Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 02/19/16

CRITERIUM® ENGINEERS

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February 12, 2016

Via - Email

Bobby Soucy
28 Harvey Street
Portland, ME 04101
207-749-0615
Soucy17@gmail.com

STATE OF MAINE
JESSE C. NASH
12967
LICENSED
PROFESSIONAL ENGINEER
2/12/2016

RE: 28 Harvey Street, Portland, ME
Dormer Design – Phase 2

Dear Mr. Soucy,

Attached please find calculations sheets 1 through 9, dated February 12, 2016, which verify the structural adequacy of the proposed new shed dormer off northwest side of the existing hip roof of the residence at 28 Harvey Street in Portland, Maine. Sketches 1 through 5, dated February 12, 2016 show the structural design including required faming members and components.

Design is based on the 2009 International Building Code, 2005 National Design Specification for Wood Design, and Criterium Engineer's Limited Structural Evaluation report dated January 8, 2016. The design only includes the structural design and structural components. The homeowner and/or contractor is responsible for all non-structural components such as roofing, flashing, windows, siding and/or considerations for egress, fire protection and life safety.

The homeowner and/or contractor will also be responsible for ensuring the structural design is implemented and installed correctly, as well as for any temporary conditions including shoring, bracing or support necessary as a result of the contractor's construction methods and/or sequences. The homeowner and/or contractor is also responsible to bring to Criterium Engineers attention any significant discrepancies in existing conditions from what is shown in the drawings.

Summary of Design Intent:

Based on information provided by the homeowner, Bobby Soucy, the new shed dormer will be approximately 12-feet wide and extend off the west side of the existing roof. The roof of the new dormer will run from the existing ridge-line to the west exterior wall with a 3/12 pitch. The existing second floor partition wall below the ridge-line will be removed. Then, new walls on each side of the ridge will be added to create a second floor hallway as well as an additional room below the added dormer.

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To accomplish the layout described by the homeowner, the east added hallway wall will be designed as a bearing wall that would align vertically with the existing first floor bearing wall below. The new wall on the second floor will extend to the underside of the roof rafters at the existing rear dormer. These existing rafters will then cantilever over the added bearing wall and support the ridge. The ridge (and cantilevered rafters) would in turn support one side of the roof rafters of the added dormer. A bearing wall would also be added along the west exterior wall to support the exterior end of the roof rafters of the added dormer. Walls at the ends of the existing and new dormers (the walls running perpendicular to the roof ridge), as well as the newly added bearing wall, will serve to provide lateral resistance for the roof.

Design Loads:

Dead:	Roofing:	2 psf
	Roof sheathing:	3 psf
	Framing:	6 psf
	Insulation:	1 psf
	Drywall:	2 psf
	Misc. MEP	1 psf
	Total Roof Dead Load	15 psf

Snow:	Ground snow load =	$P_g = 60$ psf
	Flat roof snow load =	$P_f = 0.7C_eC_tIP_g$
	Exposure factor =	C_e = use 1.1
	Temperature Factor =	$C_t = 1.0$ (cathedral roof)
	Importance Factor =	$I = 1.0$
	Flat roof snow load =	$P_f = 0.7x1.1x1.0x1.0x60psf$
		$P_f = 46.2$ psf (use 46psf)

Wind: 25 psf (lateral)
Only used to verify adequate lateral resistance for dormer projections. The existing roof structure is assumed to act as it always has with the roof diaphragm transferring lateral forces to the perimeter walls.

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Other Lateral Load Considerations:

East-West Direction:
The existing and new dormers will be supported vertically at the two exterior walls and near the ridge by the new bearing wall. This configuration will not induce lateral 'kick-out' forces that would require rafter ties.

North-South Direction:
The existing hip roof surfaces on the north and south ends of the home rely on the ridge beam and second floor framing to resist lateral loads induced by these sloping hip roof surfaces. These components (ridge beam and second floor framing) will remain in place and reinforced as necessary to resist the induced loads.

If you have any questions please do not hesitate to contact me.

Sincerely,

Jesse C. Nash, P.E., LEED-AP
Criterium Engineers

Enclosures: Structural Calculations – 9 Pages
Structural Sketches – 5 Pages