# STEM INNOVATION CENTER



September 2019

# **Broken Arrow Public Schools**

In 2015 the patrons of BA passed a 12 year, four phase bond issue that included a High School STEM Facility and a new Vocational Agricultural Facility. We are in Phase two of that bond issue.

# STEM INNOVATION CENTER

# **BROKEN ARROW PUBLIC SCHOOLS**

# **STEM**

Construction will begin this spring on our STEM Innovation Center and Vocational Agriculture Center. After the High School Configuration Study came back overwhelmingly to stay one high school and institute pathways for students, we have spent the last year meeting with a programming group of students and staff members to make sure we are meeting their needs. The marriage of the STEM facility with our Vocational Agriculture Center provides many opportunities to align the curriculum in all areas of STEM. We are designing the facility to be its own teaching tool and will include signage and "cut away" sections of the building to show students various systems.

The 80-acre site is perfect for a campus of this nature. It is located less than  $\frac{1}{4}$  mile from our high school campus, has its own pond and pasture area. The facility will be embedded into the hillside and will contain a storm shelter, a green roof, an outdoor promenade, makerspace, workshop, build shop and 4 learning communities that will each have a wet lab, dry lab, offices and storage.

# **VOCATIONAL AGRICULTURE**

Currently the District does not have their own facility for their vocational agriculture program. The current barns are owned and operated by the alumni group. The bond issue included money to build a facility for this program. They will have two show/practice arenas, pens for sheep, pigs and cows and greenhouses to support their agricultural units. They will also be able to park their trailers and equipment on the site and if they choose to, will have room to pasture their animals.



# **SUSTAINABILITY**

The facility is being designed with Low Impact Development strategies in mind. We will be applying for The City of Broken Arrow's certification for this type of development. It is similar to a LEED certification, but without the costs associated with it. Attached to this report is an example of signage and symbols that we will locate throughout the facility to show the sustainable items that were designed into the facility.

Funding is always tight on any project, especially when we pass bonds but build several years later and then experience tariffs and fluctuation in interest rates and raw materials. We are designing with a master plan in mind and are applying for grants and seeking donations to add outdoor classroom amenities, a fishing dock, cistern, and solar energy. It is our dream to fully power the barns with solar energy. We have approached PSO/AEP and they are working with us to see if we can find a way to fund such an endeavor.

# Sustainable Awareness and Education in Architecture

The built environment has a profound impact on our natural environment, economy, health, and productivity. This building was designed using STEM processes and concepts to insure sustainability.

This building is also designed to be a teaching tool of these sustainable concepts.



# Sustainable Sites

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et environmental elements of the site, such as ponds, creeks, pastures, and wooded areas, and use as teaching stations
ce the heat idand effect by limiting impermeable paving and providing shaded paving.
Intake areas on the site to be used a spini-use public outdoors spaces
rate ear area in the facility to be used as join-use community space
to the facility to be used as join-use community space.

# Water Efficiency

- Low 'flow water instruces
  Rainwater and gray water reuse for non-potable water uses
  Irrigation sourced for existing pond
  Reduce the footprint by building multi-story maximizing space for water absorption

# Indoor Environmental Quality

- Delighting
  View windows with direct line of site from all occupied spaces
  Use high quality and flexible estificial lighting
  Use how menting naterials
  Control dust and segregate pollutant sources, utilize high quality fifters on the HVAC system
  Use all ducted retrieval control and learning and office spaces
  High level scoustical performance in all learning and office spaces
  Thermal control renhanced by operable windows or separate controls for each learning space



## Materials and Resources

- Storage and collection of recyclables Construction site waste management by recycling, composting, and salvaging non-hazardous construction and demolition debris. Selecting high recycled content or rapidly renewable materials. Georgia of the construction of the



# Energy and Atmosphere

- Nergy And New Committee (1997) and the State of State of

- Innovation and Design

  Combining Agriculture with Science. Technology, Engineering and Meth to have Synergistic Learning
  Combining the natural and built environments to triple the learning space of Staffum. Cale
  Taking advantage of the existing space of the site for thermal country and to minimize storm sheller initial costs
  Take advantage of the original pose of the site for the minimized may be advantage of the original pose of the site for foreign country and the site of the sit

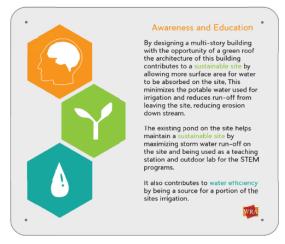


Awareness and Education

Awareness and Education sustainability placed around the campus to educate users and visitors on sustainability

# In the United States alone, buildings account for:

- 72% of electricity consumption,
- 39% of energy use,
- 38% of all carbon dioxide (CO2) emissions,
- 40% of raw materials use,
- 30% of waste output (136 million tons a year),
- 14% of potable water consumption.



Sample Sustainable Awareness and Education Plaques located around this facility