

From: John Oney [<mailto:joney@archall.com>]
Sent: Thursday, December 12, 2013 10:11 AM
To: Kowalski, Matthew
Cc: Robert J. Wanty; David Kaldy
Subject: Germain Audi/Porsche/VW additions

Matt,

I hope all is well and look forward to seeing you next week. I wanted to follow up to Rick's December 3 Response letter and let you know what we have researched in regards to Bonnie Bona's request that we investigate the possibility of incorporating a "green roof" into the project.

The following is a summary of our investigation:

1. We talked with **Bloom Roofing** (large roofer in area that has installed green roofs) about pros and cons. In addition to initial costs concerns his concern was maintenance
2. We talked with **Big Georges** who installed a 13,000 sf green roof. The cost was \$300,000 or \$23.00/sf. In addition to initial cost concerns his concern was maintenance cost.
3. We talked with **John Aleck of LiveRoof**, the company that installed 10,000 sf "green roof" on the Ann Arbor Municipal/ City Hall Building. He suggested we use his "middle of the road" system a 4" deep system. His cost estimate including material, installation was \$18/24 sf plus addition steel cost for 29PSF saturated weight. Maintenance cost was estimated at \$1/2 sf annually.
4. We talked with our **structural engineer** to confirm additional tonnage of steel to support additional load. Structural costs increased 25%
5. We talked with our **mechanical engineer** to confirm energy savings. Most of the energy savings comes from reduction of cooling costs since the green roof acts as a heat island and evaporative cooling occurs. Assuming we had a black roof of 20,000 converted to a green roof an annual energy savings would be \$8000. However we have proposed a white reflective TPO roof and no addition cost of a black roof and can produce the same energy savings as the green roof without the added initial cost and continuing maintenance cost.
6. We contacted **Jan Culbertson at A3C Architecture** and she was most helpful. She suggested the green roof they installed on their building, Xero Flor, was performing well and suggested it could be more a economical system. She estimated the material cost to be \$10 sf plus installation, structural and maintenance cost. She suggested the 2" system which would reduce saturated weight factor to 10PSF. She also said that their maintenance cost was around \$.75 SF annually \$.
7. We contacted **Heather Barker, Xero Flor green roofs**. She suggested 2" XF301 system similar to the A3C roof. She estimated \$8-12 sf material, \$3-6 sf installation, addition structural cost (10

psf saturated weight) and \$.50 sf annual maintenance cost with some self-performing of the work. Assuming \$2 sf additional steel cost her estimate of initial cost would be \$13 to 20 sf

Summarizing the above research we came to the following conclusions:

1. Initial cost of 20,000 sf of roof area (10,000/ bldg.) using the 2" system would be \$16.50sf x 20,000 sf = \$330,000
2. Annual maintenance cost would be \$.75 sf x 20,000 sf = \$15,000
3. Energy savings annually would be insignificant since we already are eliminating the heat gain of a black roof by using a reflective white TPO roof
4. Installing green roof to gain parking spaces is economically not something the owner can pursue with the scope and budget restraints of this project.
5. Based on that the Owner wishes to reduce the number of parking spaces requested and install bio swales, trees and green space that meet and/or exceed code requirements on the ground where they can be seen and help to improve the environment and customer experience.

Please don't hesitate to call if you have any questions. We look forward to your support and to seeing you next week. We are anxious to keep the project moving and on schedule.

Thanks

JOHN ONEY

PRESIDENT

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