

Juniper Hill Design Build Inc

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HARVARD TOWN HALL ENVELOPE ASSESSMENT

General

Identification of structural and exterior envelope issues and solutions in the Town Hall structure.

Goals

Juniper Hill D/B Inc. is assuming (based on the town hall administrator's statements) that minimal interior work is to take place during this scope of work. The town's main goal during this phase is to "restore" the exterior of the structure with a strong focus on the long term, energy use, envelope durability and ease of maintenance, while maintaining its historic "Italianate" character.

Preliminary utility/mechanical planning

A complete layout should be done for air to air roof jacks, plumbing vents, radon vents, future heating (concentric or separate) CPVC flues and terminations, exterior lights, heat sensors, etc. prior to any work on the exterior. Our goal here is to install the properly sized, spaced and flashed HVAC penetrations thru the envelope now. The interior portions of these terminations will be tied in during phase II after the vertical utility chases are built (i.e. chimneys removed).

1. Main Structure/ Issues/ Solutions

A. Crawl Space

1. Lift, align and support the first horizontal main girt.
2. Install "shoulder Beam" under newly aligned girt, see engineers drawing and spec sheet.
3. Rebuild CMU wall corner to support the same, the area accessible from the front utility staircase.

4. Repair floor joist in crawl space damaged by improper installation of condensate line (AC). Re-plumb temporary condensate line to code.
5. Re-build and point washed out fieldstone sections on west foundation walls.
6. Conveyer remove excess fill and debris, inspect post footings.
7. Install schedule 40, 4" -6" drains in crawl space for future downspouts on west side elevation. Locations to be determined. All interior piping to tie to schedule 80, 4"-6" buried header pipes on exterior. All tied to approved existing manholes. Cleanouts provided at pre-determined locations.
8. Crawl space floor- It's my opinion, given the contours and outcroppings of ledge in this area, that a poured concrete slab (rat slab) might not be feasible. I suggest that all soils be smoothed and debris removed by conveyer in preparation for 20 mil ASTM vapor barrier by Raven. At this point, the feasibility of a multi-level slab can be discussed. This will require the Town to develop procedures for future utility work (electrical, plumbing, gas) under the building that will address maintaining the integrity of the vapor barrier.
9. New window frames/insulated glass awning windows installed in crawl space. All glazed daylight openings and muntin widths as original. Screens to be provided.
10. Coal shoot/bulkhead area to be reevaluated and secured.
11. Southeast corner cornice and soffit - reframe to architectural plan. This sectional plan to show completed eave structure with apron gutter system.

B. Chimneys

1. Determine the fate of the three masonry chimneys. We have been told the two sister chimneys to the rear will be removed. The small front chimney is currently servicing the existing heat and is an active leaker. It has a failed cricket and masonry flashing. The rough opening starting in the basement furnace room is a plenum for warm/moist air to move vertically thru the building frame into the roadside soffit structure, which is a perfect recipe for ice dams. We should not assume this chimney can work in any way for a future system, until we have the new concentric or separate CPVC details. We recommend that heat/loss calculations are done on the planned new building envelope, yielding BTU calculations for more efficient heat delivery system. If it is determined that it has potential once repaired, these repairs should be done during phase I. At this point, the exterior

sheathing will be removed for the structural repairs, exposing the chimney.

C. Sills / Outside Corners

1. Rebuild sill sections using lap joint method on the front façade gable wall for 8 feet and 14-16 feet on the roadside. (both repairs to start at the outside corner).
2. An interlocking brick joint to be used for the outside corner wood joinery. All Materials suitable for ground contact and Simpson structural screws and anchors as specified.

D. Post and Frame

1. Rebuild southeast corner post and frame areas. To include a lap joint repairs to 5 1/2" x 10" post at three SE corner areas, six foot vertical repair at sill and post bottom intersection, second floor height (labeled on SE corner of building), six foot lap joint repair, third repair at top plate soffit height, a six foot lap joint repair.
2. Stud bottoms replaced on 6 studs adjacent to the SE corner post using Butt/sister method,(see architect drawing).

E. Trusses

1. Cupola truss connections spliced/ stabilized steel plate and threaded rod connections as per engineers' specs.
2. All hanging roof truss connections inspected and approved by engineer.

F. Main attic area

1. Rafter repairs at the chimney in the SE corner (repair details are effected by the decisions on the chimney's fate).

2. Rear Addition Issues/Solutions

- A. Crawl space - all new girder footings excavated, formed and poured to engineers specs.
- B. Provide permanent access to crawl space from exterior.
- C. New fire columns to engineers' specs.
- D. Conveyer removal of excess rubble and fill
- E. Both girders to be rebuilt to engineers specs.

- F. Perimeter sills where visible appeared sound.
- G. Implementation of engineers plan for new second floor header system.
All point loads to have footings/ posts as per specs.
- H. Suggest evaluation of old outhouse brick containment and removal of same.
- I. ASTM 20 mil Raven product install after subs.
- J. Rat slab feasibility addressed

Exterior Weather Envelope

General

Both the main structure and the rear addition , are in need of a new roof, siding and windows. Existing rebates on the exterior trim set the parameters for optional drainage plane and any sheathing changes. All trim heads to have new freedom grey copper flashings with hemmed kickers (see architectural drawing).

Roof/Eaves area

Recommending design and installation of roof apron (see sample) gutter system. Size of which will be determined by roof area and volume of water and the aesthetic by existing rake molding.

The face profile of this 20 oz. copper gutter (freedom grey) would resemble the existing rake molding (Juniper Hill has template) gutlets would be sized to accommodate calculated water volume. A full and continual roof apron is integral to this system and follows up the roof slope 6" Gutter brackets attached on top of waterproof sheathing with high temperature membrane over and under. Gutlets can also be filled with permeable blocking to minimize any cleaning.

All framing and rebuilding of eaves will represent model (sample section to be shop built).

Soffit venting to be determined after insulation budget is established.

Recommendations

Material for finish trim:

1. Products with suitable lifespan for historic structures.
(long life products)
2. Plantation grown product internally treated, no finger joints
(approved by Cambridge Historical Commission). P 2 Pine
3. All heart vertical grain red cedar *
4. Products suitable for quoins
5. Big Leaf Mahogany
6. Spanish Cedar
7. Azek - PVC (planned for expansion joint)
8. KOMA - Celuka - PVC (planned for Expansion rate)

Note: All Quions and running trim to use offset fastening where possible.

Materials for siding:

1. Clear vertical grain all heart red cedar in profile of choice

2. One coat of alkyd oil base primer (California) all sides, prior to siding
3. After siding complete, caulk all joints with 3M – 5200 white caulk
4. Apply second coat of primer on entire completed building
5. Apply 2 coats of 100% acrylic latex top coat (California)

Material for window: options

1. Pella brand windows (same as library)
2. Marvin brand window (are better, but more costly)
3. Anderson

Energy Envelope

Choices if siding is removed

1. Sheathing- structural insulated sheeting by Hubercorp.
2. Drainable rain plain under siding
3. Henry breathable air barrier

Insulation

1. Two pound closed cell Baer foam insulation if budget allows (at least in eaves and sills)
2. Half pound open cell foam icynene
3. Volcanic fiber for walls and roof, Roxul
4. Three pound closed cell foam in crawl space interior field stone Foundation
5. Any exposed foam must have application of intumescent paint

Wood Adhesives

1. For new glue joints and repairs to existing windows/door/trim, use Flexible epoxy by Advanced Repair Technology, Art flex-tec HV. Must use primer (prime- a-trate) first then flex epoxy .
www.advancedrepair.com , 607-264-9040
2. For Boral- follow manufacturers specs.

The integration of air to air system with bath ventilation and air conditioning to properly ventilate interior.