House Wrap – What is Required & When

The Problem:

Hail damages the vinyl siding on two elevations of a house. The house does not have a weather resistive barrier (WRB). The contractor wants to remove everything on all sides and install house wrap. He states the reason for the full replacement is the building code.

- Is this right?
- Does everything need to come off?
- How much has to come off?
- Who is in charge of making that decision?
- What is required?
- Who is requiring what to happen?

These are all good questions. People might want to jump to a certain conclusion and act as an expert authority on building matters, but the surprise answer might be:

It depends

It depends on what? …well, everything. When evaluating an existing building problem, the first thing to do is gather all pertinent information. The following things can never be ignored:

1. Everyone must use common sense. Things need to be reasoned out, thought about, and evaluated.
2. One size does not fit all.
3. The building codes are a compiled, evolving mountain of common knowledge that have been closely examined to help protect the general public and result in safe, efficient, protected structures.
4. The building official is the ultimate authority of a local area.

The Simple Answer 1

We have a good, better, and best approach. We also have a bad, worse, and worst approach.

Ignoring money, people's feelings, and the environment, the **best approach** to a damaged 10 year old residential house is to tear it down completely, remove the foundation, and build everything new. Hands down, this solves every building problem. Of course, this is ridiculous. Right?

Ignoring everything and acting like a problem does not exist is the **worst approach**. Small problems can turn into larger problems, so repair options must be evaluated.

Then there is everything in between: partial replacement or modifications all fall into the category of repair.

Only Few Pieces Damaged – Answer 2

If just a few pieces of siding were to be repaired then it could be done with like and similar material.

If the house was functioning and built with no building wrap, or wrong building wrap, or obsolete building wrap; so what? It was functioning just find before the few pieces were damaged. The correct answer is to replace only the few damaged pieces and move on. The house would be considered as being restored to a pre-loss condition.

Whole Side Damaged - Answer 3

If the siding on an entire side (the elevation) was damaged and in need of siding replacement, then the old weather resistive barrier (WRB) if incorrect along with the siding would have to be replaced. This is reasonable.

If there was no existing WRB, then a new one should be installed over the sheathing as per the manufacturer installation recommendations.

Practical Difficulties – Answer 4

We can't let projects get unnecessarily out of hand and disproportionately expensive compared to the damage. A simple dent in some minor flashing should not force a little old lady to reroof and reside her entire house and pay for it out of her pocket. That is unreasonable.

Code compliance determinations are not based on whose pocket the money comes from.

The Minnesota Building Code has a powerful paragraph that helps Building Officials make and enforce logical code decisions. It reads as follows:

> MSBC 1300.0110 Duties and Powers of the Building Official Subpart 12. Modifications.
>
> If there are **practical difficulties** involved in carrying out the provisions of the code, the building official may grant modifications for individual cases, upon application by the owner or owner's representative, provided the building official finds that special individual reason makes the strict letter of the code **impractical**, the modification is in compliance with the intent and purpose of the code, and the modification does not lessen health, life, and fire safety or structural requirements. The details of action granting modifications shall be recorded and entered in the files of the Department of Building Safety.

Note that if the damaged building is in an area where there is no Code enforcement, we would still have "practical difficulties" that make code adherence "impractical". Owners, contractors, and design professionals would need to use common sense (just like a building official) to determine if something is practically difficult.

If something is practically difficult, a reasonable approaches must be sought out and taken.

Undamaged Items -Answer 5

The soffit and windows on a building, where the siding is being removed and replaced, would not have to be modified or replaced if not damaged.

They may be old and leaking. It would be a good idea if someone had the money for a home improvement project, and that it would coincide with a siding replacement project. But it is unreasonable to force anyone to replace windows that are not damaged by a covered loss.

The adequately installed (possibly out of date) siding on other elevations would not have to be removed and replaced as this would be considered impractical.

Does the Code Apply

Yes, the code applies. Whenever we **repair** a structure, the work must be repaired with the code in mind. The MN code applicability section reads as follows:

> Minnesota State Building Code (MSBC) 1300.0040 Scope Subpart 1. Applicability.
>
> The code applies to the design, construction, addition, alteration, moving, replacement, demolition, **repair**, equipment, installation, use and occupancy, location, maintenance, and inspection of any building, structure, or building service equipment in a municipality, except work located primarily in a public way, public utility towers and poles, mechanical equipment not specifically regulated in the code, and hydraulic flood control structures.

Repair does not Mean Replace?

Repair does not mean replace in every situation. A contractor (a good salesperson) would most definitely want to jump to the conclusion that repair means replace. This would be the fastest means of increasing the bottom line of a project. New is better.

Dictionary Definition of Repair

According to the Merriam-Webster dictionary, the word Repair can be broken down to three paths:

Fix - to restore by replacing a part or putting together what is torn or broken.

Renew: to restore to a sound or healthy state.

Remedy: to make good: compensate for

Code Definition of Repair

The building codes recognizes the dictionary definition of repair. The definition of Repair in the MSBC IRC R202

REPAIR. The reconstruction, replacement, or renewal of any part of an existing building for the purpose of its maintenance or to correct damage.

What is Required by Code?

There is no better way to answer this question other than citing code paragraphs word for word. (certain words are underlined for emphasis).

CHAPTER 7

WALL COVERINGS (IRC 2018)

Chapter 7 establishes the various types of materials, materials standards and methods of application permitted as interior and exterior wall coverings. Interior coverings include interior plaster, gypsum board, ceramic tile, wood veneer paneling, hardboard paneling, wood shakes and wood shingles. Exterior wall coverings regulated by this section include aluminum, stone and masonry veneer, wood, hardboard, particleboard, wood structural panel siding, wood shakes and shingles, exterior plaster, steel, vinyl, fiber cement and exterior insulation finish systems. This chapter also contains requirements for the use of vapor retarders for moisture control in walls; wind resistance and **water-resistive barriers for exterior wall** coverings; and the water-resistive barrier required beneath exterior materials.

IRC R703.1.1 Water resistance.

The exterior wall envelope shall be designed and constructed in a manner that prevents the accumulation of water within the wall assembly by providing a water-resistant barrier behind the exterior cladding as required by Section R703.2 and a means of draining to the exterior water that penetrates the exterior cladding.

IRC R703.2 Water-resistive barrier.

One layer of No. 15 asphalt felt, free from holes and breaks, complying with ASTM D226 for Type 1 felt or other approved water-resistive barrier shall be applied over studs or sheathing of all exterior walls. No.15 asphalt felt shall be applied horizontally, with the upper layer lapped over the lower layer not less than 2 inches (51 mm). Where joints occur, felt shall be lapped not less than 6 inches (152 mm). Other approved materials shall be installed in accordance with the water-resistive barrier manufacturer's installation instructions. The No. 15 asphalt felt or other approved water-resistive barrier material shall overlap the flashings required in Section R703.4 not less than 2 inches (51 mm). The No. 15 asphalt felt or other approved water-resistive barrier material shall be continuous up to the underside of the rafter or truss top chord and terminated at penetrations and building appendages in a manner to meet the requirements of the exterior wall envelope as described in Section R703.1

APPROVED. "Approved" means approval by the building official, pursuant to the Minnesota State Building Code, by reason of:

a. inspection, investigation, or testing;
b. accepted principles;
c. computer simulations;
d. research reports; or
e. testing performed by either a licensed engineer or by a locally or nationally recognized testing laboratory.

WATER-RESISTIVE BARRIER. A material behind an exterior wall covering that is intended to resist liquid water that has penetrated behind the exterior covering from further intruding into the exterior wall assembly.

Case Study 1

This house obviously got hit by large hail on the north wall. There was no evidence of any hail impact to the front of the house. The hail had a clear NW-to-SE direction. Anything having exposure to the NW had evidence of large hail impact.

The siding on the north and west walls had numerous fractures. The siding on the north and west walls will need to be removed and replaced.

The weather barrier under the siding will need to be evaluated.

If there is no weather resistive barrier (WRB). One must be installed from corner to corner.

If there is a WRB, but for whatever reason it is defective, or concluded by reasonable thought that it is inadequate for a specific reason, it would need to be removed and replaced with an approved product.

Case Study 2

An exterior wall is scheduled to have the siding removed and replaced. It was discovered that the house has fanfold insulation under the siding. The contractor wants both new fanfold and new house wrap to be installed citing one only provides air resistive-fanfold insulation and the other is a water resistive barrier WRB. He stated that the Wisconsin state code allowed foam sheathing, if properly taped, to be acceptable as a water resistive barrier, but the house did not have foam sheathing.

Answer: Both will need to be installed to bring the building back to a pre-loss condition and to satisfy the code.

Foam plastic sheathing is not the same product as fan fold backer. They each have a different function. Extruded foam sheathing with permanently taped joints is acceptable as a water-resistive barrier. FanFold insulation is not a WRB.

FOAM BACKER BOARD. Foam plastic is used in siding applications where the foam plastic is a component of the siding. This provides an insulation value and a sound deadening component. This is not a WRB.

FOAM PLASTIC INSULATION. A plastic that is intentionally expanded by the use of a foaming agent to produce a reduced-density plastic containing voids consisting of open or closed cells distributed throughout the plastic for thermal insulating or acoustic purposes. If taped, it can serve as a WRB.

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