

# 5

## Ways Z Desktop Workstations Empower AEC Professionals to Unleash Innovation and Enhance Outcomes

Despite national investments of nearly USD 2 trillion in architecture, engineering, and construction (AEC) infrastructure projects<sup>1</sup>, India's AEC sector continues to face shortages of time, materials, and skilled talent. Digital technologies such as AI, ML, and BIM are emerging as the only way for AEC professionals to overcome the time, risk, and inefficiencies of traditional AEC processes, and deliver world-class public infrastructure.

Here are **5 key areas** in which HP's Z Desktop Workstations put these technologies at the fingertips of architects and engineers, empowering them to create ever higher-quality buildings and structures against the obstacles of limited time, evolving needs, and computing horsepower.

### 01 Delivering optimized project outcomes



#### Challenges

How to realize complex design projects with **minimal costs, risk, and time?**

#### Solution

Computational processes like **Generative Design** which save valuable time and manual computing effort by automatically producing options for complex designs based on criteria pre-defined by architects.

#### Z Desktop Workstations enable...

Demanding generative design workflows that require high-performance technology optimized for software applications like Revit® and Grasshopper.

With high-frequency processing power and large memory configurations, **Z Desktop Workstations accelerate AI workflows to improve project outcomes.**

#### Case Study

##### Building an optimized, low-waste structure with generative design<sup>2</sup>

The designers of Galaxia, the intricate timber spiral centerpiece of the 2018 Burning Man festival, wanted to minimize waste as the structure was meant to be burned during the event. To achieve this, they put generative design algorithms to work finding the optimal design based on the criteria of lowest material weight and maximum structural integrity.

The resulting design utilized only 60 tonnes of wood for a 3,000 sqm structure – a mere fraction of what it could have been with manual calculations.



### 02 Reducing complex data processing loads



#### Challenges

How to **process large volumes of data for complex 3D modeling projects** while ensuring model accuracy?

#### Solution

Technologies such as LiDAR and photogrammetry that generate 3D models used to capture data for complex 3D modeling projects, **speeding up project completion and saving computing time.**

#### Z Desktop Workstations enable...

Processing of complex LiDAR point cloud data and accurate 3D modeling. Z Desktop Workstations, packed with massive memory, multi-core Intel® Xeon® processors and high-end NVIDIA RTX™ professional graphics, **save hours of computing time and free up AEC professionals for tasks that call for human brainpower.**

#### Case Study

##### Speeding up complex 3D modeling for digital archiving<sup>3</sup>

Cultural preservation non-profit CyArk tested the 3D modelling speed of HP's Z8 G4 workstation against that of its own top-performing machine, using one of its most complex datasets: the Metropolitan Cathedral in Mexico City.

The HP Z8 reconstructed a 1:1 digital replica of the site 70% faster, saving CyArk 14 days and 33 hours of computing time.



### 03 Facilitating seamless collaboration with borderless computing power



#### Challenges

How to connect remote power users to work on **computing-intensive projects in real time?**

#### Solution

VR technologies that enable distributed teams to collaborate seamlessly on complex projects in a single space in real time, **shortening time to project delivery.**

#### Z Desktop Workstations enable...

Provision of on-demand computing power through **ZCentral Remote Boost**, which allows power users to remotely access a racked workstation from an endpoint device of their choice.

Z Desktop Workstations' high-performance computing power **accelerates VR workflows to improve quality of collaboration between teams.**

#### Case Study

##### Fueling workforce collaboration with HP ZCentral<sup>4</sup>

Global engineering and R&D consultancy Caggemini centralized computing horsepower and leveraged HP ZCentral Remote Boost to make it available to its Italy engineering operations teams anywhere, anytime. As a result, teams gained:

**40%**

increased work efficiency

**30%**

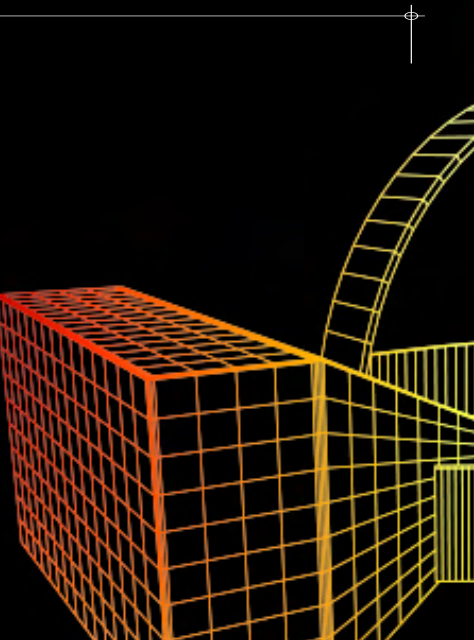
increased information sharing and simultaneous action capabilities

**20%**

decreased project lead time

**70%**

decreased data exchange time



### 04 Minimizing waste from inaccurate demos



#### Challenges

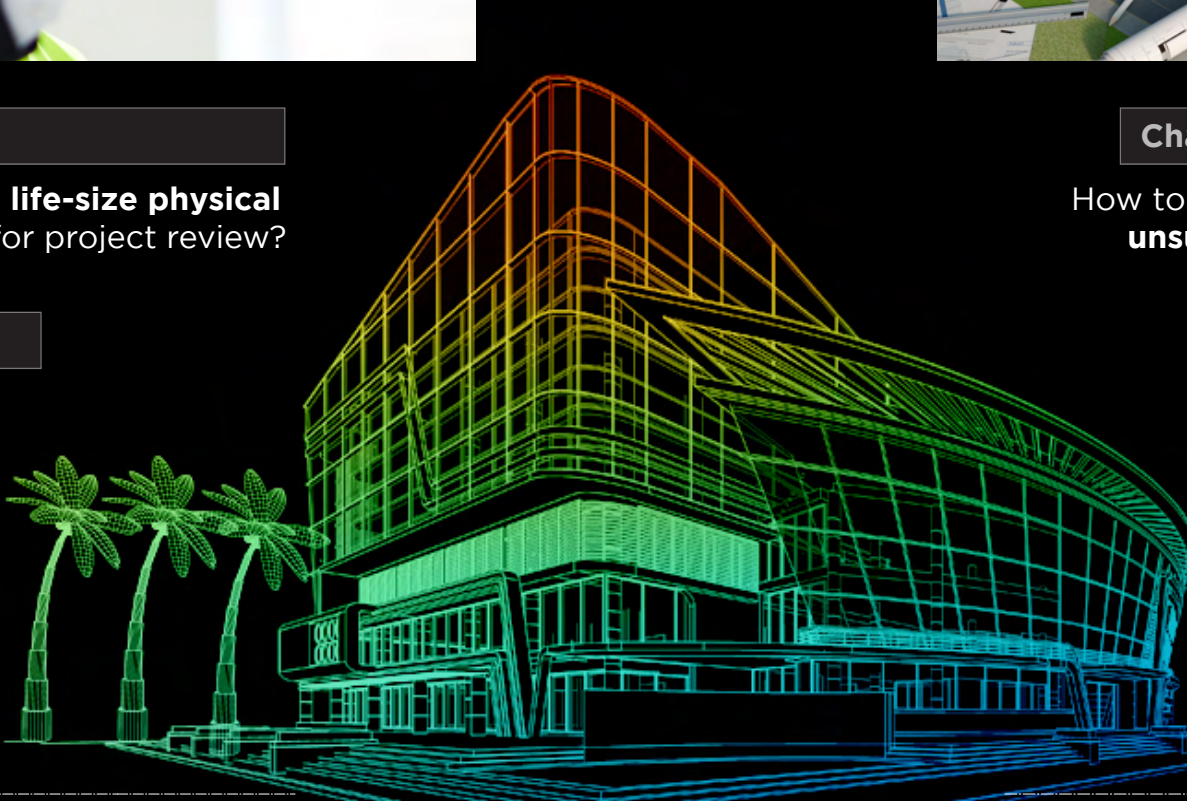
How to **reduce waste from life-size physical mockups** built and rebuilt for project review?

#### Solution

Fully immersive VR & AR visualizations that enable easier understanding, review, and troubleshooting of projects, thereby **minimizing the need for building physical demos.**

#### Z Desktop Workstations enable...

Demanding architectural visualization workflows that require high-performance technology optimized for software applications like Unity, Unreal Engine, Enscape, and V-Ray. With professional graphics and large memory configurations, Z Desktop Workstations accelerate VR workflows and the **production and deployment of high-quality virtual environments that expedite project development and review while keeping construction waste low.**



### 05 Integrating sustainability into construction



#### Challenges

How to **optimize design plans to reduce use of unsustainable materials** while incorporating eco-friendly processes?

#### Solution

Computational processes like generative design which enable the building of structures in line with pre-defined sustainability metrics, thereby **creating greener architecture.**

#### Z Desktop Workstations enable...

Computer-aided design that helps architects and designers pursue 'Green Architecture' approaches to future structures by generating numerous options based on material types, material quantities, incorporation of natural light and wind sources, and other pre-requisites. Created for peak performance in applications like Unity, Unreal Engine, Enscape, and V-Ray, Z Desktop Workstations **accelerate the most complex and demanding architectural workflows.**

**Whether the need is 2D & 3D concepting, simulation & clash detection, or high-frequency modeling & rendering,**

**Z Desktop Workstations work seamlessly with key AEC software tools and technologies to:**



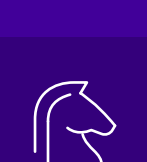
**Elevate**  
productivity through advanced performance



**Enable**  
remote real-time collaboration across the design and construction lifecycle



**Improve**  
overall project efficiency and sustainability



**Humanize**  
the use of human brainpower for strategic, high-value tasks

**Power through today's heaviest workloads to build tomorrow's best buildings with Z Desktop Workstations.**

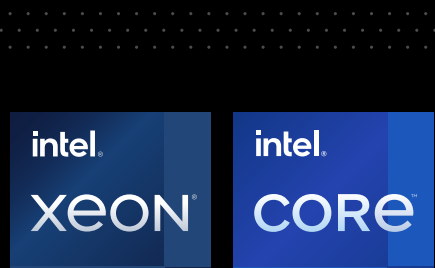


#### HP Z4 G4 Tower

**Processor:** Intel Core i9-1040X 3.3 Ghz , 14 core  
**Memory:** 64GB  
**Storage:** 512GB SSD + 1TB M.2 + 4TB SATA  
**Graphics:** NVIDIA RTX A4000  
**Operating System:** Windows 11 Pro or Windows 10 Pro

## Remove barriers to brilliance with Z Desktop Workstations

**EXPLORE NOW**



Exceptional performance with Intel® Xeon® and Intel® Core™ i9



Sources:  
1. AEC Panel Discussion: The role of infrastructure design in India's ambitions : Express Computer  
2. AI enters the mainstream | Creating new frontiers for design  
3. Cyark Discovers Extreme Power in HP Z8 for Digital Archiving  
4. Caggemini empowers teams, fuels collaboration with HP Zcentral