



**InDepth**

Engineering Solutions

# AMUSEMENT PARK & THEMED ENTERTAINMENT ENGINEERING SERVICES





## ABOUT US

InDepth Engineering Solutions is a full-service provider to the amusement park and themed entertainment industry. Over the years we have worked on the design & engineering of various systems that make a successful attraction. Our multi-disciplinary team of engineers has the depth and experience needed to deliver large complex programs.

### Our capabilities include -

- Ideation and Concept Design
- Structural Design
- Mechanical System Design
- Detailed Design - CAD Modeling, Fabrication Drawings
- Loadcase development, Multibody Dynamics
- Design Validation - FEA / CFD
- Computer Aided Optimization
- Failure Mode & Hazard Analysis, Third Party Reviews
- Prototype and Fabrication
- Instrumentation and Testing
- Electrical and Controls
- Certification and Documentation

With a passion and perseverance for excellence, we continue to provide innovative design solutions for projects across the globe.

## OUR REACH



\* Generic pictures are used to convey our intentions

## AMUSEMENT RIDES

Our engineering team has successfully executed projects involving the design and development of tracks, track switches, ride vehicles, seat & restraint systems. We have extensive experience working with standards like ASTM F2291, EN 13814 and GB 8408.

### Some of our past projects –

- Design of Vertical and Lateral drop switch that is part of a roller coaster ride
- Dark Ride Design Validation – Track, Rotary Switch and Guest Compartment
- Validation of composite ride seat with horse-collar restraint system.
- Motion base ride vehicle design and validation



## WATER RIDES AND AQUATIC PLAY ELEMENTS

Utilizing our in-depth engineering approach, we have helped clients in the water park industry, bring their creative ideas to life. Various standards we have worked with include ASTM F2376, ASTM F2461 and ASTM F2291.

### Our previous experiences include –

- Shoot-the-chute ride vehicle chassis validation
- Novel multi-level and modular water play structure – Design and engineering support
- Large indoor water themed play structure with water slides, tipping buckets and splash elements – steel optimization and validation
- Water ride conveyor system – design and engineering of retrofit drive system and guarding structure upgrades

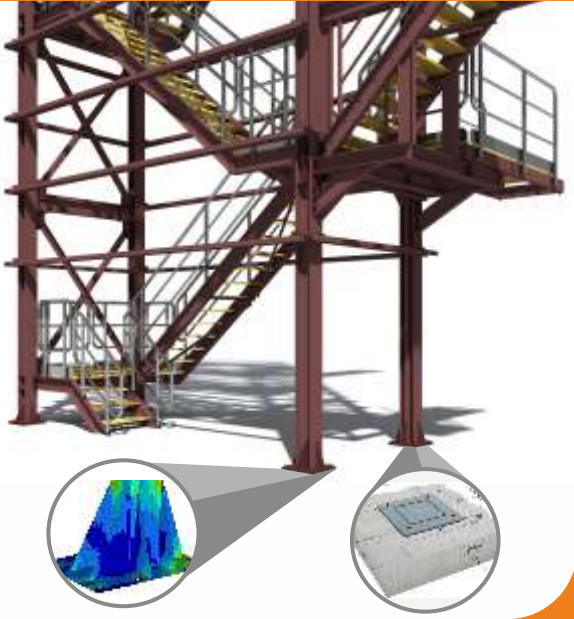
## ADVENTURE COURSES, ZIPLINES AND PLAY STRUCTURES

We excel in developing pencil sketches of themed adventure course and zipline rides into reality. Hand-in-hand design and validation using CAE enables us to meet the most stringent safety requirements as well as tight timelines.

### Our portfolio include –

- Multi-level adventure course including zip-lines, ropes course and climbing walls – Design and engineering
- Ropes challenge course involving 50+ elements – Concept to detailed design and engineering
- Zip-line and Roller coaster zip-line projects. Multi line with spans > 1,000 ft
- Powered zipline ride – design, engineering, fabrication, testing & commissioning of mechanical, electrical and control systems





## RIDE SUPPORT & FACILITY

With an excellent understanding of industry codes like IBC, AISC and ASCE, we have helped our customers design efficient support structures & auxiliary features for the rides. We design & validate structures for dead and live loads & provide certified documentation.

### Examples of our work -

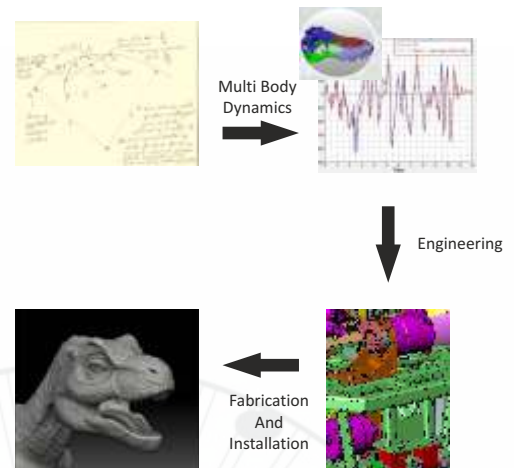
- Support structure for adventure course and aquatic play structures
- Zip-line towers, platform and launcher design
- Maintenance catwalk, stairs and handrail design for junior coaster
- Ride action and maintenance doors - riveted aluminium construction
- Pop-up guardrails

## ANIMATRONIC FIGURES, SHOW ACTION EQUIPMENT AND PROPS

We leverage our expertise in MBD and advanced CAE simulations to develop optimized metal and FRP composite designs for animatronic figures, SAE and props.

### Some of our achievements include –

- Design and engineering of animal animatronic figure structure for outdoor use. Multiple simultaneous motions including body and facial movements.
- Animation figure design optimization – up to 60% weight reduction using load bearing FRP and honeycomb sandwich construction.
- MBD-to-Test Correlation to validate animation figure design analysis.
- Outdoor Show Action Equipment – Design and engineering support



## FLOAT PARADE AND PERFORMANCE STAGES

Float parades and performance stages continue to be an important part of celebrations around the world for theme parks, festivals, entertainment shows and more. Our engineering team can develop concept designs into reality using 3D models and CAE tools.

### Our previous projects include –

- Design and engineering of float parades involving actuated show action equipment.
- Concept to detailed design of main load bearing structure for multiple themed float parades
- Static and moving show stage design and analysis.
- Moving walkway design engineering.





## WHY PARTNER WITH US?

**Our Experience** - With over a decade of experience in the amusement park and themed entertainment industry, we are well poised to meet the industry challenges.

**Custom Solutions** - We assess each project's requirements individually and develop solutions that are tailored to your needs.

**Latest Technology** - By keeping abreast with technological advancements, we bring in the latest innovations into our design solutions.

**Concurrent Design & Engineering** - Upstream and simultaneous design and CAE minimize design iterations and prototype build resulting in reduced time-to-market.

**Engineering Team** - Our designers and engineers love to get their hands dirty and bring in expertise from different disciplines into our winning recipe.

**Customer Service** - We take personal pride in our work, thus creating relationships that make our customers come back again and again.

## OUR TOOLS



Altair

HyperWorks®

HyperMesh™ RADIOSS™

MotionSolve™ AcuSolve™

HyperStudy™ OptiStruct™

Weid Certification Director

Altair Partner Alliance

nCode DesignLife

PART S-Life FKM  
Engineering



SOLIDWORKS 3D CAD  
SOLIDWORKS Simulation



## OUR EXPERIENCE

- Ride Tracks and Switches
- Ride Vehicles
- Guest Compartments
- Seats and Restraint Systems
- Motion Base Simulators
- Show Action Equipment
- Animatronic Figures
- Water Rides and Play Structures
- Adventure Courses
- Zip Lines
- Themed Structures and Props
- Float Parade Structure
- Show Stages and Moving Platforms
- Maintenance Platforms and Walkways
- Support Structures - Guard Rails, Hand Rails and Ride Gates

## STANDARDS AND CERTIFICATION EXPERIENCE

- ASTM
- AWS
- AISC
- ASCE
- IBC
- DIN
- EUROCODE
- FKM
- IIW
- GB
- CSEI
- TUV
- CORPORATE STANDARDS

## DESIGN AND DEVELOPMENT SERVICES

- Concept Design and Feasibility Studies
- CAD Modeling, Detailed Engineering
- Mechanism Design
- Structural & Architectural Engineering
- Fabrication Drawings, GD&T
- Engineering Analysis – FEA / CFD
- Fatigue Analysis
- Loadcase Development
- Multibody Dynamics Analysis
- Design Optimization
- Joints Evaluation - Welds, Bolts, Rivets

## OTHER ENGINEERING SERVICES


- DFMEA and Hazard Analysis
- Root Cause Analysis
- Third party Design review
- Instrumentation and Testing\*
- Test-to-FE correlation
- Electrical and Controls\*
- Certification Documentation
- PE/SE Stamping
- Fabrication and Installation\*


*\*through our worldwide partners*

## MATERIAL EXPERTISE

- Steel
- Stainless Steel
- Aluminum
- Composites – FRP and Sandwich Panels
- Plastics
- Wood

## CONTACT US

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