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January 24, 2012

Art Guadano
AG Architects, PC
624 Central Ave.
Dover, NH 03820

Re: Rye, NH Public Safety Building
Structural Review

Dear Art,

At your request, I have done a brief review of the Rye Public Safety building to determine if a second floor over the apparatus bay is feasible. My review is based on a site visit, as well as the construction drawings (CD's) prepared in 2004 by HKT Architects, Inc.

The CD's are very clear that the structure of the apparatus bay was designed to accommodate a second floor. The design loads specified on the drawings included a dead load of 20 psf, a partition load of 20 psf, and a live load of 60 psf. This adds up to a total design load of 100 psf. Based on my calculations, using a typical W16x26 interior beam with a column spacing of 22' 3", the allowable total load capacity for this beam is approximately 88 psf (lower than the 100 psf noted on the drawings). A floor with an allowable total load of 88 psf is generally capable for office use. Current office minimum design loads include 50 psf live load, 15 psf partition load, plus dead load. Assuming a dead load of approximately 15 psf, the total load would be 85 psf, so the existing steel framing is just adequate.

The code does also require office corridors to be designed for a live load of 80 psf. Depending on the floor layout, and whether corridors are used, this would need to be considered in the design of the new floor framing. In addition, file storage areas can create far higher loads than for the typical office use. File storage areas would need heavier framing and possibly reinforcing of existing steel beams, all of which would have additional costs.

Based on the CD's, the anticipated future floor would be wood framed. This would need to be the case as a concrete floor would exceed the load capacity of the beams. The floor would need to have adequate fire ratings for separation of the proposed uses. The new floor would also need to be flush framed with the steel beams, and supported by hangers. There are some locations where electrical conduit would need to be relocated to install the floor. In addition, all of the existing steel cross bracing would need to be removed.

In addition to structural review, there are also logistical issues evident on this site. Due to the size of the floor area, two fully enclosed and rated stair towers and an elevator would be required. The stairs would need to be remote from each other, and be separated from the elevator. These would likely be added outside of the existing building, and the site seems very restrictive for such additions. Also, the floor to floor height would be exceptionally large. CD sheet 103 says the proposed floor would be 19' 2-1/4" above the ground floor, where most buildings have floor to floor heights in the order of 10 to 12 feet. Use of the stairs would be very inconvenient and awkward, and the stairs would be quite expensive.

Thank you for contacting JSN Associates, Inc to provide this review and please contact me if you have any questions.

Sincerely,

Jeffrey S. Nawrocki, P.E.
President

Rye Public Safety

Second Floor Access

AG Architects Project 12-617

23 January 2012

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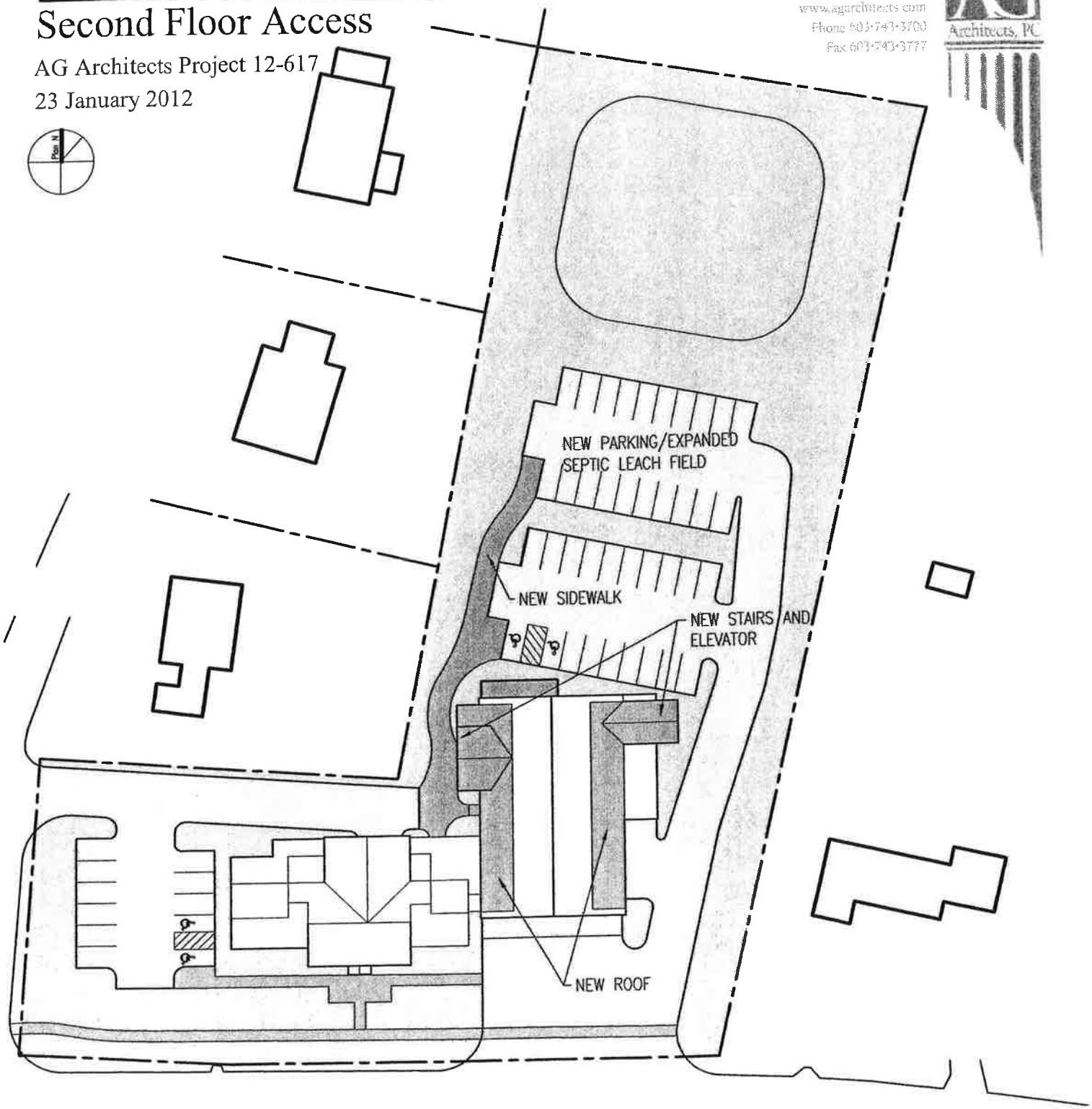

1 Proposed Site Plan Modifications

15' 30' 60' 120' 1"=60'

Town of Rye, Public Safety Second Floor Analysis

Estimate of Probable Construction Cost

AG Architects Project Number 12-617
24 January 2012

Division	Description	Unit	Qty	Unit Costs Low	Unit Costs High	Budget Cost Low	Budget Cost High	% of Total Low	% of Total High
Sitework	Pave parking area	Allow	1	$ 27,500.00	$ 30,000.00	$ 27,500.00	$ 30,000.00		
	Sidewalk modifications	Allow	1	$ 5,000.00	$ 10,000.00	$ 5,000.00	$ 10,000.00		
	Septic leach field enlargements	Allow	1	$ 10,000.00	$ 15,000.00	$ 10,000.00	$ 15,000.00		
	Sitework Sub-total					**$ 42,500.00**	**$ 55,000.00**	**3.7%**	**4.0%**
Substructure	Tower foundations	Allow	1	$ 7,500.00	$ 10,000.00	$ 7,500.00	$ 10,000.00		
	Demo for dormers, steel	Allow	1	$ 15,000.00	$ 20,000.00	$ 15,000.00	$ 20,000.00		
	Structural modifications, rated floor	SF	6,259	$ 16.33	$ 18.29	$ 102,209.47	$ 114,477.11		
	Substructure Sub-total					**$ 124,709.47**	**$ 144,477.11**	**10.8%**	**10.5%**
Exterior Building	Add an elevator for public access, 20' rise	Allow	1	$ 65,000.00	$ 70,000.00	$ 65,000.00	$ 70,000.00		
	Add two stair towers and elevator shaft	SF	1,500	$ 35.72	$ 42.86	$ 53,580.00	$ 64,290.00		
	Stair flights	Each	4	$ 10,800.00	$ 12,960.00	$ 43,200.00	$ 51,840.00		
	Add dormer each side with windows	SF Wall	1,600	$ 31.57	$ 37.89	$ 50,512.00	$ 60,624.00		
	Dormer roof	SF Roof	3,200	$ 11.16	$ 13.39	$ 35,712.00	$ 42,848.00		
	Shell Sub-total					**$ 248,004.00**	**$ 289,602.00**	**21.5%**	**21.1%**
Interior Building	Partitions	SF	6,259	$ 10.22	$ 12.26	$ 63,966.98	$ 76,735.34		
	Doors	SF	7,759	$ 5.14	$ 6.17	$ 39,881.26	$ 47,873.03		
	Casework	SF	6,259	$ 5.00	$ 6.00	$ 31,295.00	$ 37,554.00		
	Glass	SF	6,259	$ 1.00	$ 1.20	$ 6,259.00	$ 7,510.80		
	Ceilings	SF	7,759	$ 2.31	$ 2.77	$ 17,923.29	$ 21,492.43		
	Floors	SF	7,759	$ 4.20	$ 5.04	$ 32,587.80	$ 39,105.36		
	Paint	SF	7,759	$ 1.72	$ 2.06	$ 13,345.48	$ 15,983.54		
	Accessories (Blinds, Toilet Accessories)	Allow	1	$ 8,000.00	$ 10,000.00	$ 8,000.00	$ 10,000.00		
	Interiors Sub-total					**$ 213,258.81**	**$ 256,254.50**	**18.5%**	**18.7%**
Services	Plumbing	SF	6,259	$ 3.90	$ 4.68	$ 24,410.10	$ 29,292.12		
	Sprinkler System	SF	7,759	$ 2.27	$ 2.72	$ 17,612.93	$ 21,104.48		
	HVAC	SF	7,759	$ 19.15	$ 22.98	$ 148,584.85	$ 178,301.82		
	Electrical Service/Distribution	SF	7,759	$ 11.27	$ 13.52	$ 87,443.93	$ 104,901.68		
	Services Sub-total					**$ 278,051.81**	**$ 333,600.10**	**24.1%**	**24.3%**
SUB-TOTAL	**Building**					**$ 864,024.09**	**$ 1,023,933.71**		
	Building and Sitework					**$ 906,524.09**	**$ 1,078,933.71**		
	GC General Conditions	%		0.10	0.10	$ 90,652.41	$ 107,893.37	7.9%	7.9%
	GC Overhead	%		0.05	0.05	$ 49,858.82	$ 59,341.35	4.3%	4.3%
	GC Profit	%		0.10	0.10	$ 104,703.53	$ 124,616.84	9.1%	9.1%
	Sub-total					**$ 245,214.77**	**$ 291,851.57**	**21.3%**	**21.3%**
TOTAL						**$ 1,151,738.86**	**$ 1,370,785.28**	**100.0%**	**100.0%**
Square Foot Summary	**Building $/sf**	**sf**	**7,759**	**$ 142.96**	**$ 169.58**	**$ 1,109,238.86**	**$ 1,315,785.28**		
	Building $/sf with sitework	**sf**	**7,759**	**$ 148.44**	**$ 176.67**	**$ 1,151,738.86**	**$ 1,370,785.28**		

Estimated Size

Second Floor	6,259 SF
Stair/Elevator Towers	1,500 SF
Total	**7,759 SF**

Estimated Cost New Construction (added stairs/elevator not required)

6,259 SF ($175-200/SF) = $1,095,325 - $1,251,800

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24 January 2012

Mr. Michael Magnant
Town Administrator
Town of Rye
10 Central Road
Rye, New Hampshire 03870

RE: Rye Public Safety Building
AG Architects Project No. 12-617
Second Floor Analysis

Dear Mr. Magnant,

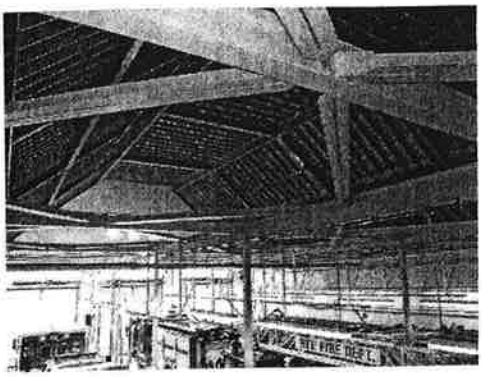
We have completed our review of the Public Safety building and what would be necessary for installing a second floor above the apparatus bays. It has been proposed that a second floor be constructed in order to provide space for several departments currently located at Town Hall rather than expanding Town Hall. The Public Safety building was built in 2005, and serves the Police and Fire Departments. There is a public parking area to the West with 11 spaces, and a staff parking area behind the building with 20 spaces.

Our investigation included a site visit with our structural engineer, Jeff Nawrocki from JSN Associates, to review existing conditions and to obtain copies of the construction drawings. The apparatus bay structure was designed with a steel frame and steel columns to support a future second floor. The wood framed roof above the potential second floor is supported by a bent steel frame located at each column line, so the columns do not extend through the second floor space. The second floor framing is located approximately 19'-4" above the apparatus bay floor. Currently, there are no stairs or elevator that would be able to access this second floor area. The footprint of the building where the second floor would be installed is 99'-9-3/4" L X 62'-9-1/4" W column-to-column, which is approximately 6,259 SF. The roof rafters are 10:12 pitch, and extend from the second floor level at both sides as a gable roof to the center peak. There are three windows in each of the two gable ends of the building, with sills located over 6'-3" above the second floor level. There are no windows, dormers or skylights in the gable roof above the future second floor. A second floor extending to the edge where the roof rafters meet the floor would not be usable space along the perimeter due to a lack of head room, unless a dormer were added on each side to use the floor area and to provide for windows.

The structural capacity was reviewed in order to confirm the feasibility of adding the second floor. A copy of the letter from JSN is attached, which indicates that the existing framing is just adequate for an office floor loading (85 PSF). File storage areas would require a higher floor loading and would likely require additional reinforcing of the existing steel beams, which means added costs. The floor structure would have to be wood framed, rather than a metal deck with concrete due to load limits, and is required to be fire rated to provide separation from the garage apparatus bays.

Installing a second floor will require a number of significant building modifications and improvements in order to be accomplished. The following list identifies many of these items as follows:

- The existing steel framing has steel cross bracing installed in each bay that would need to be removed in order to install flush floor framing. Installing floor framing over the top of the steel is unlikely to be practical due to the limited height for bearing where the perimeter joists and rafters meet.
- There is currently no access available to the second floor area. The Police and Fire Departments are secure areas that limit access to the general public, so existing stairs and elevator are not available for use even if they were in a reasonable location, which they are not. Accessing the second floor will require two new stair towers and an elevator, both with independent access from outside the building.
- The new stairs and elevator need to be built on the outside of the building so as to not reduce square footage in the apparatus bays. Constructing these enclosures with exterior walls, windows, stairs, roofs, and providing an elevator are significant additional costs. The site is very tight which limits where the stairs and elevator could be located. The attached sketch of the site and building shows a possible location for these towers.
- The height of these stair towers to serve the second floor will require special framing and reinforcing.
- There are no windows serving the second floor other than 3 high windows at each gable end. It would be extremely inappropriate to develop office space without a reasonable level of natural daylight. It is possible to install roof windows (skylights) across the roof, but then a significant area of the floor would be unusable along the gable perimeters. Installing a shed dormer along each side of the gable roof for the length of the building would provide walls for installing windows and permits the floor to be used to the perimeter. This is the appropriate solution, but will require modification of the existing roof framing.
- Offices, partitions, and interior finishes such as flooring and ceiling will be required to be fit up on the second floor.
- The addition of 6,259 SF of office space separated from Police and Fire will require plumbing for toilet and break room facilities. It is a strong possibility that the septic system leach field will also need to be expanded to accommodate the additional plumbing fixture load.
- The second floor area does not currently have a mechanical system for heating and cooling the additional office space. Heating, ventilation and air conditioning equipment is required.
- The electrical system for the building has 800 amp capacity. Assuming there is available capacity for 6,259 SF of office space, a panel, wiring, lighting, outlets, fire alarm system and communication systems will all need to be installed.
- Providing parking for staff and public will require an expansion of public parking. The only space available on the site is to the rear of the building above the leach field, which was designed to allow this. The access drive to this area would require the public to use the drive that is used by emergency vehicles, potentially creating a dangerous situation. The attached site sketch shows the parking location and driveway access.
- The existing sidewalk will have to be relocated, and a new sidewalk extended to the new parking area.



The installation of a second floor to the Public Safety building for use by several Departments from Town Hall is a complicated proposition and does not offer any advantages over new construction elsewhere. Access to the additional parking on the site interferes with fire apparatus which is a safety issue, separate stair and elevator towers are required, and the second floor space requires complete construction and fit-up with the exception of the foundation. Dormers, windows, interior partitions and finishes, plumbing, sprinkler modifications, mechanical system, electrical wiring and lighting, and fire alarm system are all necessary. We estimate the construction for the second floor to cost between $1,152,000 and $1,371,000. This cost is higher than new

construction costs for a similar amount of new space ($1,095,000-$1,252,000). Constructing new space for Town Hall needs would be more appropriate with a Town Hall facility that includes all Departments in one location. Efficiency, communication and supervision of Town Hall staff is compromised when Departments are located in different buildings and staff have multiple responsibilities that cross Departments. Operational efficiency would be negatively impacted if Departments were in separate buildings. It would also be more difficult for the public to access Departments in separate buildings, and would be less convenient when visiting more than one Department.

Providing a second floor in the Public Safety building is possible, but is not recommended for the many reasons noted above. There are no advantages over new construction, including costs. If you have addtional questions or concerns, please contact us.

Sincerely,

Art Guadano, AIA, LEED AP BD+C

AG:bg

Town of Rye Public Safety Building

Second Floor Analysis

Town of Rye Public Safety Building: Second Floor Analysis

Review existing conditions

- Steel frame installed, no floor
- Almost no natural light

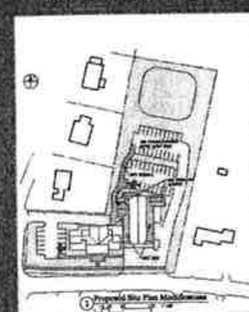
Review design construction drawings

Analysis: Structural Engineer

Town of Rye Public Safety Building: Second Floor Analysis

Town of Rye Public Safety Building: Second Floor Analysis

Site Plan

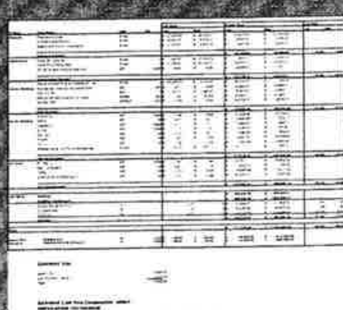


Town of Rye Public Safety Building: Second Floor Analysis

Estimate of Probable Construction Cost

Second Floor: $1,182,000-$1,371,000

New Construction: $1,095,000 - $1,350,000



Town of Rye Public Safety Building: Second Floor Analysis

Advantages

- Utilize existing foundations and steel frame.

Disadvantages

- Parking and driveway safety.
- Construct stair and elevator towers.
- Construct dormers and fit up interiors.
- Provide HVAC and electrical.
- Construction more costly than new construction.
- Town Hall Departments in multiple locations; inefficient and inconvenient for public.