routine preventative testing (uplift, moisture, thermal, air and water seal testing, etc.).
7. Improved test methods for roofs, EIFS, windows, etc. to better reflect real life weathering, degradation, moisture effects, water intrusion, dynamic wind loading, etc. is needed.

Backup Slides

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Safety Factors.

1. Increase design safety factors (SF) of roof perimeters, or at least the corner zones, to 3.
   - About 90% of failures start in the perimeters or corners;
   - P&C zones make up only ~10-20% of a typical roof area. C are <5%.
   - increasing the perimeter or corner SF will add minimal to no cost to new construction while providing far greater resilience.

Simplify construction process

2. Simplify wind related codes and construction practices.
   - Design, construction materials, choices, methods, etc. are very many and increasingly more complex leading to a host of all too frequent design, installation, workmanship, and inspection issues and mishaps.

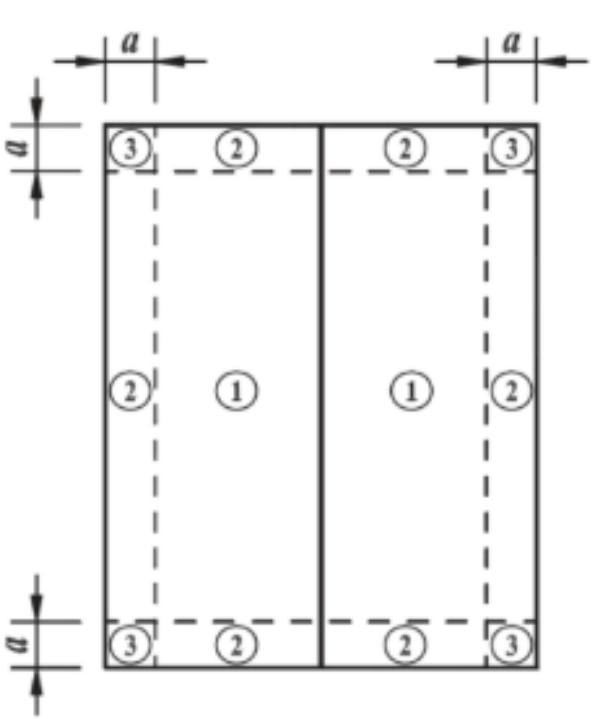
   - Simplification of the entire construction process including test standards, codes, construction design, and practices would help increase the chances that the appropriate wind load is determined, the right design is chosen, the most appropriate materials are chosen, and that it actually gets built right from the onset and maintains the design strength.
   - Mitigation inspections are already done by many insurers but it would help to make details easier to check. To enable proper inspections, perhaps on site documentation of the pertinent details can be made mandatory as done in the fire sprinkler industry.

Safety Factors.

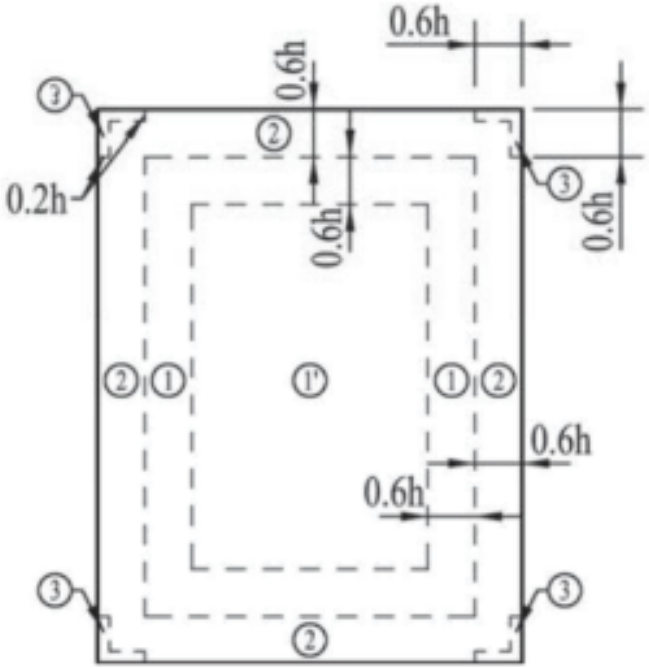
- Need to simplify to keep construction implementation easy.

Zones

h ≤ 60 ft., gable roofs ≤ 7 degrees



ASCE 7-10



ASCE 7-16 (draft)

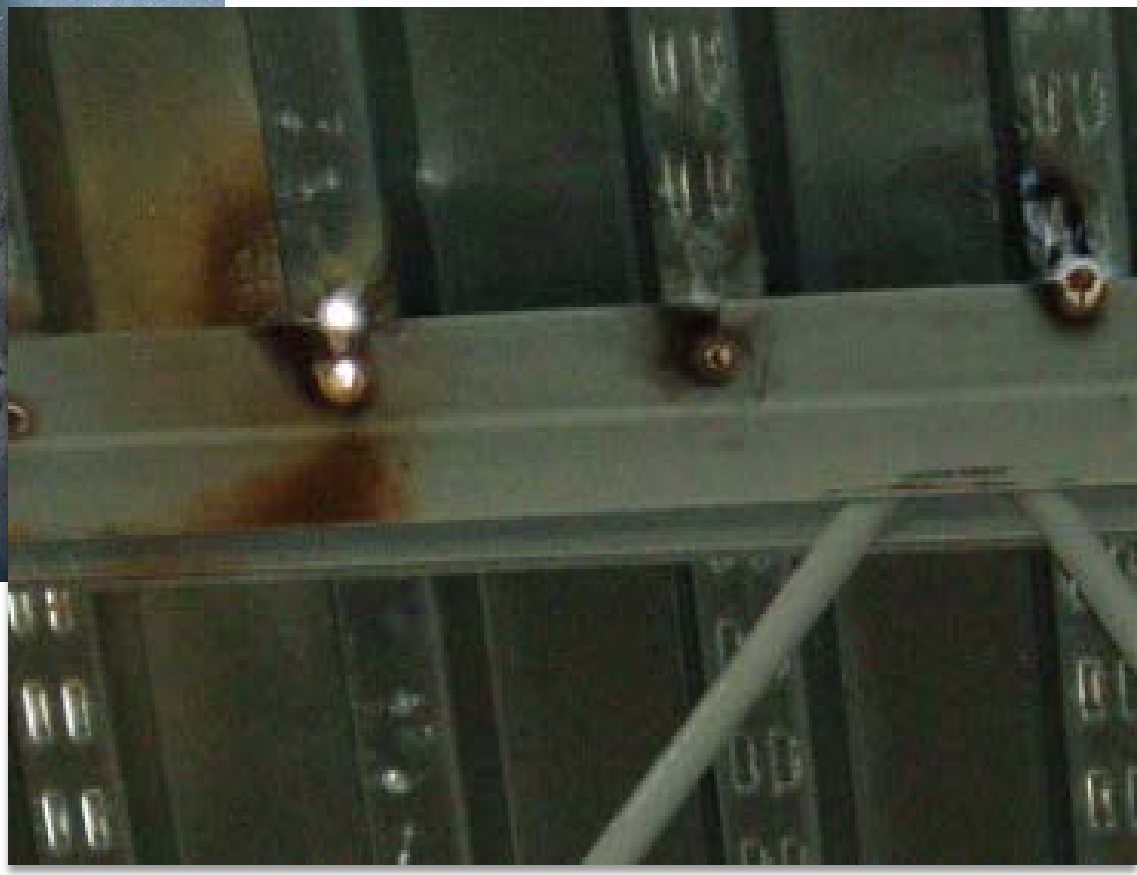
Reward good workmanship

3. Incentivize better workmanship.
   - Currently, value driven engineering and low cost construction prevail in the industry while good workmanship is seldom noticed or rewarded.
   - More incentives for better workmanship would help promote longer lasting, better performing buildings.

Safety Factors.

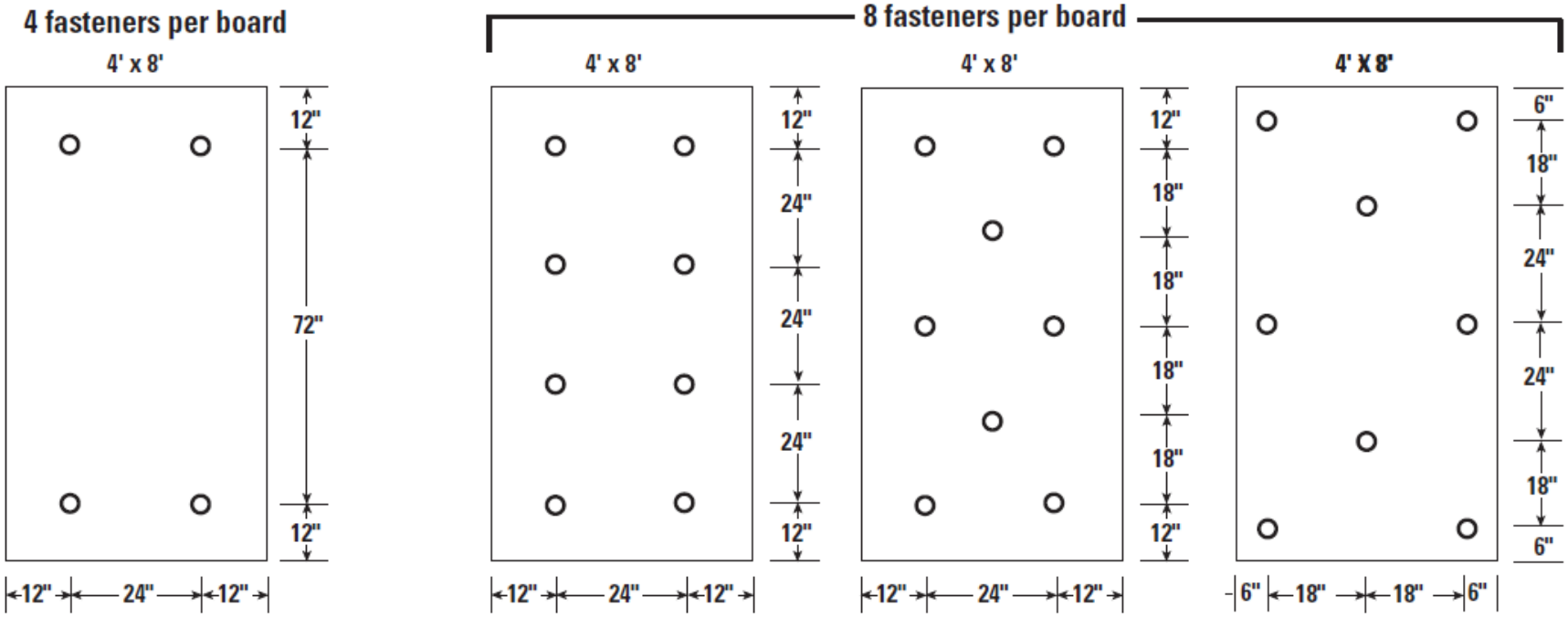
- **Why are SFs important?**

- Welds and decks in the real world – new construction.

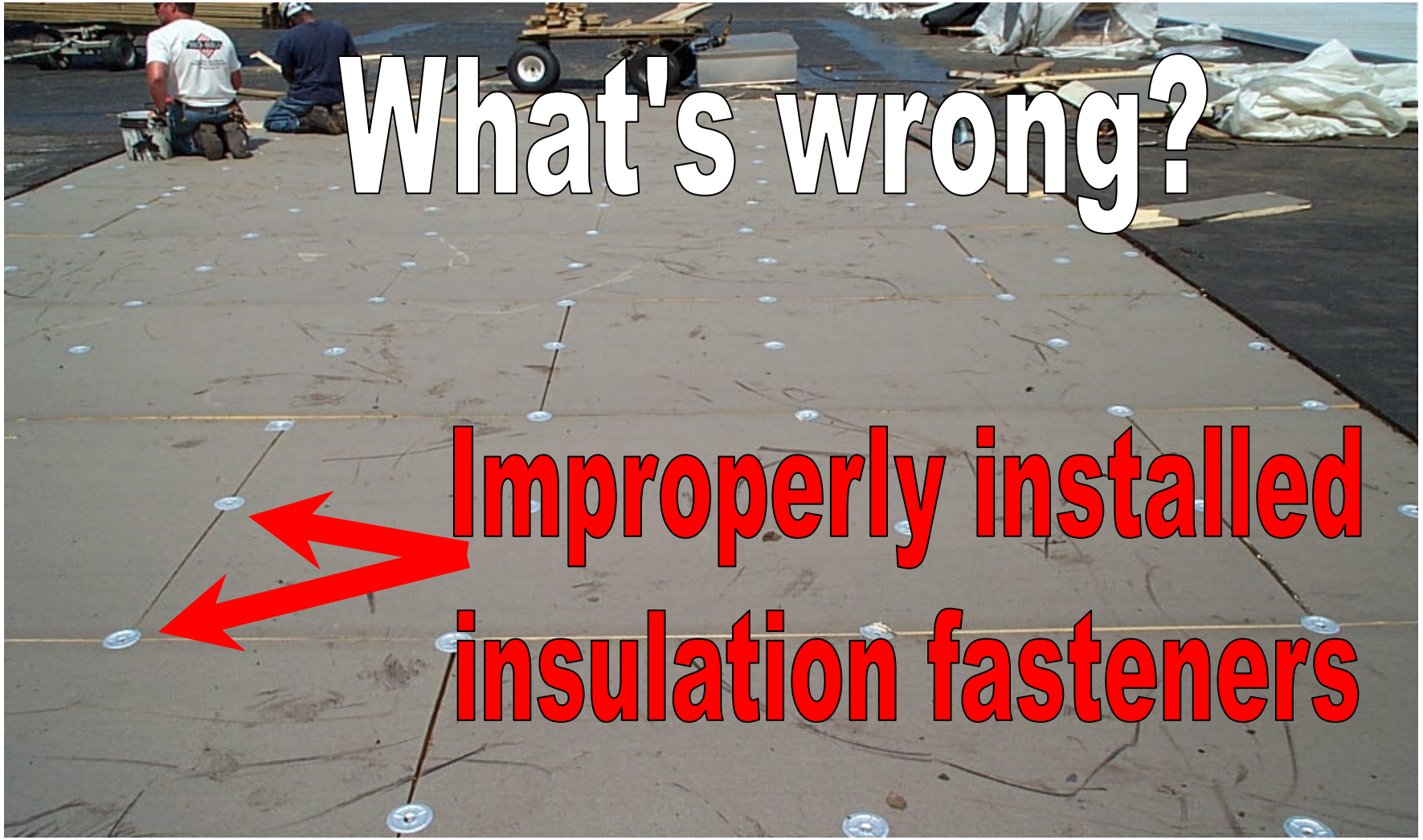


Required roof insulation fastening

- **Insulation Securement Patterns**



Required roof insulation fastening



Roof Warranty

4. Incentivize warranties to be more meaningful. Do Roofers offer any wind warranty? While roof warranties are provided, the vast majority are essentially not binding for any wind related damage so manufacturers and installers have little skin in the game.

- Mostly for marketing.
- There is no set standard.

Below are some examples of verbiage of covered events.

- No mention of a wind speed (0 mph)
- “Windstorms” (64-72-mph)
- “Full gale-force” (46 mph)
- The actual wind speed printed from 38 to 120 mph
- “Gale force” (46 mph)
- Beaufort wind scale #8 (46 mph)
- “Gales excluded” (31 mph)
- “Capped at 38 mph”
- Wind speed coverage prorated (loses a portion of the wind coverage every year)

Generally, all below a CAT 1 storm!

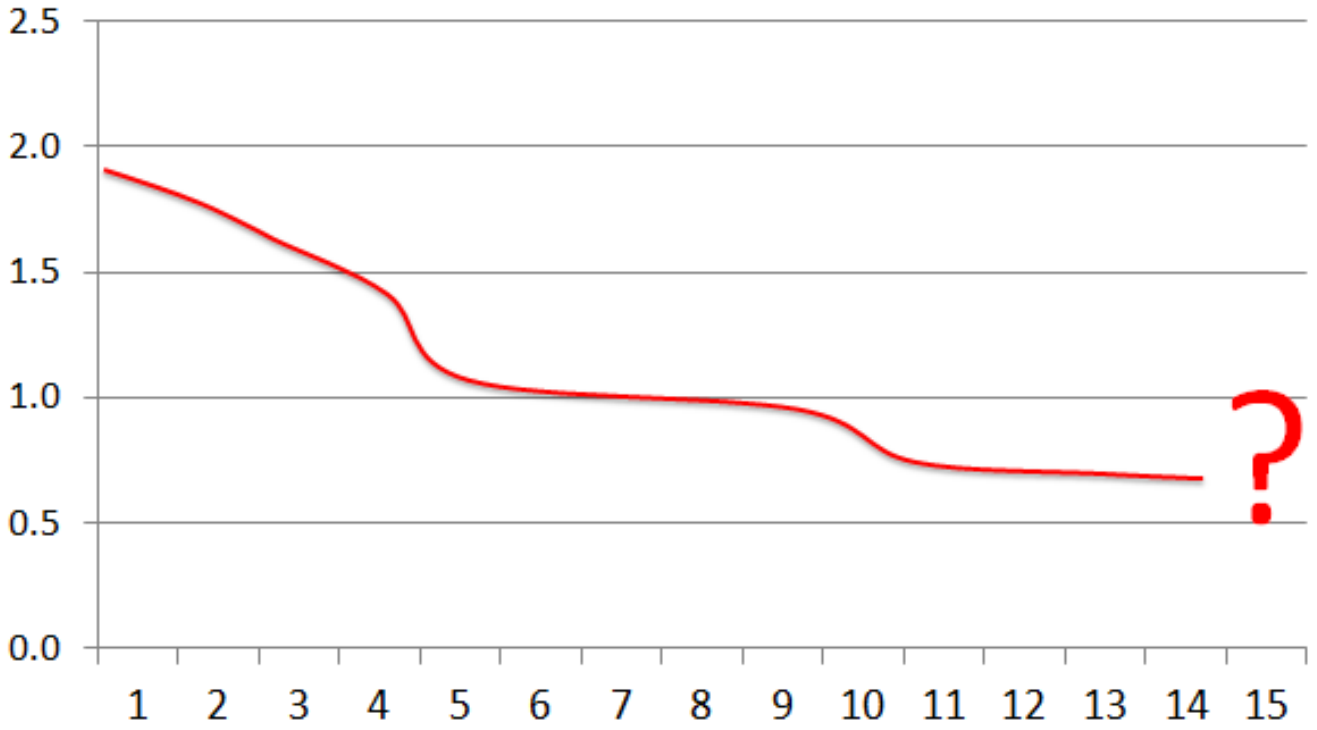
Testing, Codes, Claims

5. Close the gaps between testing, codes, and insurance claims and coverage.

- There is often a disconnect between the way products are specified, how they perform under testing, and how they are expected to perform in actual conditions in terms of what is seen as damaged or just normal wear and tear in the eyes of the insurance and claims industry.
- Minor damage (considered passing during lab tests) is usually seen as cause for roof repair/replacement.
- This has led to a large number of insurance claims based upon the belief that damage has incurred or that the life of the roof has been reduced.
- These claims are usually paid out and there is obviously a huge economic impact from this which affects everyone.

Better PM needed

6. Incentivize more routine preventative testing (uplift, moisture, thermal, air and water seal testing, etc.).
   - Many failures in windstorms are due to building systems and components that are simply not well maintained and so moisture migration, deterioration of components, etc. lead to a gradual decline in SFs and, consequently, premature failures.



SF over time……??????

Improve test methods

7. Improve test methods for roofs, EIFS, windows, etc. to better reflect real life weathering, degradation, moisture effects, water intrusion, dynamic wind loading, etc. is needed.

- IE, the most widely accepted roof test standards do not test for dynamic wind loads, account for exterior and interior humidity differences, weathering, UV degradation, etc. IE, FM 4470 and FL TAS 114 tests for static load only.
- It would also help to have full scale wind tunnel testing done to validate some of the most common construction designs.

- **Test requirements** for new windows is **inadequate** for hurricanes. Even for impact windows, testing is only 15% of the wind load resistance the product is certified for and well below 100 yr. storm pressures.