Consideration of AERCON for LEED Certification

Leadership in **E**nergy and **E**nvironmental **D**esign (LEED) Certification distinguishes building projects that have demonstrated a commitment to sustainability by meeting the highest performance standards[1]. Commercial buildings as defined by standard building codes are eligible for certification under LEED Version 2.0. Commercial occupancies include – but are not limited to – offices, retail and service establishments, institutional buildings (e.g. libraries, schools, museums, churches, etc.), hotels, and residential building of four or more habitable stories.[1] The LEED program is sponsored by the United States Green Building Council (USGBC - http://www.usgbc.org).

USGBC certifies buildings, not the materials that are used to construct the building. Therefore the vast majority of building products will only contribute to achieving LEED points.[2] The following discussion identifies categories in which the attributes and characteristics of AERCON products can be considered in the certification justification.

[1] https://www.usgbc.org/LEED/Project/certprocess.asp
[2] http://www.usgbc.org/docs/LEEDdocs/LEEDfaq-materials.pdf

Energy & Atmosphere

Credits 1.1-1.5 – Optimize Energy Performance

These Credits represent 10 points, which exceed 1/3 of the total points required to achieve certification. Relative to performance, AERCON's energy efficiency is a premier characteristic that can be utilized to obtain a high percentage of these subcategory points. Different studies have indicated how well autoclaved aerated concrete performs as compared to conventional building materials. ACCA's Manual J Residential Load Calculation, Eighth Edition includes values for AAC wall systems in Table 4A that can be utilized to evaluate the enhanced performance for an AERCON wall.

A secondary effect of using an AAC wall system is the thermal lag, which is a shifting of when the maximum interior temperature occurs relative to the maximum outside temperature. The graph shown below indicates this phenomenon. This shifting of temperature results in a shifting of maximum energy usage from the afternoon to late night / early morning. Studies have shown that the thermal lag is 6 to 10 hours. Cost savings can be realized by the building owner using lower cost "off-peak" energy, while the demand on the utility company becomes more constant.

Error! Objects cannot be created from editing field codes.

A study was performed by the Florida Solar Energy Center using the Florida Energy Code to compare conventional construction with AERCON construction. The results, shown in Attachment 1, indicate the significant energy efficiency that can be realized when using AERCON building products. Having an enhanced building envelope allows for smaller HVAC equipment, which in turn means lower energy usage for the life of the structure. Considering the decades of longevity of AAC structures, the total life cycle savings for an AAC building can be tremendous.

Materials & Resources

Credits 2.1-2.2 – Construction Waste Management

AERCON blocks are typically installed in a running bond arrangement, with blocks being cut to fit at building irregularities. Since AERCON blocks are solid, the unused portion of a cut block can actually be installed virtually anywhere in the wall assembly, thus allowing for almost 100% usage. This is in contrast to CMU construction where the remaining piece of a cut CMU cannot ordinarily be used, thus becoming waste. Similarly in stud construction, the cut pieces of wood or metal studs are typically disposed of since the length of the leftover pieces are not conducive to reuse.

One method of dealing with the small amount of waste that may occur is to crush any residual AERCON and mix it with general non-structural fill materials around the job site. AERCON is not toxic and will not harm the environment since chemically it is a hydrated calcium silicate equivalent to the natural mineral Tobermorite.

When using AERCON panels, there is minimal incidental waste since each panel is custom-made to fit together with no field modification. AERCON panels are typically reinforced with mild steel reinforcing bars. For any waste pieces that may exist, the reinforcement can be separated from the AERCON base material and recycled. The AERCON base material can be crushed and used as noted above for blocks.

Blocks and panels are shipped on wooden pallets that can be reused for future shipments or for transportation of other materials and products. Pallets are environmentally friendly since they are made of southern pine, which can be replanted and harvested quickly. The plastic shrink wrap that encapsulates AERCON blocks can be recycled since it is low density polyethylene, Designation 4.

Credit 5.1 Local / Regional Materials

AERCON's plant is located in central Florida, conveniently located to major roads and interstate highways. The 500 mile criterion encompasses the entire state of Florida, most of Georgia, most of South Carolina, and about 1/3 of Alabama. This geographic region is based on actual driving mileage. If the 500 mile radius criterion is considered as air miles, the geographic region would include all of Florida, Georgia, South Carolina, Alabama; about 60% of North Carolina; about 40% of Tennessee; about 50% of Mississippi, and a small portion of Louisiana. See Attachment 2 for a visual reference of these areas.

Major metropolitan areas include Tampa, St Petersburg, Orlando, Miami, Tallahassee, Pensacola, and Jacksonville in Florida; Atlanta, Macon, Savannah in Georgia; Columbia and Charleston in South Carolina; and Montgomery, Alabama in the 500 mile driving region.

Credit 5.2 Local / Regional Materials

Dry raw materials used in the manufacturing of AERCON are (by weight):

70-75% sand – mined within 15 miles of AERCON's plant
10-15% cement – manufactured approx 110 miles from AERCON's plant
lime – from eastern Tennessee
anhydrite – from Norfolk, VA
slag – from central Florida

Water is also added to create a slurry, and a very small dosage of aluminum powder is used as the catalyst for the aeration process. Attachment 3 indicates the geographic area that is within 500 miles of any raw materials that AERCON uses in its production process. Any projects in South Carolina, most of North Carolina and Georgia, and eastern Tennessee would satisfy the distance requirement with respect to AERCON products.

Indirect beneficial usage of AERCON products

Sustainable Sites

Credit 4.2 – Alternative Transportation

AERCON products can be used for the construction of secure bicycle storage with changing facilities to satisfy the requirements of this Credit. In doing so, the attributes of AERCON become an integral part of, and an enhancement of, the storage facility.

Materials & Resources

Prerequisite 1 – Storage & Collection of Recyclables

AERCON blocks are superb for use in shaft wall construction due to their fire rating and ease of installation. The attributes of AERCON blocks as enumerated elsewhere can be promoted for construction of recycling chutes in multistory buildings, as identified in the “Potential Technologies & Strategies” section for this Prerequisite.

Indoor Environmental Quality

Credit 7.1 – Thermal Comfort

The thermal efficiency, thermal lag, breathability, and low equilibrium moisture content of AERCON products make them an ideal selection for the building envelope. Having AERCON walls and a roof can be a substantial asset in attaining the temperature and humidity comfort ranges to satisfy this Credit requirement.

Intangible benefits include reduced energy consumption for transportation, erection, production. Lightweight; volume ratio: raw vs finished.
Plenteous raw materials; no scarce resources are consumed.
Non toxic finished products; no toxic emissions during production.