



# Effectively Assessing Barn Renovations



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On the third week of March 2014 pork producers saw something they had never seen before – individual pigs sold for more than \$300 each. The fact that this coincided with moderating grain prices meant that margins had never been better in recent memory (last 7 years). Now what? Although there is plenty of debt to soak up these margins, there is a noticeable change in perceptions on the future of the pork industry. A new future could be imagined that included facility and equipment renewal. Over the next 2 years there will be plans and purchase decisions made to address pent up demand by facilities and their managers to address the repair and maintenance concerns of pig barns. Nationally we have an aging ‘fleet’ of barns, with the last big building effort concentrated between 1991 and 1998; these barns have seen more than half their productive life, even with good maintenance. This is complicated by the

fact the maintenance and repairs over the past 7 years have been well below the level required to keep the ‘fleet’ in tip top shape. Some barns have passed their ‘best before date’, but for those barns we want to remain operational for the next 20 years we need to consider reinvestment. The challenge, there are many demands and few resources so how do you decide where the first dollar should be spent?

It would be nice to “have an app for that” but the complex considerations of capital vs operational investments, people vs infrastructure, and short-term vs long-term return on investment make analysis of this ‘apples and oranges’ comparison very challenging. We challenged ourselves to consider what kind of a tool might assist in making these decisions logical and a good contributor to profitability. We also saw this challenge of barn reinvestment choices being influenced by personal preference, and rather than money spent being a positive influence on future cash flow and profitability, they could be simply expenditures on ‘my favourite things’.

Here is a checklist approach to making objective barn investment decisions. We considered a simple approach using a combination of perceived risk of not making a change in each area, and the impact of a worst case scenario if catastrophic failure of that overlooked area was to occur. Our suggestion is you take a walk around and through the entire barn; you may want to have someone accompany you since perception of risk and impact is subjective and the exercise could benefit from a second opinion. You will also want to take a few tools with you to poke and

prod and assess equipment and structure. This is where the title of this article comes in, “Shining a light...” is a direct reference to your need to have a high intensity flashlight with you to inspect below slats, in attics and behind pillars and equipment. We recommend at least 200 ft candle power (as little as \$50) and better yet 800 ft candle lights, an inexpensive investment that will bolster your judgment with greater clarity in important areas such as assessing concrete cracks and rafter strength. The other tools you will need include a ladder tall enough to allow you to get on the roof, a small ladder in the barn for accessing attic hatches, and in the tool belt a screwdriver and knife for scrapping and digging, perhaps a can of fluorescent paint to mark areas for re-inspection in the future.

The following Risk Assessment Checklist looks at four areas of consideration (Biosecurity, Structural, Utilities and Operational). Certainly more could have been added but in balancing the need for brevity and ease of use against being all encompassing, we opted for a quick tool that will reveal the areas of greatest need and allow you to pursue an action plan or seek professional structural or other engineering and construction advice. A special note regarding safety for people working in barns; the structural and utility sections of the checklist identify safety considerations. For example, marked exits, emergency egress exits and fire separation — to increase time to exit the building, these may not have been part of the original barn plan but should be considered essential upgrades as we evaluate our barn structures.

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# Risk Assessment Checklist

Area	Description of area observed	Risk scale 1-5	Impact of failure on farm net income 1-5	Avoidance of risk, best return score
<b>BIOSECURITY</b>				
<b>STRUCTURAL</b>				
OUTSIDE	Cracks in foundation wall			
	Insulation, studs, vapour barrier			
	Pit walls			
	Eaves, soffit, fascia			
	Roof steel, seams, screws			
INSIDE	Floors, cracking and heaving			
	Slats, cracks (along length or across slat)			
	Under the slat in high use areas			
	Farrowing and nursery floors			
	Suspended floor supports			
	Ceilings plywood, PVC liners			
	Interior perimeters moisture migration			
<b>UTILITIES</b>				
OUTSIDE	Electrical service connection to barn			
	Emergency generator exhaust vent			
	Fire department access road around structure			
	Water supply for fire fighting			
	Exit doors and emergency egress openings clear of obstacles and functional			
	Gas lines painted yellow, and other utilities clearly marked			
INSIDE	Fire detection/alarm system (tested)			
	Fire extinguishers in all passageways that lead to exits (tested annually)			
<b>OPERATIONAL</b>				
OUTSIDE	Gravel building perimeter; control of weeds, placement of rodent control			
	Sewer vent pipes clear of debris			
	Manure pump out access covers solid and secured			
	Feed bins stable and secure, boot bottoms			
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INSIDE	Equipment tied to the floor			
	Sow stalls, feeders			
Other				

## Perimeter (walk the barn)

- ✓ check for cracks in foundation wall, hairline cracks are expected, larger cracks need further investigation
- ✓ stud walls can be inspected by removing fasteners and looking at the condition of insulation, studs and vapour barrier
- ✓ check the manure pit access, this will give the best view of visible pit walls, do not enter pit
- ✓ check eaves, this is where ventilation air enters barn, eave doors should be intact, soffit and fascia can be checked

## Check roof

- ✓ climb on roof and check steel condition, watch for rust at seams, popped screws and pay special attention to valleys and any chimney or pipes that penetrate roof steel, note placement on roof so that when inspecting attic these areas can be targeted from the inside

## Enter barn and check floors and slats

- ✓ when checking slats look for surface cracking, cracks or pops along the length of the slat mean rebar has been exposed to manure and is rusting, cracks across the slat is of more immediate danger and slat could collapse with warning
- ✓ check the bottom of the slats in 10 high use areas, slats will often show wear under slat first. This will show as concrete blown off the bottom side of slat, if this occurs slats are of no value
- ✓ check solid hallways for cracking, minor cracking in these areas is expected, look for unusual amounts of cracking that could be caused by frost penetration

### Preparing for a Barn Inspection

- a tall ladder for roof access
- a small ladder for accessing attic hatches
- screwdriver and knife for scraping and digging
- fluorescent paint for areas of re-inspection

## Check equipment tied to floors

- ✓ areas where equipment such as dry sow stalls, feeders, farrowing floors are attached to floors are high wear areas
- ✓ use screw driver and scrape until metal is uncovered, this will give some indication of required maintenance.
- ✓ farrowing and nursery floors are self supporting, check beams or framework to insure stability
- ✓ any plastic coated expanded metals should be inspected for cracking, even hairline cracks means life of product is greatly diminished

## Ceilings

a variety of products are possible on ceilings, the most common are plywood and PVC liners

- ✓ pay particular attention around the interior perimeter, moisture entering from eaves will cause deterioration around perimeter first
- ✓ check integrity of plywood ceiling with a knife, wood should not be punky and should be difficult to penetrate with a knife
- ✓ PVC ceilings will not show this wear but check to make sure strapping above this product is sound, again in a few suspect locations pierce the PVC and check for soundness of strapping

## Load bearing walls

- ✓ not all barns have load bearing walls but any structure over 80' will almost always have trusses supported in the interior of the barn. These may be steel posts, concrete walls or stud walls usually on a concrete curb and these supports hold up a split truss and are extremely important
- ✓ if the structure has steel posts look for rusting especially at the base. Scrape away any surface rust until good steel is found, there should be very little deterioration or an engineer should be consulted
- ✓ if concrete look for cracking, hairline cracks are expected
- ✓ if wood, expose some of the stud wall and inspect for damage

## Attics

- ✓ this area tends to be the most neglected area of a structure so pay special attention
- ✓ trusses are normally spaced at 48" centers. You cannot step on any area except the bottom cord of a truss or you may fall through the ceiling
- ✓ any roof leaks will be obvious from the condition of the insulation. Blown insulation should appear fluffy and evenly spread. Every discolouration or sagging is a roof leak. Every steel roof will have a few leaks (these should be repaired) but the important points are how much and how long, any leaks will have caused some deterioration to ceiling, bottom cords and truss plates, the amount and duration of these leaks will be directly related to the amount of damage. Minor damage is not significant but if the bottom cord is punky or the truss plates corroded an engineer should do further assessment, again scraping rust looking for good metal in plates and penetrating wood trusses with a screwdriver will give some indication of the amount of damage
- ✓ pay special attention around the perimeter of the roof as this is where snow has most likely entered the attic
- ✓ truss plates should be closely looked at. They should appear shiny and basically look like new, any rusting on truss plates is an issue that can cause roof collapse
- ✓ if there is no cladding under the roof steel such as tentest or vinyl back insulation holes in the attic will be obvious when you shut off the flashlight
- ✓ if the roof steel has under cladding of tentest this product sags easily if wet so roof leaks are again fairly obvious
- ✓ if the roof has vinyl back insulation this is more difficult. Water will run down the vinyl until it finds an exit so where you see insulation damage the leak may be higher up the roof

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