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.

This grant has been funded through the Robert Sincerbeaux Fund of the Preservation Trust of VT.

May 30, 2007

Mr. Randy Berno
Duxbury Congregational Church
773 Turner Hill Road
Moretown VT 05660

Dear Randy:

As requested we visited The Duxbury Congregational Church and Community Hall on May 29, 2007 to examine and document existing conditions of the buildings, 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.

A. SOUTH DUXBURY CONGREGATIONAL CHURCH

EXTERIOR

Steeple

The two-stage steeple has a slender octagonal spire with clapboard sheathing and wooden ribs. A board stave top is beginning to come apart and the lightning rod that was attached to the weather vane (now removed) is partially detached. The base of the spire is surrounded by an octagonal hub flashed with aluminum. The octagonal bell stage below this has louvered openings on the principal faces and clapboarded sections between. A broad square tower base has rusticated horizontal wood sheathing and relatively new asphalt shingle roofing with aluminum flashing. The tower base is flashed to the roof with aluminum flashing and tar. Tar is at best a stop gap material and this flashing should be repaired to sound condition that does not require tar. Paint has worn off much of the steeple and there are open joints in the woodwork and some deterioration at the louvers and their cased openings. The top stave section of the spire should also be repaired and flashed if necessary to exclude water. If the weathervane is reinstalled it may be possible to include a gasket where it penetrates the wooden top. While many steeplejacks prefer to remove the steeple and work on it on the ground, the repairs here probably do not warrant that level of intervention, but will require skilled workers familiar with rigging a steeple.

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Roof
The simple gable roof structure is covered with asphalt shingles over a somewhat irregular board-sheathed roof deck. The shingles appear to be at least two thirds through their service life. Inspection in the attic indicated several waned and irregular roof boards, leaving small sections of asphalt roofing unsupported, and leaks have occurred in this area on the south roof below the steeple. Water that has penetrated the roof has substantially deteriorated one 6" round rafter and has damaged plaster, paint, and wallpaper finishes in the sanctuary. Irregular or waned board sheathing should be replaced when the roofing is replaced, hopefully in the not-too-distant future. Temporary stabilization flashing should be repaired to water-tight condition in the meantime.

Chimney
A tall slender elegant 16" x 16" brick chimney with a corbelled cap is located on the north roof near the west end. Originally one of a pair of chimneys, its mate has since been removed below the roof line. This chimney has dangerously loose bricks at the top and rusty flashing at the base, both of which should be repaired. Iron ties secure this tall slender chimney to the ridge. These should be prepped and painted with a rust-inhibiting paint. Lead counter flashing should be used at the base and appropriate mortar designed to match the hardness of the original mortar should be used in re-pointing. A concrete cap on masonry posts appears precarious but does appear to be protecting the flue from rain and there is a bird screen visible as well, which probably needs re-securing.

Woodwork
This vernacular Greek Revival wood frame building has a simple narrow stepped cornice and board soffit with a narrow flat frieze. Flat 6" corner boards frame the clapboard wall covering which is spaced at 2 3/4" and has rusty fasteners. Windows and doors have flat trim. An entablature at the pair of front doors on the east has flat casings and a projecting molded cap. Woodwork appears to be in generally sound condition. Shutters on the windows are in fairly good condition on the north but are substantially weathered on the south and are weathered to the point of partial disintegration on the steeple. These are high-maintenance details, but add to the historic feel of the old church.

Doors and Windows
On the north are three 16/16 wood double-hung windows with no storms, in need of sash conservation.

On the east are two 16/16 wood double-hung windows with no storms, in need of sash conservation. Two seven-panel wood doors appear to be in good condition.

On the south are three 16/16 wood double-hung windows with no storms; these are very weathered and in need of major sash conservation.

On the west there are no windows but a 15 x 26" opening in the brick foundation needs a frame and screen to exclude critters.

Paint
Paint is severely alligatored on the west and south and substantially alligatored elsewhere. The north and east sides were stripped with methyl chloride years ago and have less residual paint but this building is in need of the major 50-year prep and painting on all exterior painted surfaces. It could be addressed one side at a time, in which case the south and west sides should be done first, and the steeple is a high priority as well.

Getting painters who are capable of the kind of careful and thorough preparation necessary to ensure good paint performance is difficult; *Preservation Brief #10: Exterior Paint Problems on Historic Woodwork* should be used as a guideline, and painters pre-qualified by their familiarity with these guidelines and a willingness to follow them.

Paint failure, especially with newer paints lacking the VOCs that older paints had, is a common problem, underscoring the need for careful preparation and use of the best possible materials, including caulks, primers and finish coats. The stages, causes and responses to paint failure are well-described in Preservation Brief #10: Exterior Paint Problems on Historic Woodwork, which should be used as a guideline in addressing paint repairs.

Prep work is 90% of the success of a paint job, and is skilled work that should not be left to amateurs; there are also new paints on the market which extend the cycle of repainting by several years. Although the materials are more expensive, most of the cost of painting is in labor, so that extending the cycle quickly becomes a substantial net gain.

Foundation
The foundation is constructed of brick above grade and stone below grade. Water-struck brick 2" x 7 3/4" is laid in a running bond with a soft lime mortar gaged with a narrow shadow line. Some Portland re-pointing has occurred in the past and a minor amount of additional re-pointing (using soft mortar and matching joint profile) needs to be carried out. It is usually more harmful to try to remove hard Portland mortar than to leave it, but any that is loose should be removed, and cracks caused by shrinkage can be sealed. We noted three missing bricks at the NE corner. There appear to be numerous bricks stored in the attic and around the building that might be used for this repair. Matching brick and mortar used for repair with the originals for hardness and appearance is critical to the success of the repair.

Site
The site is nearly flat with a slight slope to the south. The area around the church is covered with lawn and is contained by Route 100 60' to the east, which is now substantially higher than the grade at the church. The building sits on a slight rise so that there is positive drainage in all directions, however water falling from the roof has washed out soil at the drip line, particularly on the south. A gravel drip pitched away from the building should be provided at both eaves to break up falling rain water and direct it away from the foundation.

INTERIOR
Interior repairs are generally of a lower priority than exterior ones, since they have less impact on the building's condition and are not as vulnerable to weather-related accelerated deterioration.

We note conditions here for the record, and urge the owners to prepare a comprehensive preservation and maintenance plan that will address ongoing cyclical maintenance of all interior and exterior elements.

Crawl Space
The crawl space appears to be accessible only from the access hole in the foundation on the west. 7" round joists are spaced at 24 – 28" on center and are framed into 8 x 8 hewn carrying beams that span across the building, dividing it into four bays. The dirt floor between 10" and 18" below the framing has boards and rocks strewn about. It would help the building to clean out the material on the ground and install a 6 mil vapor barrier to discourage moisture from migrating up through the building.

Main Floor
The **vestibule** has carpeting over a plank floor, plaster walls and ceiling, six-panel doors and flat casings. On the north end is a **utility closet** under the winder stairs that lead to the balcony. A four-panel wood door closes off the **stairs** from the vestibule. There is no door or enclosure at the top of the stairs. The **sanctuary** has a wide plank floor with a wainscot consisting of applied flat wooden frames and plaster centers. Plaster walls are covered with a lovely antique wallpaper and the ceiling is plastered as well but appears to have been partially repaired with gypsum board. A pair of parged chimneys flank the raised platform on the west. A woodstove on the west is connected to the operable chimney and appears to be the only heat source in the building. Painted fixed pews appear to be in good condition. There are electrified oil lights on the walls and on the chandelier, which is suspended from the center of the ceiling and counter balanced in the attic with a barrel of rocks. Approximately 60 square feet of ceiling on the south is heavily water stained and appears to be supporting mold growth; the cause is the roof leak described previously, which should be repaired to prevent any further loss of historic interior finish.

Balcony
The narrow balcony on the east is open to the sanctuary and similarly finished. It is framed in front of the two east windows and a trap door in the ceiling over the center of the balcony leads to the attic.

Attic
The unfinished attic has four king post trusses supporting a pentagonal ridge beam. Trusses have 8 x 8 bottom chords, 7 x 8 king posts, 5 x 4 struts, 2 x 4 braces, and are spaced 6.5' on center. The 8 x 8 bottom chords frame into 8 x 8 top plates on the north and south walls and 6" round rafters spaced 40" on center extend from top plates to the pentagonal ridge. 4" wide x 1.5" deep joists span between truss bottom chords at 24" on center with the sanctuary's lathe and plaster ceiling attached to the underside. Other than the one deteriorated rafter on the south (noted previously) framing appears to be in good condition.

The **tower** is supported on 8 x 8 posts bearing on 8 x 8 transfer beams that bear on the first truss. As is typical in this familiar framing pattern, the truss has deflected slightly, allowing the tower to lean to the west. The owner reports that it has been inspected fairly recently by noted steeplejack Jay Southgate, who determined that it is sound and in no immediate danger. A sturdy ladder leads to the bell stage, where birds are nesting due to the detached screening and broken

louvers. A 32” Cowing and Company bell is mounted on a cast iron frame with an iron rope wheel. The pitched bell deck is covered with wooden shingles and a minor amount of bird trash. Typical post and beam framing and radial framing around a center mast at the peak appear to be in good condition.

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 volatile economy, taking into account special contractor expertise as required. Skilled volunteer or donated labor may reduce these costs significantly.

High Priority

Steeple repairs (spire; louver frames; flashing; etc.)	Allow	$8,000-12,000.
Stabilization flashing @ leak on south roof	“	500.
Repair chimney, replace flashing, paint iron ties	“	4,500-6,500.
Repair tower (bell stage) shutters (8)	“	2,500-3,500.
Sash conservation – worst (3)	“	4,000.
Subtotal:		19,500.- 26,500.

Medium Priority

Re-roof Church w/ standing seam Galvalume; repair roof deck	Allow	18,000-22,000.
Sash conservation (remaining 5)	“	4,500-5,500.
Prep/prime/paint entire exterior	Allow	25,000-35,000.
Provide gravel drip @ both eaves	“	500.
Subtotal:		48,000-63,000.

Low Priority

Repair/re-paint all other shutters (32)	Allow	3,000-4,000.

Foundation repairs, re-pointing; screen in W opening	"	1,500.
Clean out crawl space, install 6 mil. Vapor barrier on ground	"	500.
Subtotal:		5,000-6,000.
Total:		**$72,500-95,500.**

B. COMMUNITY HALL

EXTERIOR

Roof

The simple gable roof is covered in asphalt shingles that are well past the end of their service life and should be replaced. While we did not see signs of active leaks inside the building or the attic shingles are substantially curled, cracked, and broken, and we noted pieces lying on the ground. This material cannot remain weather tight for long and plans should be made to replace it.

Chimney

The chimney on the community hall matches the one on the church with a corbelled top and tall slender proportions. The community house chimney is located at the west end of the building and projects through the center of the ridge. The top has loose bricks that are in danger of falling and the top portion needs to be rebuilt while the bottom will need re-pointing. Aluminum flashing should be replaced with lead. Bricks and mortar have an iron oxide wash that gives them a reddish color, and this can be renewed once the chimney is repaired.

Woodwork

This very plain vernacular building has trim similar to the church with a very thin roof profile, resulting in narrow fascia boards, and a board soffit and flat trim at windows, doors, and corners. We noted some deterioration in the north fascia (approximately 5 – 10') and some soffit cracks in this area, which may indicate concealed conditions of deterioration. The east door sill has a knotty cross-grain appearance devoid of any paint and an old four-panel door showing the ravages of time. New pressure treated porches and stairs have been provided at both east and south entries. Clapboard with a 2 ¾" – 3" reveal appear to be in sound condition.

Doors and Windows

On the south a four light three panel door needs conservation at the glass. Two 2/2 wood double-hung windows with no storms need sash conservation.

On the east two 2/2 wood double-hung windows with no storms need sash conservation. A five-panel door is weathered but sound.

On the north, four 2/2 wood double-hung windows with no storms need sash conservation.

On the west there are no openings.

Paint

Like the church, paint on this building is alligatored with rusty fasteners showing through the paint on most locations. Paint is worn off the window sills. This building is in need of a complete prep and repainting but can be stabilized with touch up painting for several more years if necessary. Rusting fasteners on both buildings should be addressed by sanding away rust, priming with a rust-inhibiting metal primer and then top-coating with regular house paint.

Getting painters who are capable of the kind of careful and thorough preparation necessary to ensure good paint performance is difficult; *Preservation Brief #10: Exterior Paint Problems on Historic Woodwork* should be used as a guideline, and painters pre-qualified by their familiarity with these guidelines and a willingness to follow them.
Paint failure, especially with newer paints lacking the VOCs that older paints had, is a common problem, underscoring the need for careful preparation and use of the best possible materials, including caulks, primers and finish coats. The stages, causes and responses to paint failure are well-described in Preservation Brief #10: Exterior Paint
Problems on Historic Woodwork, which should be used as a guideline in addressing paint repairs.
Prep work is 90% of the success of a paint job, and is skilled work that should not be left to amateurs; there are also new paints on the market which extend the cycle of repainting by several years. Although the materials are more expensive, most of the cost of painting is in labor, so that extending the cycle quickly becomes a substantial net gain.

Foundation

The foundation consists of mortared and dry laid stone with an 8 – 12" exposure. Several stones were displaced on the north but the foundation appears to be in generally good condition.

Site

The site is similar to the church, bounded by Route 100 to the east with a slight pitch to the north. Like the church, the hall sits on a slight rise providing generally good drainage. A gravel drip at the eaves and minor re-grading would remedy the slight depression created by water falling from the eaves and washing out dirt next to the foundation.

INTERIOR

Interior repairs are generally of a lower priority than exterior ones, since they have less impact on the building's condition and are not as vulnerable to weather-related accelerated deterioration. We note conditions here for the record, and urge the owners to prepare a comprehensive

preservation and maintenance plan that will address ongoing cyclical maintenance of all interior and exterior elements.

The **main hall** has tongue-in-groove fir flooring that is very worn and has no finish remaining. Plaster walls have a flat chair rail. The ceiling is covered with hardboard and batten finish over the old lathe. Plaster appears to have been stripped prior to application of the hardboard. A shelf chimney on the west is parged and serves a woodstove that appears to be the only source of heat in the building.

The **lobby** has vinyl tile flooring and typical plaster walls and hardboard ceiling. The kitchen is similarly finished.

The **attic**, accessible only through a window from the exterior, is unfinished with exposed 2" x 5" rafters at 18" on center with no ridge. Floor joists spanning across the building (22') are 2" x 7.5" at 22" on center. Gable walls are framed with 2 x 4s at 20" on center and all framing is circular sawn. Lathe is visible on the underside of the ceiling joists.

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 volatile economy, taking into account special contractor expertise as required.

High Priority		
New standing seam Galvalume roof	Allow	14,000-16,000.
Repair/rebuild chimney	"	3,500-4,500.
Stabilization painting	"	1,000.
Subtotal:		18,500- 21,500.
Medium Priority		
Woodwork repairs (some concealed)	"	1,000-1,500.

Sash (8) and door (1) conservation	"	10,000-12,000.
Major prep/prime/paint exterior	"	12,000-15,000.
Subtotal:		23,000-28,500.

Low Priority

Minor foundation repairs/re-pointing	"	500.
Add gravel drip @ eaves	"	500.
Subtotal:		1,000.

Total:	**42,500- 51,000**.

CONCLUSION

Both buildings have received substantial and regular care over their life-cycles. Repairs now will return a number of deferred maintenance details to a condition requiring only routine maintenance; conversely, these problems will accelerate shortly 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

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 these significant historic resources. 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 yours,

Thomas F. Keefe, Architect
Keefe & Wesner, Architects, PC
TFK/hos
Encl./