

KEEFE & WESNER ARCHITECTS, P.C.

ARCHITECTURE & PLANNING

This is a preliminary diagnostic report on conditions available to visual inspection at the time of our site visit; it is not a specification, and should not be used as a basis for contractor bids. Bid Documents contain substantially more information on quantities, standards, schedules, details and conditions of the work, which guide and protect both the Owner and the Contractor.

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August 31, 2016

David Pisha, Town Manager
Town of Chester
P.O. Box 370,
Chester, VT 05143

Dear David:

As requested we re-visited the Old Chester High School, sometimes referred to as Chester Academy, on August 25, 2016 to examine and document current conditions of the building, and to prepare this diagnostic report. Our findings are summarized below; conditions reported are those available to visual inspection at the time of our visit. Please note that while this report contains recommendations for repairs, it is not a specification for bidding; specifications contain substantially more information on quantity, quality and materials that both assist and protect you and potential bidders in carrying out repairs to your historic building.

We assessed this building in 2000, and since then at least one major renovation/restoration project has been carried out in 2007, addressing the cupola, roofing, chimney, and accessibility. The 2000 Assessment is printed here in *dark blue italics* and comments/updates are in black standard typeface, focusing on any changes in the conditions noted sixteen years ago.

EXTERIOR

Overview

The Chester Academy is listed as a contributing structure on the Chester Village Historic District (#69), where its architectural details are described, along with a contextual statement of its significance; we will not reiterate the descriptions here.

This listing makes the building eligible for State Historic Preservation Grants, and other grant funds, and affords some protection from impacts of any state or federally-funded or licensed work.

Roof

The slate roof has had substantial repairs over the years, particularly near the tower where falling snow and ice has caused breakage to the original large (12X20) purple slates; most replacement slates are 'Vermont weathering green' (gray), and

therefore readily distinguishable. The roof plane is flat, and the ridge straight; the main ridge flashing (north of the cupola) has been replaced recently with lead-coated copper, but the small south section in front of the tower is rusty galvanized metal that should also be replaced. The galvanized circular ventilator needs painting, and some repairs on its top. There are several loose, slipped or broken slates on the west, and 15-20 on the east slope. Lichens have made a small incursion on the slate; a low-pressure (<100psi) wash with trisodium phosphate will remove them.

The small skirt roof on the tower base is covered with aluminum and heavily caulked with silicone; this will suffice for the short term, but should eventually be replaced with a more permanent and compatible system (lead-coated copper). It is not visible from the ground, nor is the cupola roof, which we could not access as there was no ladder or stair; provision should be made to access and inspect this roof, which appears to be copper, but may have copper flashing and a bituminous or membrane field. Absent visual confirmation, we recommend you carry an allowance for probable repairs to this roof; out of sight should not mean out of mind if you want to avoid unpleasant surprises.

The cupola roofing and flashing was replaced in 2007, and slate roofing repaired, including flashing at the chimney. The small section of south ridge was replaced, and lichens cleaned off the roofing. Minor maintenance repairs are needed on the west slope where several slates are slipped, broken or missing; these are routine repairs that are part of annual maintenance of slate roofing of this age. The eaves drip flashing on the east side near the center needs adjustment to prevent water from running onto the fascia below. In general slate roofing appears to be in excellent condition. We could not see the cupola roofing from the ground; its sound condition should be confirmed when a lift is available.

Chimney

The 28"X 36" brick chimney on the north end needs rebuilding from the roofline up; it has been repointed with hard Portland cement mortar, and has through-cracks running down half of its exposed sides. The painted galvanized flashing should be replaced with sheet lead, which needs little or no maintenance. The wash on top needs repair, and it a metal rain hood (or a masonry one, if research so indicates) is recommended to exclude weather, which hastens deterioration.

The chimney was entirely re-built above the roofline in 2007, and a lead-coated copper rain cap added; it appears to be in sound shape with no additional work needed.

Cupola

The bracketed Italianate wooden cupola has a delicate cornice with sawn frieze details supported on dentils and moldings, paired brackets in the corners, a crown molded fascia, and flat cornerboards. Repairs are needed to some small woodwork cracks, and the paint is alligatored, particularly on lower sections, where splash from the skirt roof and main roof has rotted bottoms of corners and the vertical matched-board sheathing on the tower base. Horizontal matched boards and clapboards on the upper section have extensive paint failure, but appear otherwise sound.

The cupola was substantially repaired and re-roofed in 2007; woodwork and siding appear to be in good condition, needing paint repairs on some of the trim details (cornerboards; label moldings; window sills). The cornices appear sound and paint here is performing well; paint on the clapboard and matched-board siding is weathering, and needs some general repair, especially on the base in the splash zone above the main roof.

Masonry

This attractive load-bearing brick building is laid in 10-course modified American bond with grape-vine joints which still carry vestiges of white paint. Rock-face granite sills and double rows of soldier brick in segmental arches over window and door openings are in good condition, as are the sand-finished granite door sill on the south. The granite foundation has been pointed in places with hard Portland cement mortar (esp. north); purple slate was used to level the top of the stone where it transitions to brick, reinforcing our belief that this is the original slate roofing color.

Sound Portland pointing can be left in place; where it has cracked or shrunk away from the stone it should be replaced, with care to avoid damaging historic fabric.

On the east, the 6th-9th course (in the splash zone) of brick has been Portland repointed; historic brick is softer than this mortar, and will eventually be damaged by it. Efflorescence occurs here as well, and needs to be cleaned off, as do lichens being nurtured by the splash. Additional cleaning could remove whitish dissolved paint stains below the painted windows on all elevations, but particularly the east. Paint drips on the masonry are harder to remove; care to prevent them is worth the effort. Algae growing on the bricks in the splash zone can be removed with a mild TSP wash using soft-bristle brushes. A settlement crack running beside the 2nd bay of windows needs repointing.

On the west, a settlement crack in the brick over the entry door needs repointing; this whole area around the door has been repointed with light Portland mortar which stands out from the original appearance. The concrete sill on this door is cracked; it pitches back toward the building, and should be rebuilt to drain properly. Bricks in the splash zone (first 11 courses) along this side under the eaves are damaged and need repointing, and possibly some replacement; matching replacement brick can be found, and is an important component of careful restoration work.

On the north (rear) Portland cement patching near the bottom of the wall should be removed and replacement brick toothed in; spalling bricks should also be replaced (15-20 bricks). Tar on the brick, where an old addition once attached, should be carefully cleaned off. The original salmon brick color can be observed on the lower wall where the former shed addition protected the masonry from atmospheric discoloration; if cleaned, this is what the whole building would look like. The aluminum ventilator could be painted to blend with the wall.

On the south (front) the spilled paint on the brick is particularly noticeable; protection of the masonry during painting is critical to maintaining the integrity of appearance. Brick under the door sills needs pointing, and the granite steps on the right have settled, exacerbating the effect of very irregular step heights, which could be a safety hazard to some patrons. The non-historic iron railing here needs paint.

The 2007 work included reconstruction of the brick chimney, but no other masonry repairs have been done. There is a very minor amount of re-pointing needed on the east, west and south sides, most of it near the ground. The settlement cracks noted previously do not appear to have enlarged; crack monitors could be installed on these to determine if there is any active movement. The granite steps on the right side of the south elevation have been re-built as part of the accessibility work in 2007, and the railing re-worked and painted. The broken concrete sill at the west entrance door still pitches towards the building and needs replacement. While some maintenance work is needed, in general masonry is in good condition and not a high priority for repairs.

A note on hard Portland cement: mortars incorporating this material develop strength (and rigidity) many times greater than soft lime mortars typically used in 18th and 19th C. masonry construction in North America. It may adhere tenaciously to porous masonry, but is also known to shrink away while curing, leaving gaps that admit water; in some cases it detaches and works free of the wall. Masonry buildings are designed to relieve normal stresses through the softer, sacrificial mortar joints; while initially self-healing as the excess lime dissolves, these mortar joints eventually erode and need re-pointing to maintain weather-resistance and structural adhesion and support. When hard Portland mortar is introduced, the stresses are re-directed to the relatively-soft masonry units (brick; marble) which are ground down and broken, leading to expensive repairs and loss of historic material.

Woodwork

The main cornice is in generally good condition, with minor cracks to be sealed; it has been well-maintained, but should be repainted soon. The NE cornice return shows minor paint failure, and stains from nesting birds. The NW return is substantially deteriorated and needs rebuilding. The raking cornice on the north has an open woodwork joint that needs adjustment and sealing. The returns are topped off with matched boards that are now curling from paint failure and water penetration; these should all be flashed with lead-coated copper. On the south, the right side raking cornice has a piece broken off the top exposing ends of sheathing boards; this should be repaired soon, before water damages the roof structure. The peak joint in the raking cornice also needs sealing. Cupola woodwork has been discussed above.

Some woodwork repairs were done in 2007, and in general woodwork is in good shape. Paint is beginning to fail on the main cornice, and a number of open joints in the soffits and at outside corners where crown molding is mitered need repair, as they are admitting moisture and will worsen if not repaired. Cracks need to be caulked when woodwork is repainted. The SE cornice return has a hole at the outside corner which needs patching. Jambs at the west doors need minor repairs at the bottom; basement window sills need re-painting and the north end basement window sills on east and west sides need epoxy repairs. All window surrounds appear to have been caulked and painted fairly recently. The north 1st floor window on the west side has rusty fasteners bleeding through the white paint; this occurs in several locations, and rusty nails should be touch-sanded and spot primed with a rust-inhibiting primer (e.g. Rustoleum). The north door at the fire escape needs epoxy repairs to the sill.

Doors and Windows

Much of the building's character derives from its tall, segmentally-arched double hung windows and doors. On the south are 7 large windows and two paneled doors; there are 10 large windows on the west, 10 on the east and seven on the south. There are 10 segmentally-arched basement windows and 2 square-top ones. There is a single arched door on the north, and paired segmentally-arched doors on the east and west. There are no storm windows or doors on the building.

Sash conservation, as described in Preservation Brief #9: The Repair of Historic Wooden Windows (available at << www2.cr.nps.gov/tps/briefs/presbham.htm >>) is needed to some degree on all windows. Paint has failed in many locations, and is alligatored, a sure indication that the wood cannot support additional layers without stripping paint to bare wood or sound layers of paint (see Pres. Brief #10: Exterior Paint Problems on Historic Woodwork). The sash-weighted windows need some adjustments to work smoothly, and all wood to masonry joints should be cleaned out and re-caulked with a long-lived high-quality caulk (e.g. Sika-Flex 1A). Basement windows were boarded over and unavailable for inspection, but almost always need repairs. Sills are in poor condition where visible... The rusty fire escape on the north should be replaced (probably cheaper than repairing it), and the rusty bulkhead Bilco door needs prep/prime/paint. On the west, the jamb on the double doors is rotten at the bottom, and the door wracked and water-damaged.

No window repairs appear to have been done other than on four of the five basement windows on the west, and all of the large segmentally-arched 6/6 wood windows need sash conservation. Divided-light over lights above the east and west entrance doors need sash conservation, and bottoms of the doors on the east and west need maintenance repairs and re-painting. The fire escape has been inspected by a structural engineer and repaired and re-painted, and appears sound. The rusty steel Bilco door on the north needs painting.

Our observations made from the ground with binoculars, may not detect deterioration that is visible from a close inspection with ladders or a lift; some additional repair should be anticipated.

Sash conservation typically consists of removal of sash to a shop for complete disassembly and repair/re-glazing/re-painting, and prep/re-painting of the sill, jambs and casings before the sash is re-installed. It also includes provision of a secure security panel in the opening while the window is being repaired. Maintenance repairs can typically be done in place and involve less-extensive repairs to glazing, woodwork and finishes.

Paint

There is relatively little painted wood on the building; the doors and windows, cupola and cornices are the main painted components, and their paint condition has been indicated above. Paint plays a key role in protecting historic woodwork, and needs renewing periodically (every 4 years or so with current ingredients). There are some

paints on the market (Schreuder/Fine Paints of Europe 800.332-1556 or www.fine_paints.com) now which extend the life of the paint; since most of the cost of painting is in the labor of preparation, these more-expensive materials are a bargain if they offset one painting cycle.

Paint repairs are needed on the cupola woodwork and siding, the main cornice, and on selected windows and doors and associated woodwork identified above for repairs. The large, round sheet metal ventilator on the roof needs some paint repair, too.

We no longer recommend use of Schreuder paints; the best performance we've seen comes from using Sherwin-Williams oil primer and acrylic latex Emerald top coats.

Painting is a relatively cheap form of protection for the more expensive woodwork and metal-work it protects, and needs to be renewed every 4 years or so, with shorter cycles for high-exposure items or horizontal surfaces.

Site

The site appears to drain reasonably well away from the foundation; the problem arises where hardscaping meets the foundation on the eaves sides, creating splash against the masonry walls and basement window and causing deterioration. Unless removed, this will require increased maintenance of all materials within the splash zone. The preferred treatment is a gravel strip at the drip line pitched away from the building to break up the drops and direct splash outwards. At a minimum, the crack between the paving and the foundation walls should be sealed with a pourable sealant.

Plantings along the front of the building are trapping moisture and damaging the brick; the rule of thumb is to keep all vegetation 3' from the walls, and to prune back overhanging trees as much as possible.

Other minor cosmetic repairs include painting the non-historic iron railings at the front entry, and repairing the bare bulb fixture on the front façade.

A canted strip of bituminous paving has been installed against the foundation on the west side, to direct water away from the building. The seam between this and the foundation should be monitored and filled with a pourable sealant if not water-tight. Drainage around the new ramp appears to function well. The same paved apron remains along the east side; plants gaining a foothold here should be removed, and the joint to the foundation sealed. The cracked and negatively-pitched concrete threshold at the west entry doors should be replaced.

INTERIOR

The interior consists of two large classrooms on each floor with a large vestibule and stairs at the south end; smaller offices, bathrooms, and coatrooms are carved out between the vestibules and the classrooms. Stairs at either side of the first floor lobby lead down to the basement locker rooms (boys on the east, girls on the west), and to mechanical and storage spaces.

Interior repairs are a lower priority, since they have much less impact on the building's physical well-being; we note them here for the record, and urge the Owners to prepare a comprehensive maintenance plan that will address the on-going maintenance of all interior and exterior elements.

FIRST FLOOR

The lobby has strip maple flooring with a worn varnish finish, plaster walls and ceiling, beaded board cabinets, and 4-panel doors with alligatored paint finish. On the west the stair goes down to the basement; on the east an over-under stair goes down and up. Finishes are somewhat worn in the stairwell, especially the treads along the upper banister where generations of school children have worn grooves in the treads.

The west classroom (Art Guild) has a strip maple floor, plaster walls and ceiling, slate chalkboards (mostly covered with homasote for hanging art-work), a suspended modern ceiling and lights, and older pendant schoolhouse lights. A large ventilation grille is mounted on the south wall. Finishes are worn but serviceable.

We noted a substantial crack in the plaster finish on the north end of the interior partition dividing Room #1 from Room #2. This is above the area in the basement where some new structural concrete block piers have been installed, and this may have addressed a settlement problem.

A storage closet and bathroom are attached to the south end, and have typical finishes, including vertical beaded board wainscot, and modern hot water heat. The large paneled doors to all ground floor rooms have back-banded casings and square transom overlights.

A second bathroom opposite the first one has been carved out of the former coat closets; it has finishes similar to its twin.

The east classroom (Historical Society) has the same finishes except that the original plaster ceiling is exposed; similar coatroom/storage and bathroom spaces occur on the south.

The east classroom (#2) was locked and not available to inspection.

BASEMENT

The east basement (girls locker room) and west basement (boys) are essentially similar, with concrete floor, old bathroom fixtures and stalls, failed paint, and exposed mechanicals. There is friable asbestos on the east side. Behind the locker rooms is a mechanical 'room' in the center with an abandoned boiler, and a substantial amount of friable asbestos. Exposed steam piping occurs here and in the adjacent storage rooms. Hewn beams and sawn joists supporting vertically-sawn floorboards are visible overhead. Lack of functional lighting made inspection difficult; the extent of deterioration and the presence of asbestos make this space unusable without substantial work.

Some repairs and reinforcement have been done on the west side, including a partial brick enclosure at the water heater, and a 6x6 wood column reinforcing the first floor. A new fire-code compliant enclosure and door assembly has been installed at the SW access to the stairs. A portion of the wall between the main room and an adjacent west room has been removed; a dehumidifier was running. The mechanical room, down 6" from the main room, has several new concrete block piers supporting an older steel I-beam. Asbestos appears to have been removed, and lighting is somewhat improved. The 275-gal. oil tank has no enclosure in case of a spill. All other spaces are essentially the same.

SECOND FLOOR

The **stairwell** on the east has vertical beaded board wainscoting, with a chair rail, and painted plaster walls and ceiling with large cracks. All finishes need repair. The **upper hall** has a maple floor, typical wainscoting, (5) 4-panel doors with square over lights and molded back-banded casings, and the bell-rope for the tower bell. The **SW office** has all typical finishes, as do two small coatrooms associated with the classrooms.

The **E classroom** has the typical finishes (wood floor; vertical beaded-board wainscot with chair rail, plaster walls and ceiling) and chalkboard slate is installed all around the room between window and door openings. Paint is severely alligatored on the windowsills; pendant schoolhouse lights remain.

The **W classroom** (Historical Society) has similar finishes, but an acoustical tile ceiling over the original plaster.

The SW office was locked and not available to inspection. Finishes and conditions remain essentially the same in all spaces.

ATTIC

Access is by ladder through a trap door in the SW Office; the attic is unfinished, and the roof framing is exposed, consisting of 4 principal Queen post trusses with 8X8 top and bottom chords and queen posts, 8X10 cross tie, 3X8 struts, and a 2X6 ridge. Three 8X8 purlins are supported on each side, framing onto the brick gable walls at each end; these support 3X4 rafters at 17"o.c. with circular-sawn roof boards and slate roofing on top. Longitudinal 8X8s run under the bottom chords beneath the queen posts, into which are framed 2X8 ceiling joists at 19"o.c., supporting the lath-and-plaster ceiling below. Old knob and tube wiring appears to be abandoned; this should be checked/confirmed by a licensed electrician for safety reasons.

A 37"X41" wooden ventilation duct system connected to E and W vertical risers from the stacked classrooms angles together and rises in a single wooden duct to the central roof-top ventilator. A makeshift ladder leads to the **belfry**, which holds a 16"bell. A small access door on the north side of the tower accesses the roof; there is no interior ladder up to the belfry roof. This should be provided and the hatch made operable, so that periodic inspection and repairs can be carried out. The ladder from attic to belfry should also be reinforced/repared, for the same reason.

Access to the attic was not available due to the locked SW room; we did not observe any signs of water leaks or other signs of any problems emanating from the attic.

PRESERVATION STRATEGIES AND COSTS

Repairs are ranked below in order of priority. It is also strongly recommended that you carry at least a 20% contingency for conditions that cannot be seen in a non-destructive investigation such as this one. Use of contractors skilled and experienced in preservation work will help to manage discovered conditions and insure that proper consideration is given to materials, practices and preservation concerns; this is usually

the most cost-effective approach and protects the integrity of the building, including its eligibility for funding.

This opinion of probable cost addresses historic preservation issues; it is not based on full research, specifications or details, and should be considered advisory only. Our estimates are explicitly "Order of Magnitude" preliminary opinions of probable cost, exclusive of any Div. 1 (General Conditions) costs, any specific costs associated with choice of materials and methods, any scale of work issues (small projects are more expensive per unit than larger ones), any project-specific conditions, any discovered conditions or additional information that a bidding contractor may well uncover, and that a specification can address but this brief report does not.

Costs are based on hired labor and new materials, both at market rates in a recovering economy, taking into account special contractor expertise as required.

High Priority NOTE: costs from 2000 Assessment are out of date.

Replace small south section of ridge flashing	500.
Slate repairs	800-1000.
Rebuild chimney above roof; new flashing, rain cap	3500-4500.
Cupola – minor repairs and repaint	5500-7000.
Masonry repointing/repair	3500-4500.
Sash conservation (worst ½) (23)	6000-6500.
Replace rusty fire escape	2000-2800.
Repair west doors and jamb/sill	1300-1800.
Seal crack at foundation/paving	400-500.
Repair ladders in attic/cupola	150-200.
Subtotal:	<u>\$23,650 – 29,300.</u>

Masonry repairs and Sash Conservation not done yet; Sash conservation (23) is highest priority, with estimated cost of \$27,600. Masonry re-pointing and repairs estimate: \$4000-6,000.

Medium Priority

Repair/prep/paint ventilator	1800-2200.
Clean off lichens from roof	600-800.
Woodwork repairs (cornices)	1500-1800.
Repaint cornices	4200-4800.
Sash conservation (other half) 23	4500-5500.
Subtotal:	<u>\$12,600 – 15,100.</u>

Some additional cornice work now needed – Allow \$2,500-3,500.

Sash conservation (19) remains high priority – Allow \$22,800.

Low Priority

Replace aluminum skirt roof on tower with lead-coated copper	1200-1500.
Allowance for cupola roof repairs	3000.
Paint aluminum ventilator (north side)	150-200.

<i>Paint iron railing on front</i>	150-200.
<i>Prep/prime/paint Bilco door</i>	600-800.
<i>Repair light fixture on front</i>	200.
<i>Cut back vegetation</i>	200.

Subtotal: \$7,000 – 8,100.

Cupola, ventilator, railing and vegetation done; remaining work – Allow \$1,000.

Total: \$43,250 – 52,500.

New Total: \$57,900 – 60,900.

CONCLUSION

Repairs now will return a number of deferred maintenance details to a condition requiring only routine maintenance; conversely, these problems will accelerate if not addressed. Employment of tradesmen with demonstrated expertise in historic building repairs - even though they appear more expensive than others - will avoid most maintenance problems created by unskilled repairs. Some repairs benefit greatly from using specifications for bidding (e.g. masonry; window restoration; painting) to guide the contractor and ensure that unqualified contractors are not selected based solely on a lower price; there is nothing more expensive than poorly-done work that has to be re-done.

A comprehensive plan for the use and periodic maintenance of the building should be developed to organize records, avoid costly repairs, anticipate cyclical replacement of materials, and utilize the best methods and materials from a growing body of research and experience with historic building maintenance, which often differs significantly from maintenance of newer buildings.

We are pleased to have had this opportunity to assist you in the on-going stewardship of this significant historic resource. Please don't hesitate to call if you have questions on any of the above, or need additional information or assistance in continuing restoration work on the building.

Sincerely,



Thomas F. Keefe, Architect
Keefe & Wesner Architects, P.C.
TFK/hos