

Snap-Pipes

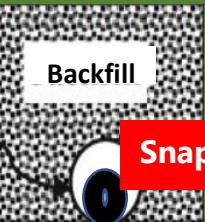
**Re-Imagining Undergrounding
Helping Mitigate Climate Risk
Reducing Time and Cost of Undergrounding**



1. Re-Imagining Undergrounding

Process Simplification

Snap-Pipes



Backfill
Snap-Pipe

All Terrain

Asphalt
Concrete
Rock
Clay
Loam
Sand
Marsh
Forest
Woods
Water
Snow
Ice

Current Method

Escalating Costs

Individual Project Planning

Individual Project Engineering

Construction Standards

Construction Management:

Trench Fill Materials

Heavy Equipment

Scheduling Skilled Labour

Long Lead Time

Complex Inventory Management

Centralized Effort

Individual Project Planning

Individual Project Engineering

New Construction Standards

Construction Management:

Trench Fill Materials

Heavy Equipment

Plentiful Non-Skilled Labour

Long Lead Time

Simple Inventory Management

Field Empowerment

Declining Costs

Snap-Pipes

Paid from Construction Savings



2. Re-Imagining Underground

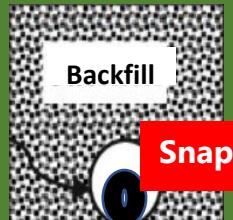
Improving Efficiency & Effectiveness in cabling

Snap-Pipes



All Terrain

Asphalt
Concrete
Rock
Clay
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Water
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Ice



All Weather

All Terrain

- Single Solution
- Less Inventory
- Land + Water
- Global Use

Little or No
Excavation

- Surface Run
- Shallow Trench
- Time Saving
- Labour Saving

No Heavy
Machinery

- Rental Savings
- Fuel Savings
- Job flexibility
- Use Hand tools

Env. Benefits
(CO2 tons/mile)

- Snap-Pipes->2.8
- Machines-> +++
- Fuel-> +++++
- Vegetation-> ++

Other Savings

Eliminate "Fill"
Materials

- Sand
- Flagstone/Brick
Cover

- No Vegetation
Management
- Un-armoured
Cable



Snap-Pipes

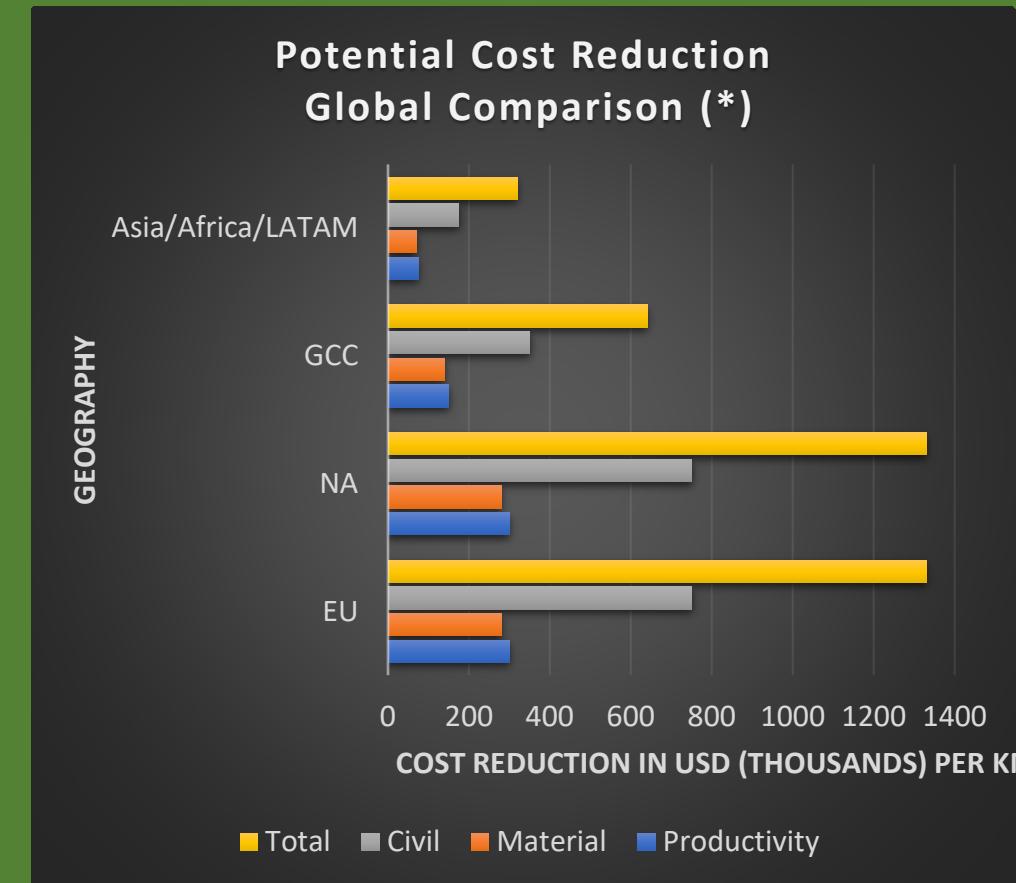
Paid from Construction Savings



3. Re-Imagining Cost Reduction

Drastic Reduction in Civil Construction & Trenching Costs

Snap-Pipes

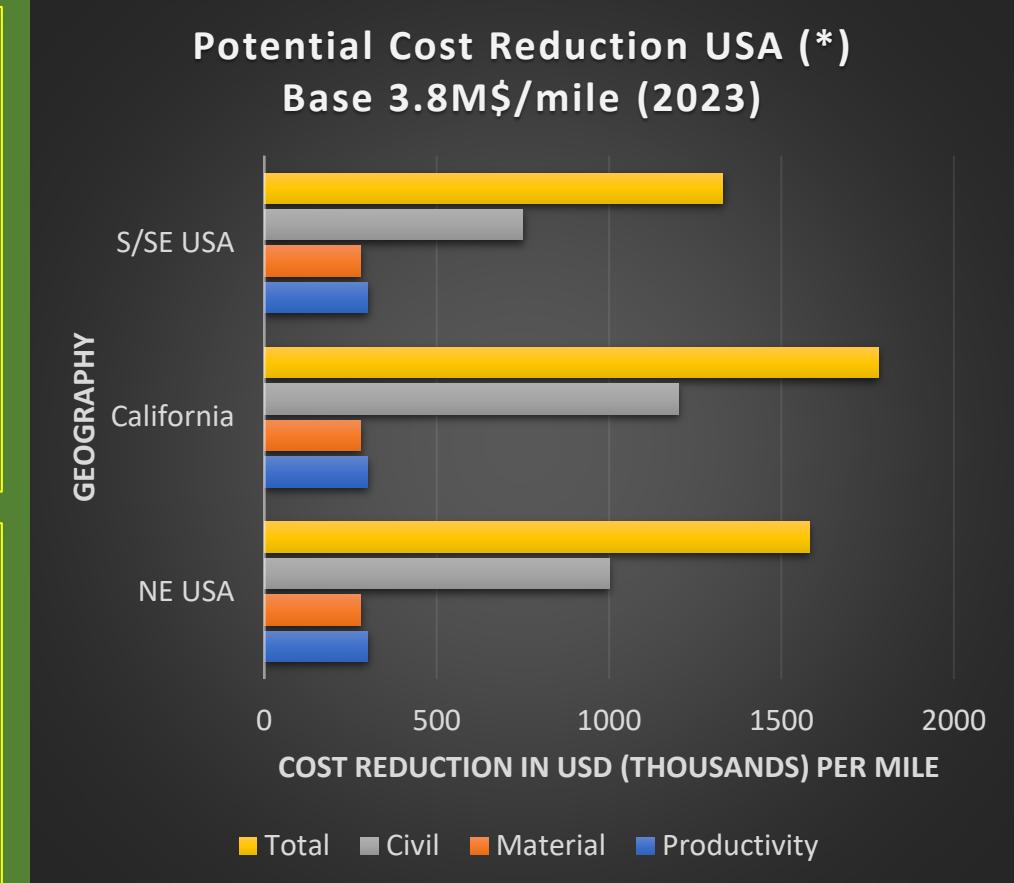


Savings

- Planning
- Material
- Process
- Labour
- Equipment
- Time

Other Savings

- No Vegetation Management
- Easy cable repair - open at fault location only



(*) individual project cost reduction will depend on material and labour costs in each jurisdiction

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Snap-Pipes

Paid from Construction Savings



Snap-Pipes

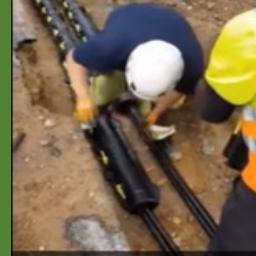
All-terrain - Single Solution

- **Flexible Split Pipe Interlocking System:**

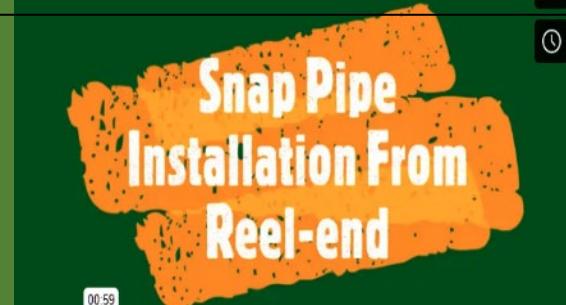
- Recycled (PP-EPDM) Automotive Plastic (~2.8 t CO2-eq/mile)
- Ambient -40 to +55 ° C (-40° F to 135° F)
- UV & Impact Resistant
- Collar Flex 22/15/7 degrees (x-y-z planes)
- *Same Tests as Other Underground Electrical Pipes (EN 61386-24)*
- *Fire Resistance Coating available upon request*

- **Single System – Multiple Installation:**

- HV / MV / LV Cables (1C and 3C)
- Open only select fault location sections – Rest undisturbed
- *All-Topology - Above-Grade, Shallow Below-Grade; Underwater*
- *All Soils – Rocky, Clay, Sand. Forest, Marsh, Snow, Permafrost*
- *No Power Tools, Simple & Fast Operation*



Click View Button OR Click "Trust Document" in PDF to activate video



[Cable Protection System | Biosirus Inc.](#)



[Cable Protection System | Biosirus Inc.](#)



[Cable Protection System | Biosirus Inc.](#)

Best Value

Snap-Pipes

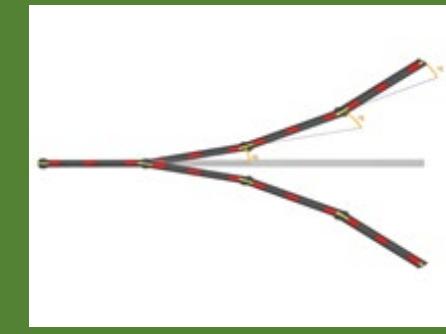


- High Fuel Costs
- Remote Distances
- Expensive Rentals
- Easy Scheduling

- Trade Special Labour
- High Labour Rates
- Project Delays
- Low Productivity

- Few Sizes
- All Terrain Application
- Outdoor/Site Storage

- Forest, Thicket
- Rock, Clay, Sand
- No Shoring
- Water Bodies



North America:



Canada



Manitoba Hydro

- Little Grand Rapids, Family Lake, Manitoba
- 0.5 km (1640 ft) – Lake Crossing/Onshore



Hydro One

- Bancroft Lake Area. Ontario
- 1.2 km (0.75 miles); multiple shorelines



USA



PG&E

- Innovation Pitch Fest 2023 Winner
- Underground Category



Select Utilities

- Discussions
- HV/MV/LV Undergrounding of O/H lines



Channel/Service Partners



European Union:



Sweden



Wind Farms

- Aland (4.4 Km), Blakliden, Fäbodberget
- Stigshöden – Above ground (4.4 Km)



Urban

- Tingsryd Town (just 0.35 m under asphalt)
- Above ground temporary construction cables (1.6 Km)



Above Ground

- Archipelago, Stockholm (0.8 Km)
- Lustån, Dalarna county - alongside railway tracks (2.3 Km)
- Jönköping – alongside railway tracks (700 m)



Sub-Sea / River / Under Water

- "Möcklö-Senoren" island, archipelago Karlskrona (850 m)
- "Alsterån" River Crossing, Kalmar County (50 m)
- Snäckö, east coast archipelago (1.65 Km)



Railway

- Above ground along railway tracks



Belgium



Floating Solar

- Port Oostende



France



Nuclear Plant

- Above Ground - Temporary Cable (2.5 Km)

Asia and Australia:



India



Tata Power

- Bend Restrictor - urban direct buried cables
- New Delhi and Mumbai (80m/263 ft)



Indian Utility Discussions

- Elephant electrocution prevention
- U/G of forest O/H line sections



Australia



Railways - Above Ground

- Perth Area – along railway tracks
- 5.5 km



Channel/Service Partners



Middle East/GCC



Discussions:

HV/MV/LV & Solar PV Cable Protection

Wide Product Range



Outer Dia.	Inner Dia.	Length(s)	Joint Angle	Weight
110 mm 4.33 in	102 mm 4.02 in	1200 mm 47.2 in	22.5 deg	1.7 Kg 3.75 lb
120 mm 4.73 in	110 mm 4.33 in	1200 mm 47.2 in	22.5 deg	2.7 Kg 5.95 lb
160 mm 6.3 in	150 mm 5.91 in	1200 mm 47.2 in	22.5 deg	3.1 Kg 6.83 lb



Outer Dia.	Inner Dia.	Length(s)	Joint Angle	Weight
60 mm 2.36 in	50 mm 1.97 in	1000 mm 39.4 in	15 deg	1.2 Kg 2.65 lb
110 mm 4.73 in	99 mm 3.89 in	1000 mm 39.4 in	15 deg	2.7 Kg 5.95 lb
160 mm 6.3 in	144 mm 5.67 in	1000 mm 39.4 in	15 deg	4.3 Kg 9.48 lb
220 mm 8.66 in	200 mm 7.87 in	1000 mm 39.4 in	15 deg	8.0 Kg 17.64 lb



Ring Stiffness	Compression	Impact Test	Heat & UV Resistance	Material Evaluation
ISO 9969-2016	EN 61386-24	EN 61386-24	ISO 4892-3/527	ISO 14044



Pipe Nom. Dia.	Length	Weight	Tie Down	
76 mm 3 in	890 mm 36 in	10-12+ kg 22-27+ lb.	2 straps	
101 mm 4 in	890 mm 36 in	18-20+ kg 40-45+ lb.	2 straps	

Uni-Weights (Marine/Shore)



Outer Dia.	Inner Dia.	Length(s)	Joint Angle	Weight
70 mm 2.36 in	50 mm 1.97 in	300 mm 11.8 in	7 deg	1.0 Kg 2.20 lb
70 mm 2.36 in	50 mm 1.97 in	1000 mm 39.4 in	7 deg	3.4 Kg 7.5 lb
110 mm 4.73 in	90 mm 3.54 in	300 mm 11.8 in	7 deg	1.7 Kg 3.75 lb
110 mm 4.73 in	90 mm 3.54 in	1000 mm 39.4 in	7 deg	4.7 Kg 10.36 lb
160 mm 6.3 in	140 mm 5.51 in	300 mm 11.8 in	7 deg	2.1 Kg 4.63 lb
160 mm 6.3 in	140 mm 5.51 in	1000 mm 39.4 in	7 deg	6.0 Kg 13.23 lb

Best

Typical Application Notes

Snappy-Pipes

Notes:

1. Generic guidelines per EN 61386 (5% limit)
 - Compression Strength Class: 250/450/ 750/ 1250
 - Impact Resistance: N
 - Deeper depths for higher loads, larger pipe dia.
2. National Codes may differ
3. Results may differ for non-typical loading
4. (*) Quiclock 110mm is 250N rated
5. (**) Hardlock 60mm is 450N rated



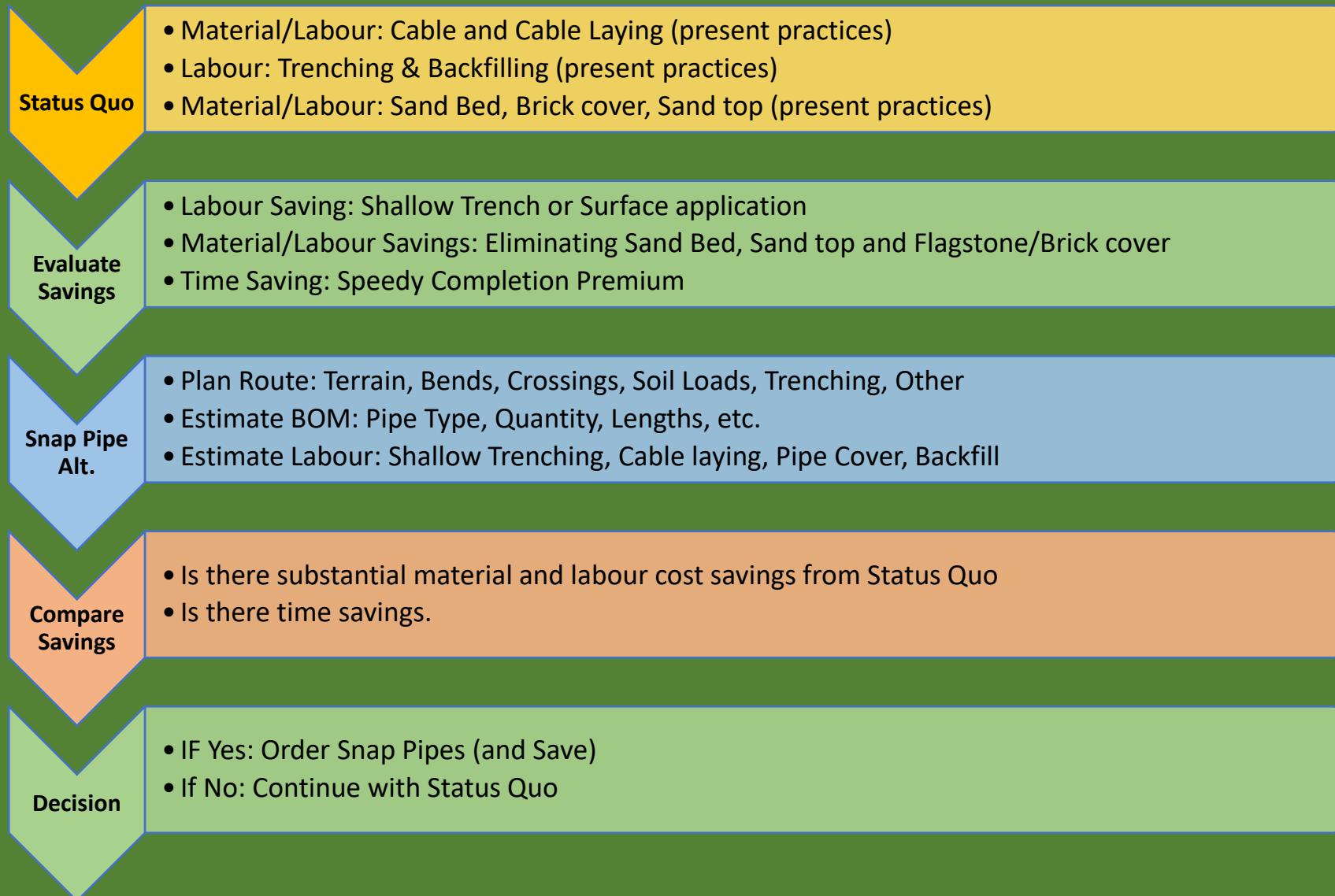
EN 61386-24: Load should not cause internal pipe diameter deformation by more than 5% (limit)

Quicklock (Class 250 N*/450 N) [Good]				
(Depth per EN: 61386-24)				
Outer Dia.	15 kN	125 kN	250 kN	400 kN
110 mm* 4.33 in	0.3 m 11.8 in	0.5 m 19.7 in	0.7 m 27.6 in	0.8 m 31.5 in
120 mm 4.73 in	0.3 m 11.8 in	0.5 m 19.7 in	0.7 m 27.6 in	0.8 m 31.5 in
160 mm 6.3 in	0.3 m 11.8 in	0.6 m 23.6 in	0.7 m 27.6 in	0.8 m 31.5 in

Hardlock (Class 450 N**/750 N) [Better]				
(Depth per EN: 61386-24)				
Outer Dia.	15 kN	125 kN	250 kN	400 kN
60 mm** 2.36 in	0.3 m 11.8 in	0.4 m 15.7 in	0.5 m 19.7 in	0.5 m 19.7 in
110 mm 4.73 in	0.3 m 11.8 in	0.5 m 19.7 in	0.6 m 23.6 in	0.7 m 27.6 in
160 mm 6.3 in	0.3 m 11.8 in	0.5 m 19.7 in	0.6 m 23.6 in	0.7 m 27.6 in
220 mm 8.66 in	0.3 m 11.8 in	0.5 m 19.7 in	0.7 m 27.6 in	0.8 m 31.5 in

Panzar (Class 1250 N) [Best]				
(Depth per EN: 61386-24)				
Outer Dia.	15 kN	125 kN	250 kN	400 kN
70 mm 4.73 in	0.3 m 11.8 in	0.3 m 11.8 in	0.5 m 19.7 in	0.5 m 19.7 in
110 mm 4.73 in	0.3 m 11.8 in	0.4 m 15.7 in	0.5 m 19.7 in	0.6 m 23.6 in
160 mm 6.3 in	0.3 m 11.8 in	0.4 m 15.7 in	0.6 m 23.6 in	0.6 m 23.6 in

Solution Steps



In Closing:

Snap-Pipes

Commercialized Technology - Simple – Fast – Less Expensive

Climate Change Mitigation at a lower cost

Steps:

- Client Meeting:
 - Product Samples/Demo
 - Standardize Needs
- Short Term: 1-50km Field Trials
 - Forest/Thickets (surface run)
 - Hilly Terrain (surface run)
 - Rural (shallow-trench)
 - Water Crossing (submarine)
- Long Term: Partnership
 - Achieve: 1,000 miles/year
 - Bulk PO → Periodic Release
 - Work with contractors
 - Establish local inventory



Spec. Highlights

4", 5", 6"
Sch.40 (4 mm wall)
22° Collar Flex

Above-Grade

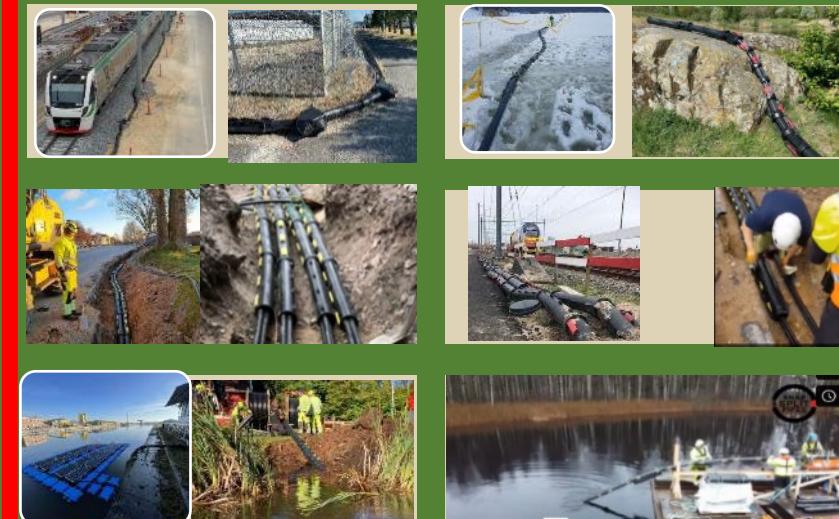
Limited Use

Shallow Below-Grade



Water-Crossing

Not Recommended





[Downloads \(biosirus.com\)](http://Downloads (biosirus.com))

Thank You

Reducing Time and Cost of Undergrounding
(Surface / Below Grade / Underwater)



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