

BARNs

Like the houses in the rural areas of the region, the typical stable-loft barns have undergone a considerable, and interesting, evolution over the past one hundred years. The growing size of the farm, technical advances, and changes in available manpower all affected the development of the barn in Elton-Cornwallis. The transformation of the barn in this area has not been completely regular, however. Economic conditions, especially, disrupted or prolonged certain stages in the progression from the earliest crude barns of the 1870s to the large frame barns of the 1920s. Despite these inconsistencies, some basic barn types have been identified. Four main stages in this process are discernible: during the nineteenth century: 1) Initial structures, 2) Early frame barns, and, 3) Southern Ontario-style barns; and during the twentieth century, 4) plank framed barns. The increasingly sophisticated planning, construction and decoration that characterized barn development in the planning district can be better understood with an analysis of these four barn types.

Initial Structures

The first barns constructed in the planning district would not likely be recognized as barns today. Small and low, these early barns frequently had the appearance of medium-sized sheds. Lean-tos and roughly constructed log structures comprised the earliest shelters for the few cattle and the small amounts of feed that the early settlers maintained. These could be completely separate structures, but the remaining examples suggest that, in the planning district, the livestock stable and hay storage loft were frequently united in one building. The arrangement could vary. They could either be joined in a single storey structure, or in a 1½ storey structure with a hay loft above the livestock stable. The latter was the typical arrangement of nearly all barns in Western Canada.

The very first barns built around Brandon were straightforward in design and construction. Their basic rectangular plan and simply-constructed log walls provided an adequate shelter for the material and animals inside. Any refinements of designs would have been unnecessary, and indeed, extravagant. Like their log houses, these first barns were usually considered temporary by their builders, and more pressing concerns took priority.

Only three log barns were located in the survey; one is just to the west of Douglas, while the other two are in the Brandon Hills. The barn near Douglas, which appears to be the oldest of the three, offers a fair representation of early log construction (Figure 30). The exterior walls which were built of 180 to 200 mm (7" to 8") wide logs, either peeled or roughly squared on two sides, were sheathed over with horizontal drop siding (Figure 31). The interior corners suggest that the walls were connected by dovetail joining, the same technique used in pioneer residential construction. The loft gable end walls were constructed with 40 x 80 mm (2" x 4") studs. Because the only function of the loft floor was to store feed, the careful notching used to secure the log walls was unnecessary. The loft floor was made of 50 to 70 mm (2" x 3") wide rails that were simply laid across the larger 100 to 125 mm (4" to 5") wide beams. The roof was, like the loft floor, hastily constructed (Figure 32).

The construction of log barns required additional work to produce a sound, warm structure. The spaces between the wall logs were filled with chinking, which consisted in this case, of a mortar mixture. In the loft the cracks between wall logs and gable end boards were left open to encourage ventilation. Although the thickness of the log walls provided heat retention and retarded the spread of fire, these barns took an individual a considerable time to build. The short logs that were available also limited the construction of larger log barns. Additionally, log barns had a rough pioneering appearance that many settlers considered backward and unsightly. Thus, while log barns continued to be built until the turn of the century, settlers who needed larger barns by the mid-1880s considered a different construction method.



Figure 30
Early log barn, NW 3-11-17W, ca. 1880.
The framed lean-to on the left was a later
addition.

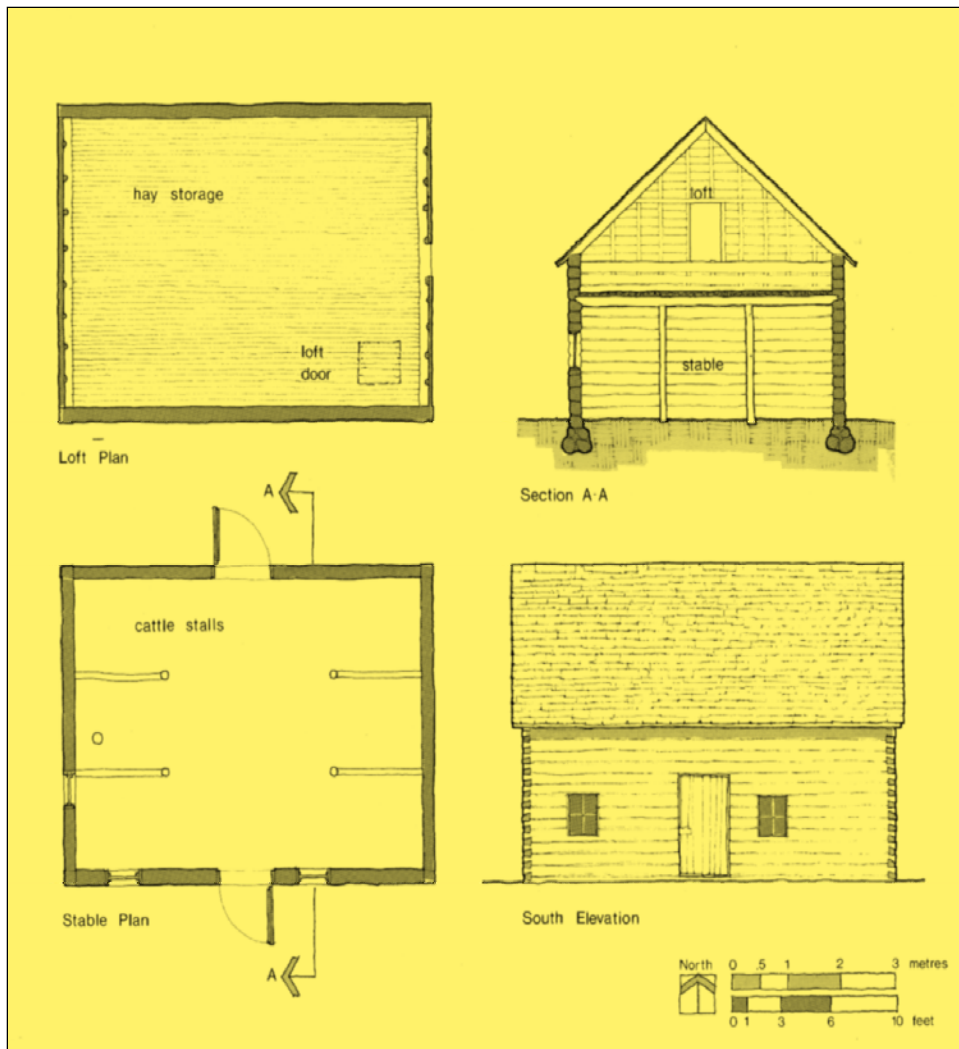


Figure 31
 Early log barn, NW 3-11-17W: plans, section and elevation. The simple stable, with room for six animals, was small and poorly lit.



Figure 32

Early log barn, NW 3-11-17W. The roof construction of this log barn consisted of rough log rafters that sat in a notch in the wall sill plate and were connected at the roof peak by butt joints. Without notching, the rafter ends were cut at rough angles so they could be toe-nailed together. The rafters were covered by planking and shingles.

Early Frame Barns

Frame construction resolved some of the restrictions inherent in log construction. It became possible, by 1885, to build larger, neater barns, with nearly any plan configuration. However, in Elton-Cornwallis the variety of barn plans allowed by frame construction, although common in other areas, were not immediately employed. It was the increased size and the ease of construction, that local settlers found especially attractive.

The same framing procedures used in house construction proved just as effective for early frame barns. Milled 40 x 80s (2" x 4"s) or 40 x 150s (2" x 6"s) were arranged as frames to form the wall skeletons which were, in turn, covered with horizontal drop siding. The floors and roof were constructed in the same manner as their residential counterparts. Although these new framing procedures altered the general appearance of barns in Elton-Cornwallis, there were other features that transformed the entire character of these buildings.

While log barns were usually built on rough stone footings, frame construction required well-built level foundations for a neat, durable structure. In many early frame barns the roughly-dressed fieldstone foundation rose seven feet above grade, creating the walls for a ground floor stable. The foundation wall was frequently built into a rise in the terrain, permitting access to the barn from two levels: one side of the barn from the higher ground, into the loft, and from the other side into the ground floor stable.

Barns with such access at two levels were known as bank barns and a few variations were common in southern Ontario during the nineteenth century. The two most common forms of bank barns were either a simple two-storey rectangular building or else a two-storey building with loft overhanging the yard floor on the side of the barn away from the hill.

The bank barn with the loft overhand was not common in the region. The typical bank barn in Elton-Cornwallis was oriented east-west, with the stable access to the south and the loft access up the ramp, from the north. This orientation created a stable yard on the south side which was warmed by the sun and sheltered from the prevailing north-west winds. In addition, this layout created better air movement in the barn. Vents in the loft permitted natural flow-through ventilation, but because of the earth berm against the north wall, the stable was more difficult to ventilate naturally. There was one other advantage to the location of a barn in a south-facing hill: because cattle and horses were usually separated, this layout permitted the location of two distinct entrances on the same side into the barn. All of these inter-related planning and construction developments gave the new framed bank barns in the planning district a sophistication that was difficult to achieve with logs.

The original portion of a barn at SE 4-11-19W, in Cornwallis, is an interesting example of an early framed bank barn (Figure 33). Built by Robert Hutton in the 1880s when this kind of barn was most common, its planning and construction illustrated general bank barn characteristics (Figure 34).

The small fieldstone stable was simply planned. It was divided into two sections: one for horses, one for cattle. Two separate doors on the south permitted access for six horses into one side and ten or twelve cattle into the other. The loft was also straightforward. While it has been partitioned into small rooms, it was originally an open space with a drive-in central alley, flanked by two storage areas.



Figure 33

Hutton Barn, SE 4-10-19W, ca. 1885. The original bank barn, from the northeast, shows the hillock that provides upper level access to the loft. This section has square nails, a feature helpful for dating nineteenth century construction.



Figure 34

Hutton Barn: cross section of the original barn and elevation of the barn addition. The north ramp to the loft and lower access to the stable that were characteristic of early bank barns are evident here. The typical framing procedures in the loft consisted of stud walls sheathed with horizontal siding and rafters covered with planks and shingles. The rafters were stabilized with a horizontal connecting strut nailed about 0.6 m (2') below the roof peak.

Southern Ontario-style Barns

Small framed bank barns continued to be built until the 1890s. With a small herd of cattle and a limited number of horses, it was not necessary to build a larger structure. Before the turn of the century there were, however, a number of ambitious farmers in the planning district who sought to enlarge their operations. The economic situation in the west had changed considerably by the 1890s and the sudden prosperity encouraged farmers with sufficient capital to expand their operations. With larger herds of cattle and more plough horses, small framed bank barns were hardly adequate for their needs.

Many farmers simply added a larger frame structure onto the smaller original barn, in the fashion of the Hutton barn. Others, however, erected completely new buildings. Because of the structural complexities involved in building a large barn, it was difficult for settlers to design their own plan. When considering the kind of large barn they would build, it was reasonable that the farmers of the planning district would look to their own heritage for precedents. Most settlers in the Brandon area had originally lived in a few counties in southern Ontario and within these counties a very distinctive banked barn, which came to be called the southern Ontario style barn, was prevalent (Figure 35). In the planning district two distinct sizes of the southern Ontario style barn were built. The smaller barns were generally constructed before 1900; more substantial barns, which still retained basic southern Ontario features, were usually built after 1900.

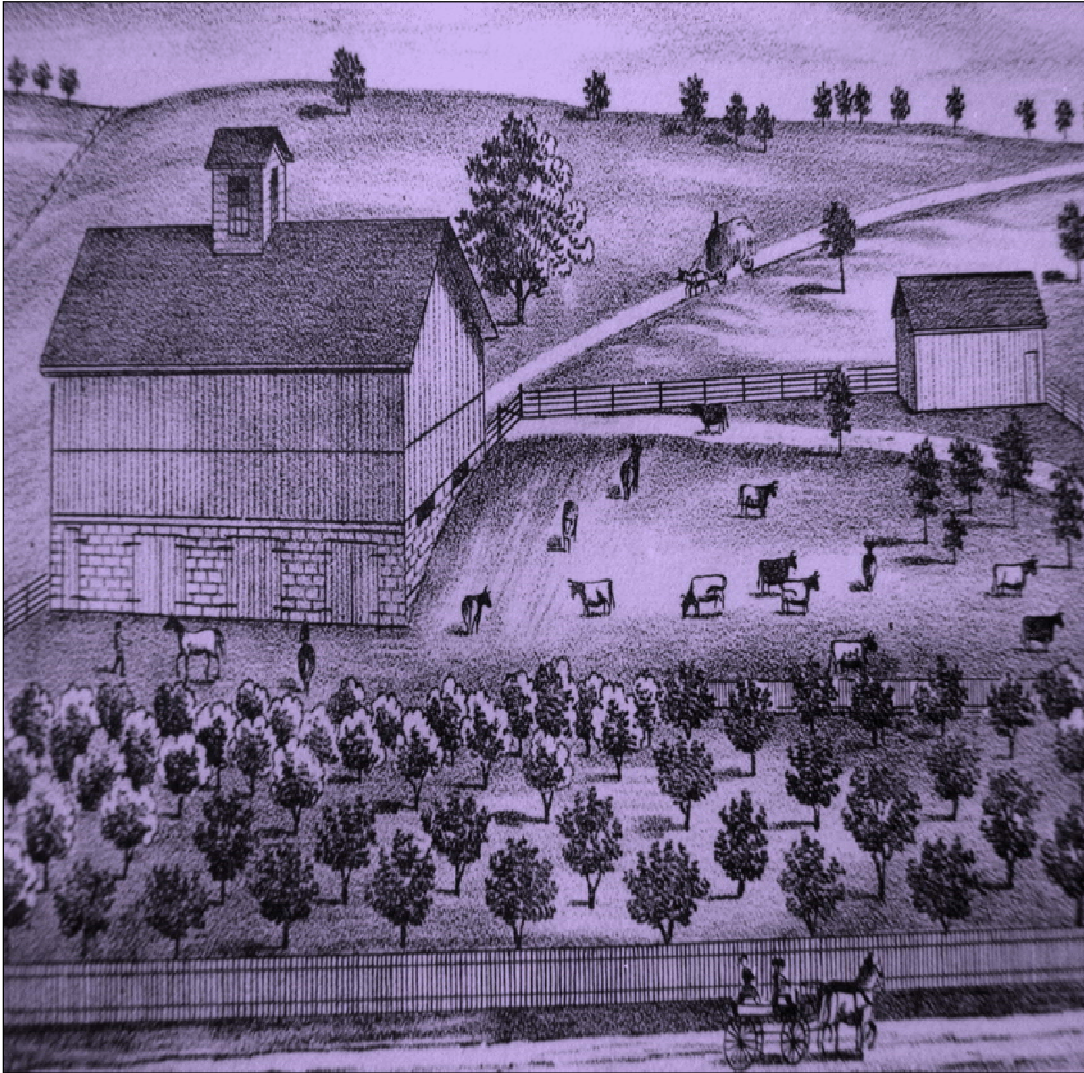


Figure 35

A southern Ontario style barn, built during the 1860s in the county of Hastings. (Illustrated Historical Atlas of the Counties of Hastings and Prince Edward.)

Besides the north ramp, stone stable and east-west orientation that characterized the earlier bank barns, the typical southern Ontario style barn was distinguished by a heavy internal post-and-beam network, mortise-and-tenon joinery and vertical board-and-batten siding. Large posts and beams were joined in a straightforward fashion (Figure 36). Two hundred-by-two hundred millimeter (8" x 8") posts extended from the loft floor, either to the height of the exterior walls, or to an intermediate point between the wall and the roof peak. Plates and purlins connected these posts respectively at the top, and supported the 40 x 150 (2" x 6") rafters. Stabilizing beams, also called girts connected all the posts at intermediate levels. Two beams rarely joined a post at the same point; the mortise notches cut in the posts were staggered vertically or laterally so that beam tenons were not aligned and the post was not weakened. Details like the butted ridge joint, the shoulder cut rafter seat, the post and girt connection and the loadbearing scarfed joint typified most southern Ontario construction. The mortise-and-tenon joints that were used for most of these connections, including the diagonal sway bracing between posts and beams, were secured with wooden pegs.

This system of posts and beams in the loft was generally referred to as bentwork. Each set of posts and beams running across the width of the building was called a bent. Barn sizes were frequently expressed in terms of the number of bents; large barns could have seven or eight bents, small barns typically had four bents. The Ferguson barn at SE 30-11-18W, with four bents is a very good example of the smaller southern Ontario style barn (Figures 37 and 38). The planning of this barn, like the earlier framed bank barns, was based on an east-west orientation that permitted dual stable access from the south. The loft, entered from the north hillock, had a central drive-in alley with flanking storage bins (Figure 39). The elements of the bentwork in the Ferguson barn consisted of 250 x 250 (10" x 10") posts, 180 x 180 (7" x 7") connecting girts and 40 x 80 (2" x 4") diagonal braces (Figure 40). All of these connections were secured with straightforward mortise-and-tenon joints (Figure 36(c) and 41).

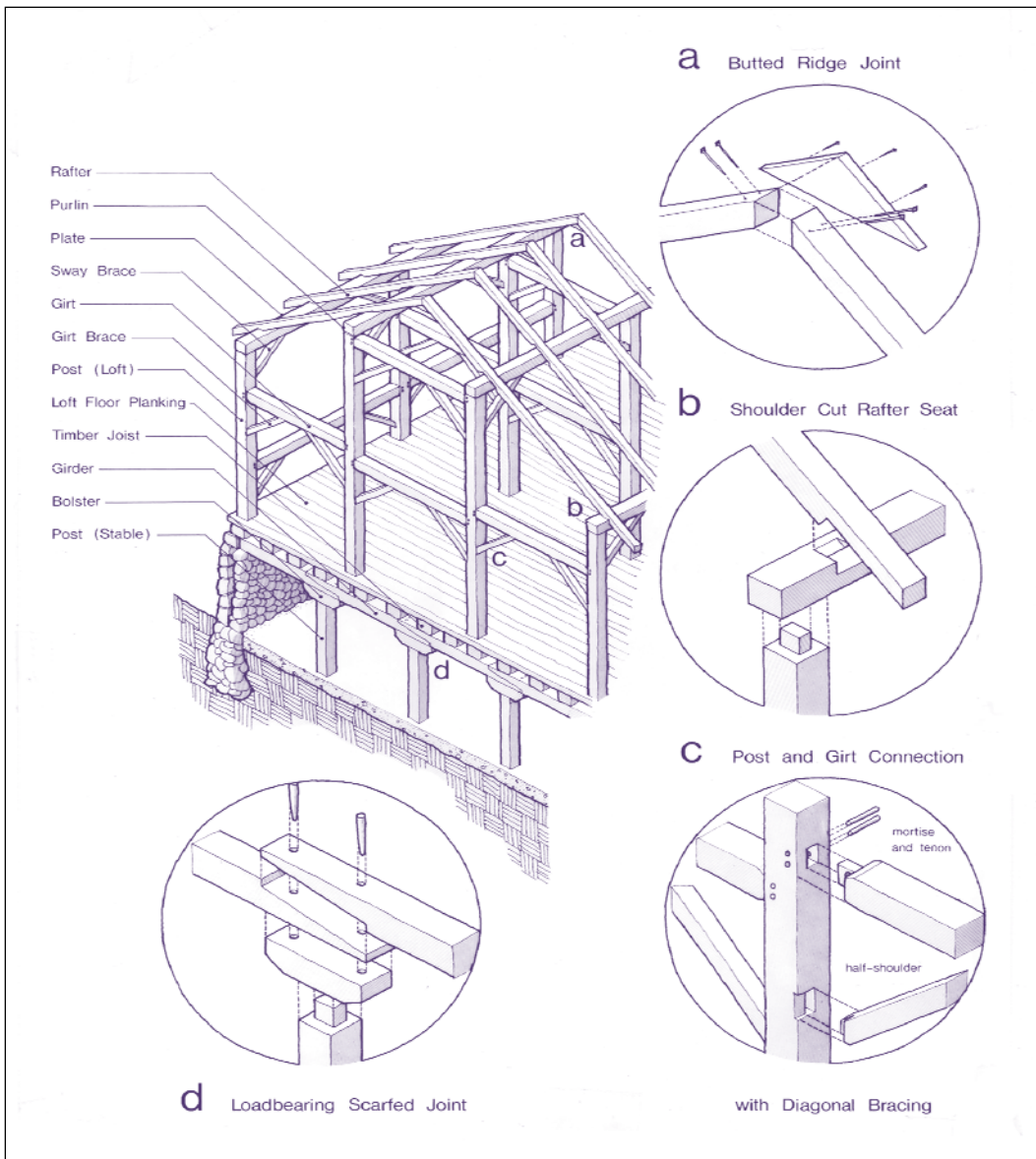


Figure 36
 The construction procedures used for a typical southern Ontario style barn featured some interesting details.



Figure 37

Ferguson Barn, SE 30-11-18W, ca. 1890. This northwest view shows the hill that permits access to the loft. The location of the internal structural members can be discerned by the jogged horizontal joints in the siding.



Figure 38

Ferguson Barn. The southwest view features the stable entrances at the ground level, the fieldstone foundation walls and the vertical board-and-batten siding.

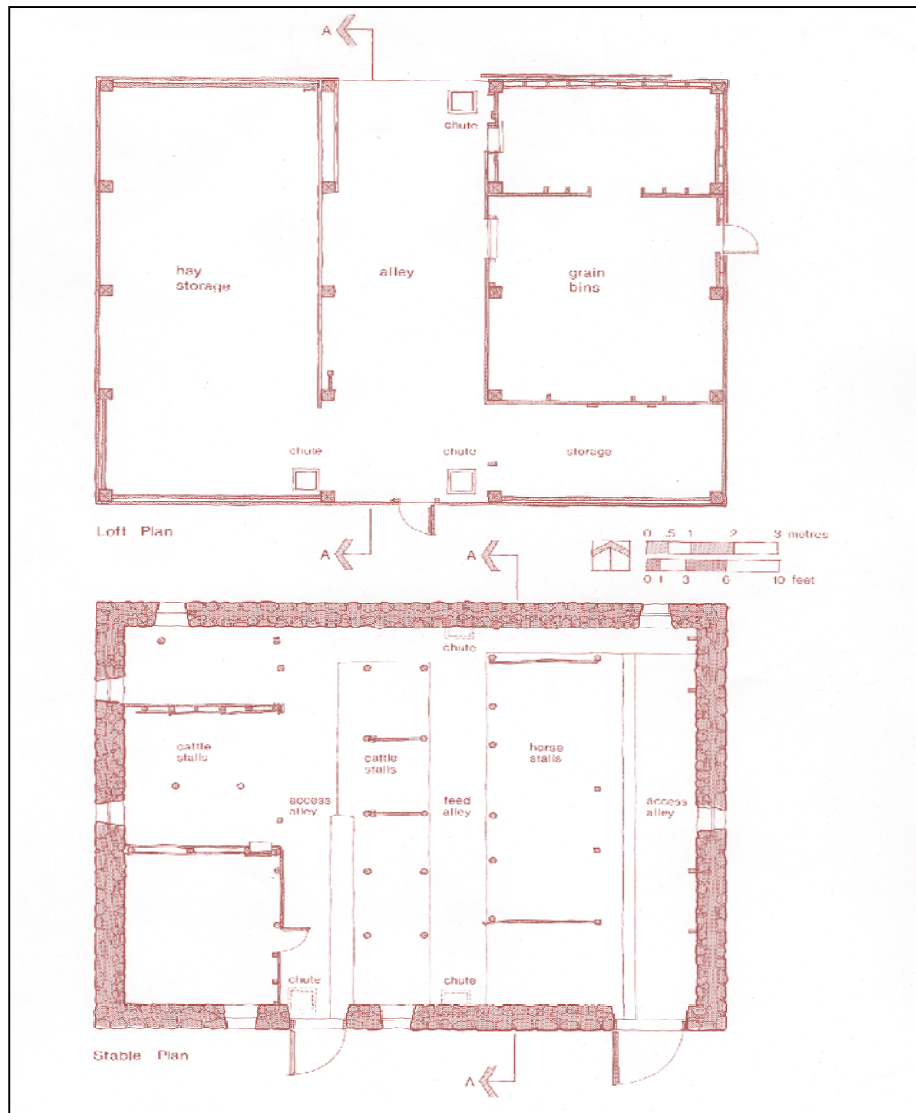


Figure 39
Ferguson Barn: loft and stable plans.

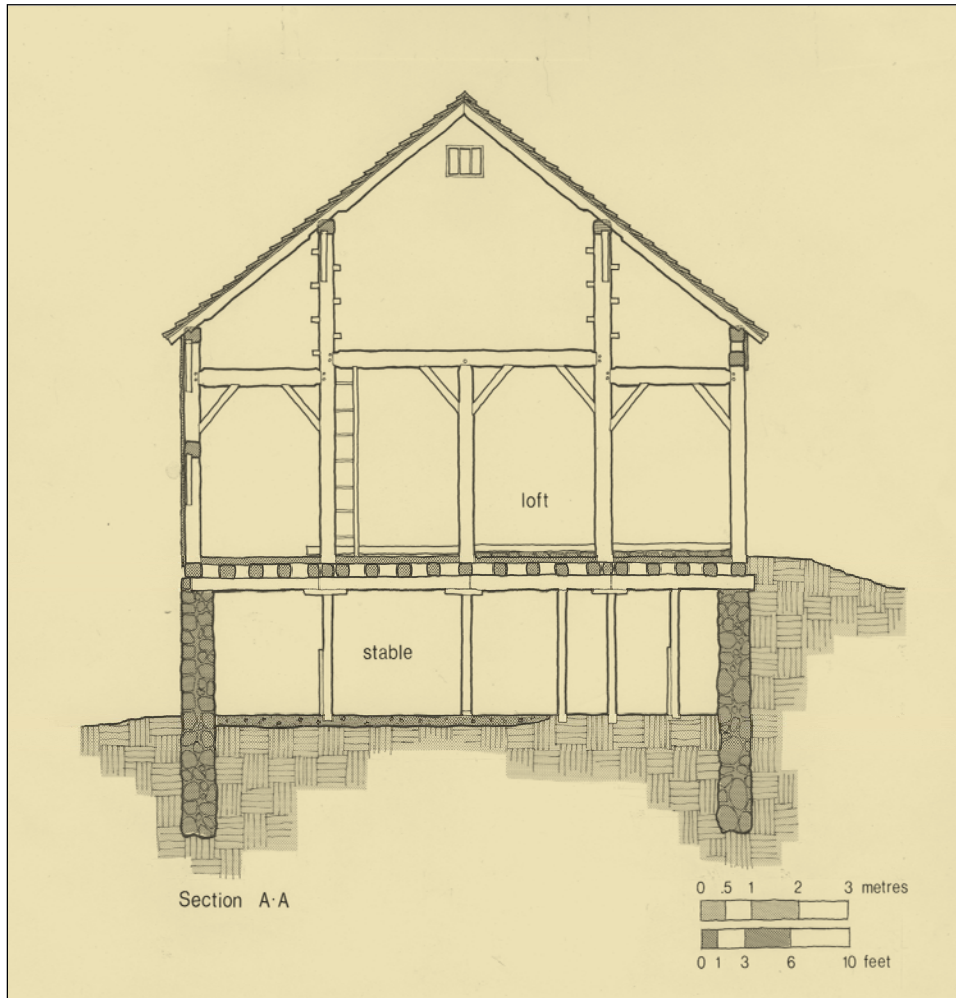


Figure 40
Ferguson Barn: section. This cross section shows the access at two levels, the loft bentwork and the fieldstone walls. The pegs on the two interior posts provided access to the upper areas of the loft.



Figure 41

Ferguson Barn. Typical post, beam and diagonal brace connection in the loft. The staggered beams were connected to the post with mortise-and-tenon joints. The notched beams created a more secure structural connection as well as an interesting decorative feature.

This cluttered and heavy support construction in the stable was required because of the insecure structural relationship between the loft and the stable. The situation was somewhat different at the junction of the loft walls and the foundation walls. The loft posts around the perimeter sat rather precariously on a wooden sill plate that was simply laid atop the stone walls. While basic construction shortcomings like these may have warranted the criticism levelled against them by later barn designers, these early southern Ontario style barns did, nevertheless, contain interesting features including ingenious joinery and rationalized internal planning.

Small southern Ontario style barns continued to be built in Elton-Cornwallis for a number of years after 1885. However, just before the turn of the century, as agricultural productivity increased, larger barns became a necessity, and more substantial structures began being erected.

While southern Ontario style barns relied on the same orientation, internal layout and construction procedures that characterized their smaller predecessors, certain developments changed the nature of the new barn. A gambrel roof, which provided a larger loft capacity, replaced the moderately-pitched gable roof of earlier southern Ontario style barns (Figure 42). Instead of relying on a hill for access into the loft the new barns were generally accessed by a built-up earth ramp on the north side. Because these barns required a larger work force for their construction, barn-raising bees were often organized. Local neighbours volunteered their time and gathered at the site, where, under the direction of a carpenter, they constructed the stable walls and structural frame (Figure 43).

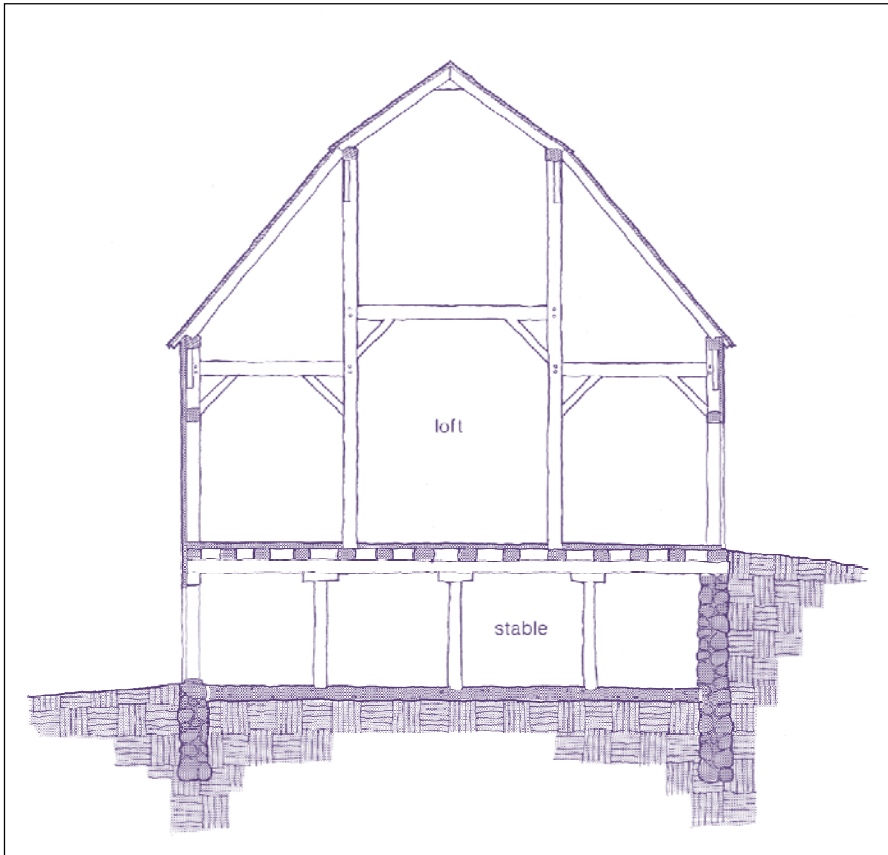


Figure 42

Typical gambrel-roofed southern Ontario style barn. The central bay was narrower and the two centre posts were taller than barns with a gable roof. The rest of the barn was constructed and planned like earlier southern Ontario style barns.



Figure 43

A barn-raising near Douglas nears completion of the structural skeleton on this six bent barn. The long built-up ramp was covered with large logs. The planking used for the siding and the roof can be seen inside the barn, on the left. The siding and roofing were usually finished by the farmer, his sons and hired help. (F. Willmott)

The larger loft and stable areas in these new barns required different plan organizations. The loft plan of the typical small southern Ontario barn was enlarged, in the larger barn, by an additional alley and adjacent storage area. The stable was usually doubled in size and frequently included a root cellar and foaling and calving pens against the north wall.

A number of these large southern Ontario style barns were built around Brandon before 1920. The McCallum barn, built just at the turn of the century, is a very interesting example of the mature southern Ontario style barn (Figures 44 and 45). The bentwork in the loft and the construction of the stable reflect the basic similarities to the Ferguson barn. The planning, however, of the McCallum barn represents an advance over the Ferguson barn. The access alleys divided the large loft into three storage areas while, in the stable, the stalls were arranged into a neater grid (Figure 46). Although more animals could be housed in the McCallum barn, the individual stalls were not appreciably better than those in the Ferguson barn. The addition of the root cellar, however, made the McCallum stable more useful. The building, which has been dismantled, offers an excellent view of typical southern Ontario barn construction (Figure 47).

The roof of the McCallum barn was not actually typical of the mature southern Ontario style barn. While most large southern Ontario style barns in Elton-Cornwallis had gambrel roofs, the McCallum barn was designed with a hipped gable roof. Both of these roof types provided a more aerodynamically efficient form than the simple gable of the earlier southern Ontario style barns. The gambrel, however, was considered by many barn builders to be the better roof profile as it provided a larger loft capacity.



Figure 44

McCallum Barn, SW 3-11-18W, 1900. This northwest view shows the built-up north ramp and the characteristic gable end jog in the vertical sheathing. This jog, the reverse of the Ferguson barn jog, was required by the slightly different bent arrangement.

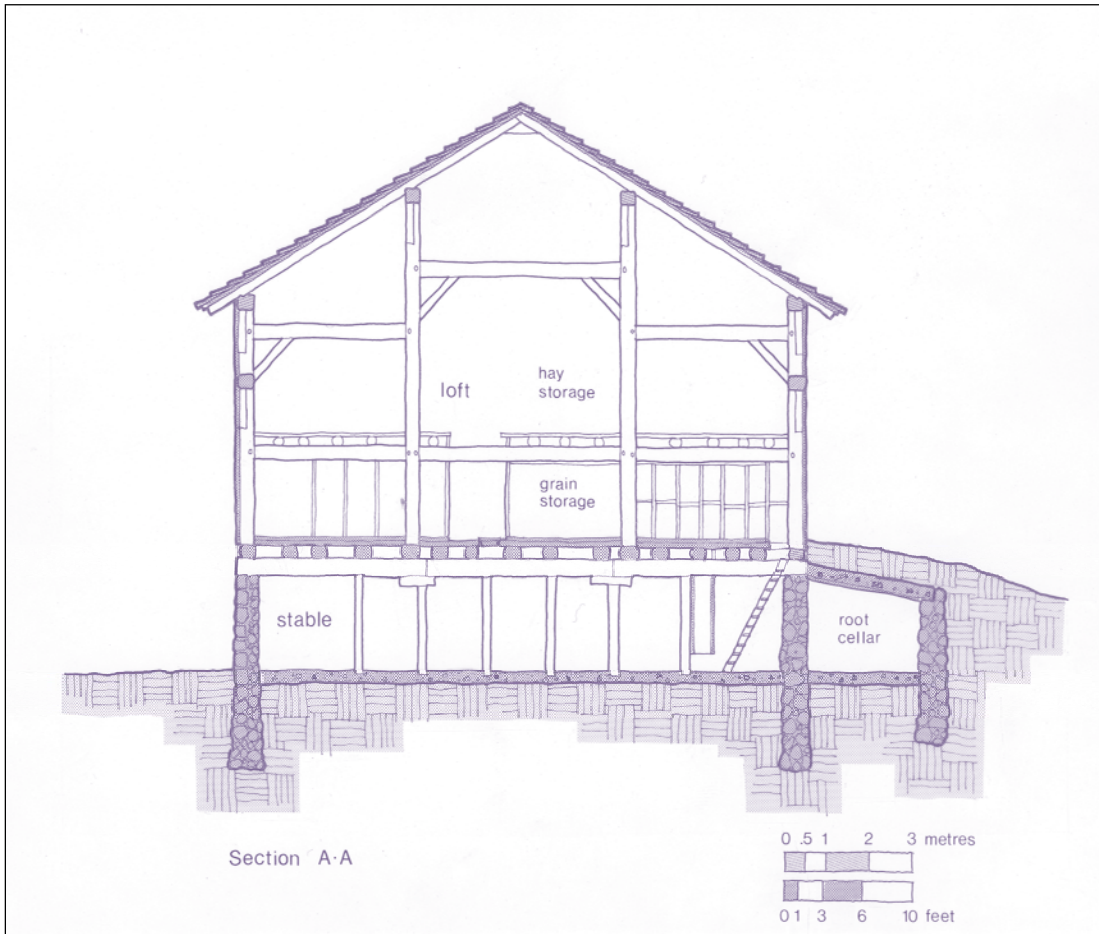


Figure 45
McCallum Barn: section. This cross-section shows the heavy fieldstone foundation walls, the root cellar under the built-up ramp and the loft bentwork.

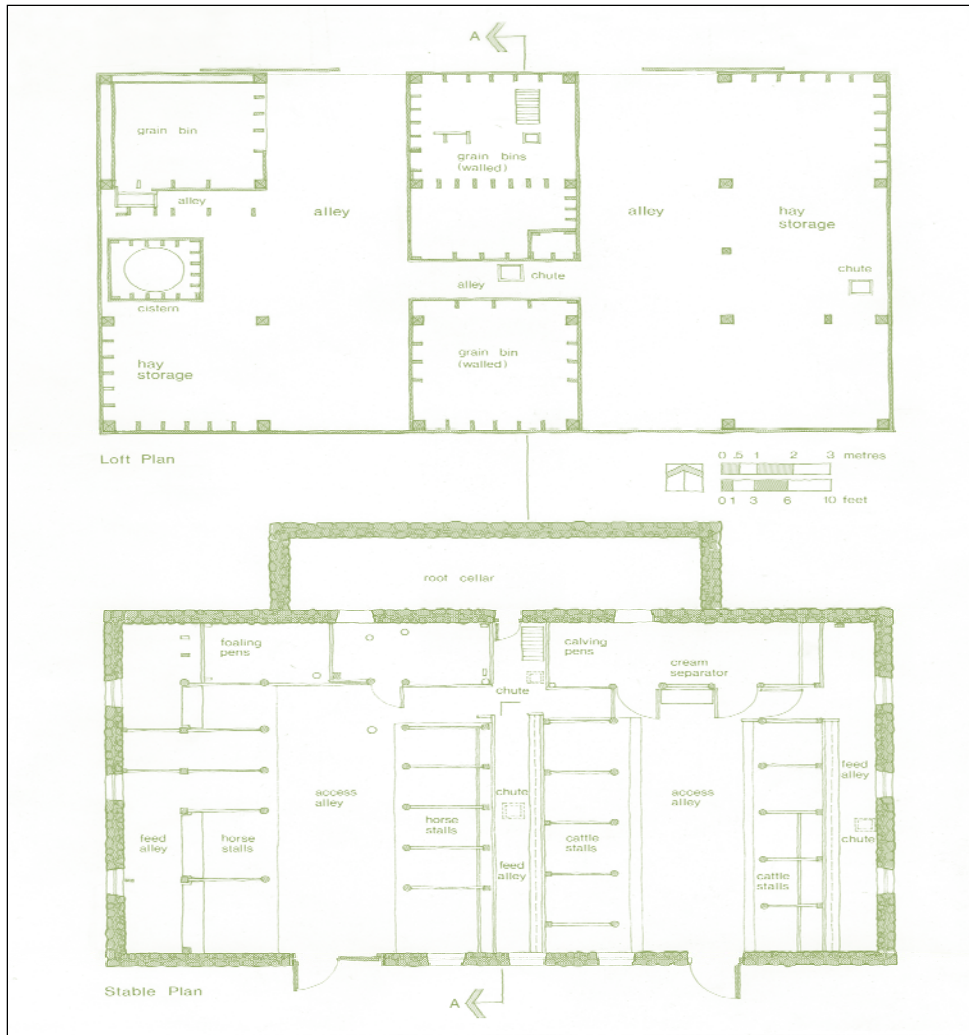


Figure 46
McCallum Barn: loft and stable plans



Figure 47
McCallum Barn. The vertical siding removed from the south side of the barn reveals the heavy timber framework.

Barn Transition

Despite some irregularities in construction, the McCallum barn represents the excellence that large hand-crafted southern Ontario style barns had attained in the planning district. By the turn of the century, however, the specific failings of structure and planning that affected the McCallum barn were being assessed by barn builders. The structural continuity between the stable and the loft was improved in many barns while in others the standard north ramp was made smaller to admit some light and improve ventilation in the stable (Figure 48). By the turn of the century other technological advances changed the nature of barns in the planning district. New devices, like hay slings, provided an easier, more economical way of moving feed around in the loft (Figure 49). Paralleling this development was the decline in the importance of the horse. As mechanized devices began replacing horsepower, the whole barn could be devoted to cattle production which, by 1910, was becoming a viable part of the agricultural economy in the planning district. A longitudinal barn with a long central alley became as common as the standard southern Ontario layout.

The modestly-sized Kneeshaw barn, built in 1905 at SW 21-9-17W shows the introduction of some of these developments (Figure 50). The southern Ontario style ramp was excluded and access into the stable was gained through two doors in the north or two doors on the south (Figure 51). The construction of this barn resolved the discrepancy between loft and stable connections (Figure 52). While construction details reveal some dependence on southern Ontario joinery the bentwork was simplified by eliminating some horizontal members. This development permitted easier movement in the loft.



Figure 48

McPherson Barn, NE 9-9-18W, 1923. The narrow north ramp on this barn allowed light and air into the northern half the stable. The typical southern Ontario stone stable walls were replaced with a lighter sheathed frame

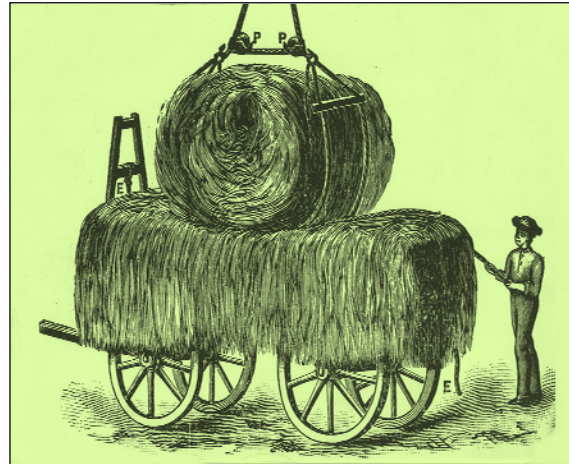


Figure 49

A hay sling, which was connected to a moveable pulley attached to a track in the roof peak, could distribute hay to various parts of the loft. (Provincial Archives Manitoba.)



Figure 50

Kneeshaw Barn, SW 21-9-17W, 1905. This view from the southeast shows the hay sling's extended track which was added after the barn's construction. The windmill was used to provide power for moving and crushing feed inside the barn.

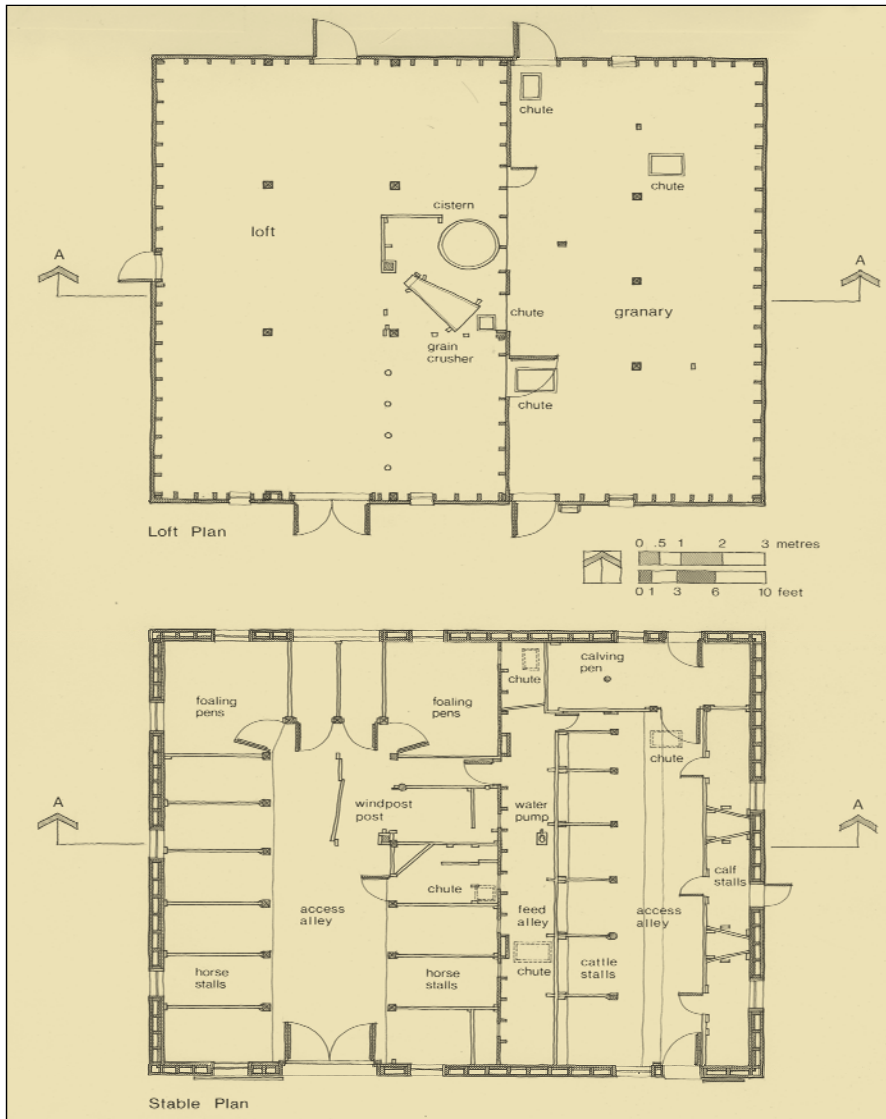


Figure 51
Kneeshaw Barn: loft and stable plans

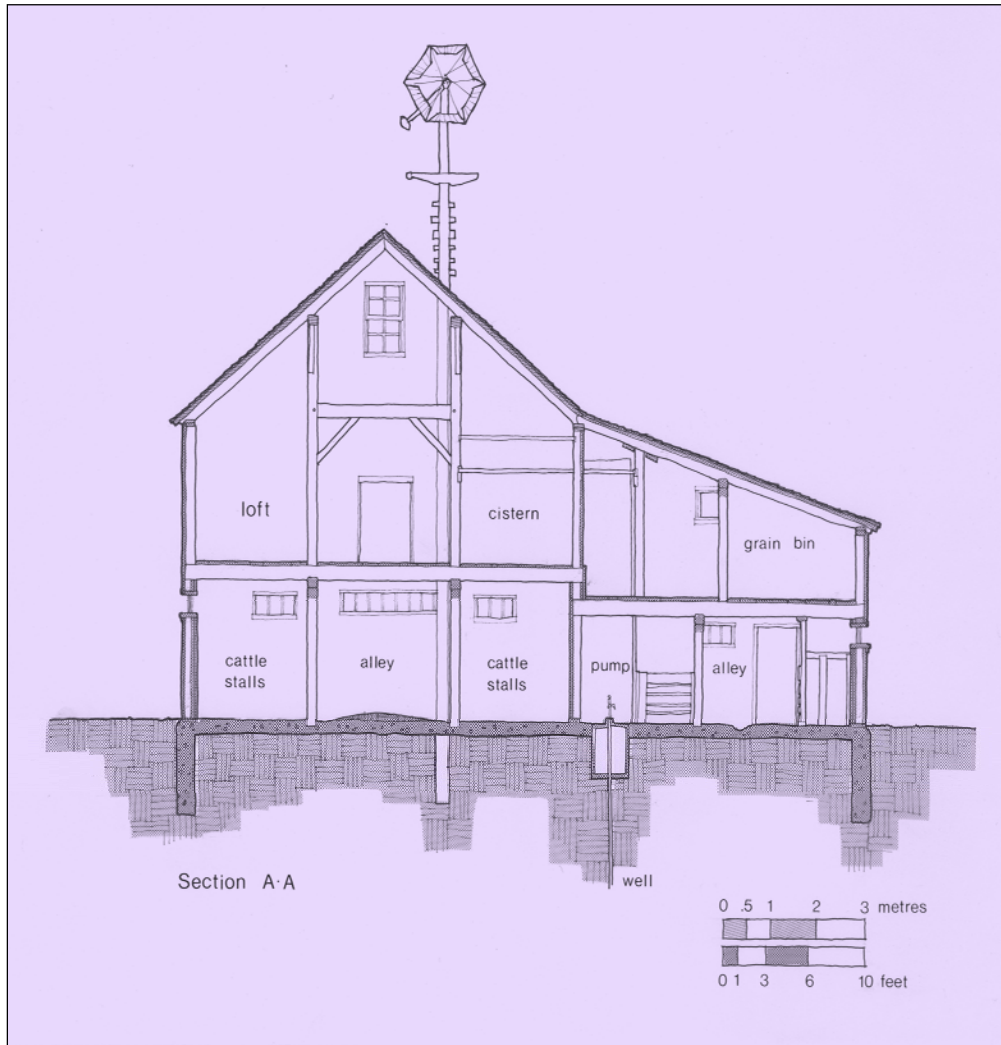


Figure 52
Kneeshaw Barn: section. The posts from the loft extended directly in a line to the stable posts.

In the Brandon Hills the settlers from Nova Scotia introduced a structural system that also created a more open loft (Figure 53). Each bent was connected to the next only by a purlin; the welter of horizontal connectors that provided external wall and loft stability in southern Ontario style barns were excluded in Nova Scotia style barns (Figure 54). The simpler bent arrangement permitted much easier movement in the ship-like loft. However while hay slings were often incorporated inside these barns, there was no easy source of access into the loft. The southern Ontario style north ramp was not included with Nova Scotia style barns and grain had to be thrown into the loft through 1200 x 1200 (4' x 4') hatch doors.



Figure 53
Roddick Barn, SE 17-9-18W, 1904.



Figure 54
Roddick Barn. The builders of Nova Scotia style barns concentrated the main structural supports away from the walls, increasing internal stability and freeing the external walls for frame construction.

Plank-framed Barns

While all the advances mentioned produced slightly more efficient barns than southern Ontario designs, some form of heavy loft bentwork was still required in these later buildings for structural stability. This situation was dramatically altered, however, with the introduction of plank framing (Figure 55). This system not only permitted the construction of a roof without the use of heavy, and increasingly costly, timber posts, but the bracing profiles of the trusses created a gambrel roof shape.

Barns built with plank framing were ambitious in design and scale. The Shields barn, built from 1910 to 1912, at NW 8-9-19W, reveals the advanced state that barn building in the Brandon area had attained (Figure 56 and 57). While the barn was built with concrete stable walls and was not planned with a long central alley, the huge open loft was very modern (Figure 58). Constructed using a series of plank trusses, the voluminous space in the loft allowed a hay sling complete freedom of movement along a track in the roof peak (Figure 59). Hay and grain could be lifted from wagons on the east side and shifted easily through any part of the loft. The Shields barn was built as a physical and technical rival to the new livestock barn at the Brandon Experimental Farm. The barn at the experimental farm burned in 1916 and the Shields barn now stands as one of the few remaining large truss-roofed barns in the Brandon area.

Farmers who built barns after the First World War usually relied on the same internal organization and construction procedures that were developed in earlier structures. Because the new barns were generally built exclusively for dairy cattle the longitudinal stable plan became predominant. New mechanical devices like the extended hay sling changed the profile of the barns, while new roof shapes were developed with later technological advances. However, it was the gambrel roof, the longitudinal stable alley, the hay sling and the loft framework developed for earlier barns that provided the basis for many later barn designs (Figure 60).

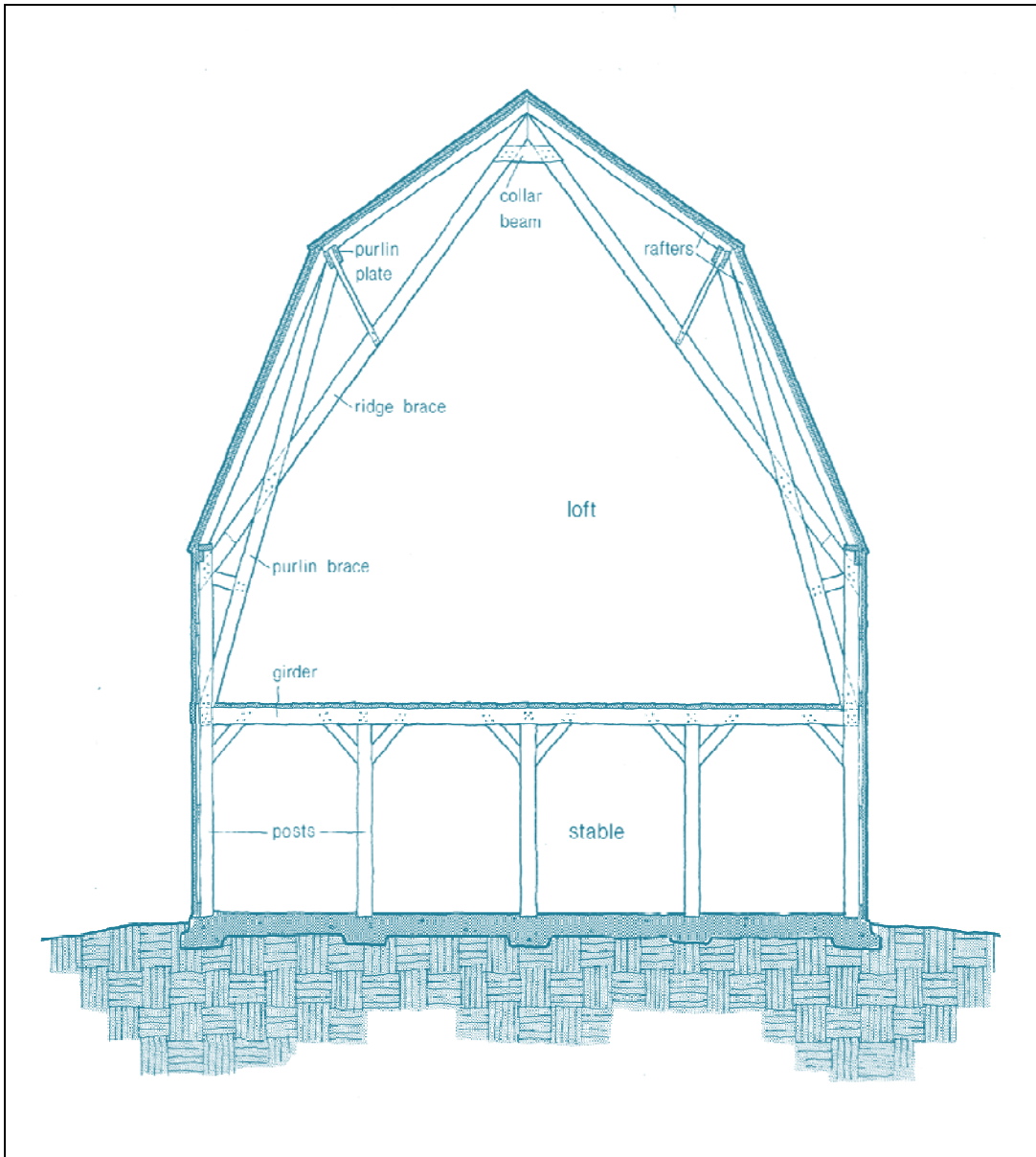


Figure 55
Plank-framed gambrel-roofed barns were built around the turn of the century.



Figure 56
Shields Barn, NW 18-9-19W, 1910-12:
southeast view.

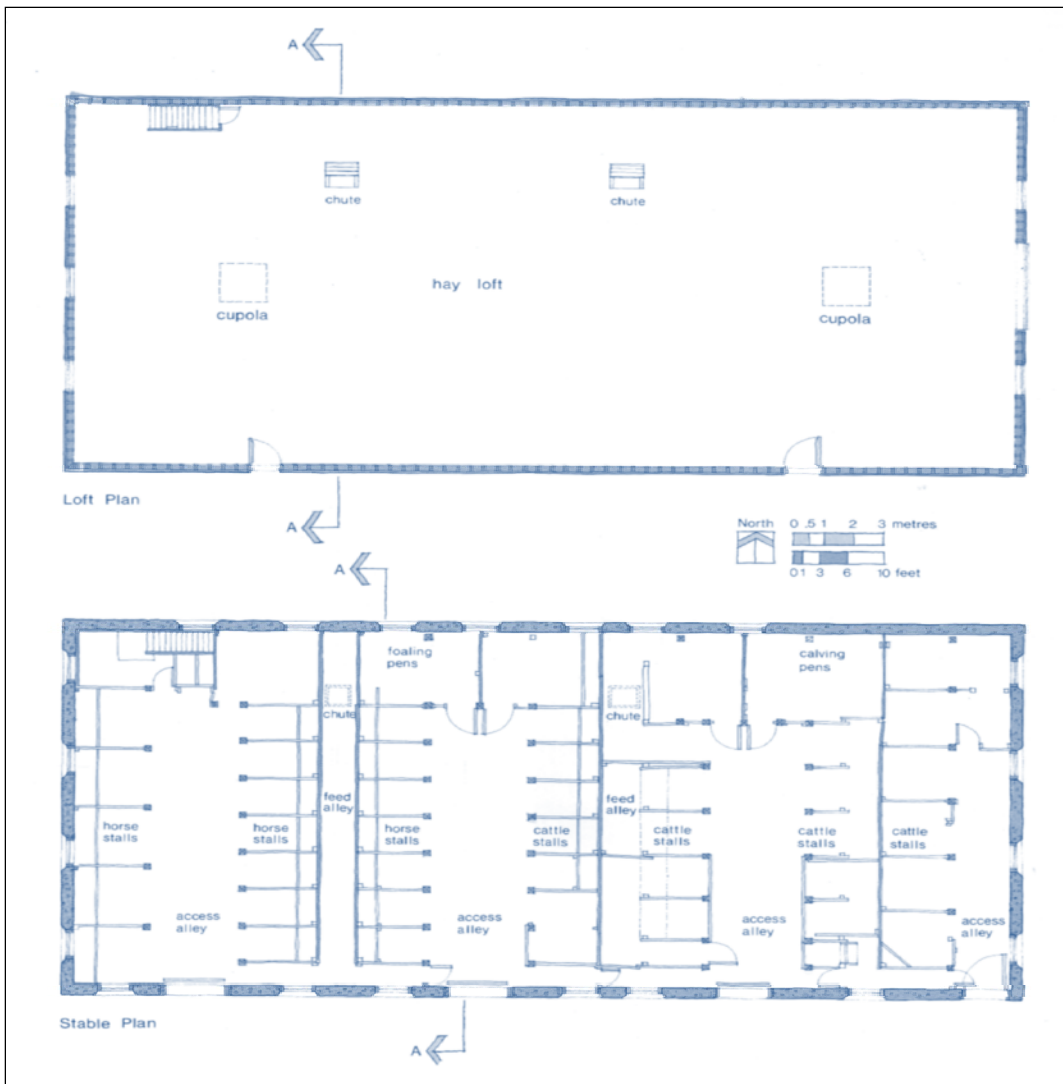


Figure 57
 Shields Barn. Without the necessity of supporting a heavy loft network, the spacious stable was well organized; the western section was for a few horses, the two eastern sections were for cattle.

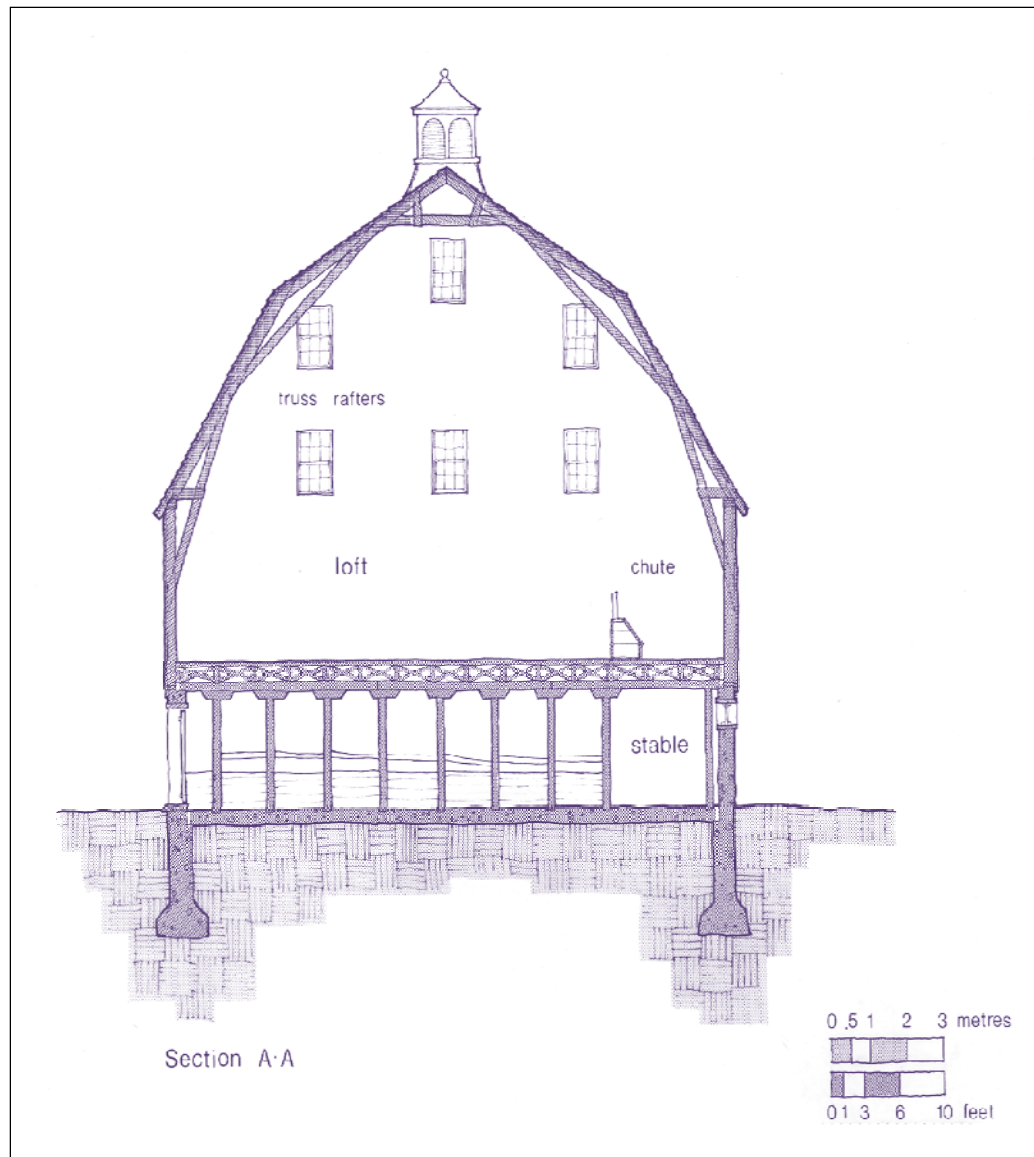


Figure 58

Shields Barn. The hay sling would be rolled out along a track in the roof peak to a point a few feet beyond the east gable end. From this position hay and grain could be hoisted through a huge door into the loft and deposited anywhere inside.



Figure 59

The extended hay sling required the addition of a roof peak that provided protection for feed lifted up to the loft. Loads could be pulled inside more easily through the large loft doors.



Figure 60
Hamilton Barn, NW 34-10-19W, 1949. The roof of this barn was constructed with laminated trusses that were built in Souris.