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March 19, 2010

Ms. Ann Stanton  
Mr. Mo Madani  
Building Codes and Standards  
Florida Department of Community Affairs  
2555 Shumard Oak Boulevard  
Tallahassee, Florida 32399-2100

**RE: REQUEST FOR RELIEF  
FLORIDA BUILDING CODE – ENERGY  
SECTION 13-101  
NEW BUILDING PROJECT  
M-E PROJECT #DV08077**

Dear Ms. Stanton; Mr. Madani:

In accordance with our recent conversation, we are submitting this letter to request the New Marlins Ballpark be designated as a Special Use Building under Florida Building Code Section 13-101.1.5. In conjunction with this request, we are requesting relief from the Florida Building Commission regarding the method of compliance with Chapter 13 of the Florida Building Code. Our specific request is stated at the end of this letter. First, allow us to describe the project.

### **Project Description**

The project consists of a 928,000 square foot, 37,000 spectator Major League Baseball complex, enclosed within a three panel operable roof system which covers the playing field and seating terraces. In the open ballpark configuration, the operable roof panels park over a plaza adjacent to the ballpark and the outfield walls are retracted. For the majority of the year, the ballpark will be open to the sky to allow the natural turf to grow. For an anticipated 60 ballgames per year, or for less than 5% of the year, the roof will be closed and the interior will be cooled.

Portions of the bottom two levels of the ballpark, the field level and mezzanine level, are used year-round by the team and support staff and are considered regularly occupied. These areas represent less than 200,000 square feet, or approximately 20% of the total ballpark. The levels above, including the main concourse, suite and club levels, press and upper concourse levels are only used during events. The number of anticipated events per year is 83.

The architecture of the ballpark is a kinetic and sculptural expression with large curvilinear moveable roof panels, and exterior form. The exterior skin of the ballpark consists of a faceted metal panel system, bands of glass curtain wall and plaster. Following are two images of the ballpark to get an idea of the geometry.

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## Code Language

The 2009 Supplement to the 2007 Florida Building Code applies to this project. There are two possible sections that the building could fall under; 13-101.1.1 New construction, or 13-101.1.5 Limited or special use buildings. We believe the project should fall under section 13-101.1.5.

Section 13-101.1.1 of the Florida Building Code states:

**13-101.1.1 New construction.** Subchapter 13-4, Commercial building compliance methods. Commercial buildings of any size and multiple-family residential buildings greater than three stories shall comply with Subchapter 13-4 of the code. This chapter contains two compliance methods.

Method A: Whole Building Performance Method

Method B: Building Prescriptive Method

Subchapter 13-4 of the Florida Building Code states:

**13-400.0.A Method A, the Whole Building Performance Method.** This is a computer-based energy code budget method which may be used for determining the compliance of all proposed designs, except designs with no mechanical system. Under this method, cost performance is calculated for the entire building based on the envelope and major energy-consuming systems specified in the design and simultaneously for a Baseline building of the same configuration, but with baseline systems. Compliance is met if the *design energy cost* does not exceed the *energy cost budget* when calculated in accordance with this section; and the energy efficiency level of components specified in the building meet or exceed the efficiency levels used to calculate the *design energy cost*. Compliance calculations are those utilized in the EnergyGauge Summit Fla/Com-2008 computer program and are as described in Appendix 13-B. Basic prescriptive requirements described in the sections called Mandatory Requirements shall also be met.

**13-400.0.B Method B, the Building Prescriptive Method.** This is a prescriptive methodology that is allowed for shell buildings, renovations, change of occupancy, limited or special use buildings, and building system changeouts. The building envelope complies with the standard if the proposed building meets or exceeds the Mandatory Requirements and all relevant criteria on Form 400B or the EnergyGauge Summit Fla/Com 2008 computer printout. Only the prescriptive envelope measures of Method B are permitted for shell buildings.

Section 13-101.1.5 of the Florida Building Code states:

**13-101.1.5 Limited or special use buildings.** Buildings determined by the Florida Building Commission to have a limited energy use potential based on size, configuration or time occupied, or to have a special use requirement shall be considered limited or special use buildings and shall comply with the code by Method B of Subchapter 13-4. Code compliance requirements shall be adjusted by the Commission to handle such cases when warranted.



## **Application of Methods**

### **Method A, the Whole Building Performance Method**

We have attempted to demonstrate compliance by using Method A, constructing a preliminary whole building performance model utilizing the EnergyGauge Summit program. However, we have encountered the following limitations which seriously affect the ability to model this project.

- 1 The ballpark has a retractable roof, with the large bowl volume cooled as a single zone. This zone is approximately 400,000 square feet floor area and 250 feet high. It consists of a very complex geometry with numerous bands of windows, curved walls, and a complex roof. The EnergyGauge Summit program limits zone area to 100,000 square feet and zone height to 50 feet. It would not be practical or realistic to break up the volume into the required 20 zones.
- 2 The ballpark bowl has 1250 kW of sports lighting for the zone. The program does not allow input of more than 199 kW per zone.
- 3 The locker room air handling units located in the year-round occupied field level utilize enthalpy recovery wheels, which are a key energy saving strategy for the project. The program does not allow input of an enthalpy wheel.
- 4 The program does not appear to allow modeling of the retractable nature of the roof. Most of the time the roof is open and the bowl is unconditioned. During some games, the roof is closed and the bowl is conditioned. When the roof is opened, the walls separating the interior sub-volumes from the bowl are exterior, but it does not appear that the program is able to take this into account.
- 5 The geometry of the building is very complex. The program does not have a graphical type of input, so it is impossible to see how the program is constructing the model. The building contains very large walls with bands of windows.
- 6 The program does not allow control of the exact placement of windows within each wall, so shading effects of building overhangs are not accurately modeled.
- 7 The whole building simulation method allows for energy savings by self-shading. Due to the geometry of the project, self-shading and orientation provide energy savings. The EnergyGauge Summit program takes self-shading into account.
- 8 The project schedule of occupancy is much different than a typical office building schedule. The majority of the building is not in use through much of the year. The EnergyGauge Summit program assumes a typical year-round schedule for the whole building, which produces inaccurate energy savings results when considering that the proposed design focuses energy savings on the regularly occupied spaces and not the event use spaces.

We believe that these limitations are serious enough to affect the accuracy of the energy model and the energy savings results. We have discussed these limitations with Mr. Mangesh Basarkar at the Florida Solar Energy Center who agreed that the program has these limitations, and that they would impact the accuracy of the model. Mr. Basarkar said that alterations to the EnergyGauge program could be made to accommodate some of the items above, but not all. We have concerns regarding the time required to alter the EnergyGauge Summit program, and the potential for the alterations to significantly delay the Ballpark's permitting process.

Over the past year and a half of design, we have utilized a whole building performance approach through the eQUEST whole building energy simulation software. The program is DOE-2 based, nationally recognized and approved by LEED (Leadership in Energy and Environmental Design). It uses the same calculation methodology as the EnergyGauge Summit program, but its capabilities are more suited to our special use project. The whole building performance method allows for tradeoffs between envelope, mechanical, and lighting systems, allowing the design team the flexibility to determine where to focus energy savings. For this project, most of the energy savings efforts are focused on the regular occupancy spaces rather than the event use spaces. For example, the retractable roof does not meet the code prescriptive requirements, but the additional energy cost is traded off with higher roof insulation in the regularly occupied spaces, where the cost payback is better. This method of compliance is acceptable, but the issue is that the EnergyGauge Summit software required by the code is not capable of modeling the project.

### **Method B, the Building Prescriptive Method**

This method would be allowed if the project were considered a limited use facility as allowed by Section 13-101.1.5 of the Florida Building Code. Because approximately 20% of the building area is used year round, the facility should be considered limited use. For less than 5% of the year (60 events at 7 hours per event) the roof is closed and the bowl is cooled. We believe that this would qualify the event use areas as limited use, and therefore exempt from the prescriptive energy analysis.

The project could demonstrate compliance with the building prescriptive method for the regularly occupied spaces only. Because the whole building performance method was used to make cost effective design decisions, certain envelope components of the event use spaces do not meet the prescriptive requirements. For the regularly occupied spaces, we could utilize the EnergyGauge Summit program to calculate compliance with the building prescriptive method, and provide the required compliance printout.

We have experience in designing a majority of the professional sports projects in the US over the past 20 years. In every jurisdiction, the local code officials recognize the limited use of these facilities, thereby exempting the event use spaces from the analysis. When an energy analysis is required, such as in Florida, we perform a code compliance analysis only for the regularly occupied spaces. The regularly occupied spaces are the areas that have the most significant impact on the energy use of the facility.

### **Conclusion**

Neither of the two methods of energy code compliance are well suited to this special use project.

## **Request**

Given the factors above, it is requested that a Declaratory Judgment be issued granting the Ballpark Special Use status as allowed by Section 13-101.1.5 of the Florida Building Code, and the Code Compliance Requirement for 15% energy cost savings be adjusted.

Adjustments to the Code Compliance Requirement of 15% energy cost savings would be calculated using a hybrid method for calculating the Ballpark's energy usage as follows:

1. Use Method A, the Whole Building Performance Method to demonstrate the energy cost savings for the regularly occupied spaces of the ballpark only. These calculations will be completed using the State mandated EnergyGauge Summit program, and the compliance printout shall be acceptable compliance documentation (showing compliance with the Code Required 15% energy cost savings).
2. Use Method A, the Whole Building Performance Method for the entire Ballpark to calculate the project's total energy cost savings using the eQUEST energy simulation program. The project shall demonstrate 12% or better energy cost savings relative to ASHRAE Standard 90.1-2004 Appendix G (a 20% reduction in the energy savings goal based on the proposed Special Use designation). The energy analysis report to be submitted will be consistent with the format accepted by the USGBC to demonstrate LEED compliance with credit EAc.1 Optimize Energy Performance.

Using the Special Use designation requested above, the ballpark shall be considered compliant so long as the following, as used by the Florida Building Code, is met:

Annual Whole Building Energy Cost Savings = 12%

We appreciate your attention to this matter. If you should have any questions, please feel free to contact us.

## **M-E ENGINEERS, INC. Denver Office**

Heath Baxa, P.E., LEED AP  
Project Manager

cc: Stewart Ervie – Populous  
Jeff King – Florida Marlins  
Roger Loomis – M-E Engineers

