3D from theory to practice
WHO is Topcon?

GeoPositioning
- Optical Instruments
- Total Stations
- GPS Systems
- Laser Scanning
- Mobile Mapping
- GPS Networks
- Field Controllers
- Software
- Survey Solutions

Agriculture
- Analyse des cultures
- Gestion de données
- Guidage et Autopilotage
- Pesage et mesure
- Cartographie
- Implémenter le contrôle
- Gestion des aliments

Construction
- Elevation Lasers
- Alignment Lasers
- GPS Rovers
- Layout Instruments
- Equipment Automation
- Sonic Grade Control
- Workflow Solutions
- Telematics
- Site Management

[Image of various Topcon products and applications]
Topcon’s world map

USA, Livermore
HQ + production
CONSTRUCTION

Russia, Moscow
GNSS firmware

Japan, Tokyo
MAIN HQ
HQ + production
GEO

Australia, Brisbane
Software
3D from theory to practice

3D system on a slipform paver

Workflow

3D Sensor input ➔ Define position reference point ➔ Calculate offset to alignment ➔ Output data to machine
3D Sensor input

- LPS: total stations
- MMGPS
LPS: Local Positioning System

- 2 Total stations + 2 machine prisms
- Optical 1 on 1 “connection”
- Main (position of machine)
- Aux (heading of machine)
- Resection by control points
- Application: tunnels, city center,…
GNSS: Global Navigation Satellite System

- Satellite signals (GPS, GLO, GAL, BEI)
- GNSS Receiver (raw position)
- RTK network corrections
- **Virtual** reference station
- “Precise” position
mmGPS

- Positioning by GNSS
- **Local** base station (radio)
- Main (position of machine)
- Aux (heading of machine)
- Known reference points \((X,Y,Z)\)
- Z: mm precision by mmLASER
- Multiple receivers on 1 source
3D from theory to practice

3D system on a slipform paver

Workflow

3D Sensor input → Define position reference point → Calculate offset to alignment → Output data to machine
Reference point on machine

- Position MAIN and AUX towards ref point
- Position of mold towards ref point
- POI: MOLD
3D from theory to practice

3D system on a slipform paver

Workflow

3D Sensor input -> Define position reference point -> Calculate offset to alignment -> Output data to machine
Offset to alignment

- Digital stringline
- POI mold
- Horizontal and vertical profile
- Templates for variable slope segments
- Radius info in curves
- Set points in software to add additional offset to alignment (position and elevation)
- Example: pitch machine (front track) for pressure on concrete when exiting mold
3D from theory to practice

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**Workflow**

3D Sensor input ➔ Define position reference point ➔ Calculate offset to alignment ➔ Output data to machine
Output data to machine

- Compatible with major brands
- Only CAN machines
- Position of tracks is crucial 3DMC
- Software can steer machine very smooth in and out radius
- Digital soft wand straight vs radius left/right

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Steering line: Path of front track of machine

100% transition after exit:

100% transition before entry:

Radius entry length

Straight changes to radius (entry transition point)

Radius changes to straight

Steering line
Advantages 3D system

- DIGITAL stringline
- Stake-out
- Material
- Obstruction
- Labor
- Time
- Auto transition from straight to radius
- Difficult situations
- Difficult shapes
- Exchangeable hardware LPS and mmGPS

< COSTS
Training

• Jobsite preparation
  • Control points
  • Design (alignment)
  • Calibrate mold
    • On jobsite preparation possible

• Training is a step-by-step process
Questions?