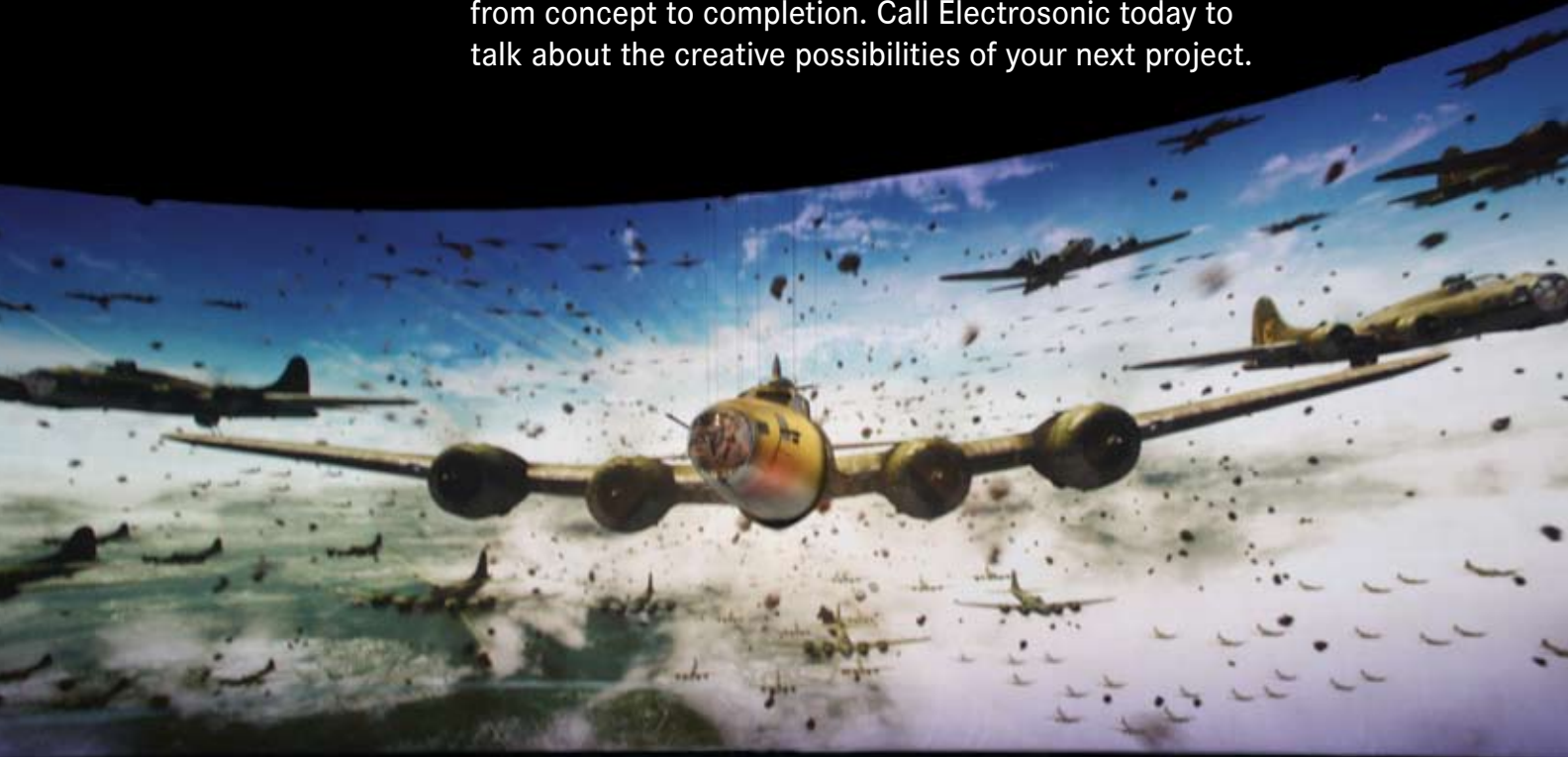


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# if you build it...

construction challenges in amusement parks

by Roger Hendrick, President, Hendrick Construction

Working in an operational amusement park is uniquely different than other construction sites. Beyond the challenges with the construction projects themselves, maintaining a safe environment for guests and normal operating hours for the park are critical concerns.

Surprises during construction often impact time and costs. But, a proactive team can identify items that require additional planning and coordination, and most issues can be eliminated when all of the stakeholders establish a clear and common goal for the success of the project.

In Hendrick Construction's experience as a general contractor, we know that surprises can come from a variety of sources, and they are unique to each project. Below are examples and recommendations for avoiding common issues faced by amusement park owners and operators during the construction of new rides and attractions.

## Owner/Contractor Review of Contract Documents

Once a general contractor is selected, review the plans with them in detail as soon as

possible. Identify the scope of work as well as the collateral requirements needed to achieve the scope of work. Make sure to understand how the project's needs translate to potential schedule and dollar impacts. With any new attraction, it is easy to assume that the design team has created the perfect project and the contractor will build it accordingly. But even though the design logic may be sound, there are often issues that affect park operation and public safety during construction. Utility tie-ins are an example. In order to get power or water to the new site, you may have to trench across an existing area that is designated to remain open. There may also be areas in the park that construction equipment needs to access that are not indicated on the plans. These issues can be very disruptive if not identified early on.

## Site Investigation

If the new ride is in a green field site, there are often fewer hidden features below ground. Any challenges should be identified with the phase I environmental assessment for the property. But if the site was previously occupied by another attraction, the construction documents need to be prepared with additional caution and attention to detail. For example, the plans

need to precisely indicate where utilities are located, especially fiber optic, gas and power lines, which need to be marked with X and Y coordinates. The paths for these utilities can vary, and they are often not as rigid as water or sewer piping. The utility company should locate the depth and distance of the pipes from fixed monuments so they can be clearly marked and protected during construction.

## Municipal Services

Emergency procedures should be clearly defined in writing, including the specific address of the worksite and whether emergency phone calls are routed through the park switchboard or straight to 911. Additionally, local authorities should know how to distinguish between an emergency with an employee or guest in the park and an emergency at the construction site.

Depending on the size of the site, it's often a good idea to have local fire, police, emergency medical services and OSHA agencies walk through and familiarize themselves with the area before construction. If you need to modify your emergency access route or evacuation points, it's critical for local authorities to be aware of the changes. These first responders also need to know what's happening at the site, the duration of the project and number of employees, whether dangerous chemicals are involved, and whether they need to be prepared for any special equipment or unique circumstances.

## Identifying Existing Conditions

It is important to clearly identify how the area will be assumed by the contractor, including descriptions of what items are to be left, the area's cleanliness, and the location and status of existing utilities.

Additionally, the full disclosure of existing hazardous materials is usually required, but identifying who is taking care of them and the associated costs is essential. This includes hazardous materials that have been disposed of improperly or other unidentified random debris.

## Logistics

Create a marshalling plan that identifies the work area and all temporary facilities, construction entrances, storage and lay-



Hendrick Construction recently completed the NASCAR-themed Intimidator roller coaster at Carowinds, which opened this year as the tallest, fastest and longest roller coaster in the Southeast. The ride is named for NASCAR legend Dale Earnhardt and features a 5,316-foot track with a 232-foot peak and multiple drops and twists that reach speeds exceeding 75 mph.

down yards, security fencing, access control points and delivery areas. Clearly identify all requirements and paths of egress to and from the site with signage for the public and the construction team that is easy to understand. Work hours and restrictions should also be known by the contractor, owner and all of the suppliers.

Spell out issues such as parking, access to the site, use of the loading dock, work-hour restrictions, noise limitations, the location of electrical panels and utility tie-ins, and who is responsible for paying the utility bill during construction.

**Utility Tie-Ins**

If using the existing utility infrastructure, make sure to locate the tie-in points and have a plan for any cutting or patching that may be necessary. Identify any temporary utilities needed for construction and plan for the time required to get them to the site.

It is important to know when new utilities need to be online and compare that information to park schedule and season. Plan accordingly for necessary shut downs.

Allow time for ancillary items when tying in to the master system. For example, when the water tie-in is complete, the system may need to be chlorinated and flushed for 24 hours and tested before service can be restored to the public. Some equipment will need to be

recalibrated if the power has been shut off. Additionally, if services such as a fire line are disrupted, sudden pressure can build on the backflow preventer when the water is restored, which can cause the fire alarm to sound. Therefore, it's important to coordinate with emergency monitoring agencies and security systems during utility tie-ins.

**Additional Considerations**

Owners need to clearly identify the expectations for cleanup, site maintenance and other issues such as stone or mud on the parking areas and roads. A "clean site" means different things to different people. Identify how often roads, project signs and perimeter fencing should be cleaned, and spell out what constitutes a tidy site.

New attractions can often be kept confidential for a long period of time. Make sure to get confidentiality agreements signed by all parties that view the documents or discuss the project. Do not post documents on a public plan room or Web site. Use either printed copies controlled by one agency in charge of distribution or private electronic plan rooms with pass codes.

Finally, it is important to consider how the project will affect the rest of the park and what work restrictions should be in place. Once the preliminary project schedule has been established, compare the activities in peak

season and evaluate them for noises, smells and other hazards. Anything that could conflict with the enjoyment of the guests needs to be addressed with a specific plan.

**Conclusion**

In conclusion, this is not intended to be a complete checklist, but rather insight into the level of detail a prepared owner needs to have prior to the start of a new project. When building new rides and attractions in occupied amusement parks, it is important to be proactive and identify items that require additional planning and coordination in order to minimize delays and cost increases.

*Roger Hendrick is a fifth-generation general contractor & president of Charlotte, N.C.-based Hendrick Construction, Inc. A leader in commercial construction in the Southeast, the company's portfolio includes facilities for amusement parks, entertainment venues and restaurants, corporate headquarters, manufacturing, industrial, health care and biotech companies, as well as schools, government buildings and churches.*

