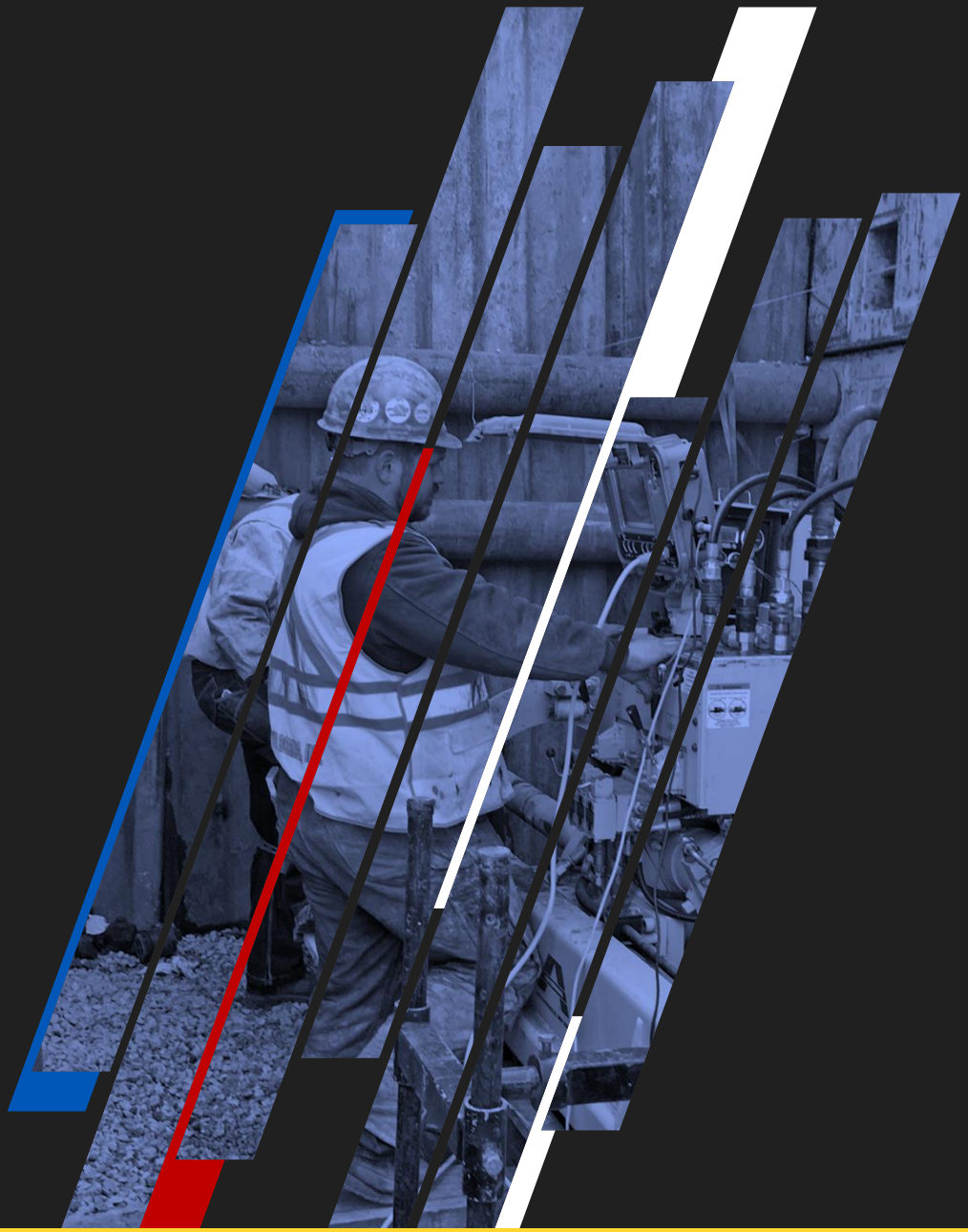


PILOT TUBE GUIDED BORING SOLUTIONS MEET PROJECT CHALLENGES

GUIDED BORING METHOD

PILOT TUBES FOR PRECISION

The Guided Boring Method is an extremely accurate, multiple-step process for installing pipelines with the grade and alignment precision required to meet the demands of the sewer, water and utility industries.

GUIDED BORING PROJECT CRITERIA

PIPE DIAMETERS

4-48 in. OD pipe with three pass method
Up to 120 in. when applied to other technologies

DRIVE LENGTH

Line and grade accuracy up to ¼-in. at 400-lf.+

SMALL FOOTPRINT

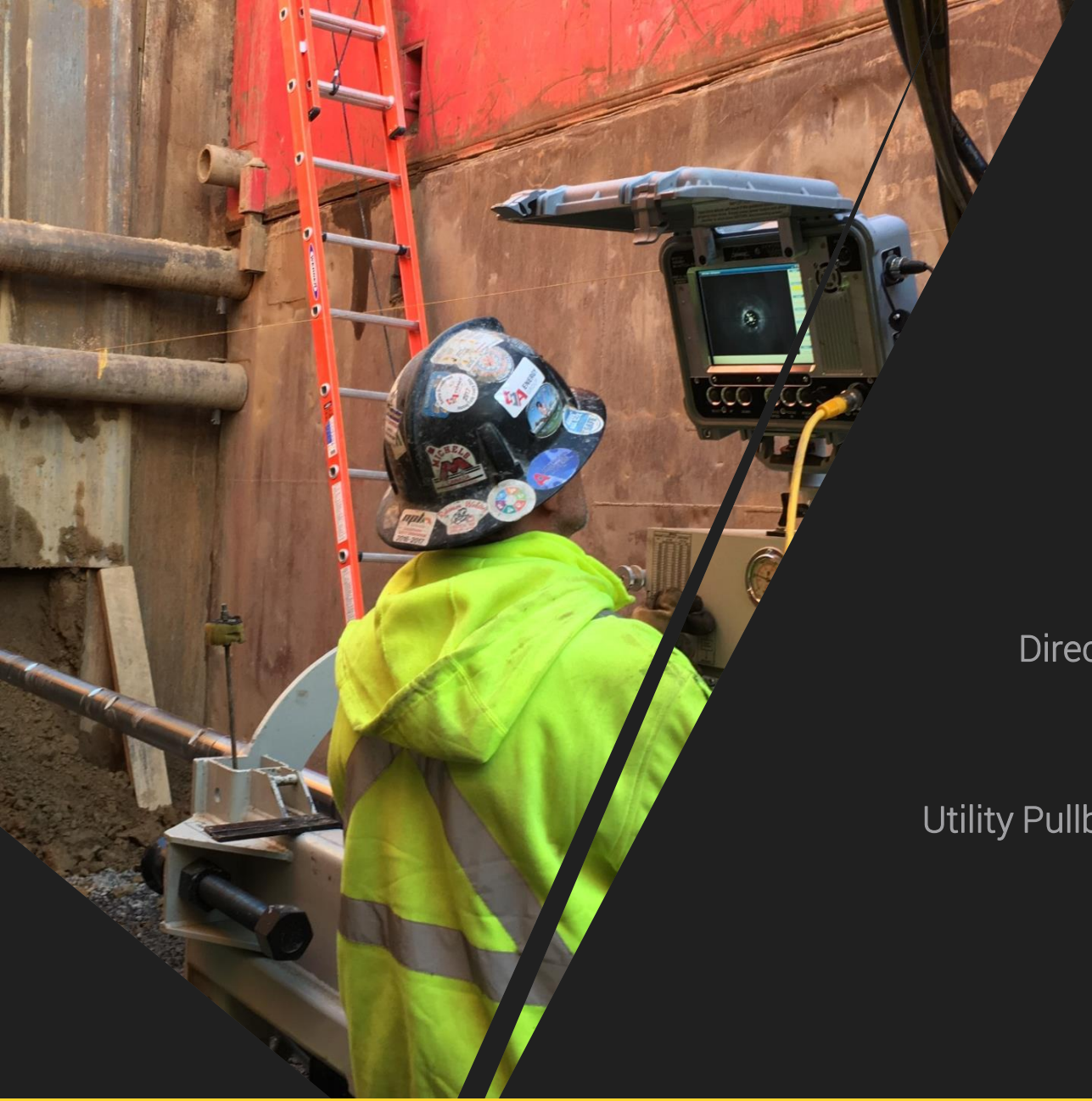
GBM systems to fit a minimum 8-ft. shaft to install 1m length pipe for minimized project disruption

GROUND CONDITIONS

Projects with displaceable N Value or SPT = < 50
Non-displaceable N Value > 50 in homogeneous ground with appropriate tooling/equipment

PIPE

Vitrified Clay (VCP),
Reinforced Concrete (RCP),
Fiber /Glass Reinforced Plastic FRP/GRP, Polymer Concrete, Steel Casing, PVC (with pullback method)



GUIDED BORING APPLICATIONS

Three Pass Method

Guided Auger Boring

Direct Steel Casing Installations

Pilot Tube Rock Drilling

Guided Pipe Ramming

Utility Pullback Installations for HDPE, PVC, Fiber Optic Cables

Guided Pipe Roofing

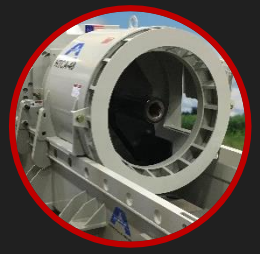
GUIDED BORING/PILOT TUBE SYSTEM **VERSATILITY OPTIONS**

POWER PACKS
HYDRAULIC POWER
DIESEL OR ELECTRIC

AUGERS AND CASING

POWERED CUTTER HEADS
20-48-IN

POWERED REAMING HEADS
14-48-IN



MASTER PUSH RING
DIRECT STEEL CASING INSTALLATIONS

SWIVELS
FOR HIGH THRUST LOADS

STEEL CASING ADAPTERS
INCREASE DIAMETERS IN ONE OR TWO STAGES

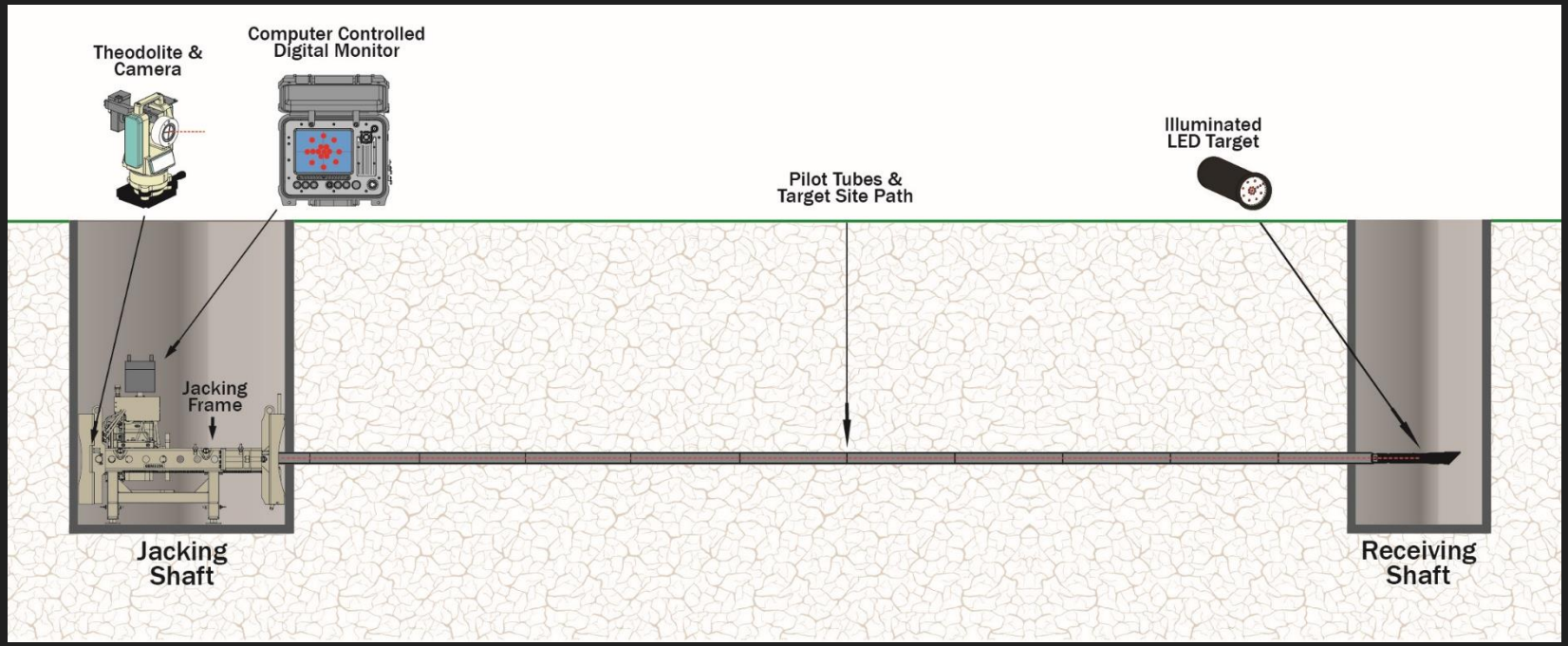
LUBRICATION
LUBRICATION & FLUSH CUTTINGS

SOFT ROCK TOOLING
DRILL BITS

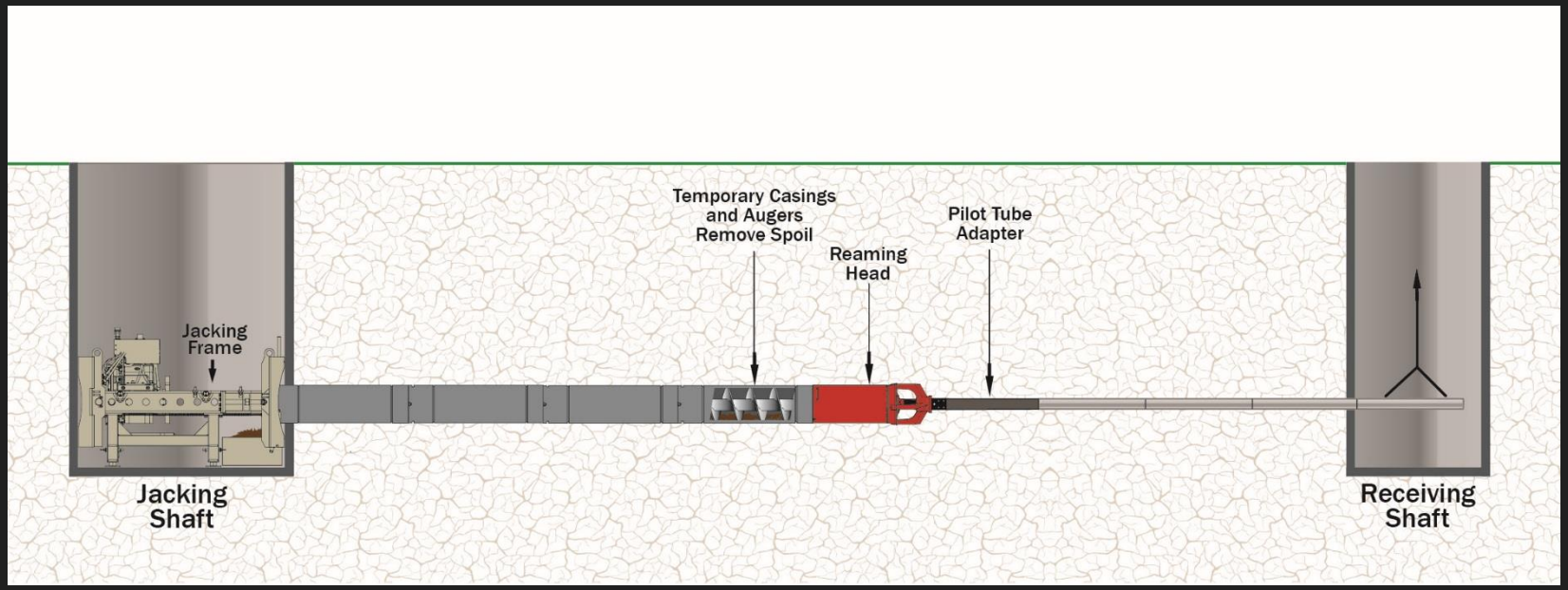
GUIDED BORING

THREE PASS METHOD

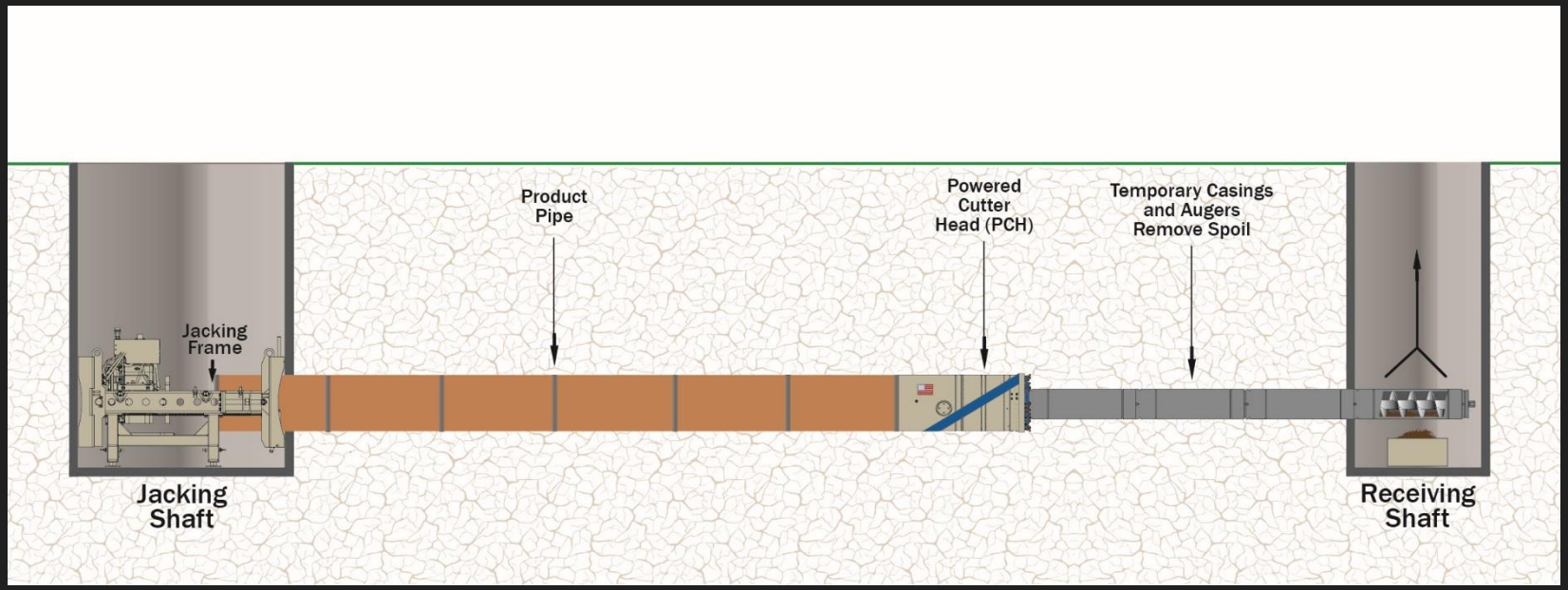
THREE PASS METHOD STEP 1 PILOT TUBES



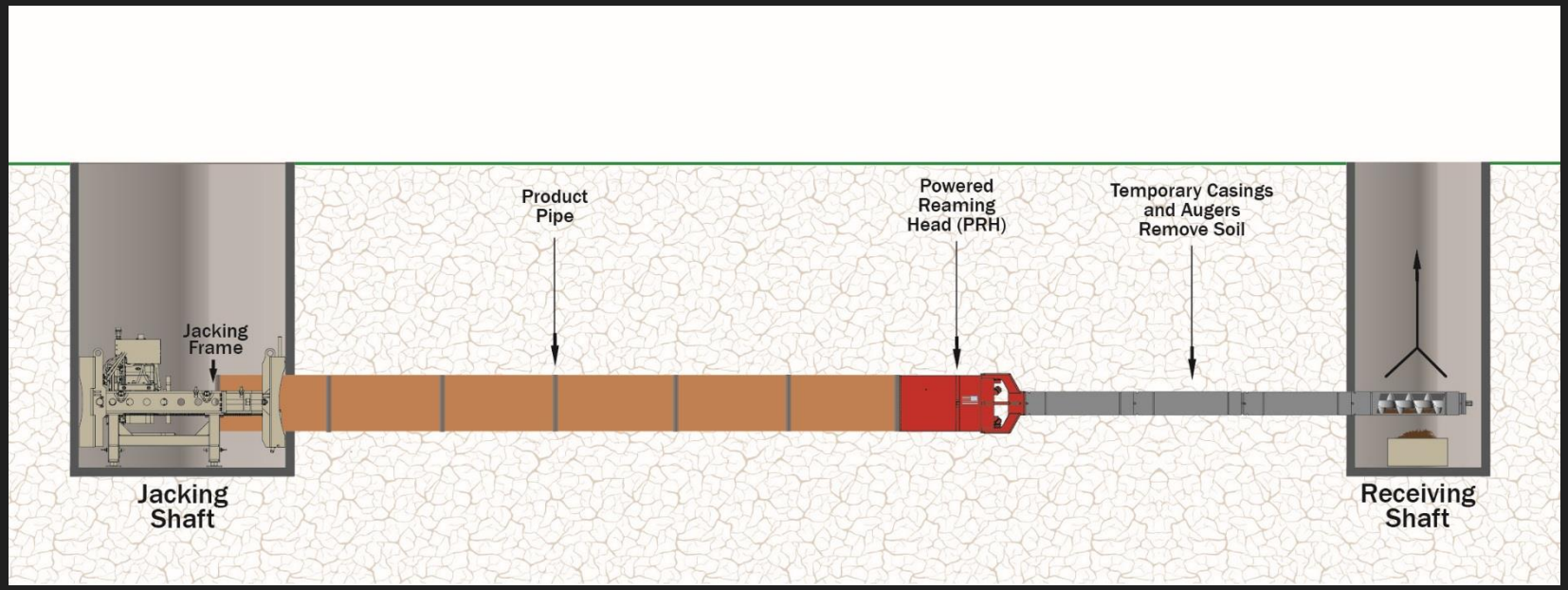
THREE PASS METHOD STEP 2 TEMPORARY CASINGS AND AUGERS



THREE PASS METHOD STEP 3 POWERED CUTTER HEAD



THREE PASS METHOD STEP 3 POWERED REAMING HEAD



THREE PASS INSTALLATION

CASE STUDY

CONTRACTOR D.V.M. UTILITIES

LOCATION ROSEVILLE, MI

OWNER CLINTON TOWNSHIP

PIPE 18-IN VCP, 2M LENGTH

TOTAL LENTH 2,000-FT, 400-FT LONGEST

NO. OF RUNS 12

PROJECT DESCRIPTION/CHALLENGES

- SANITARY SEWER CAPACITY UPGRADE
- 1,000-FT VALUE ENGINEERED TO REDUCE CONSTRUCTION IMPACT IN RIGHT OF WAY
- 13-FT SHAFTS
- UP TO 30-FT DEPTHS
- HARD CLAY GROUND
- POWERED CUTTER HEAD

THREE PASS INSTALLATION

CASE STUDY

CONTRACTOR MINGER CONSTRUCTION

LOCATION MINNEAPOLIS, MN

OWNER CITY OF MINNEAPOLIS

PIPE 12-30-IN VCP & STEEL CASING

TOTAL LENTH 1,800-FT, 425-FT LONGEST

NO. OF RUNS 9

PROJECT DESCRIPTION/CHALLENGES

- SANITARY SEWER CAPACITY UPGRADE IN DOWNTOWN MINNEAPOLIS
- TWO GUIDED BORING SYSTEMS
- POWERED REAMING AND CUTTER HEADS FOR MULTIPLE DIAMETERS

THREE PASS INSTALLATION

CASE STUDY

CONTRACTOR KRITA ENGINEERING PVT LTD

LOCATION BANGLORE, INDIA

OWNER CITY OF CUTTACK

PIPE DN200-600

TOTAL LENTH 1.86-MI, 187-FT LONGEST

NO. OF RUNS 63

PROJECT DESCRIPTION/CHALLENGES

- SANITARY SEWER ALIGNMENTS IN SAND, CLAY AND HIGH GROUND WATER
- MINIMAL DIAMETER SHAFTS
- EIGHT DIAMETERS OF PIPE
- MULTIPLE POWERED REAMING HEADS


GUIDED AUGER BORING
FOR ACCURACY AND DISTANCE

GUIDED AUGER BORING

ON LINE AND GRADE STEEL CASING INSTALLATIONS

Guided Auger Boring is the method of using a guided boring system for an accurate pilot tube installation and the final pipe installation is completed with conventional auger boring techniques.

GUIDED AUGER BORING ADVANTAGES

IMPROVED ACCURACY

Line and grade accuracy up to ¼-in. at 400-lf.+

LONGER DRIVE POTENTIAL

Much longer lengths are achieved than with an unguided bore

SMALLER CASING SIZES

With an accurate line and grade, smaller casing can be obtained

FASTER INSTALLATION

Productive way to install steel casing

IDEAL FOR MANY GROUND CONDITIONS

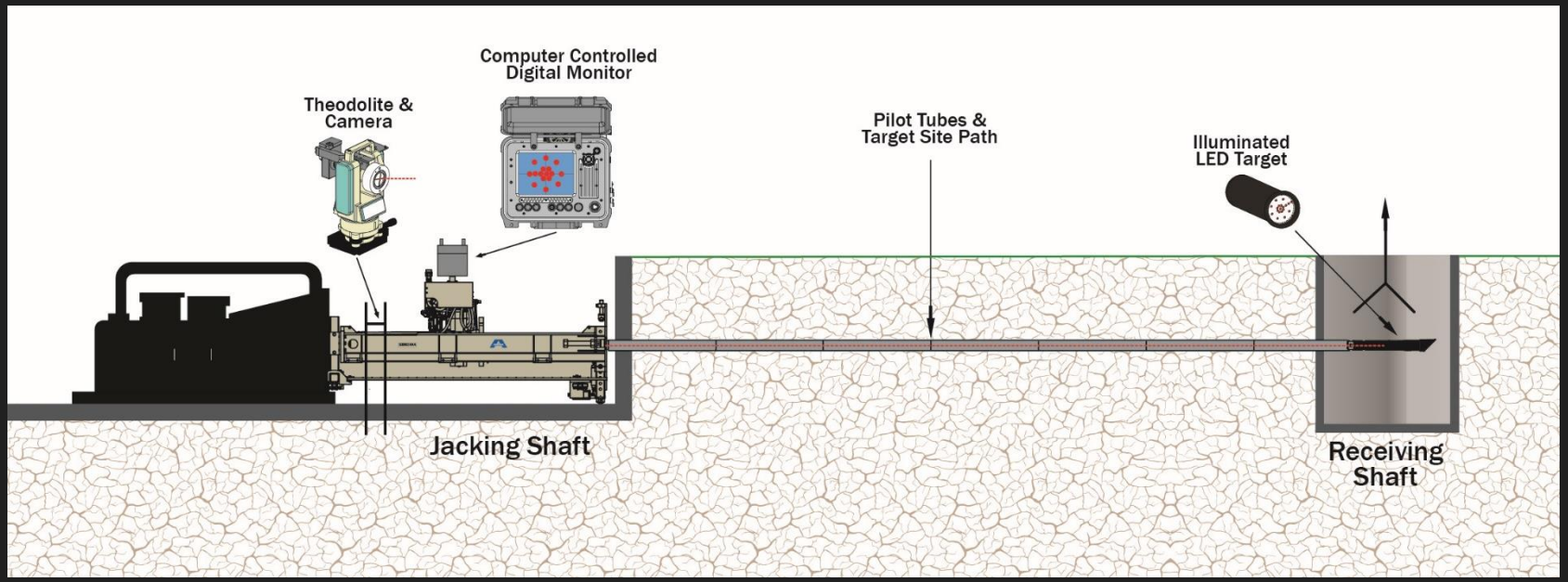
Projects with displaceable N Value or SPT = < 50

Non-displaceable N Value > 50 in homogeneous ground with appropriate tooling/equipment

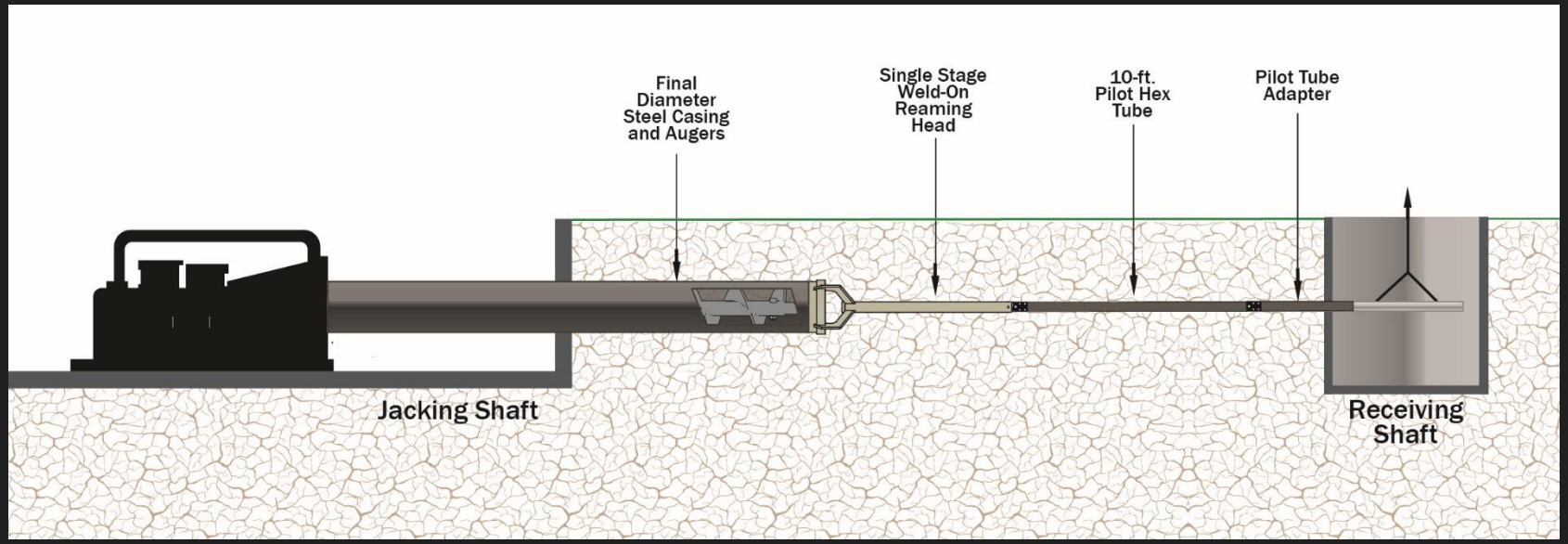
EXPLORATORY WORK

Find obstacles before they find you!

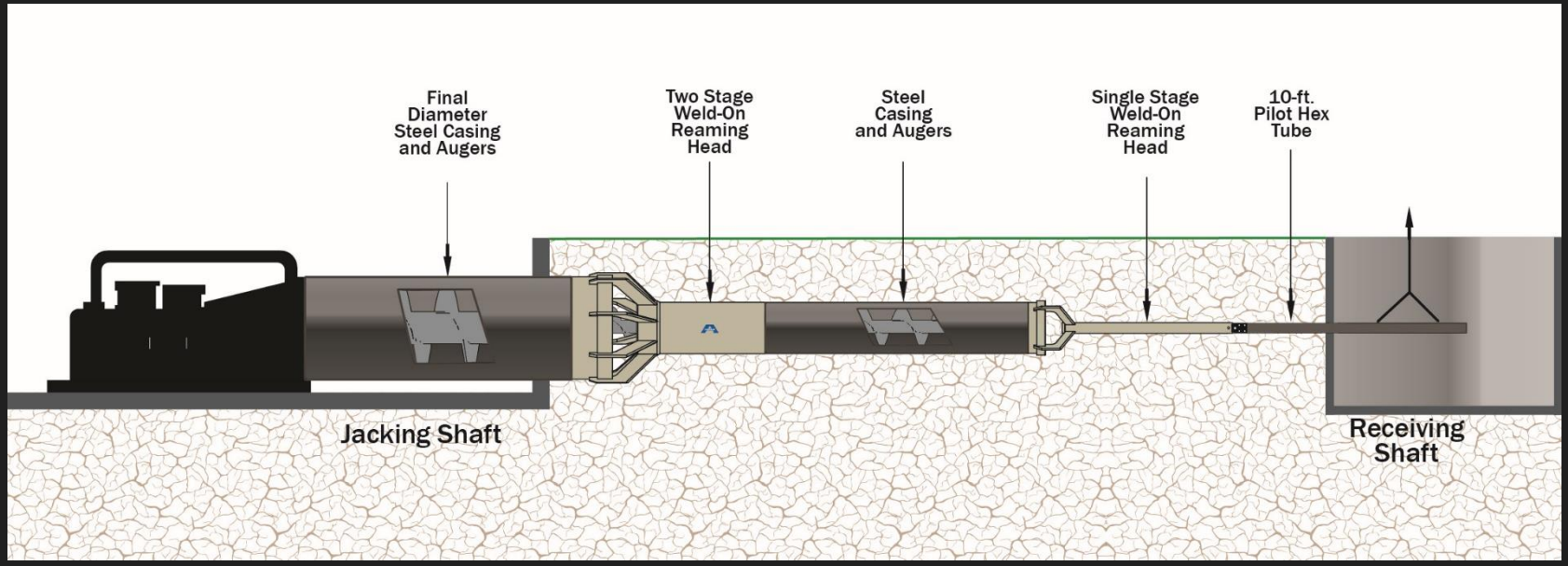
GUIDED AUGER BORING METHOD **PILOT TUBE INSTALLATION**



GUIDED AUGER BORING METHOD STEEL CASING ADAPTER < 36-IN



GUIDED AUGER BORING METHOD STEEL CASING ADAPTER > 36-IN



GUIDED AUGER BORING STEEL CASING ADAPTERS

SINGLE STAGE

Ideal for non-compacted ground where pipe can be easily advanced with the thrust of the auger boring machine

TWO STAGE

Increase to steel casing diameter in two stages

ARMS FLUSH WITH PIPE ID

Arms allow for the correct positioning of the cutter bit for standard soil removal with augers

GUIDED AUGER BORING WITH SWIVELS

KEEPS PILOT TUBES STATIONARY

ABSORBS ROTATION OF AUGER STRING

HIGH THRUST BEARING

GUIDED AUGER BORING

CASE STUDY

CONTRACTOR JOHN FITHIAN CONTRACTING CO.

LOCATION CECIL COUNTY, MD

OWNER CECIL COUNTY

PIPE 24-IN STEEL CASING

TOTAL LENTH 513-FT, 298-FT LONGEST

NO. OF RUNS 3

PROJECT DESCRIPTION/CHALLENGES

- GRAVITY SEWER UPGRADE AT 0.4% GRADE
- INSTALLATION UNDER STREAM, RAILROAD TRACKS AND ENVIRONMENTALLY SENSITIVE AREA AT DUPONT RESEARCH CENTER

GUIDED AUGER BORING

CASE STUDY

CONTRACTOR IVY TESTING SERVICE

LOCATION SHREVEPORT, LA

OWNER CITY OF SHREVEPORT

PIPE 16-42-IN STEEL CASING

TOTAL LENTH 4,959-FT, 465-FT LONGEST

NO. OF RUNS 30

PROJECT DESCRIPTION/CHALLENGES

- GRAVITY SEWER UPGRADES
- UNDER SEVERAL HIGHWAYS AND ROADWAYS IN UTILITY LADEN AREA
- DIFFICULT, HIGHLY COMPACTED GROUND CONDITIONS

DIRECT CASING INSTALLATION

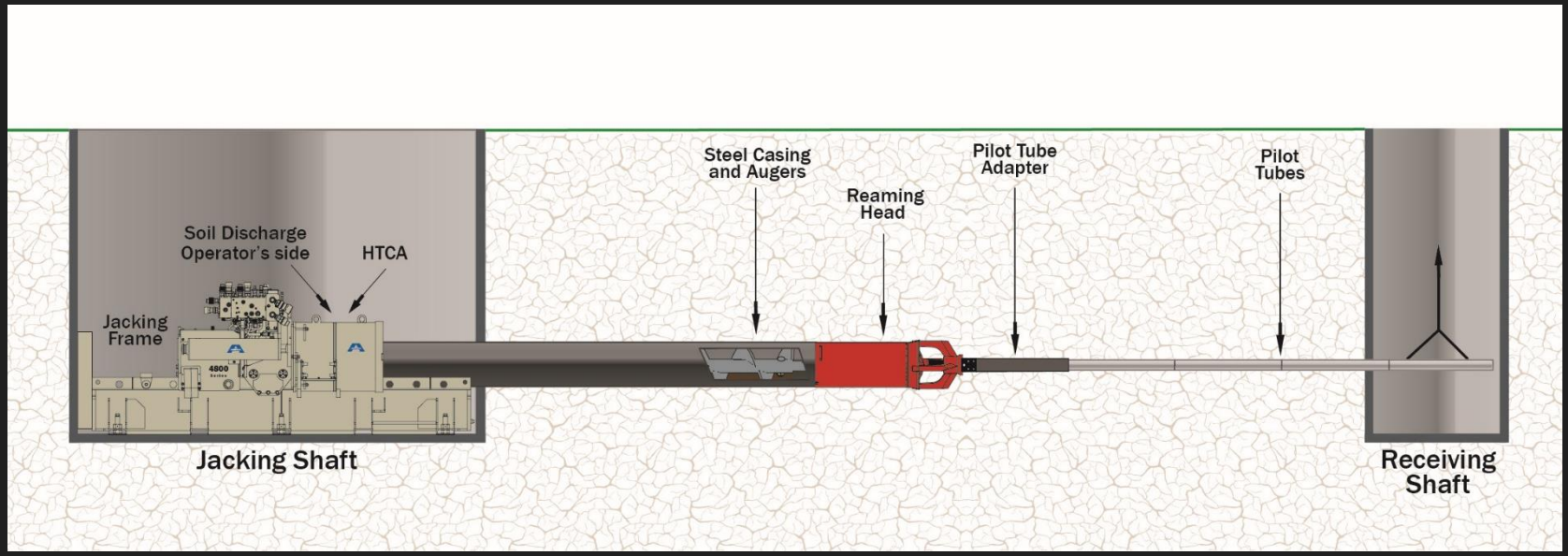
AUGER BORING WITH GBM SYSTEM

DIRECT CASING INSTALLATION

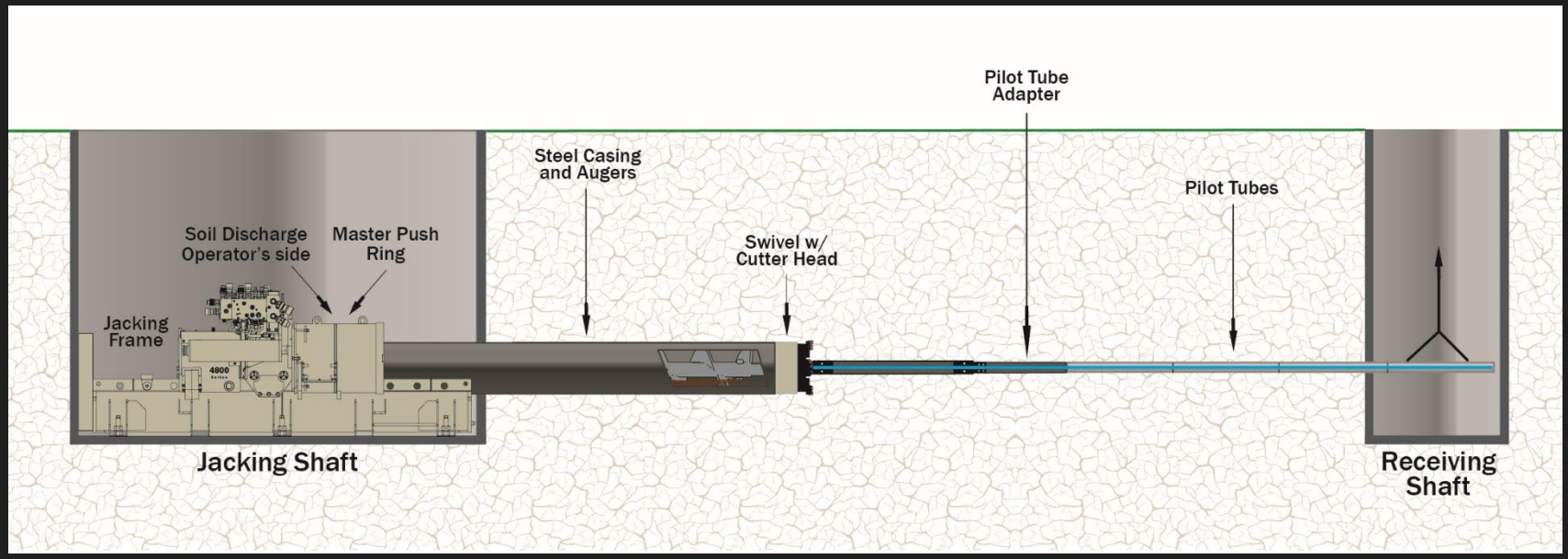
ALL-IN-ONE SYSTEM

A guided boring direct casing installation uses a high capacity jacking frame to first install pilot tubes then steel casing from a minimal diameter shaft or larger using skid extensions. The jacking frame is equipped with a master push ring or casing adapter to augment the jacking frame torque and manage the soil volume.

DIRECT CASING INSTALLATION USING REAMING HEAD & MASTER PUSH RING



DIRECT CASING INSTALLATION USING SWIVELS



DIRECT CASING INSTALLATION USING MASTER PUSH RING/CASING ADAPTER

CASING ADAPTER TO DISCHARGE SOIL VOLUME

MASTER PUSH RING ADDS ADDITIONAL TORQUE FOR LARGER DIAMETERS AND LONGER DRIVES

INSTALL MULTIPLE LENGTHS OF STEEL CASING TO MAXIMIZE PRODUCTION

DIRECT CASING INSTALLATION

CASE STUDY

CONTRACTOR CALGARY TUNNELLING & HORIZONTAL AUGERING LTD

LOCATION CITY OF EDMONTON, AB

OWNER CITY OF EDMONTON

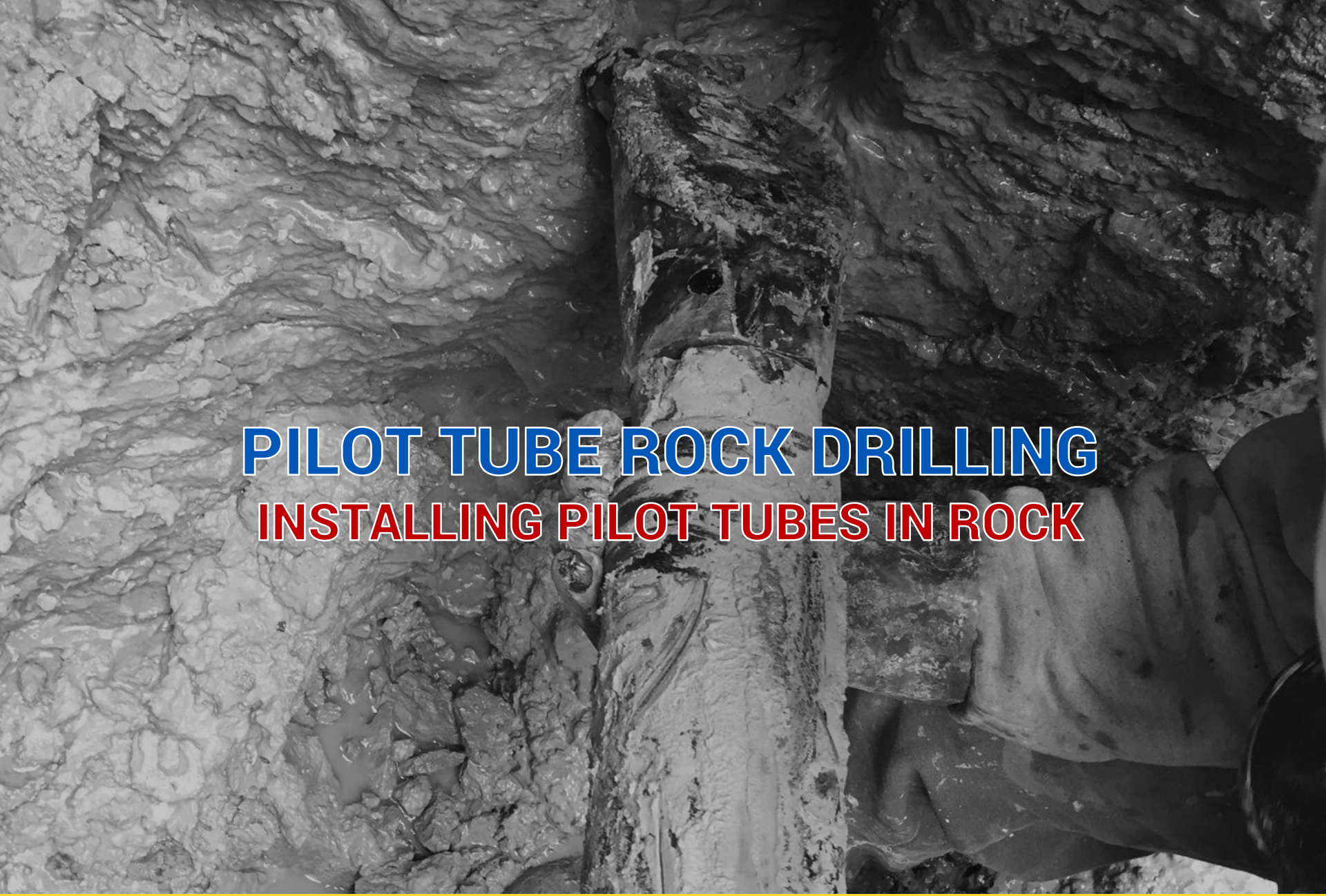
PIPE 16-30-IN STEEL CASING, 1.5M LENGTH

TOTAL LENTH 292-FT

NO. OF RUNS 5

PROJECT DESCRIPTION/CHALLENGES

- INSTALLED GRAVITY SEWER ALIGNMENTS UNDER PEDESTRAIN PATH AT ROGER PLACE
- EDMONTON ARENA DISTRICT PROJECT
- DEPTHS UP TO 10M
- MANY BURIED UTILITIES

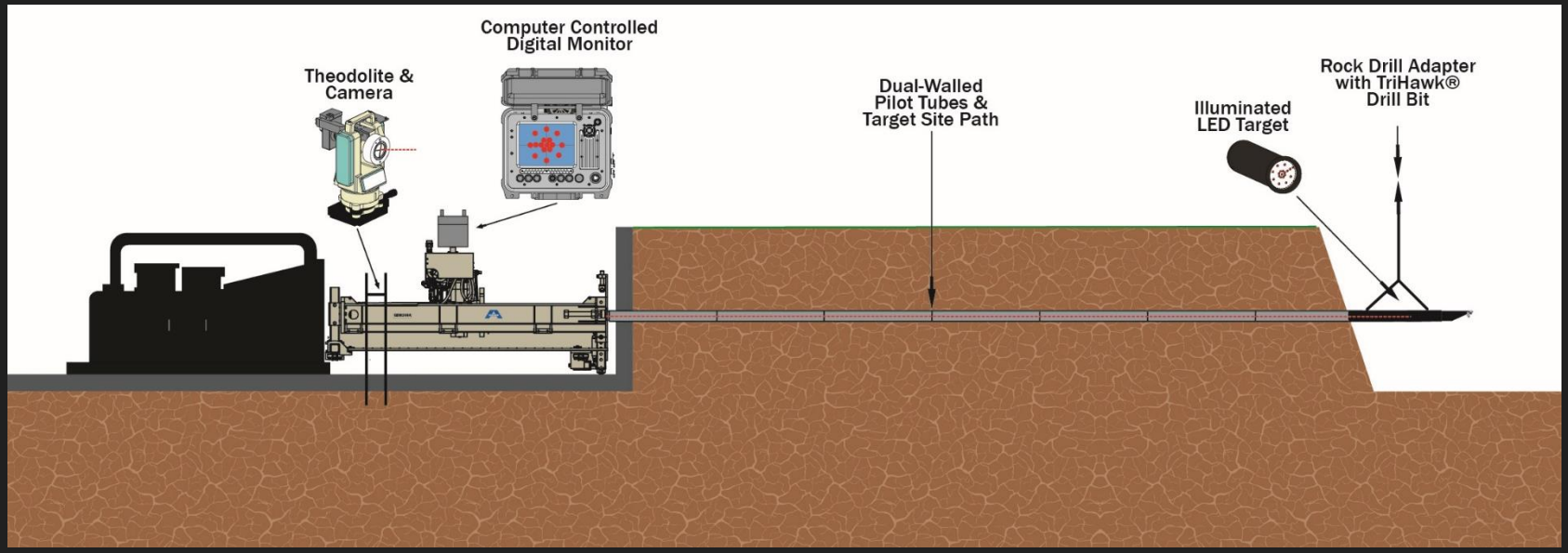

PILOT TUBE ROCK DRILLING
INSTALLING PILOT TUBES IN ROCK

PILOT TUBE ROCK DRILLING

FOR UP TO 12 KSI UCS

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 with cutting tool technology and a ground appropriate lubrication regime.

PILOT TUBE ROCK DRILLING USING DRILL BIT & LUBRICATION



PILOT TUBE ROCK DRILLING

CASE STUDY

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

LOCATION MONTERREY INT'L AIRPORT, NUEVO LEON, MEXICO

OWNER MONTERREY INT'L AIRPORT

PIPE 36-IN STEEL CASING

TOTAL LENTH 197-FT

NO. OF RUNS 1

PROJECT DESCRIPTION/CHALLENGES

- INSTALLATION TO MEET UTILITY JUNCTION BOX
- CONSTRUCTION UNDER LIVE TAXIWAY
- 5 KSI UCS WEATHERED ROCK

PILOT TUBE ROCK DRILLING

CASE STUDY

CONTRACTOR URBAN CONTRACTORS

LOCATION OKLAHOMA STATE UNIVERSITY CAMPUS

OWNER OKLAHOMA STATE UNIVERSITY

PIPE 12-IN STEEL CASING

TOTAL LENTH 180-FT

NO. OF RUNS 2

PROJECT DESCRIPTION/CHALLENGES

- INSTALLED PARALLEL CHILLED WATER LINES
- INSTALLATION ONE FOOT BELOW SANITARY SEWER LINES
- ALONGSIDE ELECTRICAL DUCT BANK
- RED SHALE GROUND CONDITIONS
- NO DISRUPTION TO CAMPUS LIFE

PILOT TUBE ROCK DRILLING

CASE STUDY

CONTRACTOR HORIZONTAL BORING & TUNNELING

LOCATION GREELEY, CO

OWNER CITY OF GREELEY

PIPE 36-IN STEEL CASING

TOTAL LENTH 327-FT

NO. OF RUNS 1

PROJECT DESCRIPTION/CHALLENGES

- SANITARY SEWER INSTALLATION
- MIXED-FACE, DENSELY COMPACTED SANDSTONE
- 25-FT DEPTHS
- UNDER HIGHWAY 34

PILOT TUBE ROCK DRILLING

CASE STUDY

CONTRACTOR MACK EXCAVATION

LOCATION HARLEYSVILLE, PA

OWNER PENNSYLVANIA DOT

PIPE 24-IN STEEL CASING

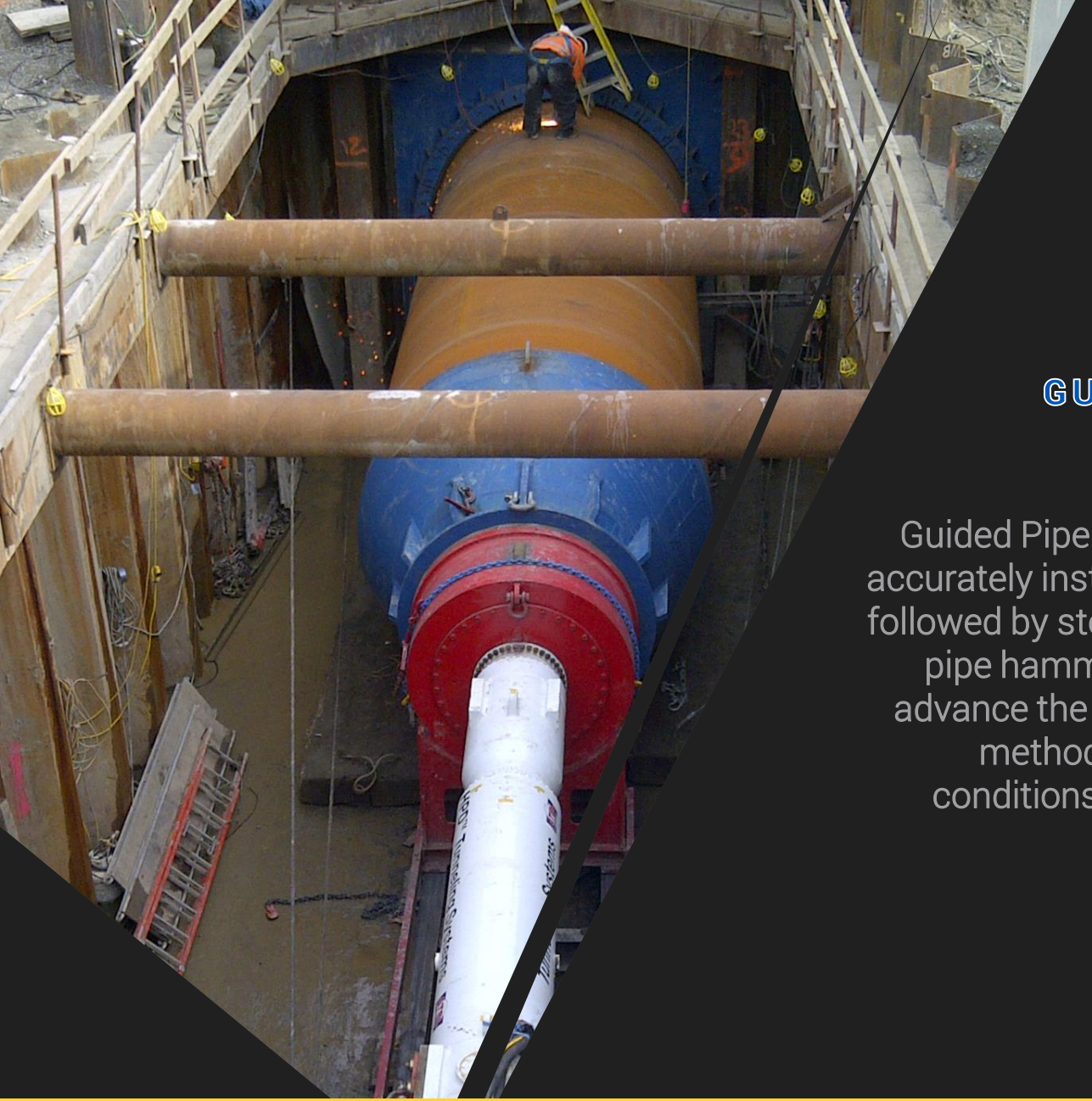
TOTAL LENTH 225-FT

NO. OF RUNS 1

PROJECT DESCRIPTION/CHALLENGES

- UTILITIES CONNECTION FOR HOUSING DEVELOPMENT
- INSTALLED UNDER PENNSYLVANIA TURNPIKE
- RED SHALE UP TO 10 KSI UCS


GUIDED PIPE RAMMING
PILOT TUBE TO STEEL CASING WITH
PNEUMATIC HAMMER



GUIDED PIPE RAMMING

Guided Pipe Ramming is the method of accurately installing pilot tubes which are followed by steel casing and a pneumatic pipe hammer which transfers force to advance the pipe on line and grade. The method is ideal for a variety of soil conditions and up to large diameters.

GUIDED PIPE RAMMING

CASE STUDY

CONTRACTOR CLAUDE H. NIX CONSTRUCTION

LOCATION DRAPER, UT

OWNER UTAH TRANSIT AUTHORITY

PIPE 20 & 30-IN STEEL CASING

TOTAL LENTH 80-FT

NO. OF RUNS 2

PROJECT DESCRIPTION/CHALLENGES

- INSTALLATION OF UTILITIES ON LINE AND GRADE UNDER ACTIVE COMMUTER RAIL LINES
- WITHIN A FEW INCHES OF RAILWAY'S FIBER OPTIC SIGNAL CONTROL LINES
- 4-HOUR-A-DAY, 20 HOUR TOTAL CONSTRUCTION WINDOW

UTILITY PULLBACK INSTALLATIONS

FOR HDPE, PVC AND FIBER OPTIC CABLES

UTILITY PULLBACK INSTALLATIONS

The Utility Pullback method uses the guided boring system for an accurate pilot tube installation which is followed by a carrier pipe installation by pullback of fiber optic cable, gas line, PVC or HDPE pipe. This method works in low blow count, displaceable soil using up to 11-in. tooling.

UTILITY PULLBACK INSTALLATIONS

CASE STUDY

CONTRACTOR CST UTILITIES, LLC

LOCATION HILLARD, OH

OWNER RICH'S FOOD

PIPE 1.5-IN HDPE

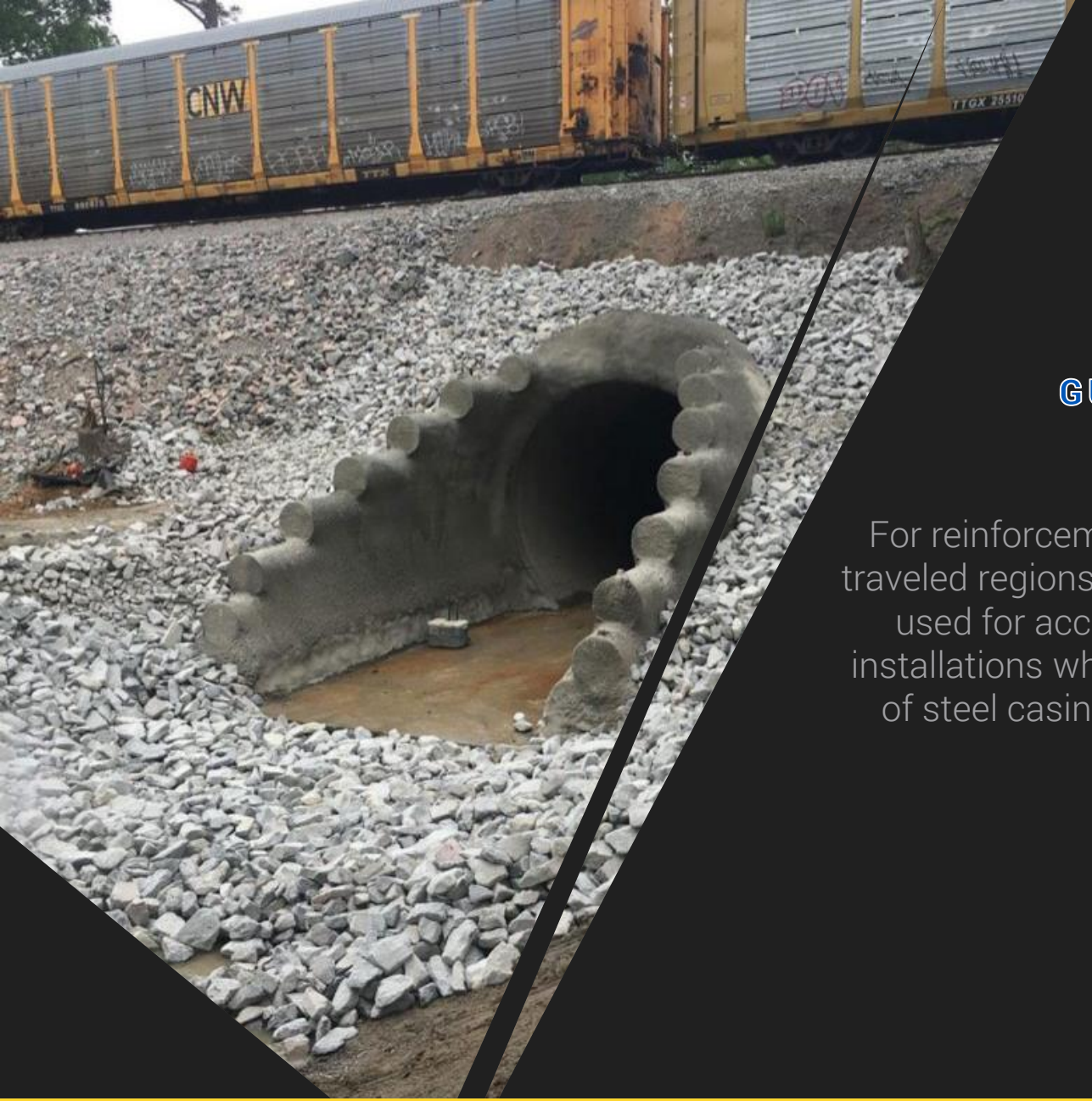
TOTAL LENTH 153-FT

NO. OF RUNS 19

PROJECT DESCRIPTION/CHALLENGES

- METHOD USED TO PULLBACK HEATING LINES IN FROZEN FOOD MANUFACTURER'S FLOOR


GUIDED PIPE ROOFING
USING PILOT TUBES AND STEEL CASING
FOR STURCTURAL SUPPORT



GUIDED PIPE ROOFING

For reinforcement on crossings in heavily traveled regions. A guided boring system is used for accurate, successive pilot tube installations which are followed by lengths of steel casing to create an arch above a support structure.

GUIDED PIPE ROOFING

CASE STUDY

CONTRACTOR TUNNELING SOLUTIONS

LOCATION SYDNEY, AUSTRALIA

OWNER MULTIPLE (3 PROJECTS)

PIPE 12.75-IN STEEL CASING, 20-FT LENGTH

TOTAL LENTH 131-FT AVERAGE

NO. OF RUNS 45

PROJECT DESCRIPTION/CHALLENGES

- METHOD USED TO SUCCESSFULLY INSTALL PILOT TUBES FOR THREE STEEL CASING PIPE ROOFS/CANOPIES
- INSTALLATION IN UP TO 50 MPA GROUND CONDITIONS

THANK YOU!

CONTACT US

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