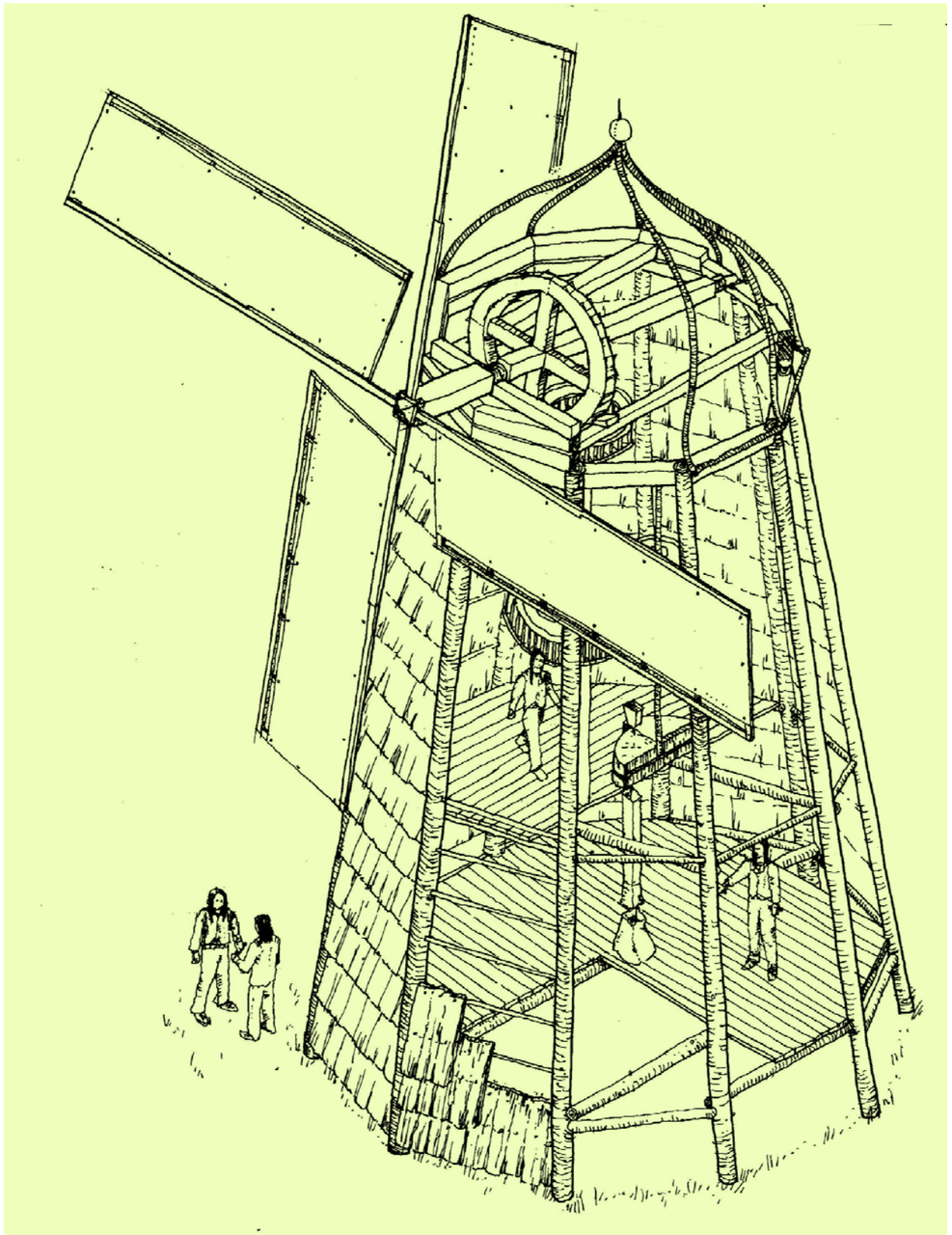


St. Peter’s Dynevor Windmill

The Story in Seven Drawings

More than 180 years ago, in 1832, the first Aboriginal agricultural settlement was established in Western Canada. That little community was abandoned a year later in favour of another site a few miles south on the Red River, near the present site of St Peter’s Dynevor Anglican Church (itself built by that Aboriginal community in 1852-57).

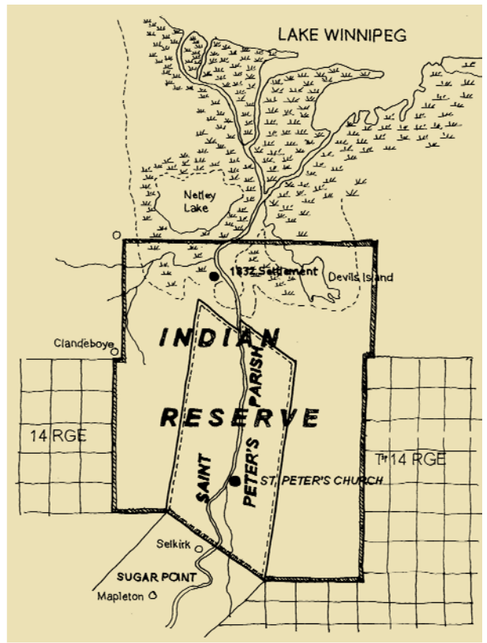
What came to be called St. Peter’s Indian Village, or Settlement, gradually grew from about 30 people at its outset to more than 500 by the early 1850s. Besides the small log houses and church (the first one, in 1835, of log), the community also boasted a windmill, one of at least 18 that served the growing Red River Settlement.

Those windmills, as well as nine water mills that started to be built in the late 1820s throughout the Red River Settlement, were imperative structures at the time, ensuring that the fledgling agricultural communities stretching along the Red River had the means to turn their grains into flour – ground at the local mill.

The St. Peter's Dynevor windmill, constructed in 1835, was perhaps even more significant than its cousins serving European settlers and retired fur traders closer to present-day Winnipeg. For the Indian Settlement windmill was at the heart of a remarkable attempt by a Scottish clergyman—William Cockran—and a band of Cree and Saulteaux people—led by Chief Peguis—to develop the kind of sustainable community that would allow the Aboriginals to live within a system and in proximity to incoming white settlers. The community's windmills (another was added in 1846) ensured that this fascinating experiment had the means to succeed.

Sadly, as was the case with so many other Aboriginal situations in Western Canada, the St. Peter's Indian Settlement sat on prime agricultural land, and it did not take long—20 years in fact, from the time of its greatest success, in the 1850s—for the onslaught of eastern Canadian settlers to take over the whole area, sending the St. Peter's people north, to what is now the Peguis First Nation in the Interlake region.

But while it did last—along with the 1846 addition—the St. Peter's windmill was a visible symbol of the quasi-industrial enterprise that would be required to transform what had been fur-trading country into a major agricultural region.



Sketch map showing the immediate vicinity of the St. Peter's Indian Village, here showing the so-called Indian Reserve, Saint Peter's (Anglican) Parish and St. Peter's Church. (Map redrawn from the original courtesy Gary Still, redriverancestry.ca)

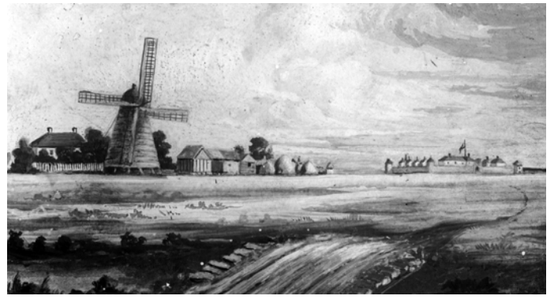
Sketch map showing the immediate vicinity of the Indian Village, with a number of buildings and sites indicated, along with roadways and vegetation. The Indian Village and related sites and topography descriptions are situated at the right. (Map redrawn from the original courtesy Gary Still, redriverancestry.ca)

All of the Red River windmills are long gone, and little exists to suggest what they looked like, notably in their many details, and especially of how they operated. This is a shame, because these striking buildings were amongst the most sophisticated sites, certainly at Red River, but in any community in which they stood. They were considered to be at the height of engineering accomplishment at the time, and even when they were rudimentary, as certainly the Red River examples must have been—built as they were from materials at hand (logs, grass for thatch)—they must still have been sights to behold, and amazing to observe when they were in operation.

This booklet focuses on the 1835 windmill, which is the only Red River windmill whose key measurements were recorded, and thus allows for a certain degree of accuracy in what is still a conjectural exploration of its construction and operation.

The booklet is extracted from a larger report developed for the St. Clements Heritage and Tourism Committee, and which provides a great deal more information on the history and context of the site, and of the history and development of windmills in Manitoba. It is recommended that anyone interested in this fascinating subject, and the story of St. Peter's Indian Settlement, consult that report for more in-depth material.

This present document presents the windmill via the seven drawings that were developed for the larger report, and which in fact were the ultimate purpose of that project – to attempt to graphically recreate the St. Peter's windmill in all its construction and operational details. And by so doing to suggest what a Red River Settlement-era windmill looked like close up, and to serve as a reminder of the kind of ingenuity, skill and determination that attended Manitoba's earliest attempts at industry and manufacturing.



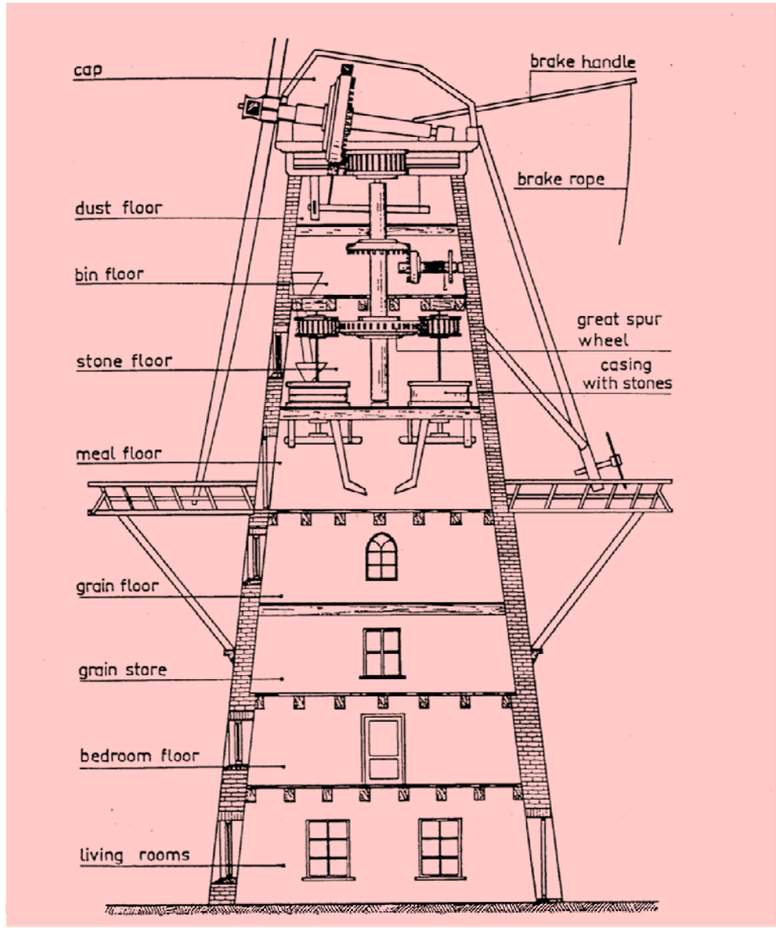
"Young's Mill," by noted painter Paul Kane, shows a windmill apparently outside the walls of Lower Fort Garry, ca. 1860. ((Image Courtesy Archives of Manitoba)

An Ojibway farmer with his team of oxen, likely at St. Peter's. (Image Courtesy Archives of Manitoba)

The St. Peter's windmill, and all other windmills at Red River were tower windmills, to distinguish them from earlier windmill types called post mills, which were popular in the Middle Ages. By the early 1800s the tower mill was a well known and familiar combination of formal and mechanical elements and features – at least to windmill builders. And while the Red River examples from the 1830s were modest and even rudimentary, they were still of this type, and presumably as sophisticated at least in terms of general mechanics and operations as their thousands of cousins throughout Europe and eastern North America.

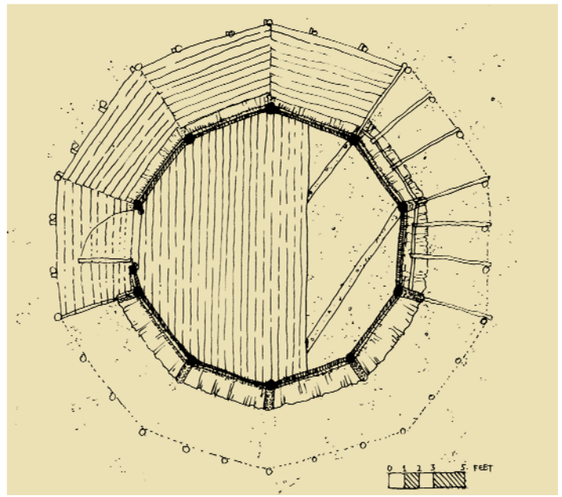
A large and sophisticated tower mill in cross section (opposite) shows some key features and details that will find their way to the mills of the Red River Settlement in the 1830s and 1840s. At the top of this drawing we see the cap, which holds a large wheel and axle which in turn are joined to the large sails and connecting features shown on the outside left of the cap. It is notable that the axle (known as the windshaft) and thus the sails and large wheel are placed at an angle to the horizontal – it was discovered fairly early on in the evolution of the windmill that this angle (about 15 degrees) was necessary for the efficient functioning of the sails. In this drawing there is a long shaft labelled "brake handle" – this feature was not present on many mills, but is a reminder of the need for a braking mechanism in this section of the windmill that could slow and stop the sails. The brake—usually a smaller wooden element—was more typically adjacent to the large wheel. We can see that this wheel also served another purpose – to turn and thus via its toothed gears drive a smaller wheel directly below the cap.

The concatenation of additional axles and smaller gear wheels, shown in the "bin floor" and "stone floor," were the typical features and arrangements in any mill—wind or water—that was used for grinding



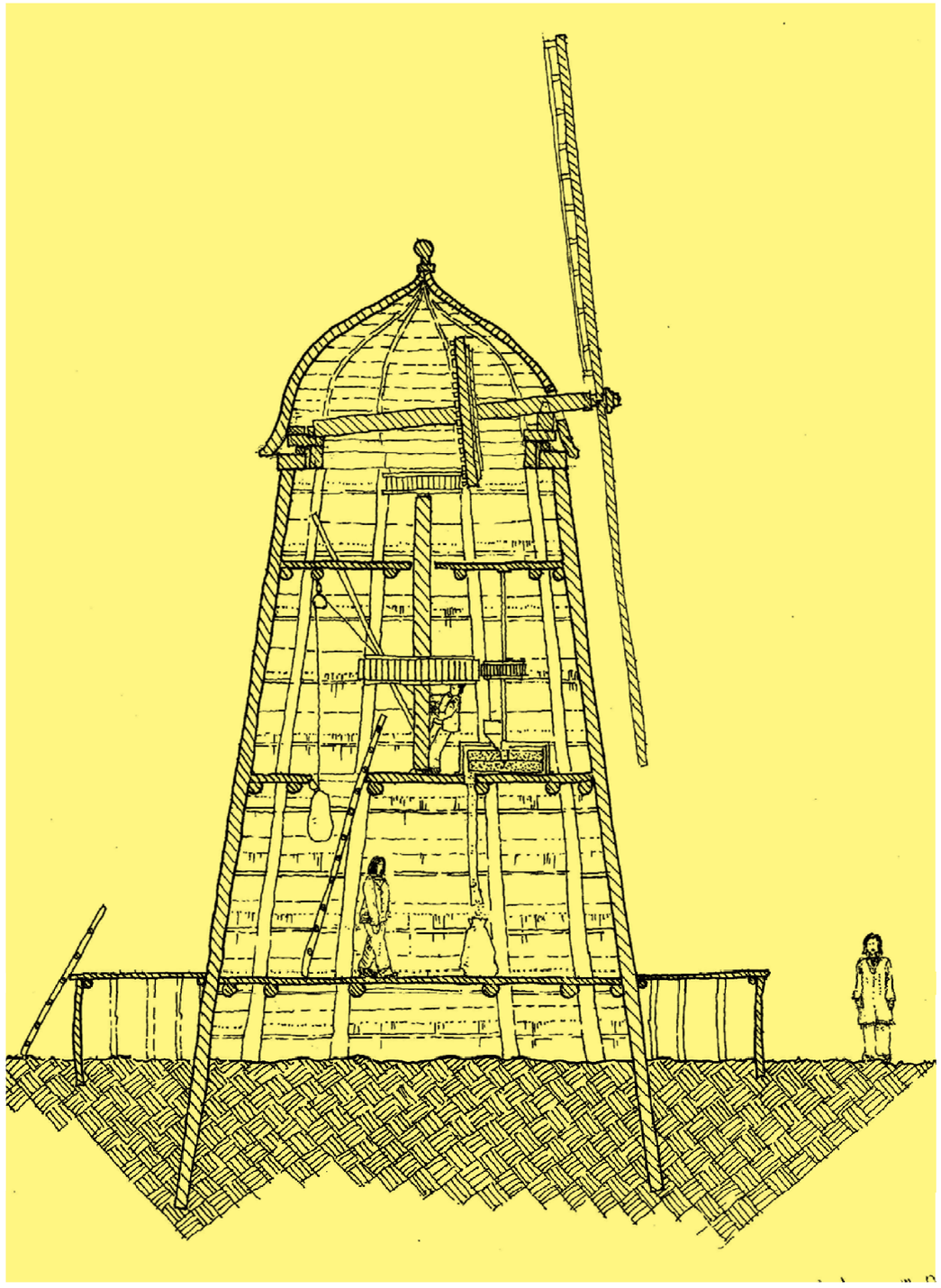
Cross section of a large Dutch tower windmill (Dennis Shepherd for the National Aeronautics and Space Administration/NASA (1990)). This mill, featuring walls of masonry construction, was about 60-65 feet high and about 25-30 feet wide at the base. The St. Peters windmill was 37 feet tall and 21.5 feet at its base. The largest known tower mill was built in East Anglia, England, in 1812 and measured 121 feet (37 metres) high and 40 feet (12 metres) at its base; it was destroyed by a storm in 1905.

grain. The ultimate destination for all of this mechanical activity, and the gradual transition of power, is seen in the “stone floor,” where two “casing[s] with stones” mark the place where grain was deposited and in this case two large grinding stones did their work. In an area here called the “meal floor” one can see two long chutes that emerge below the grinding casings, and where the resulting flour would fall via gravity – there would be bags situated under these chutes when the mill was in operation. In this drawing there are two additional floors below the “meal floor” labelled “grain floor” and “grain store,” where grain waiting for grinding would be housed. The two lower stages, “bedroom floor” and “living rooms” were only developed in the most sophisticated of windmill operations. One final feature shown in this drawing is seen at the “meal floor” stage, where a fenced platform encircles the building – this was very common on tower windmills, the area where a miller could more easily get at the sails, for repairs and adjustments, and in this case at the rope that was attached to the brake handle.



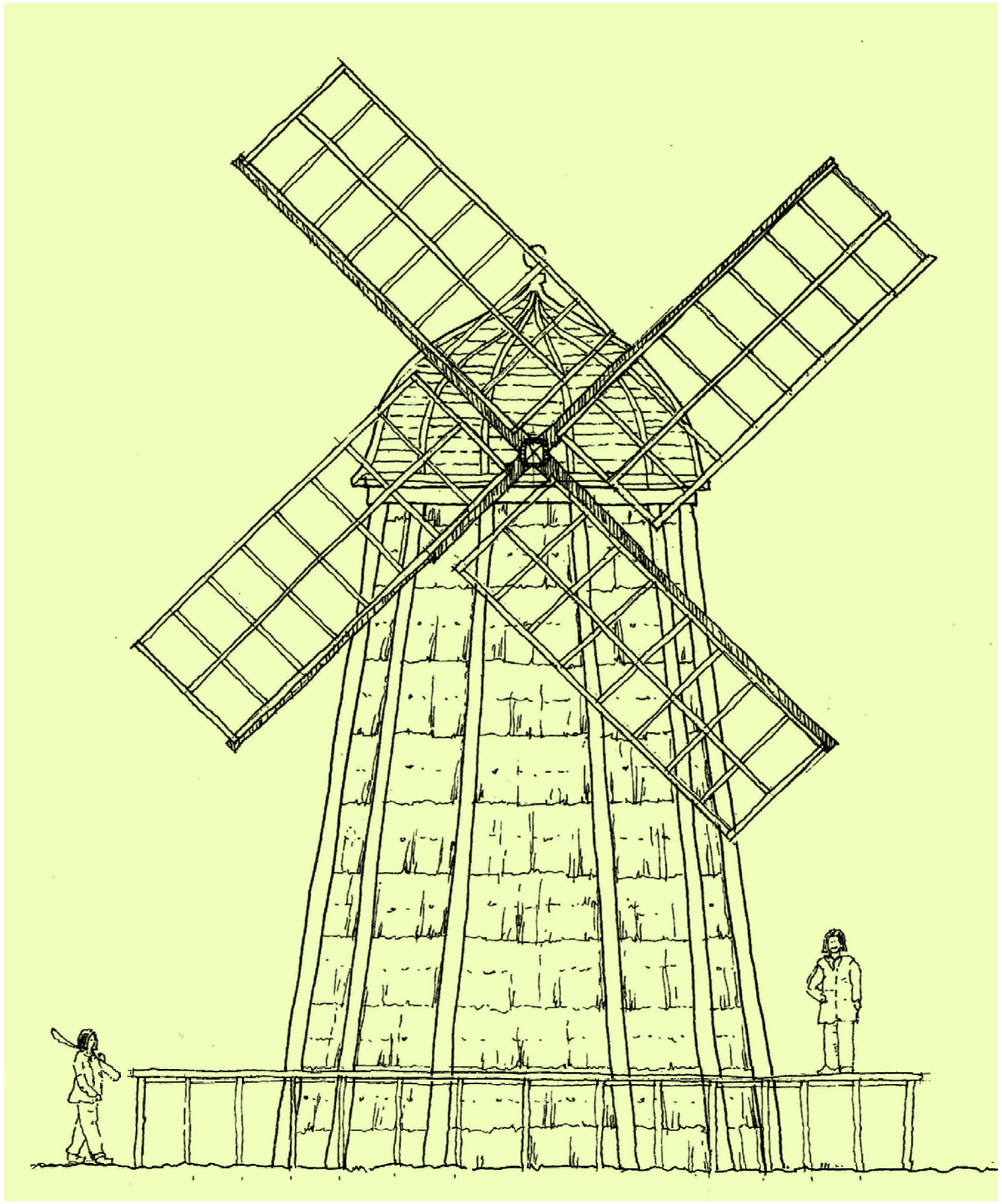
St. Peter’s Indian Settlement Windmill, Plan

A floor plan is a common graphic expression of a building as if seen from above, via a horizontal cut that allows walls and room arrangements, as well as some structural details, to be clearly presented. Most plans employ the cut at ground level, but given that the windmill’s main floor was about four feet above grade this plan shows the cut at that point. The plan shows the main floor area, entrance and some construction features. The dark shaded lines define the ten-sided form, interrupted at their interstices by the main structural poles (which are also shown extending down to ground level). The dark lines also express the top edge of the thatch sheathing in between the poles, cut at this point for the drawing. The thatch itself flares out slightly to extend to the ground level. The pole supports are shown as much as they would be visible in this plan view. The floor planks are set atop logs attached at key juncture points of the main timber supports – some of the planks have been removed at the right side of the drawing to show this situation. The ‘stage’ area that enlarges the whole plan, shown encircling the main floor area (and with planks only on the top and left side), allowed the miller access to the sails. Thin posts are continued around the whole drawing to show the full extent of this feature.



St. Peter’s Indian Settlement Windmill, Transverse Section

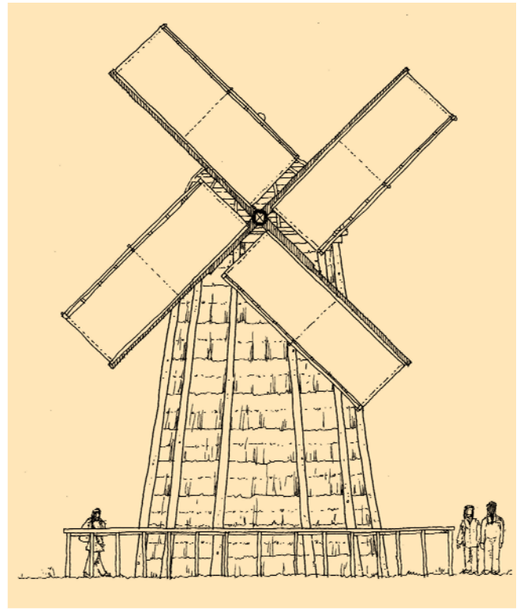
This vertical section, or cut, through the windmill from top to bottom, shows the interior arrangement of key pieces and their placement, as well as a sense of dimensions and scale suggested by the figures. We are essentially looking south, with the sails facing to the west/northwest (right on the drawing). Starting from the top of the drawing: we note a finial at the crest, decorative but with an important functional aspect – to bind in place the thin structural elements of the cap. We notice the opening at the west/front of the cap that allows the windshaft to enter the cap; note that the shaft is at a slight angle to a level position. The large wheel set on the windshaft transfers the power of the wind and sails to another gear feature in this upper level. There is not much headspace in this area – about five feet, but enough to manoeuvre to get at the shaft and wheel and other parts of the cap if they needed attention. The secondary gear, itself a wheel with slats, turns the thick shaft below it to which is attached another large gear wheel in the higher second floor of the windmill. This shaft in turn rotates the smaller gear box connected to the grinding stones, which are shown at the right (front) of the mill. Raw grain would be poured into an attached spout on the millstone housing and once ground (and manoeuvred to the edges by the design of the top stone’s grooves) dropped down a chute to the main floor, where bags would be positioned to collect the resulting flour. Other features to note in this drawing: the stage around the lower floor that allowed easier access to the sails; the basic structural frame of long logs and thatch (with the thatch shown only on the far walls, given that the section cut is through the poles); the ladders that provided access to upper floors; a grain bag being hoisted on the left (east) side. It is also important to note that the drawing has been developed according to the basic dimensions provided in contemporary sources: 21.5 feet in diameter at its base, 37 feet high from ground to the top of the dome, mill stones that were 3.5 feet in diameter, and finally sails, each containing 76 yards of canvas, that were each 17.5 feet long and six feet wide. It is presumed that the long log structural posts were dug into the ground – to get past the frost line by about six feet, and thus about 40 feet long. There is of course no way of knowing the wood species used for various features, but the map of the immediate area included above identifies aspen (likely poplar), willows, elm, oak and maple as nearby tree species, and so there were considerable options for matching wood types to structural and operational requirements – thus perhaps oak for the windshaft, wheels and gears, elm for the main structural frame, maple for support features and sail lattice, and willow for the cap structure.

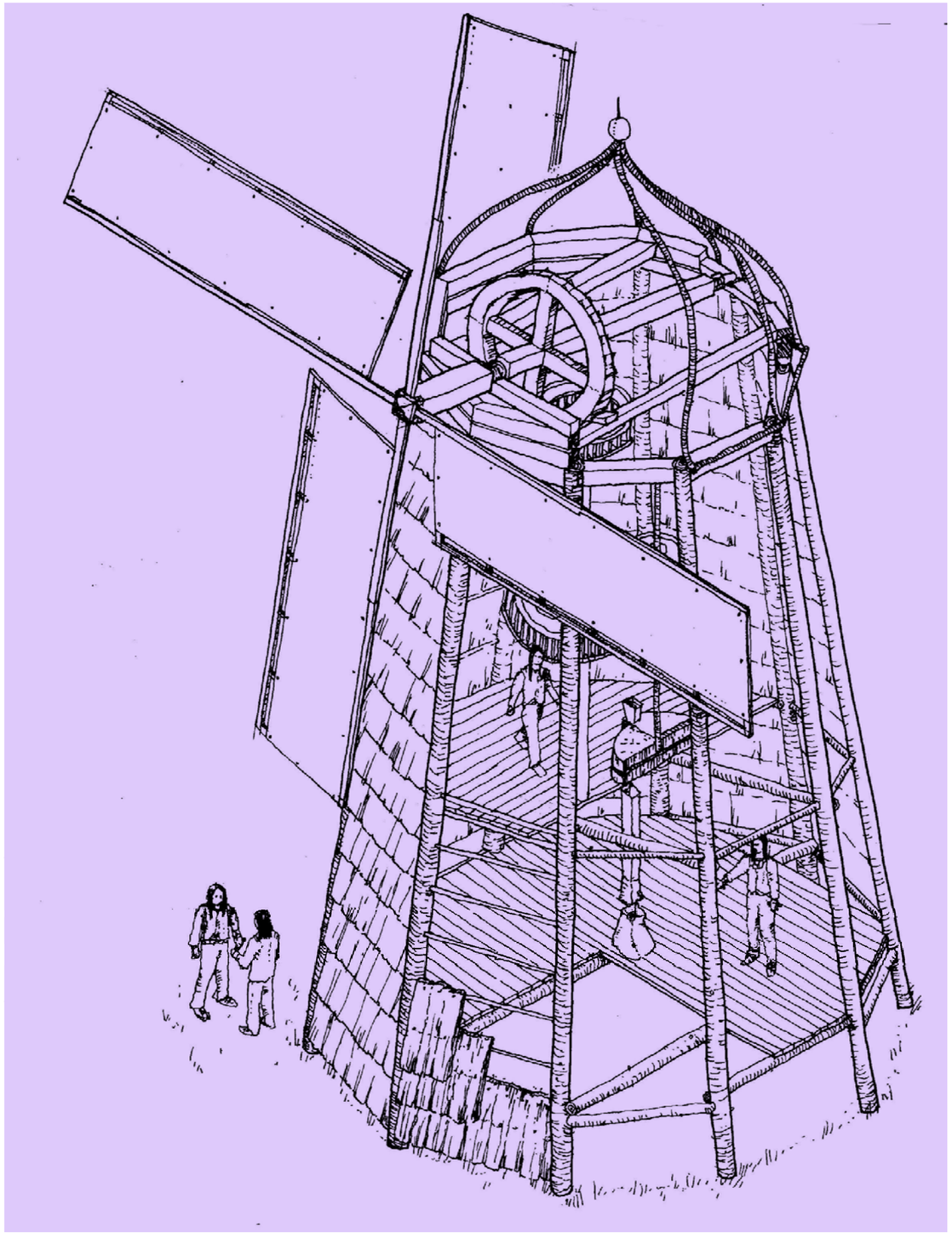


St. Peter’s Indian Settlement Windmill, Elevation With Sails Unattached

The basic elevational drawing at left shows the windmill facing west/northwest, and thus viewed looking east/southeast, from the river edge. The drawing shows key external elements, visible with the sail cloth excluded. Thus the elemental tower form, created by the use of tall log framing elements infilled with thatch, is very clear. The ‘stage’ that surrounded the tower at the mill entry level, and which gave the miller easy access to the sails—at least at their lowest point in rotation—is evident in this image. And the sail framework, of stocks and lattice (uplongs, hemlaths and sail bars) is also obvious. Figures, as usual, give a sense of scale.

Below, this elevational drawing, reprises the previous image but in this case with the sail clothes attached. This then gives a sense of how the mill looked face-on to people approaching it when it was in its working stages. It is presumed that given the prevailing wind directions—from the northwest and west—that the sails would have turned clock-wise.



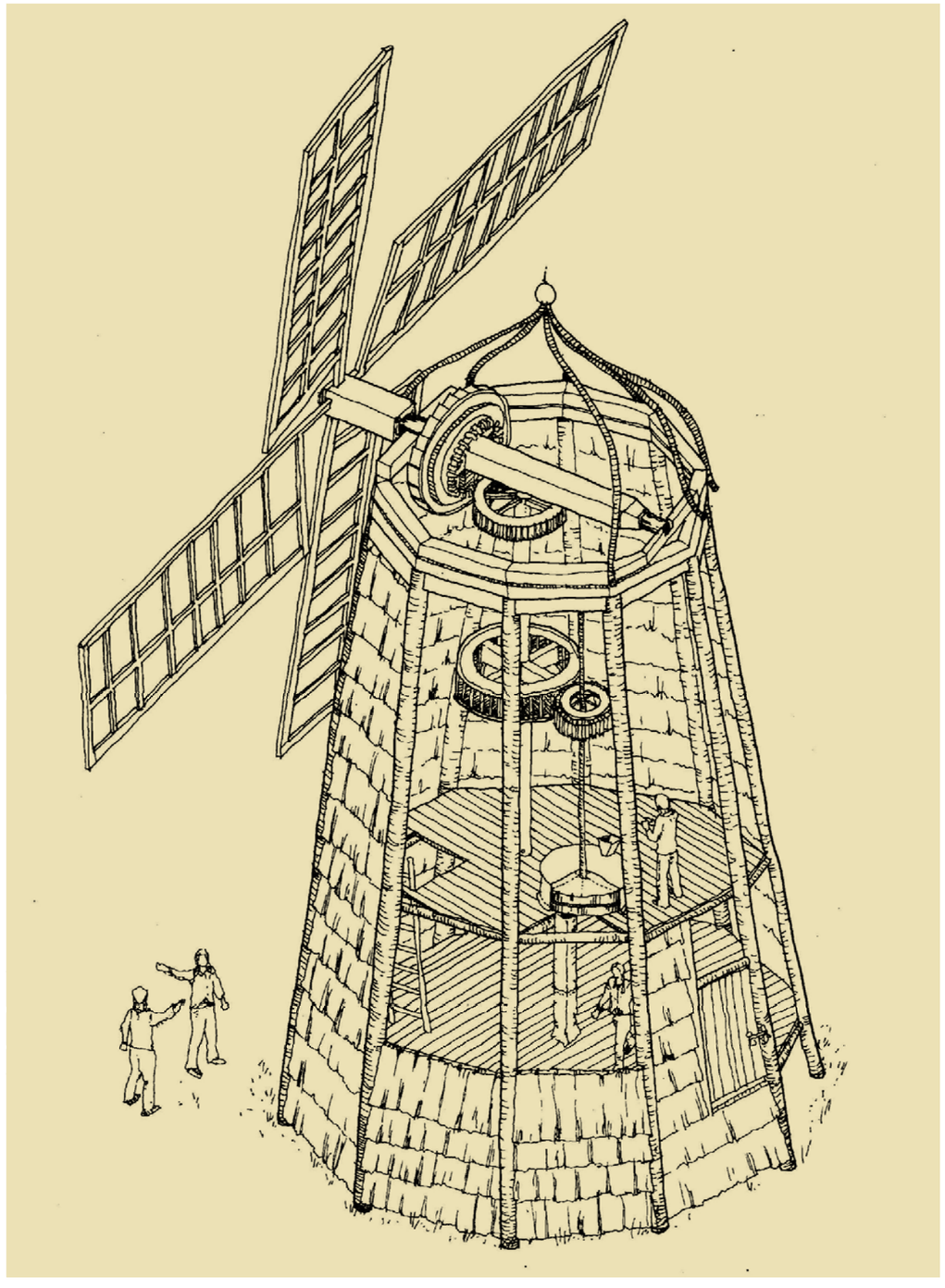


St. Peter’s Indian Settlement Windmill, Building Isometric ‘A’

This drawing presents the information developed in the preceding drawings to create a three-dimensional view of the building. Certain parts of the mill have been cut away or excluded (topmost part of the upper sail for example) to better present interior features, arrangements and conditions. And the main floor platform encircling the tower, best seen on the previous elevations, is not featured for a better focus on the mill structure and interior. There is not much more to be said here about the building or its operations that has not been noted in the previous drawings – this image is mainly to be explored and enjoyed.

And because there is not much more to say about the building via this drawing, perhaps it is useful here to recall some of the facts noted in the larger report, and thus provide at least some modest speculation that will make an exploration of the drawing more engaging.

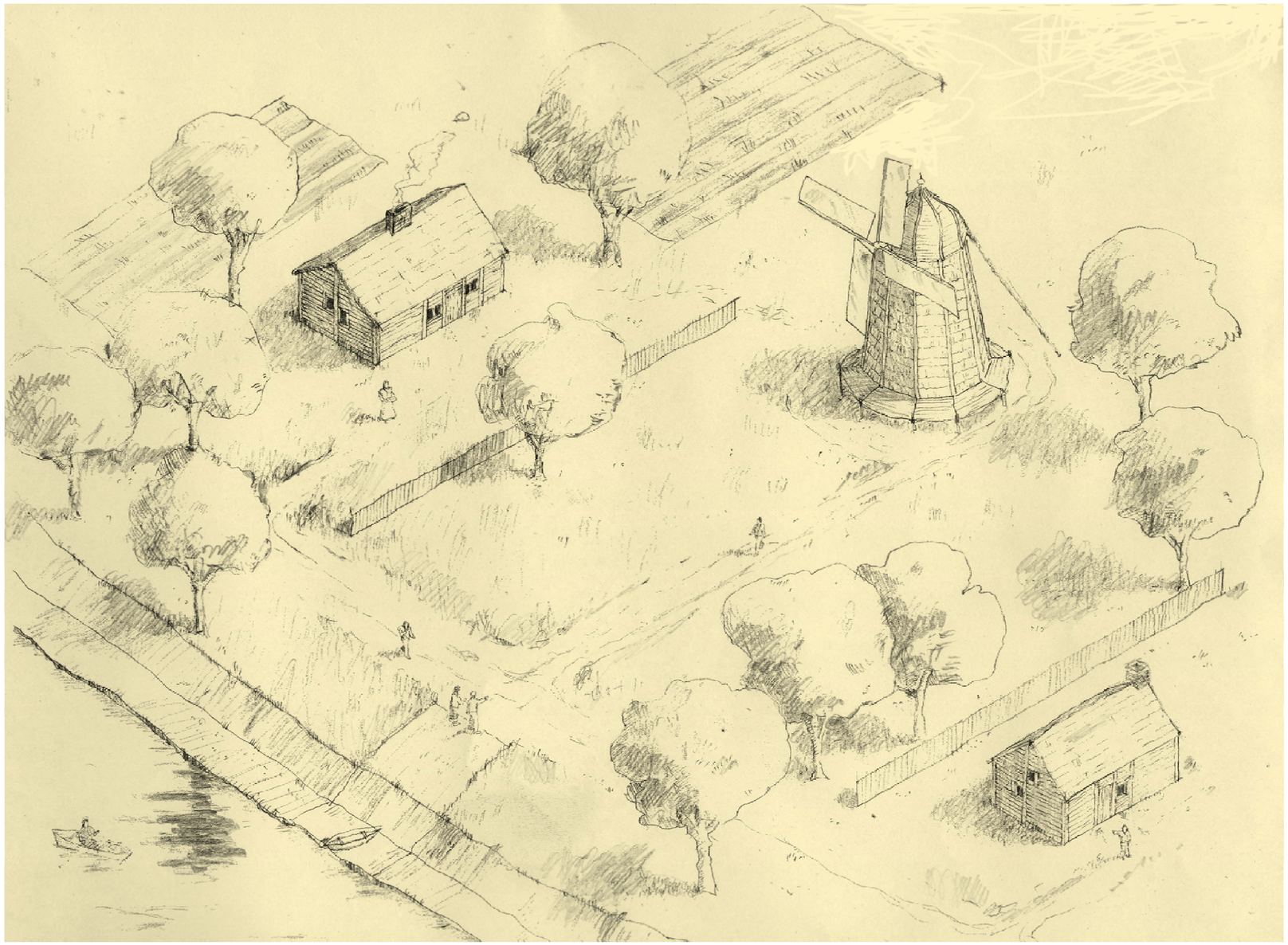
In 1835, when the mill was built, there were about 15 farmsites (with 35 acres under cultivation) and as many houses at the settlement – and so about 75 people. It is possible that the three men who built some of the early houses at the settlement—The Wind, Houlup and The Cannibal—who had building experience, were in charge. One can well imagine all the men of the settlement involved in the construction of the windmill. And then perhaps three to five in its ongoing operation. It is indeed impressive to consider the foresight, ingenuity and determination of this small band of Aboriginal people, dealing with agricultural and building technologies completely foreign to them, and yet within a few short years erecting a windmill – acknowledged by researchers of windmill technology as the height of engineering of its day. It was an astonishing achievement.



St. Peter’s Indian Settlement Windmill, Building Isometric ‘B’

Like the previous isometric drawing, this image presents information developed in the four preceding drawings to create a three-dimensional view of the building. In this image the building has been rotated 45 degrees to allow for a slightly different view into the mill. Certain parts of the building have been cut away to better present interior features, arrangements and conditions. As with the previous isometric, the main floor platform encircling the tower, best seen on the previous elevations, is not featured to ensure a better focus on the mill structure and interior. It should be noted that there would have been an opening in the second storey, likely in the section that also contained the door (but above it), which would have provided light into that area – it is also likely that stretched fish skins were used rather than glass, which was not readily available at this time. Again, there is not much more to be said here about the building or its operations – the drawing is mainly to be explored and enjoyed.

Like the previous entry, this view of the windmill might be enlivened through some imaginative thoughts. While this project has focused on the 1835 windmill (given that this mill is the only one with measurements of a Red River Settlement mill), we might also recall that it was repaired in 1845 and then joined by a new mill in 1846 (other sources suggest 1852). And both appear to have been operating for several years, including in 1851 when there were 87 families, and nearly 500 people, industriously involved in farming and in grinding their grain at their two windmills. Imagining this mill at that time reminds us that by this time this was no rough pioneer situation – this was a small but busy and industrious community, and the windmills must have been a very visible symbol of their success.



St. Peter’s Indian Settlement Windmill, Context Isometric

This final drawing shows our windmill in context, with the Red River at lower right and two adjacent farm properties, one likely for the miller. Two details are worth noting: the long pole at the back of the windmill, used to turn the cap into the wind (not shown on earlier drawings); and the presence of fences that divide farmsites, as noted in Reverend Cockran’s descriptions of the settlement.

This view, looking to the northeast, shows just a section of the Indian Settlement, focused on the immediate vicinity of the windmill. We can imagine it’s the summer of 1837, when the mill had been in operation for a few years. A skiff has beached on the river bank and two men make their way up the bank, heading to the mill; a man in another small boat, with a sack of grain in the bow, manoeuvres his way to the same spot. Other figures go about their business – a man on the main road along the river’s edge is carrying his own sack of grain, presumably heading to the mill. The scene is bucolic and inviting – and why not: a “pretty day” as they used to say at the time.

But we should recall that this is the scene of profound pioneer experience. These people, and many others at the Red River Settlement, were struggling to wrest a living from a completely new environment. And in their buildings we can see real evidence of that struggle – of small log buildings with tiny windows and rudimentary construction of logs and grasses.

And we can see those qualities in the windmill, with its body covered with thatch and the long log poles that define its framework, suggestive of the nearly medieval construction practices required when building only with materials at hand. But we can also see in the windmill the deep reservoirs of technical and architectural sophistication that were beginning to define the whole of the Red River Settlement, with fine churches, stone forts and scores of busy little farms.

The first windmill at St. Peter’s Indian Settlement was a grand achievement for all involved – Reverend Cockran, Chief Peguis, the mill builders, the local people. And while every vestige of its existence is long gone , it is hoped that this project has stirred some wonder at its mere existence, as well as a humble recognition of the determination and hard work that must have gone into its creation and operation.