Laser scanner: Integrated solutions for complex construction projects

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Class summary

The purpose of this class is to show the versatility and relevance of the Laser Scanner and point cloud visualization applied to complex construction projects. We will explore solutions covering from, clash detection, cinematic studies, quality control, volume calculation, construction progress documentation, Urban environment studies to hoisting sequences. Also, I will explain how the point cloud and the BIM Model can deliver extraordinary accurate solutions for better decision making.
Key learning objectives

At the end of this class, you will be able to:

1. Realize why the laser scanner is a great tool for decision making.
2. Understand the different solutions that point clouds can bring to projects.
3. Know the importance of integrating the BIM Model and the point cloud.
4. Comprehend the power of 3D visualization for better communication between stakeholders.
Content:
1. Introduction
2. Projects
3. Conclusions
1. Introduction
ICA time line.


“As the construction market is scheduled to grow to **US$12 trillion** by 2020, design and construction professionals need the **best tools** to design and build the world’s most complex buildings”*

*Lisa Campbell, vice president, industry strategy marketing for AEC and ENI, Autodesk*
Time to measure

976,000 points:

1 second*

35,136,000 seconds**

= .0002 h

= 9,760 h

* /www.faro.com/products/3d-surveying/laser-scanner-faro-focus-3d/features#main

** /activetectonics.asu.edu/TotalStation/document.html
Clients are asking for it: 72% say demand for Laser Scanning has increased.

Top 3 Applications for Laser Scanning

- 44% Topographic Mapping
- 34% Transportation
- 28% Architectural/BIM

Source: April 2013 point of Beginning (www.poBonline.com).
Development of cost structure

project management
process
measuring / laser scanning
process / intelligent models

History
Today
Future

Source: Astacus Germany GmbH & Co. KG, Liederbach
Development of cost structure

- Green: project management
- Orange: process
- Gray: measuring / laser scanning
- Yellow: process / intelligent models

History | Today | Future

Source: Astacus Germany GmbH & Co. KG, Liederbach
Development of cost structure

- Project management
- Process
- Measuring / laser scanning
- Process / intelligent models

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Development of cost structure

- project management
- process
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History

Today

Future

Source: Astacus Germany GmbH & Co. KG, Liederbach
Development of cost structure

- project management
- measuring / laser scanning
- process
- process / intelligent models

History  Today  Future

Source: Astacus Germany GmbH & Co. KG, Liederbach
2. Projects
Subway L12
Mexico City
NOTAS:

Georeferenciado

1. EL ORIGEN DE CADA COLUMNA ES EN EL ED: 3-495 537, TOMANDO COMO REFERENCIA EL CORNER FUNDAMENTAL AL MINUSCULO 29=300 000, UBICADO A 40 440 MTS. DE LA ESQUINA SUR-ORIENTE DE LA CALLE TECNIFONENDAS Y LA CALLE SERRA, ETAPA II.

2. TODOS LOS CADENAMIENTOS ESTÁN RECORRIDOS AL SERIE DE 2.

3. LA PLANIMETRIA FUE OBTENIDA POR MÉTODO DIRECTO.

4. SI SE INDICA EL NORTE MÁGNETICO.

5. ESTE PLANO CUMPLE CON LAS ESPECIFICACIONES ESTABLECIDAS POR LA COMISIÓN DE VALORACIÓN Y FONDO URBANO, PARA EL PROYECTO Y CONSTRUCCIÓN.

SECCIÓN EN PLANTA-COLUMNAS 113-320:

SECCIÓN EN PLANTA-COLUMNAS 117-324:
AUS
Mexico City
CORTE A5-B

San Jerónimo
VIADUCTO TLALPAN
San Jerónimo
Secuencia de Montaje
WWTP
Atotonilco, Mexico
Deep drainage (TEO)
Mexico City
CIC Los Cabos
BC, Mexico
Terminal T2
Mexico City
El Pahñu
Hidalgo, Mexico
Historical Building
Mexico City
INCAN - Hospital
Mexico City
Total Volume Backfill = 3857.19 m³
Toll booth
Mexico City
Cable-stayed Bridge
Puebla, Mexico
PERFIL LONGITUDINAL "A"

Isométrico

Sección Tipo

Proyecto: Puente Atirantado
Dirección: Lateral Autopista Puebla-Orizaba

Reporte: Análisis del Comportamiento Estructural del Puente Atirantado Santa Ana Chiautempan
Descripción: Escaneos realizados a las 2pm y 5 am

Fecha de entrega: 31/octubre/2012
Acapulco
Guerrero, Mexico
Bridge
Oaxaca, Mexico
Laboratories
Mexico City
3. Conclusions
• Safer and faster data capture in complex environments.

• Always be aware on the impact of a design based on doubtful data.

• Certainty is priceless.

• Opportune and precise information is key for decision making.

• Useful and “sexy” deliverables attract team’s attention and ideas.

• Complete projects faster.

• Never miss Site information.
Thank you!