INSIGHTS ON
LAND DEVELOPMENT

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Critical Site Considerations in School Design

Our last Education Insight article detailed the complexities of school site design regarding site access, site circulation, and vehicle segregation, and in a previous article we detailed Crime Prevention Through Environmental Design (CPTED) principles and strategies that can be implemented to promote a safe and secure site. In this segment, we will detail some other critical site considerations that impact school design.

When designing a new school, the Owner, Architect, Landscape Architect, and Civil Engineer must work together to make critical site decisions beginning early in the design process. These considerations fall into two basic categories: functional and instructional.

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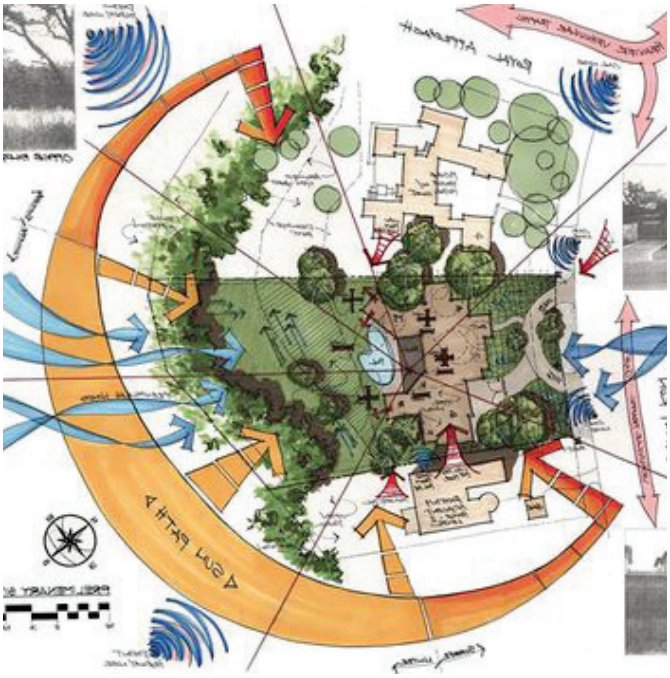
FUNCTIONAL CONSIDERATIONS

Functional considerations are based on code compliance and best practices. In addition to the items noted above, the team should consider other important functional considerations.

Building Location/Orientation

The terrain of the site should be assessed when determining the building location. Thoughtful consideration results in minimizing cut and fill costs and maximizing the effectiveness of natural drainage paths, thereby minimizing the cost of stormwater management practices. Building orientation is another important consideration. While the "front" of the school needs to be oriented to provide for clear entry and visibility, for optimal performance, the building should be oriented with its longest dimension facing north and south, positioning the largest building facades in a position to take advantage of the path of the sun and minimize unwanted solar impacts. Building orientation is often the most cost effective way to begin a sustainable design strategy. Building location may also be influenced by the location of existing utilities serving the site. Strategic placement can reduce costs to extend or tie-in new utilities to existing utility services.



Stormwater Management (SWM) Practices

Stormwater is the runoff from rainfall and snow that can contribute to flooding and pollution issues if not effectively managed. Selecting the best SWM practice for a given site depends on climate, weather, land availability, soil type, topography, maintenance requirements, and proximity to drainage areas or bodies of water. Often multiple practices are implemented on a single site. SWM Best Management Practices (BMP) include the following:

- Detention Basin: An area designated for temporary storage of stormwater. Water is temporarily stored, then emptied. Also known as an extended detention wet or dry pond.

- Bioretention Facility: Practices that capture and store stormwater runoff and pass it through a bed of bio-engineered soil media. Filtered runoff is then returned to the conveyance system or allowed to infiltrate into underlying soils.

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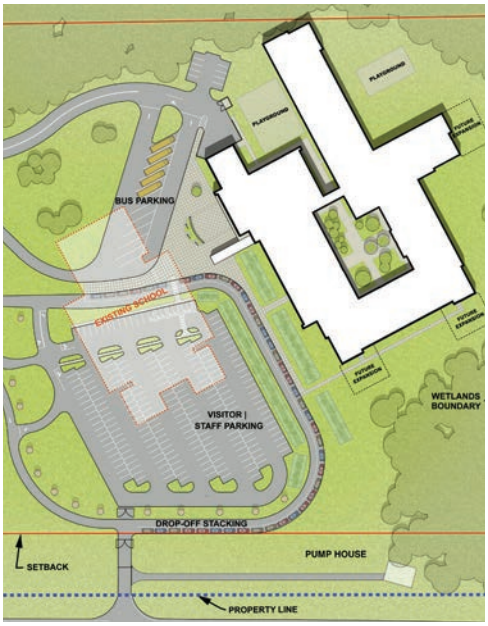
- Infiltration Facility: Practices designed to capture and temporarily store runoff volume before allowing it to infiltrate back into the soil over a day or two period. Variants include infiltration trenches, basins, or underground chamber type systems.

- Vegetated Channels: Shallow, open channels that allow runoff to be filtered and recharged along the length of the channel. Variants include Bioswales and grassed channels that slow and filter stormwater runoff and promote ground infiltration.

- Constructed Wetlands: Practices that mimic natural wetland areas to treat stormwater by incorporating permanent pools with shallow storage areas, plantings, and oftentimes gravel substrate.



Some of these practices can be utilized to reinforce CPTED strategies and provide building protection in an unobtrusive but highly effective manner.

Landscaping

Selecting native plants adapted to local weather conditions can produce a site with thriving vegetation, while at the same time reducing maintenance costs. A Landscape Architect can guide the Owner in making plant selections best suited for local conditions and develop a landscape plan promoting CPTED strategies resulting in a safe and secure site.

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INSTRUCTIONAL CONSIDERATIONS

Instructional considerations are based on educational programming requirements defined by the Owner and supported by best practices. These program areas promote the overall development of children and their need for physical fitness and play. Studies show nature helps students learn, and proper site design can play a critical role in how this can be employed.

Athletic Fields

Playing field types and quantities depend on grade levels and anticipated community use. Fields should be located close to the gymnasium with safe access routes provided. Field orientation can also play a critical role. The access route, fields, and field amenities must be designed to accommodate accessibility, and consideration should be given to providing adequate parking areas for athletic events.

Playgrounds

Research indicates play is more than just “fun and games”, and contributes to a child’s physical, social, cognitive, communication, creative, and emotional development. Age-appropriate play areas should be easy to access, provide for accessibility to be inclusive for all children, and located away from conference rooms, media centers, and study areas requiring a quiet environment.

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Outdoor Classrooms

Outdoor instruction areas provide learning experiences benefiting academic performance and student mental health. Structure types include pavilions, courtyards, and amphitheaters. The benefits of outdoor learning spaces will be detailed in an upcoming Becker Morgan Group Insight article on Outdoor Learning Spaces to be issued later this year.

Since the building and site are so intertwined, as this article shows, important design decisions must be made early in the design process. Success in meeting functional and instructional site requirements depends largely on blending the educational program with site location, available site space, requirements imposed by approving agencies, and available construction funds. For best outcomes, all stakeholders should be involved early on in discussion related to these critical decisions.