GUIDED ROCK AUGER BORING UNDER A TAXIWAY IN NUEVO LEON

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INGENIERIA EN TUNELES Y REDES S.A DE C.V.

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Presentation Outline

Project Overview

Project Challenges

Construction

Conclusions

Project Overview

Project Name Ampliación de Plataformas En Aeropuerto de Monterrey

Location Nuevo Leon, Mexico

Owner Monterrey Int'l Airport

Trenchless Contractor Ingenieria En Tuneles Y Redes S.A. DE C.V. (InturICA)

Purpose Install 197-lf. of 36-in. steel casing to meet a utility junction box on the south side of a taxiway

Timeline May - June 2017

Project Overview

Pipe ID
36-inch

Trenchless Method
Guided Auger Boring

Equipment
Guided Boring Jacking Frame and Guidance System, Pilot Tubes, Rock Drill Adapter with TriHawk® Drill Bit, Guide Rod Swivel with 36-inch Cutter Head and Auger Boring System

Project Challenges

- Accurate installation required in order to meet junction box on other side of taxiway
- No surface access
- Construction could not interfere with taxiway traffic
- Up to 5,000 psi weathered rock conditions
- Minimal cover above the proposed alignment

Construction

- High compressive strength rock required use of Rock Drill Adapter and Drill Bit to lead the pilot tube installation
- Contractor’s first experience guiding their auger boring machine
- Bentonite polymer used to cool the drill bit and provide viscosity to carry the cutting back to launch shaft
- Manufacturer's field technician dispatched for assistance

Construction

What is the Guided Auger Boring Method?

- Guided Auger Boring is the method of accurately installing pipelines by using a guided boring machine system in conjunction with an auger boring machine. The guided boring system is used for an accurate pilot tube installation and the final pipe installation is completed with conventional auger boring techniques.

Construction

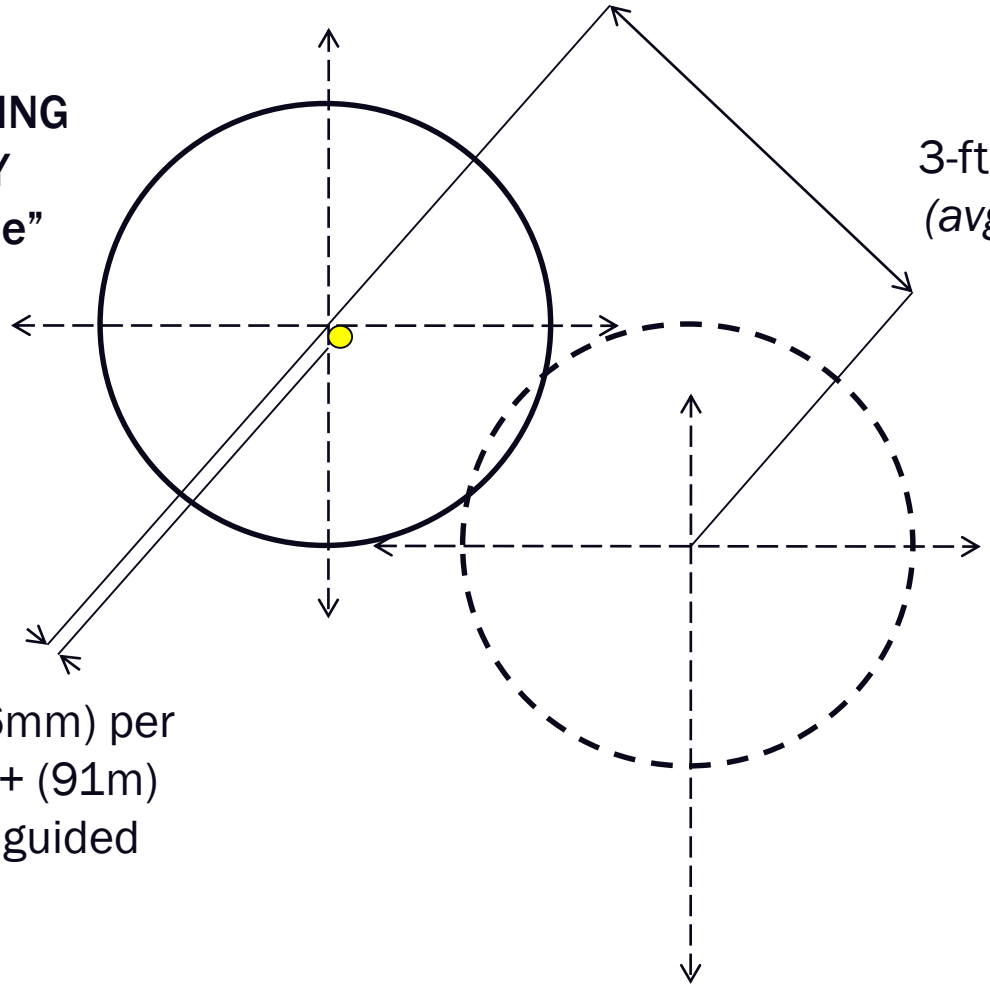
Benefits of Guided Auger Boring

Improved Accuracy	• Line and grade accuracy up to ¼-in. (6mm) at 400-lf. (122m)+
Longer Drive Potential	• Distances of 400-lf.+ (122m) are regularly achieved
Smaller Casing Sizes	• With an accurate line and grade, smaller casing can be obtained
Faster Installation	• With pilot tubes holding the steel casing on line and grade, the steel casing installation can be facilitated quickly
Ideal for Many Ground Conditions	• Projects with displaceable N Value or SPT = < 50 AND • Non-displaceable N Value > 50 in homogeneous ground with appropriate tooling/equipment
Exploratory Work	• Find obstacles before they find you!

Construction

Benefits of Guided Auger Boring

TYPICAL CASING ACCURACY "The 1% Rule"



3-ft. per 300-lf. (91m) *(avg. deviation)* when unguided

¼-in. (6mm) per 300-lf.+ (91m) when guided

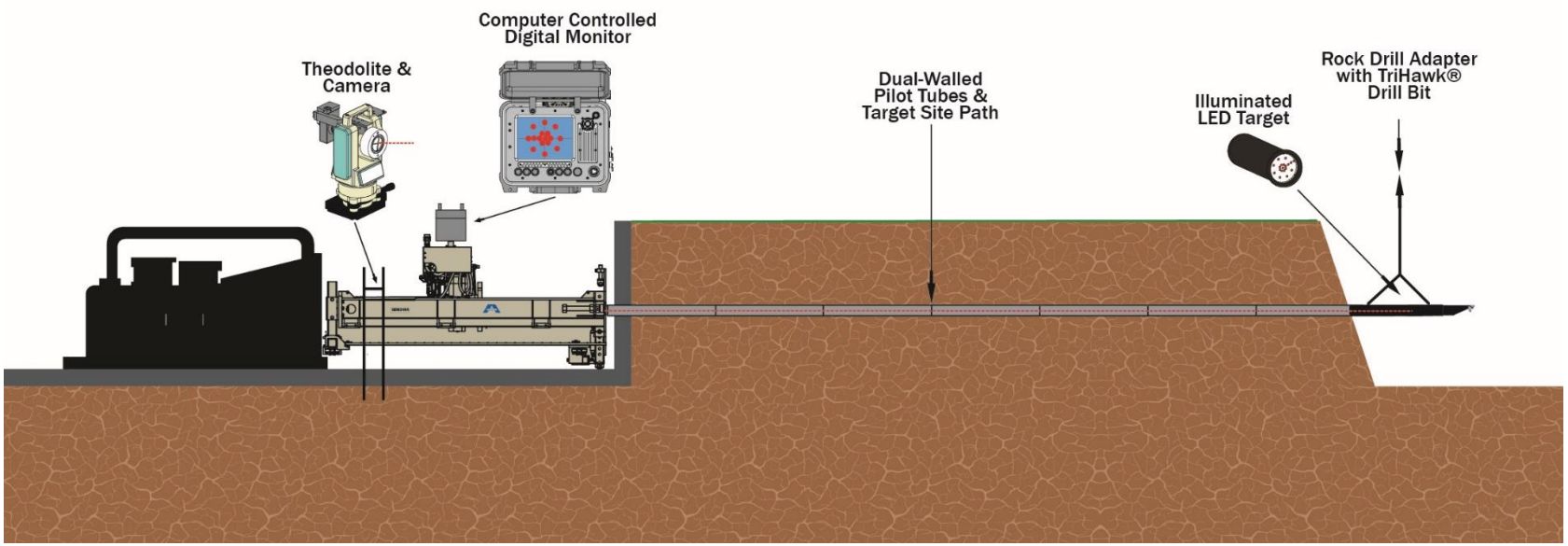
Construction

What is the Pilot Tube Rock Drilling?

- Pilot Tube Rock Drilling is the method of using a guided boring system to install pilot tubes on line and grade in rock formations up to 12 ksi UCS using the Rock Drill Adapter and drill bit leading the pilot tube string, along with an appropriate lubrication regime.

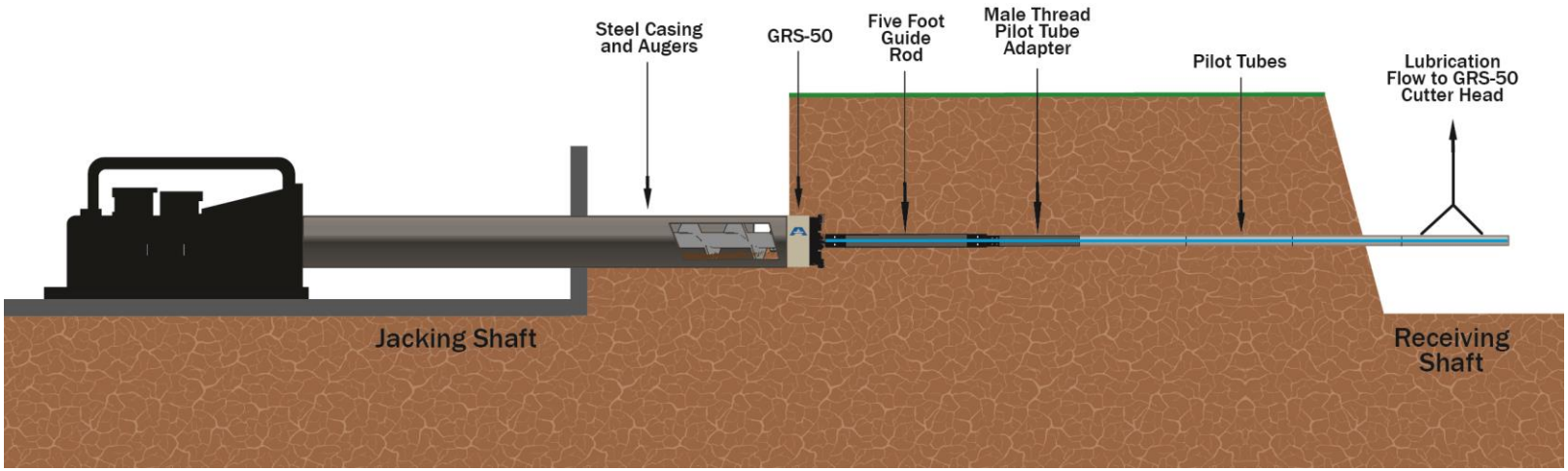
Construction

Step One: Pilot Tube Installation



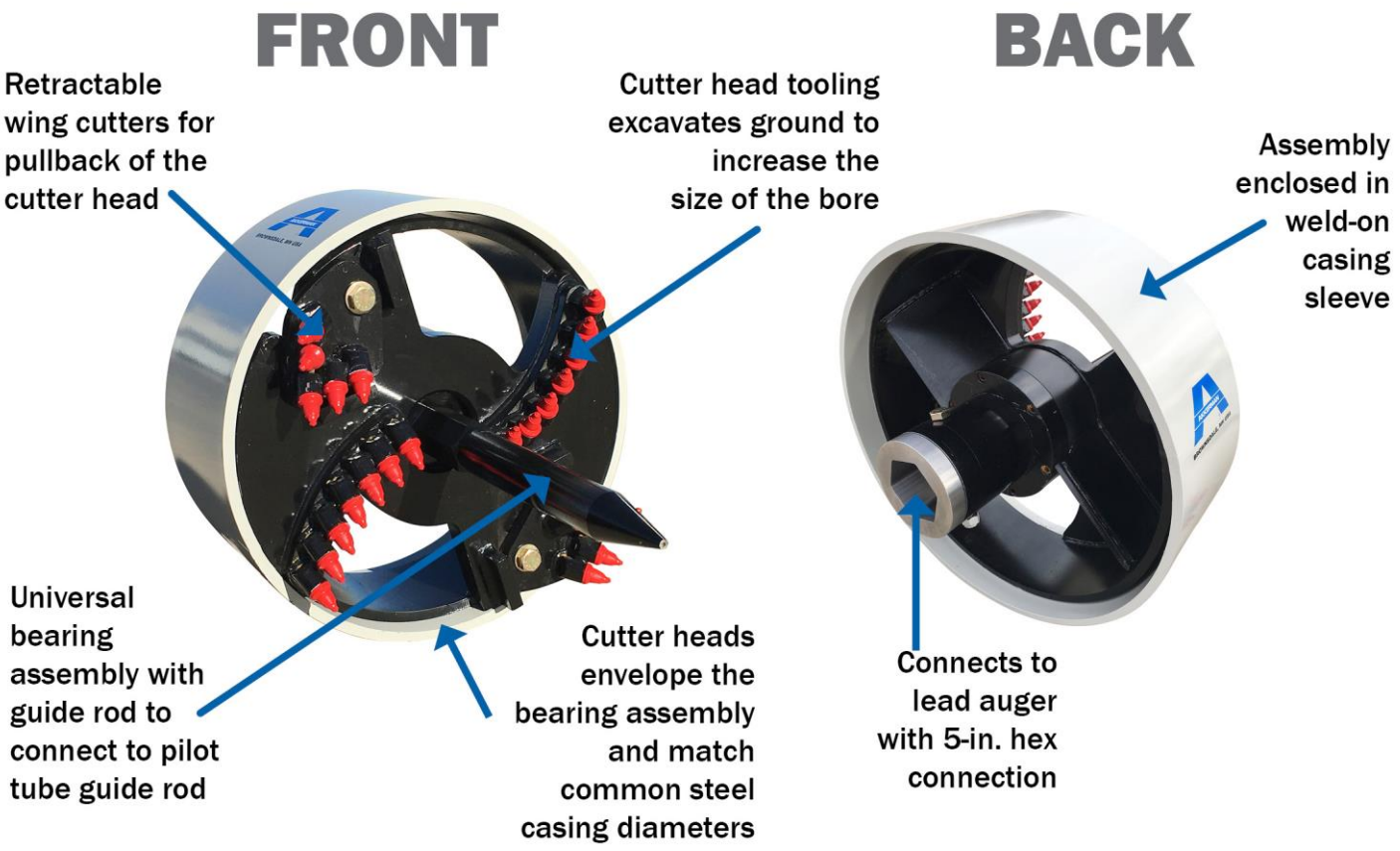
Construction

Step Two: Upsize Bore to Match Casing

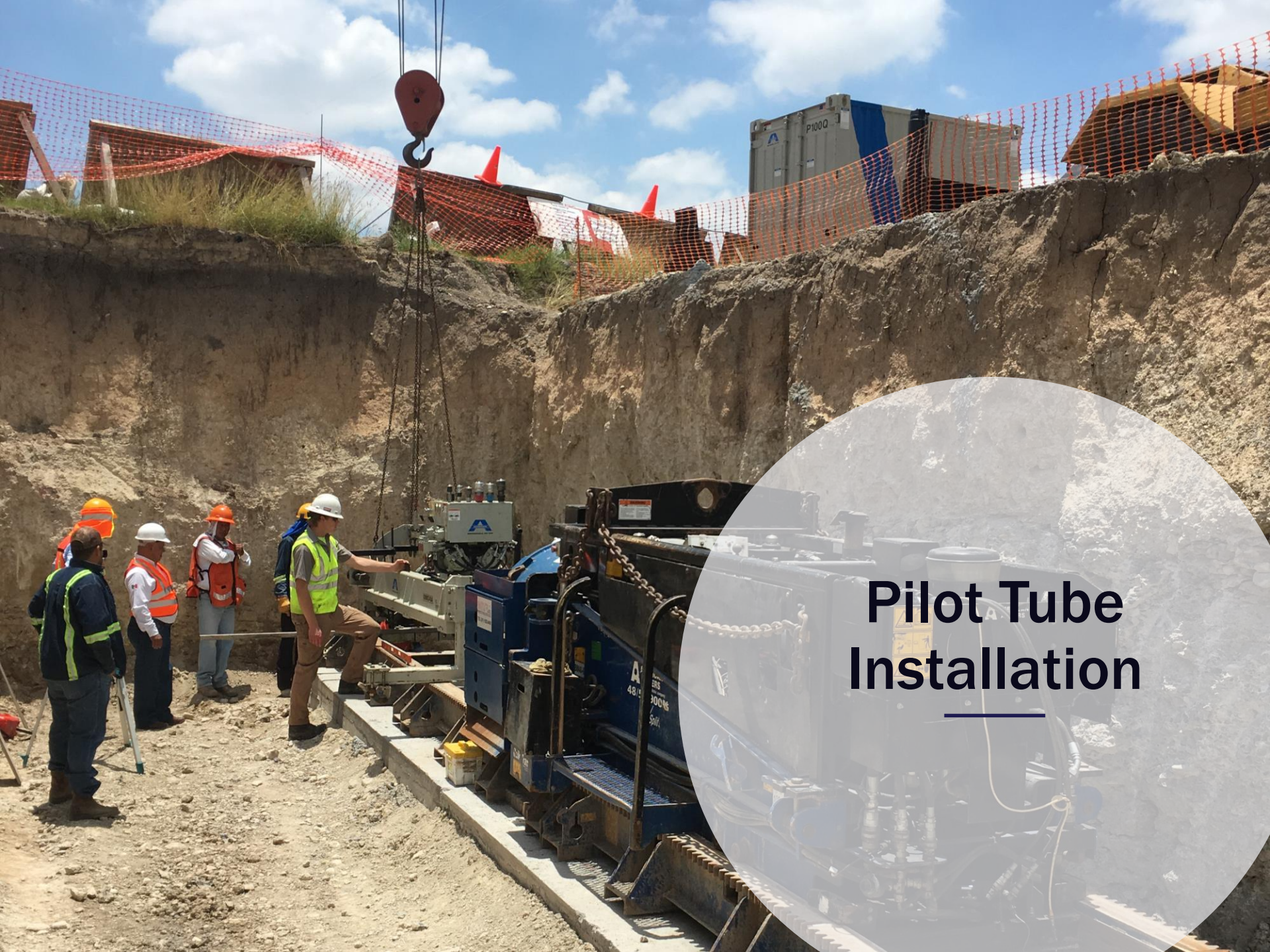


Construction

Parts of the Increase Tooling



Pilot Tube Installation



Pilot Tube Installation

Distance of Run Under Taxiway

Rock Drill Adapter and Drill Bit Emerge in Reception Shaft

Welding Guide Rod Swivel Assembly to Lead Casing

Aligning Guide Rod Swivel Needle with Installed Guide Rod


Successful
Completion!

Outcomes

- Successful installation resulted in first guided auger bore installation in Mexico
- InturICA received contracts for additional like work in this region
- Installation on line and grade
- Mitigated disruption to airport traffic

Questions?

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Thank you!

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