



EL DORADO COUNTY DEVELOPMENT SERVICES DEPARTMENT

BUILDING APPEALS BOARD

Minutes

September 18, 2013

Members Present: Garry Gates-Chairperson, Stephen Twist-Vice Chairperson, Dwayne Nystrom, Neil Moore, Kathye Russell, Jeff Haberman, Colleen Malone

Members Absent: None

Staff Present: Tom Burnette, Michael Elliott, Earl McGuire, Chris Simonson, Cara Bishop, Judi McCallum

Location of Meeting: 2850 Fairlane Ct. Placerville, Building C, Room 248

Guests: Peter Bos, Steven Brown, John Rice, Norma Santiago, Supervisor District 5, Patrick Mount

CALL TO ORDER AND ADOPTION OF AGENDA

CALL TO ORDER: 1:05pm

ADOPTION OF AGENDA:

Chairperson Gates: Move to adopt agenda. Colleen Malone seconded. The motion was approved by all Board members.

GENERAL BOARD BUSINESS

Summary of the Minutes:

Appeal by John Rice, General Manager, Sierra at Tahoe and Sprung Structures for a snow load monitoring system for a 38 psf snow load in lieu of designing a building for 450 lb. ground snow.

El Dorado County Building Official, Tom Burnette, agreed that "Alternate 2" monitoring system would be an equivalent method of public safety for 2010 California Building Code Section 104.11 – "Alternate materials, design and methods of construction and equipment".

Chairperson Gates moves that we approve the request for alternate design as stated in their September 11, 2013 paper to install a Sprung Building designed for a 38 psf roof snow load as a demonstration project using a monitoring system and/or devices for safety and educational purposes, and identify parameters for safe occupancy of the building. Kathy Russell seconds. All ayes.

Details of the minutes:

Chairperson Gates requests the appellants address their appeal.

John Rice, General Manager, Sierra at Tahoe thanks the board. I have worked at Sierra at Tahoe for 20 years. Sierra is one of two ski resorts left in this area that is locally owned and operated. We have a need for more space as we cap out at 3,000 people for indoor space. Comfortable, caring space is 50% deficient compared to other resorts. This new space would be used for retail, food, beverage, indoor seating, and rentals. The appellant is asking the board to please allow for El Dorado County to approve the request for permit.

Norma Santiago, El Dorado County Supervisor District 5, requests the Board of Appeals to please have an open mind and encourage them to remember that this innovative project would be an economic and environmental innovation in El Dorado County. Supervisor Santiago respectfully asks the board to look at this as a solution and that El Dorado County can be a test ground of innovation for other jurisdictions; and, so that Sierra can move forward with this process.

Presentation: Sprung Structure History, corporate video.

Peter Bos, power point presentation: Sprung Structure is a proven technology. All the depicted structures have been built in accordance with building code for wind, seismic, and snow load. The wall assembly is aluminum ribs, spaced 10 ft. on center. **Steve Brown** interjects how the ribs and T-bars work. Aluminum works well as it is strong, long lasting, recyclable, 1/3 the weight of steel and meets the standards of California State Fire Marshall. Sprung structures shed snow because of the membrane flexibility and it is slippery. The co-efficiency of the shedding of snow off is 0.12, curved hip roof to help with the sliding of snow off the structure with a roof pitch of 20/60.

Neil Moore: Expresses concern with the data on the maximum wind speed. He states that the County has a lot of data regarding wind. Is there anything from the County on the maximum wind speed?

John Rice: If it gets that windy, the resort will close down the lifts and the resort itself; therefore the structure will not be occupied.

Neil Moore: Wonders how high the snow drifts would become. Does Sprung have written procedures on how to keep snow clear?

Peter Bos: Yes, they have a maintenance manual and Sierra at Tahoe has made a maintenance plan that they submitted as part of their plan check package.

Neil Moore: Requests to hear more technical information. What is the maximum snow drift?

Chairperson Gates: These kinds of details will be discussed later, such as the actual design load of the structure.

Dwayne Nystrom: Expresses concern about possible tears in the fabric and if that would be cause for a shutdown of the building.

John Rice: Repairs can be made and most tears are at the base of the structure, usually not at the roof level. Access and egress is of vital importance, so maintenance of exits will be performed, as this is the specialty of the ski resort, moving snow.

Neil Moore: Have there been failures?

Peter Bos: Yes there have; usually something the consumer has done, i.e., re-erecting the structure without benefit of Sprung's expertise. Sprung has no engineers on staff. They use consulting engineers.

Kathye Russell: Does the interior heat play a part in the shedding of snow?

Peter Bos: Maybe a little, but the insulation factor is so high it most likely it not a major factor of snow shedding.

Neil Moore: Do the company's calculations prove the starting friction of the shedding of the snow?

Peter Bos: They have a snow shed document that explains the shedding rates that come to 38 PSI.

Peter Bos presents a short video of snow actually shedding off a Sprung structure in Seattle.

Steve Brown introduction: I will talk about the structural system, how it ties in with Building Code Section 104.11 and demonstrate how the project of the building will ensure safety. The fact that 104.11 of the Building Code exists is recognition that the building code cannot address all conditions. Strength requirements are equivalent to the snow load code. The basis of the snow load conditions are for conventional framing. Sprung structures are somewhat more flexible than conventional framing.

Neil Moore: Are we here for an experimental, temporary structure?

Steve Brown: No, this is not for experimental or temporary use.

Kathye Russell: Does this structure have the channels as the other one did in the presentation?

Steve Brown: Yes, it does.

Neal Moore: Is there pre-stressing in the frame?

Steve Brown: Yes they are pre-stressed.

Steve Brown: Requests to present a short video on the construction of the structure.

Chairperson Gates: Only if it has anything to do with snow load as this is what this whole appeal is regarding.

Chairperson Gates: Calls for a short recess of no more than 10 minutes. All eyes.

Chairperson Gates: Calls for reconvening of meeting.

Steve Brown: Sierra at Tahoe, Sprung Structures and I are here to seek approval to use a roof design snow load with less than 450 per lb. ground load that has been identified by the County code. Based on observations and our experience, they believe that Sprung structures readily shed snow.

Chairperson Gates: The criterion is to have equivalent as far as quality, strength, effectiveness, durability and safety. The test issue is normally done before construction. If we are going to approve a demonstration building we need to prove to the public that they can feel they are protected and the Building Official must approve of the testing element.

Tom Burnette: Due to the fact that this is going to be a year round use building and not a storage facility, public safety is going to be addressed by using a monitoring system that will sound or have some type of alarm should the design limitations be reached. This will allow for evacuation of people within a reasonable amount of time, prior to the limit. In concept, as a team, we are in support of providing with sufficient safety factors.

Kathye Russell: Is the building at Kirkwood an assembly or storage building?

Neil Moore: Was Kirkwood given the same restrictions, (snow load) as Sierra at Tahoe?

Patrick Mount: It is on a temporary permit and is an assembly building.

John Rice: A lot of jurisdictions raise these structures with temporary permits.

Kathye Russell: They are tested then approved after years of use. Sierra at Tahoe is not asking for this to be temporary.

Tom Burnette: The very nature of the definition of the word temporary is not a year round structure. I understand that many jurisdictions have gotten around the need for a building permit by using the word temporary. Most of these buildings are not on property that is required to seek approval by a county building department because they are on Federal or State land. Local forest service asks the owners or builders as a courtesy to seek approval of local jurisdictions although they are not required to.

Steve Brown: Sprung Structures has submitted two alternate designs, number two being the one that the building department is approving of. Alternate 1 consists of a series of strain gauges and data acquisition system that will have a sensor that will tie into a module that feeds off into a computer with proprietary software which will be interpreting a snow load. Two gauges will tie into it. Sprung Structures perspective is that we could determine the amount of snow load on a roof based on the strain in the lower four foot section of the arch. We instrument 3 arches at about 18" up, that record strains into a force in the column and derive the snow load from that. This interpretation then ties into the computer system, with a UPS battery backup. The alarm system would then activate, similar to a flashing light or alarm sound.

Chairperson Gates: Does it have a fail-safe power backup?

Steve Brown: The UPS will provide backup power until generator kicks in.

John Rice: The generator kicks in almost immediately.

Steve Brown: Alternate 2, which the Building Department prefers will add additional instrumentation and strain gauges up near the point of the curve; we come up into a splice, our area of maximum force. If we put a strain gauge up there, we have quite a bit of bending. Down below its primarily axial loading; up there we have quite a bit of bending.

Mike Elliott: That is a high stress area.

Steve Brown: It kind of varies along there, as far as where it is exactly located and a strain gauge at mid-length of the spreader.

Tom Burnette: At the eave point.

Steve Brown: We have technical difficulties [with that arrangement] related to how it's selected.

Neil Moore: I am concerned that there is no way to detect snow if it builds up in between the ribs. The instrumentation is nice because you could keep track of fatigue.

Steve Brown: There's a concern there, but we feel it will perform fine.

Neil Moore: Yes, in between the ribs.

Steve Brown: You mean instrumenting the purlin? Yes this is the concern.

Chairperson Gates: The data collected could be very beneficial in the years to come.

Neil Moore: Providing a set of calculations would be nice for monitoring.

Chairperson Gates: How many years of snow load events is the data based on?

Tom Burnette: 68 years.

Chairperson Gates: Do you plan to have an extensive time frame for monitoring this particular Sprung product?

Steve Brown: It will run as a demonstration building until it has a proven performance record.

Earl McGuire: Over a period of 3-4 years snow may never build up and the records could indicate that the monitoring system may never be needed.

Michael Elliott: They may have evidence of a single day event with no evidence of a problem.

Chairperson Gates: They may need to bring the question back to the Board at a later date.

Neil Moore: Does a decision need to be made today?

Chairperson Gates: The code says the Board of Appeals has a maximum of 5 days to make a decision.

Kathy Russell: The Building Department staff has come up with an acceptable method to address safety.

Tom Burnette: The Building Department, Sprung Structures and Sierra at Tahoe are on the same page with the Alternate 2 monitoring system.

Kathye Russell: We are dealing with the worst case snow load criteria and I do not want to see El Dorado County reject this system and that we only have to prove the equivalent correct?

Tom Burnette: The code section that he put on the screen that dictates the alternate design and it leaves it up to the Building Official to determine whether it is equivalent. Our local government code says we have to go the local appeals board. The last sentence that he quoted is the key are we providing an equivalent method of public safety. We really should have the testing before we issue the permit but I feel that under the circumstances they are providing an equivalent method of safety.

Kathye Russell: I would be in favor of voting to see it move forward with the safety issue addressed and the evidence of snow load addressed in other areas.

John Rice: Time is critical to Sierra. The lenders are ready to pull the funding without immediate approval.

Neil Moore: When were you aware you were going to start this permit process for this particular building? Did you start the permit process in January? When did you sign a contract with Sprung Structures?

John Rice: Sierra signed a contract with Sprung sometime in March, but said he had no indication that there would be a hold up in the Building Department.

Chairperson Gates: Are there any negatives the Board needs to address at this time?

Neil Moore: Our only function is would we accept their design work.

Chairperson Gates: They are setting up a testing and warning program.

Vice-Chairperson Twist: The instrumentation is vital with an early warning system and if that satisfies the Board and the Building Official it should be acceptable.

Chairperson Gates: We have to rely on Tom for that.

Tom Burnette: I am fine with the instrumentation. The maintenance program has to be recorded with the El Dorado County Recorder's office so that if in the future there are other owners that the maintenance program will be recorded on the property and would ensure that the new owners are held responsible for keeping up with the maintenance program.

Chairperson Gates: Anymore concerns from Neil or others?

Neil Moore: Expresses concern about a possible way to immediately add stability to the structure if the need arises.

John Rice: This building would be one of the first buildings in the event of a super storm to be evacuated by customers and employees.

Tom Burnette: One of the concerns is the lack of appreciation of site specifics of this particular location. Sierra at Tahoe does an impressive job of making sure people are safe and I have a lot of confidence that they make public safety their number one concern.

Neil Moore: Technology is there to make sure the monitoring is going well.

Tom Burnette: Parameters will have to be set to make sure the monitoring system keeps track even when the building is empty, so that people do not enter the building with unknown danger.

Jeff Haberman: What about the stress on the building?

Steve Brown: Stress will be controlled with the appropriate material.

Chairperson Gates: Will the monitoring end once the 20 year warranty has expired?

Peter Bos: The monitoring system would not be shut down.

Chairperson Gates: Asks Tom if he is satisfied with the Seismic load.

Tom Burnette: As long as they address the strengths.

Chairperson Gates moves that we approve the request for alternate design as stated in their September 11, 2013 paper to install a Sprung Building designed for a 38 psf roof snow load as a demonstration project using a monitoring system and/or devices for safety and educational purposes, and Identify parameters for safe occupancy of the building. **Kathye Russell** seconds. All ayes.

Thank you.

Meeting adjourns 3:39 pm

Minutes taken by: Cara Bishop