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## **The Granville Town Hall, Granville Vermont**

### **A Preservation Trust of Vermont**

#### **Technical Assistance Survey**

**The Granville Town Hall is a tall 2-story, white, clapboarded structure located on the west side of Rt. 100 at the center of Town. It was first built as a church in 1871. It is currently attached to the Town Offices, which are located in the Town's 1857 schoolhouse. The Town Hall probably started life sitting on a stone foundation on the ground. At a later date the church was lifted and had the current first floor added beneath it. The doorway appears to be of the original period of the church (1871), and to have been relocated to the new lower story. The original tower may have been only the first square section, but at some later date the second square and spire were likely added. I base this observation on fact that the second square section of the tower, and the spire, don't start within the first section as is usually done (telescoping), but just sit on top of it.**

**The architectural style is vernacular Greek Revival. Characteristic of this are the wide pilasters, closed pediment, and wide double frieze. There is an**

**interesting projection, reflecting the position of the tower or a porch for the doorway, on the middle of the front wall. This is seen occasionally on Vermont churches.**

**The Town Hall is of timber frame construction, spruce and hemlock, and measures about 36 x 48 in plan. The main room is spanned in the clear by a series of trusses. The first interior truss is at the back of the steeple and is queenpost in form, using two rear steeple posts as its queens. Substantial work has been done in recent years to strengthen this truss as part of the project to straighten the steeple, which had leaned back into the church dramatically. Fortunately there are also columns flanking the low choir on the front wall that also support this truss and the steeple.**

**The three interior trusses beyond the steeple truss are kingpost in form, single rafted, with some problems occurring at the third towards the rear (these problems will be discussed under Maintenance).**

**At the rear gable a brick chimney rises from below. A 6-inch diameter flexible metal flue is within this chimney to vent utilities in the new basement. This chimney is falling apart near the apex of the roof, exposing the flue, and this will also be discussed below.**

**The portions of the church below the attic level appear to have had recent maintenance and be in good condition. The exterior is painted, the large sidewall windows in good shape, a new foundation of concrete block appears stable, and the front steps have been rebuilt in granite and brick.**

**The roof is relatively new, green, standing seam metal.**

**The interior of the former church, upstairs, is little changed, even the pews appearing original.**

**The steeple has been much worked upon in the last 25 years, including being removed to the ground in the late 1990's and having extensive repairs, along with the rear steeple truss, again in the earlier 21<sup>st</sup> century. Nonetheless, the spire portion appears to be experiencing some materials failure on, at least, it's exterior, near the weathervane and at other locations. The exterior of the spire is all wood finish with soldered metal only on the skirting roofs and flat surfaces such as those right below the weathervane. It is possible that the good intention of keeping the maximum amount of historic material in place caused a substantial amount of already weakened wood to be left covering the spire. Also, the panels of the 6-sided spire, between the trim boards on the edges, are composed of very wide pine boards of poor quality, with large knots that will continue to bleed through paint. I would be surprised if these are original to the construction of the spire but more likely were already a replacement from the past, and not a good choice.**

**The hexagonal ornament atop the spire at the weathervane is falling apart, and is not detailed to survive very long, as its horizontal surfaces are completely flat and won't drain at all.**

**The Town provided me with a large number of very useful drone photographs of the spire and towers that show these problems well.**

## **Granville Town Hall: Maintenance Needs**

**1. Chimney at the rear:** The brick chimney at the rear of the attic seems to have been weakened somewhere below and partially collapsed, with the bulk of the chimney now leaning towards the rear gable boarding. Some of the brick, and the flexible metal flue is still attached to its original hole in the roof several inches forward.

This is a situation that should be addressed soon. A good mason can determine whether or how much of the old chimney can be made to function correctly. This will impact the portion of the chimney above the roof as well that is now precariously supported. Access to the attic space is difficult and at the opposite end from the chimney, and strengthening of the attic joists may be required for work to be carried out there.

**2. Third Interior Truss:** The third interior truss towards the rear has partially failed at both eaves ends where the principal rafters tenon into the tie beam. These rafters support the kingpost that in turn supports the center of the tie beam from sagging over the room below. These rafters are restrained by tenoning into the tie beam ends, but the wood at these tie beam ends occasionally fails due to water infiltration and the tenon pushes outward, sagging the truss. The reason it doesn't immediately completely fail is that it is attached by boarding and metal roofing to the common rafters and the surrounding trusses. At both ends this problem was recognized in the past, and on the north end there are a pair of boards spiked with duplex nails between the rafter and tie beam, and on the south a custom made metal plate is installed.

**While the south is a better repair than the north, neither are sufficient to restrain the thrust of the truss rafters over the long run.**

**A good repair would be similar to what was carried out by those strengthening the steeple truss a few years ago. A pair of steel plates connecting the rafters and the tie beam at both ends with a connection for 5/8 inch truss rods spanning the entire 36 ft. on both sides of the truss. A turnbuckle somewhere in the span will allow the rods to be tightened. I would not expect that you will pull the rafters in more than a very small amount with this assembly. To do so would require lifting the kingpost, and thus the roof ridge, from below on structural scaffolding or a tall post and jack rig. As long as the roof is not too sagged at this truss nor the ceiling below sagged or cracking, this is not necessary.**

**3. Common Rafters: Along the south plate most of the common rafters have been propped up on scraps of wood to produce a more straight and level eaves line. These smaller rafters are actually meant to bear not on the wall plates but on smaller flying plates tenoned into the tie beam ends out in the soffit. I could not see that the flying plates were rotted and failing, but they must be at least sagged to have allowed the commons to drop onto the wall plate.**

**I think it would be wise to merely affix wedges at all the common rafters, pushing them up an inch or so off the plate and taking most of the pressure off the flying plates. These wedges can be affixed to the plates with a couple of structural screws. There are about 24 of these common rafters.**

#### **4. Steeple Restoration:**

**The steeple of the Granville Town Hall is composed of a 10 ft. square louvered tower rising from the front tie beams and up through the roof. On top of this (not starting down within it) is another square stage 7 ft. on a side. From the base of this second stage, where some 5x5 timbers are loosely arranged in a diamond pattern around some very large timbers of cambered shape, rise 6 spire rafters that continue to support a weathervane at their apex. The spire is approximately 18 ft. from the base of the vane to the top of 2<sup>nd</sup> square stage. The top of the vane is approximately 75-80 ft. above the ground.**

**The framing of the tower stages is composed of 8x8 timbers and 4x4 braces and studs. Due to extensive leakage of the small roofs in the past most of the plates and tops of the posts at both levels had rotted, but have since been repaired in the two campaigns mentioned earlier. Rarely was a complete stick of timber changed but rather a process of cutting off and extending rotted posts, putting lintels of wood or metal under horizontals and supporting missing tenoned connections with bolted on shoulders or steel plates. While the repairs found in the two square stages do not represent the best timber repair, the stages are small and not tall, and there is a tremendous amount of short pieces of wood lagged and screwed to them, such that they are actually quite stable.**

**The spire, while not tall, is telescoped, and as a hexagonal cone, is a basically stable shape, and not about to distort unless the spire rafters are rotted at their apex, a place I could not examine. However, it is clear from the outside that the square wooden ornament at the apex, and perhaps the apex framing itself, is falling apart.**

**There is evidence however that the spire was originally constructed somewhat differently. The two large crossing timbers at the base, one notably cambered, likely once supported a timber mast that ascended to provide bearing for the spire rafters and to hold the weathervane. Further evidence of this is the set of 4 crossing timbers, called partners, which produced a square opening about 7 ft. above the cambered base timbers that would have clasped the mast. This mast may have rotted away and in earlier engineering surveys, a long steel rod, no longer evident, is described in its place.**

**I also, based upon a number of wooden spires I have rebuilt or inspected, don't think that single wide pine boards were the original covering, particularly not with their large, bleeding, knots. More likely would be 5/4 or 6/4 t&g boards, 6-10 inches wide. The three rows of clapboard at the bottom of the spire, where it meets a small flat metal skirt, may not be original but are a good idea to keep the vertical board's end grain far from a roof surface.**

**The spire has numerous problems: the rotted apex ornament, missing corner trim on the rear and a long area of rotted boarding, as well as a more general problem of 3 levels of small metal roofing that appear completely flat, and will eventually be negatively sloped as things shrink and sag, and introduce water into the spire. The easiest way to deal with all its problems are to lift the spire and the second square to the ground by crane. I know this has been done in the not too distant past but is still the best and most economical way to proceed.**

**Once on the ground a decision can be made whether to only work on the spire or to rebuild the first skirting hip roof above the 2<sup>nd</sup> stage. This is a neatly done, soldered seam, metal roof, that for some inexplicable reason is already rusting and bleeding onto the trim below on the south face at**

**least. It seems to be bleeding from the hip seams generally. There is also a large area of rot in the cornice underneath this roof. I would recommend scaffolding to the 25 ft. height of the tower and spire, dismantling this roof and uncovering the spire to see the condition of the rafters at the apex. Dropping a new 8x8 x 25 ft. timber mast in would improve the spire both structurally and historically, and deal with attachment problems at the apex.**

**If the metal roof at the base of the spire is removed, it is relatively easy to replace the cobbled together rotted plates of the second stage with length of 8x8 x 7 ft. solid timber.**

**While the spire is unboarded, it would be the time to take three small roofs (two on the top ornament and one at the very base of the spire ), remove their metal, create a slope with wooden wedges, and remetal them with copper or leaded copper or zinc coated copper.**

**The long vertical boarding should be changed over to 6-8-10 inch, 5/4 in. t&g. It is important to avoid exposed butt joints in the boards, so either use full length boards (18 ft. will probably get you within the lower roof) or make a common joint halfway down the spire with a molding and flashing belt course at that point. The corner trim should be 5/4 as well and made of red or white cedar or tamarack. Replace cornice moldings as needed in white pine.**

**Recreate the top ornament and its moldings in a way that sheds water well. This small ornament up high should dry out very well, and its problem may be caused by infiltration at the vane shaft. A metal disk, concave downward, welded to the vane shaft is your best protection.**

**Once the woodwork is nearly complete, remetal the stage 2 hip roof with copper or leaded or zinc coated copper. The 3 courses of clapboards covering the flashing of this roof are a good feature.**

**Place the Spire and 2<sup>nd</sup> stage back on the church and flash it into the lower tower roof. In joining stage 2 to stage 1, cut the corner trim shorter and remove the bottom row of clapboards as they shouldn't be touching the metal roof.**

### **Granville Town Hall: Priorities**

- 1. Repairing your chimney and vent is the most pressing problem.**
- 2. Third Interior Truss: Will get worse slowly, but is relatively easy to fix so the sooner the better.**
- 3. Steeple: The steeple is stable and not about to collapse. The exception might be the ornament and weathervane at the top. Water appears to be getting into some trim, and daylight can be seen on top of one of the south roofs, allowing water to blow in around the flashing under certain south wind and rain conditions.**
- 4. Common rafter wedged supports: Not crucial, but relatively inexpensive and easy to do. Will keep the eaves straighter and keep pressure off the flying purlins.**

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## **Granville Town Hall: Cost Estimates**

**1. Chimney at Rear: Rebuild a variable amount depending upon a masons examination. Including the metal furnace vent. Access to work.**

**Cost: \$4000-7000**

**2. Third Interior Truss: Metal plates joining the principal rafters and tie beams. A pair of 36 ft. long tie rods with turnbuckles across the span.**

**Cost: \$6000-7000**

### **3. Steeple Restoration:**

**Remove the second square stage and the spire to the ground. Place a temporary roof over the tower opening on the church. Insert a timber mast. Rebuild at least the plate level of the 2<sup>nd</sup> tower. Recover the spire in wood with better detailing. New metal roofs at three very small roofs and one skirting roof. Increase the slope of the three very small roofs. Trim repairs. Painting. Place the tower and spire back on the Town Hall and flash it into position.**

**Cost: \$45-55,000**

**Painting while on the ground can be done by volunteers or arranged by the owners.**

**Granville Town Hall**



***Granville: chimney failure at attic rear***









***Granville: Repairs in tower***





***Granville skirting roof rust***



***Granville spire deterioration***