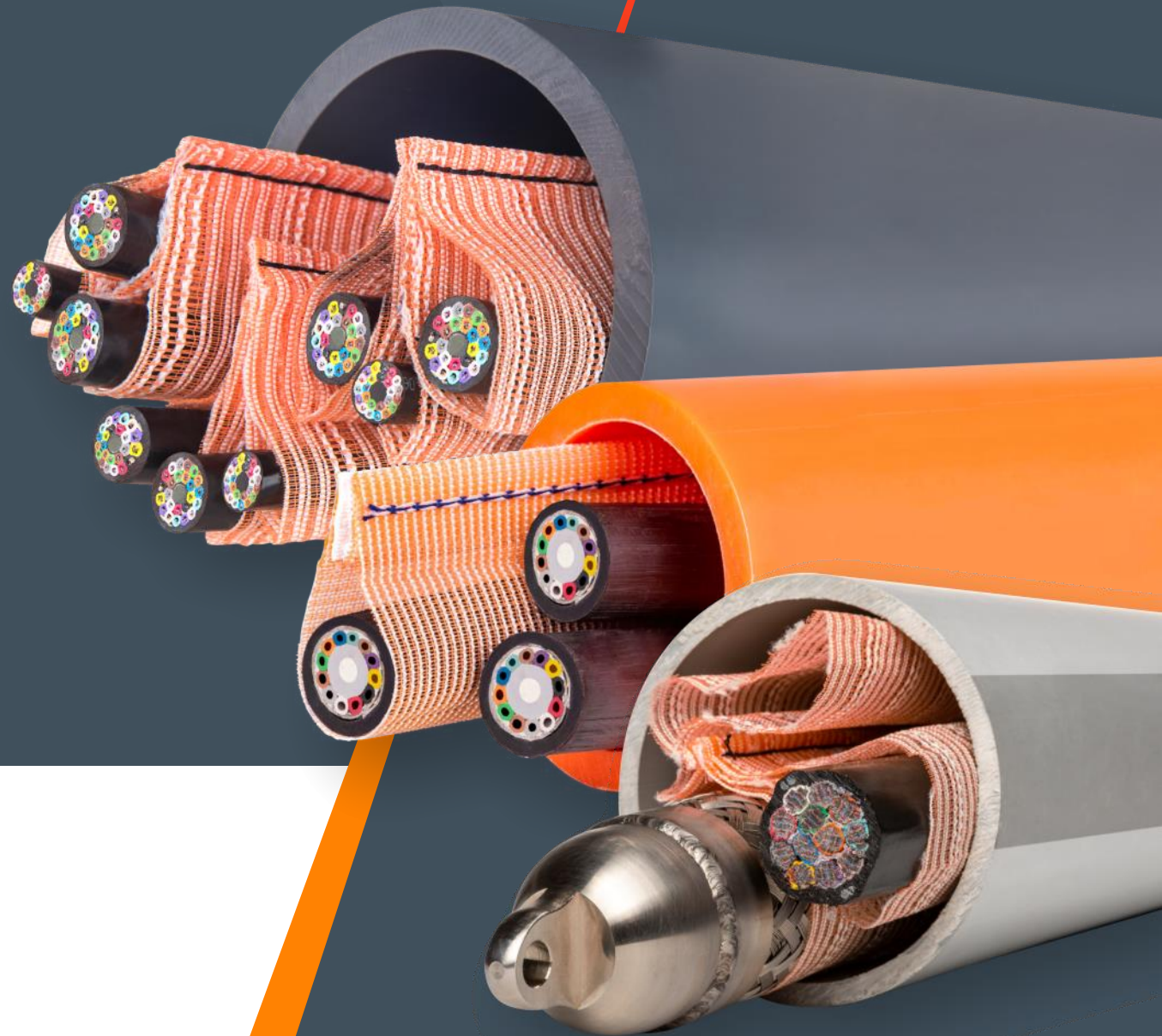


MaxCell Overview

Tyler Andrews – MidAtlantic Region



Future Network Flexibility



Fabric Mesh Innerduct

- Fabric Mesh Textile Innerduct (Inner Duct)
- Fabric Innerduct is designed for deploying communication cables.
- The flexible nature of Fabric innerduct enables it to take the shape of the cables, allowing more cables to be placed within a conduit.



Future Network Flexibility

Why MaxCell?

MaxCell is the only Flexible Fabric Innerduct System, Designed Specifically for the Network Construction Industry

- Increase cable density by up to 300%
- Reduce # of conduits required
- Lightweight product + faster installation = reduced material and labor costs
- More efficient, and sustainable than rigid innerduct alternatives



Fabric Innerduct Reduces New Construction Cost versus Rigid Innerduct



Rigid HDPE Innerduct

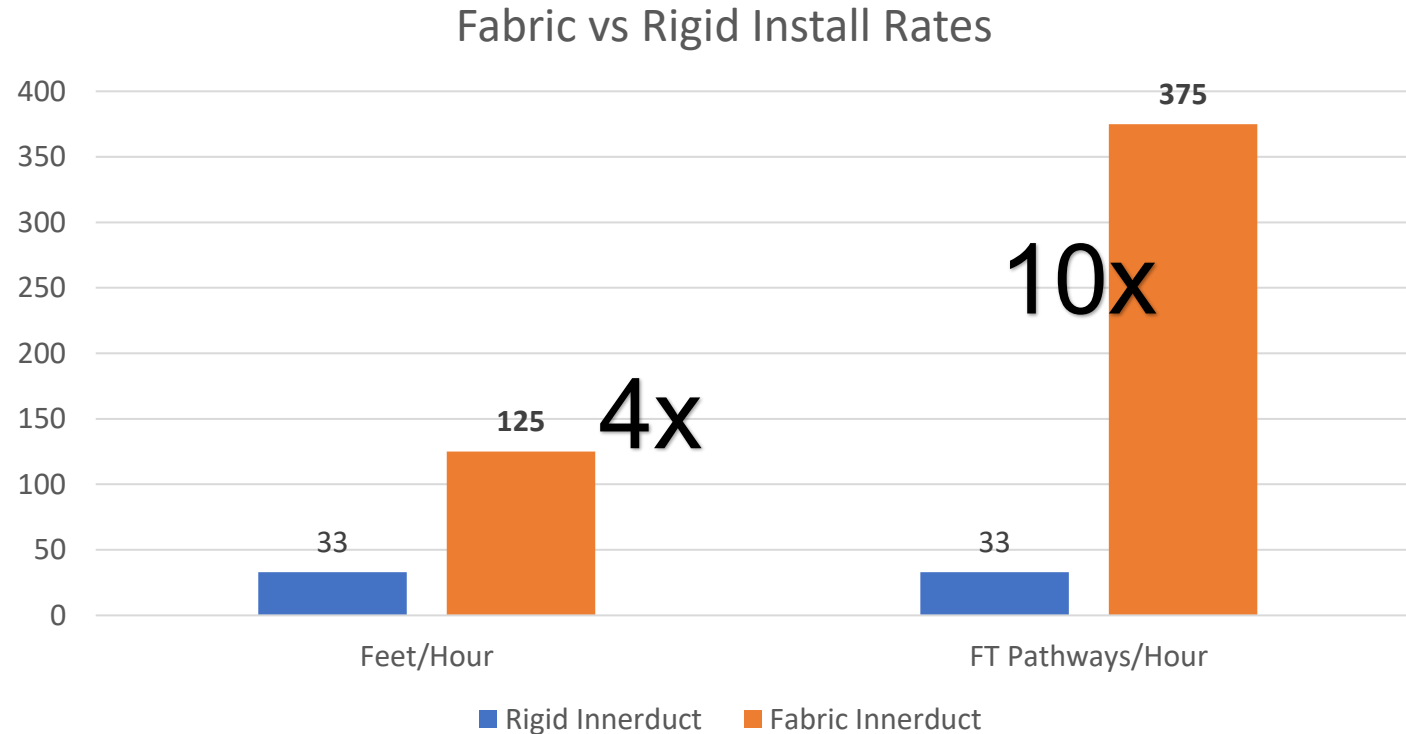


Fabric Innerduct

- Lower Material Costs – Less Outer Duct, Less Lubricant, Less Scrap
- Lower Labor Costs – Easier to Install (fewer people, faster install)
- Lower Handling Costs – Lower Shipping and Logistics Costs

More Pathways, More Time

According to NECA's Manual of Labor Units (MLU):



*Based on NECA's finding that: (3" 3-cell) Fabric Innerduct takes 8 hours to install 1,000' under standard conditions, and (1" Single) Rigid Innerduct takes 3 hours to install 100' under standard conditions.

**If it takes you 8 hours to install 1,000' of Fabric Innerduct, call us – we can do it faster.

MaxCell Installation



More Pathways, More Space

Lower Shipping Costs
Lower Warehousing Costs



1/9th the Weight
1/10th the Volume



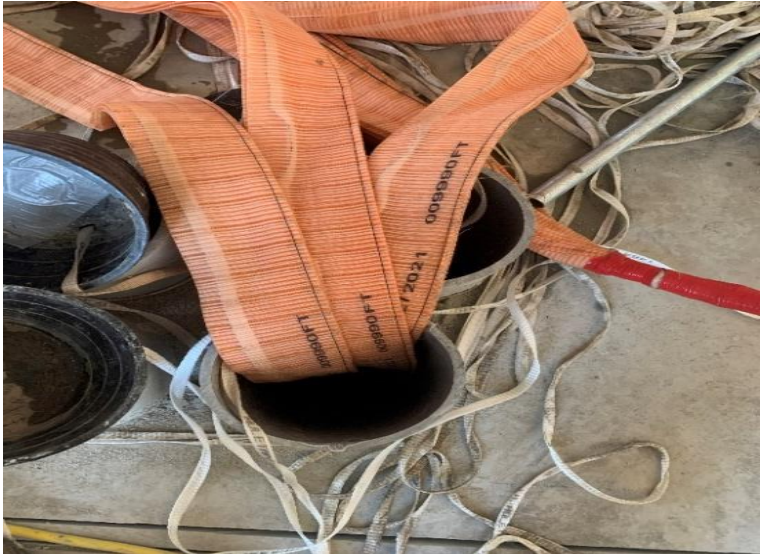
54,000 Rigid Innerduct Feet
8 Reels
15,600 lbs.
256 Sq. feet



54,000 Fabric Innerduct 3" 3 Cell Feet
1 Reel (Segmented)
1650 lbs.
24 Sq. feet

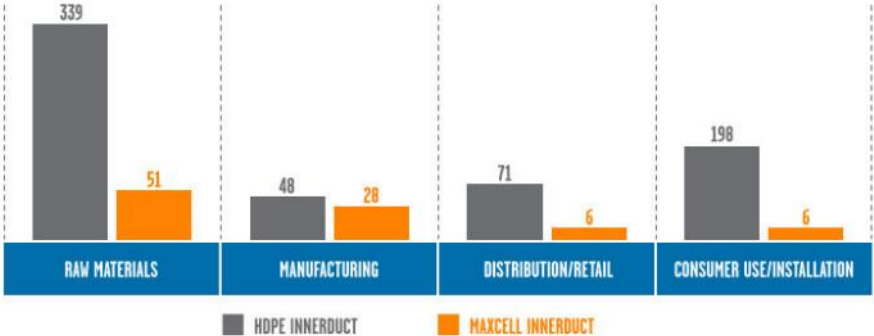
*1,000 ft of 3x3 ships UPS

Orange is the New Green



81.24% CARBON EMISSIONS REDUCTION
VS. HDPE INNERDUCT

Carbon Footprint Comparison



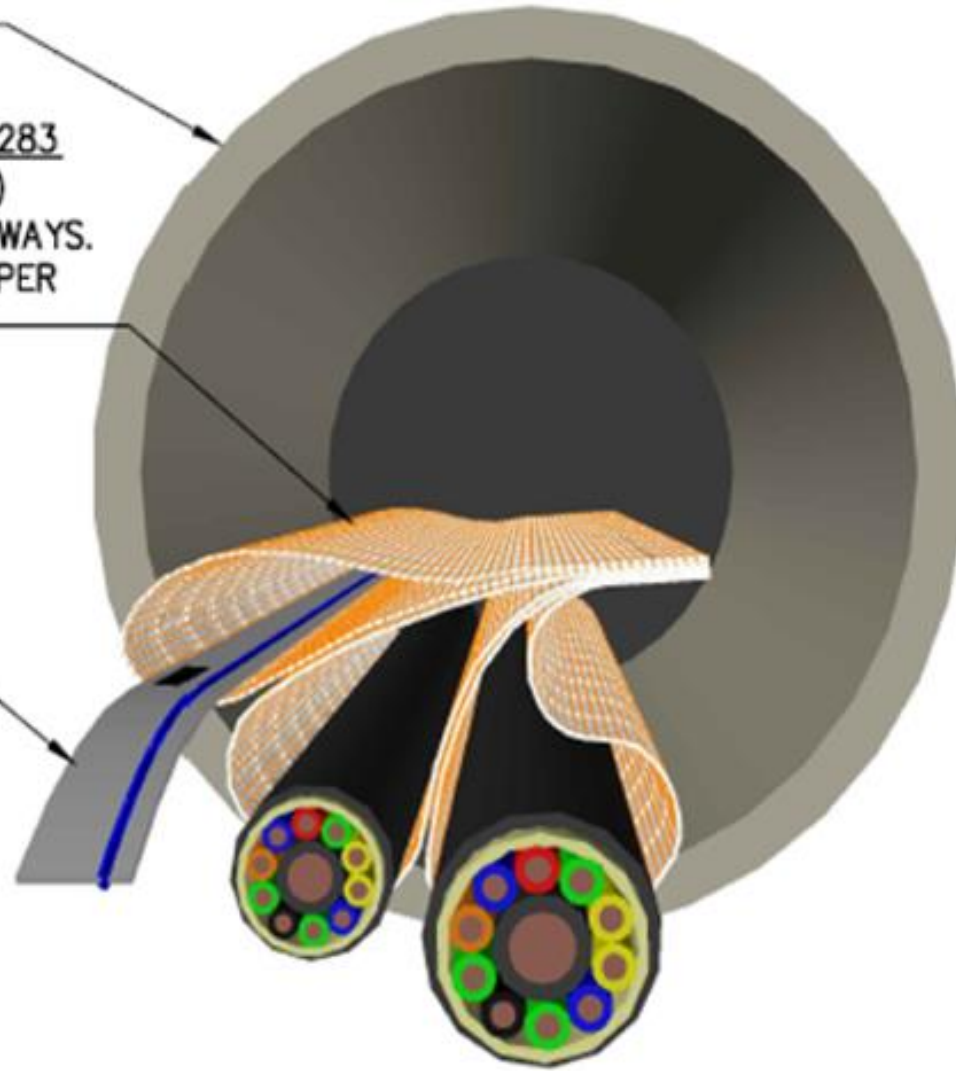
(KG CO2 equivalent per single cable pathway)



TYP. 4" ϕ CONDUIT

MAXCELL EDGE: MXE64283
3" INNERDUCT WITH (3)
FLEXIBLE CELLS/ PATHWAYS.
MAX CABLE DIAMETER PER
CELL IS 1.05"

1250# PULLING TAPE



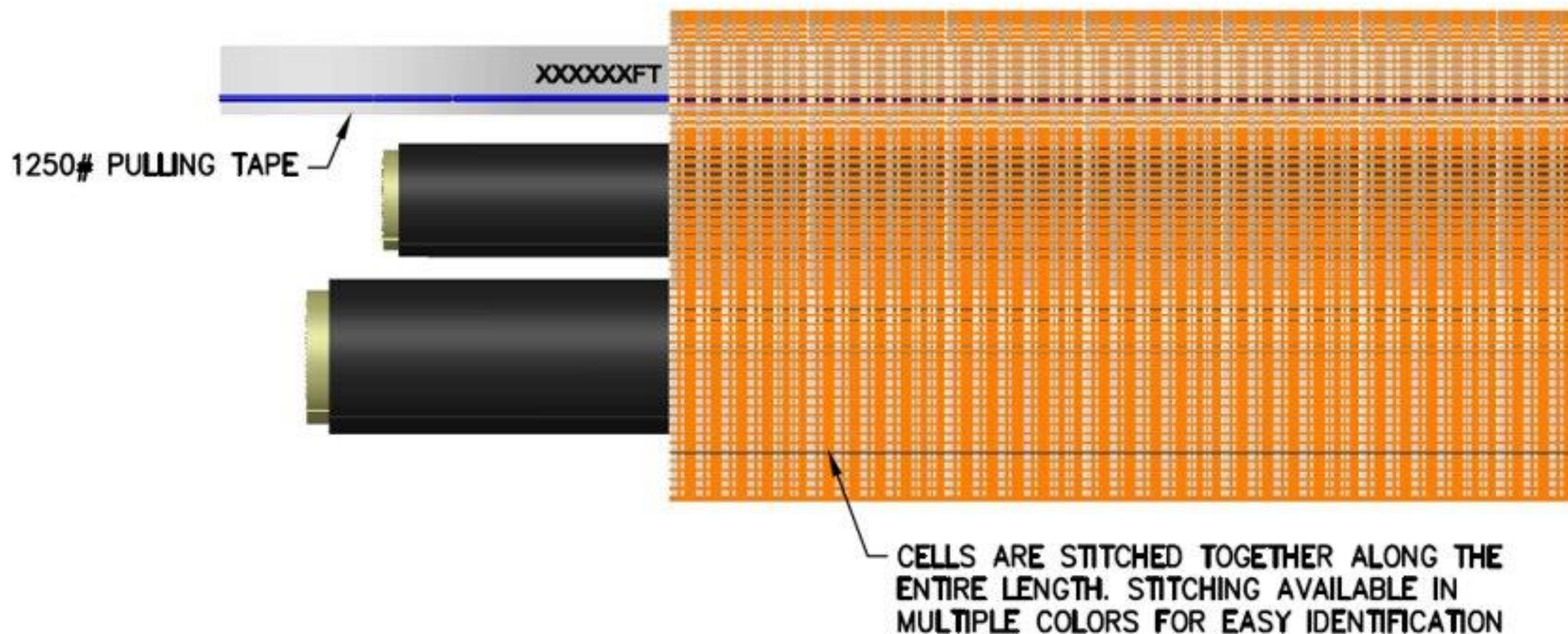
2-PACK INSTALLATION





3-PACK INSTALLATION

SINGLE PACK INSTALLATION

MAXCELL INNERDUCT INCLUDES FOOTAGE MARKERS EVERY 5FT.

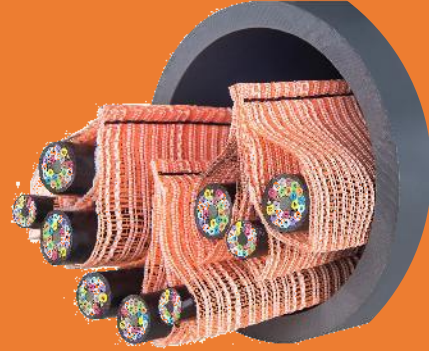


MaxCell Edge Configurations

	4"	3"	2"	1.75"	1.5"	1.25"
 4 Cell	X	X	X <i>* Edge Detectable</i>	X <i>* Edge Detectable</i>		
 3 Cell	X <i>* Edge Detectable</i> <i>** Data Center Edge</i>	X <i>* Edge Detectable</i>	X <i>* Edge Detectable</i>	X <i>* Edge Detectable</i>	X	X <i>* Edge Detectable</i>
 2 Cell			X <i>* Edge Detectable</i>	X <i>* Edge Detectable</i>	X	X <i>* Edge Detectable</i>
 1 Cell			X <i>* Edge Detectable</i>	X <i>* Edge Detectable</i>	X	X <i>* Edge Detectable</i>

MaxCell Solutions Overview

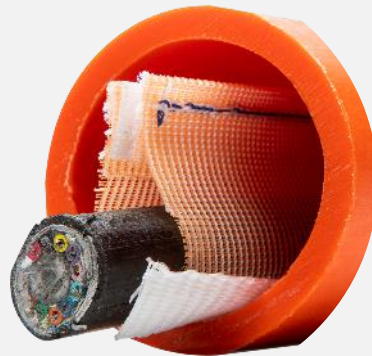
MaxCell Edge



MaxCell Premise

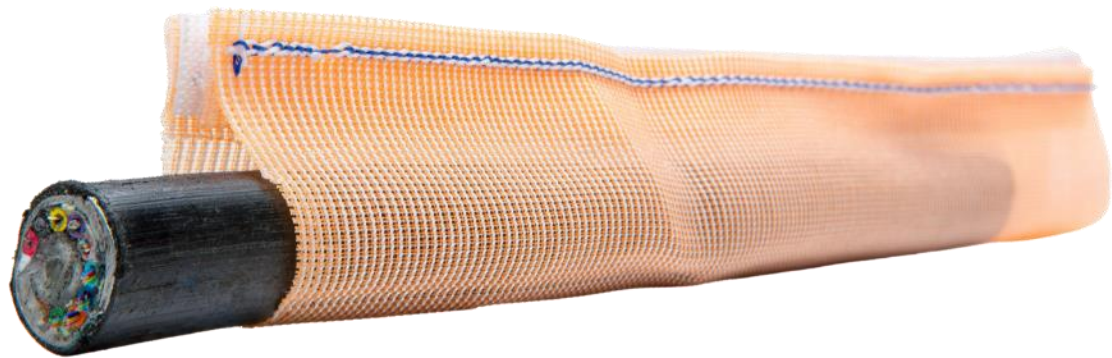


MaxWrap



MaxSpace





MaxWrap – Pull-assist Fabric Innerduct solution

- MaxWrap – the single-pull, load-carrying fabric innerduct that expands pathway capacity
- Direct 85% of pulling tension on the MaxWrap instead of cable
- Allows for longer pulls than traditional methods
- Protect against burn-through between new and existing cables



PULL



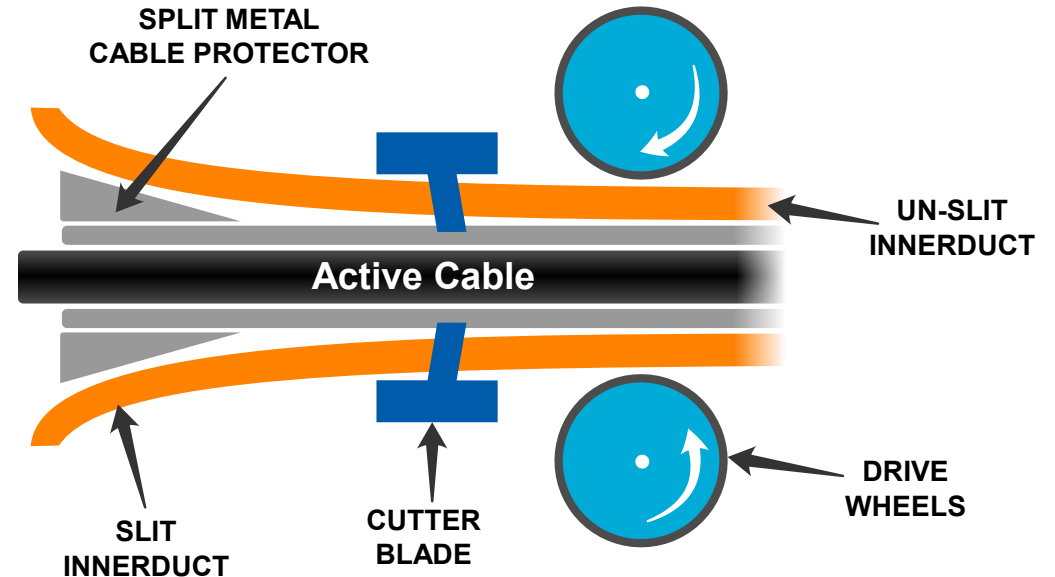
WRAP



RUN

MaxSpace Conduit Recovery Service

- MaxSpace removes rigid innerducts and recovers up to 90% more conduit space to allow for more cables to be placed in a conduit that was considered full
- MaxSpace is a patented no-dig technology and construction service that safely removes existing innerduct from around active fiber optic cables – with no interruption to service





Maximizing Pathways

- Pull cable over cable
 - Damage potential
 - No protection
 - Difficult pulls
- Standard HDPE innerduct
 - Separates/protects
 - Poor space utilization
- Microduct
 - Not robust
 - Expensive equipment
 - Multiple SKU's
- MaxCell
 - Maximum pathway efficiency
 - Low installation cost



Future Network Flexibility

Curb to Building & Fiber to Cell Sites

Problems

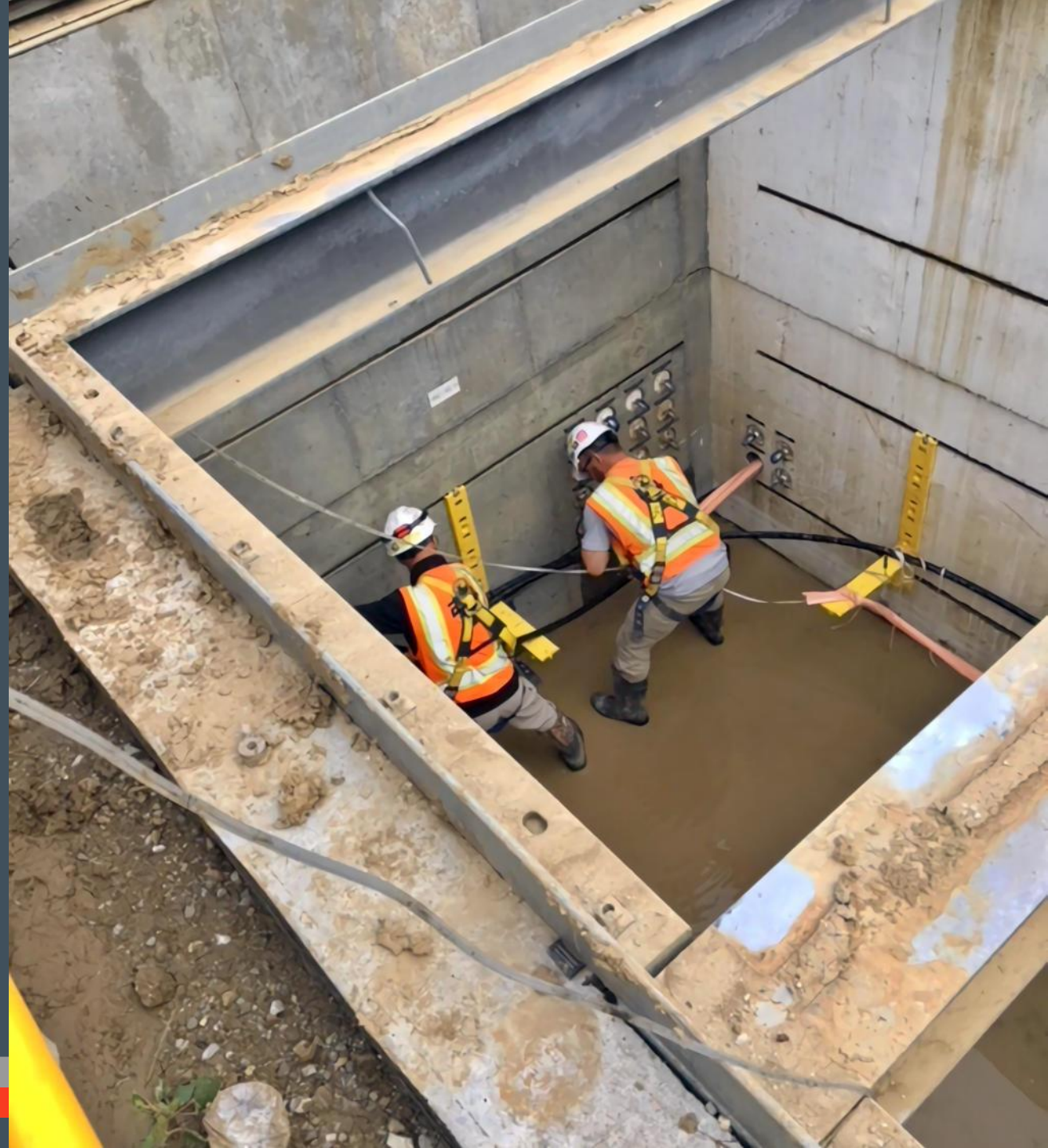
- Existing PVC or HDPE – short runs typically less than 200 meters
- Limited or congested ducts
- Patchwork designs with numerous sweeps & bends which make placing conduit or microduct difficult

Fabric Innerduct Solution

- Place in an empty duct
- Overlay in existing congested duct

General Benefits

- Avoid construction
- Quick deployment – reduced cycle time
- No special equipment needed – hand pulls
- Less manpower required per installation





Long Pulls

Problems

- Many short pulls are not as cost-effective as making single long cable pulls
- OR**
- Rigid innerduct is extremely difficult to pull long distances (>1000 feet) due to distortion and loss of duct integrity

MaxCell Solution

- Pull **MaxCell** through multiple maintenance holes

General Benefits

- Reduced overall set-up time as multiple set-ups are combined into one
- Faster MaxCell & cable placement
- Eliminate cable splices

MaxCell for Transportation

- MaxCell solutions are designed for outside plant use and challenging environments, including long-distance runs, bridge crossings, and road, river, and rail bores
- Our solutions work in all conduit sizes, including 2-in and smaller.
- Airports, Railways, DOTs, State and Local Departments, and more!

MaxCell

Future Network Flexibility



MaxCell for Airports

- Opportunity:
 - An airport used by a MaxCell shipping partner had been using rigid innerduct but found they quickly ran out of room.
 - Our initial job was to pull 10-15' of MaxCell as a trial.
- Outcome:
 - Instead, MaxCell was called to help the contractor pull over 100,000 feet of MaxCell throughout the facility.
 - We were able to facilitate the installation of MaxCell 4" 3-Cell and 3" 3-Cell on the runways, terminals, and distribution centers.
 - This new installation went from the ground to the pull box and into the buildings.





MaxSpace for Highways

- The MaxCell® and MaxSpace® team was at a job site along a heavily traveled highway in California to assist a contractor during a recent cable installation project.
- Using the MaxSpace no-dig space recovery solution, the teams removed and replaced existing smooth wall and corrugated HDPE.
- A total of 1300' of HDPE conduit (in two sections of 800' and 500') was removed in 1½ hours.

MaxCell for Bridges

- **Problem:**

- Bridges and viaducts often provide an easy passage over rough or impassable terrain. That principle applies not only to travel, but to network infrastructure as well. This can eventually lead to a bridge being a choke-point for critical communications cabling deployments

- **Solution:**

- MaxCell's multiple pathway design **reduces or avoids permit and right-of-way delays associated with new conduit placement**
- The weight of MaxCell is **1/8th the weight** of traditional HDPE while providing triple pathways which **minimizes the weight load on bridges**
- It occupies **1/7th of the volume** HDPE which allows installers **more room to maneuver in tight workspaces**
- The unique fabric mesh is **not effected by the temperature variations associated with bridge installations.**



Future Network Flexibility





MaxCell for Tunnels

- **Problem:**
 - The Brooklyn Battery Tunnel is 1.727 miles in length and is the longest continuous underwater vehicular tunnel in North America.
 - In 2013, Hurricane Sandy inundated the tunnel with salt water and destroyed much of the sensitive control and monitoring systems that existed within the tunnel. As part of the restoration project, new fiber optic cabling had to be installed in the tunnel.
- **Solution:**
 - Nearly every bridge or tunnel poses unique pathway restraints such as limited conduit space, limited space to maneuver equipment, and exposure to elements causes expansion and contraction of rigid HDPE conduit and microduct.
 - Using MaxCell, a flexible fabric innerduct solution, was a perfect fit for a long pull installation on the Brooklyn Battery Tunnel.
 - Its unique fabric construction allows MaxCell to conform to the shape of cables placed within, greatly reducing the wasted space associated with rigid innerduct.

MaxCell for Cities: Ft Collins, CO

○ Problem:

- City of Fort Collins, CO needed to deploy new municipal infrastructure under sidewalks, foliage, and railroad crossings – without disrupting the community and its aesthetic.

○ Solution:

- In a previous city project from the 1970's, an empty 2" conduit was installed for future use. This conduit needed to hold a 1/0 power cable and two 144 fiber cables for the current installation.
- Pulling cable over cable is not a suggested method for any installation, so the MaxCell 2" 3-cell was the ideal solution for this project because of its' ability to maintain separation between the three cables within the single conduit.
- MaxCell's fabric mesh technology enabled this solution by allowing for a higher fill ratio, while providing physical separation and reduced tension during installation.



Future Network Flexibility



Overview

MORE CONDUIT SPACE  **FOR FUTURE BANDWIDTH**

 **CUTS TOTAL PROJECT COST**

 **FAST**  **& EASY** 
INSTALLATION

AVERAGE PULL LENGTH  **1500'+**

Battle Card

Your Customer Is...	Ask	Have you considered?
Buying Fiber	Are you planning to use innerduct?	Reduce labor costs with MaxCell Edge or MaxWrap
Complaining about HDPE lead times/pricing	Would you be interested in a solution available immediately?	MaxCell Edge - stocked throughout the US by Wesco and MaxCell
Buying conduit only	Are you planning to use innerduct? Able to use the existing conduit?	Maximize pathways & future proof with MaxCell Edge
	Did you know MaxCell can reduce the overall number of conduits needed?	Override new pathways into occupied conduit with MaxCell Edge or MaxWrap ; or reclaim space by removing existing innerduct with MaxSpace
Looking to Expand existing network	What are your options when the incumbent pipe is full?	MaxCell Edge - maximize pathways & future proof
	Do you have conduit infrastructure limitations?	Override new pathways into occupied conduit with MaxCell Edge or MaxWrap ; or reclaim space by removing existing innerduct with MaxSpace
Expansion plans are on hold	Is it because of the high cost of trenching?	Override new pathways into occupied conduit with MaxCell Edge or MaxWrap ; or reclaim space by removing existing innerduct with MaxSpace
Need future network space	What are your future conduit requirements?	Maximize pathways & future proof with MaxCell Edge
	Are you preparing for future expansion?	Override new pathways into occupied conduit with MaxCell Edge or MaxWrap ; or reclaim space by removing existing innerduct with MaxSpace

REQUIRED INFORMATION FOR QUOTE

- Customer / Project Name
- Duct ID, cable diameter
- # cables to be deployed one day 1 & future
- Anticipated Purchase Date

MAXCELL ACCESSORIES

- **Swivel** – Add to every order
- **MaxBag** – Duct Sealing, to keep out dust, water, and debris
 - Fire Stop ISP/ building entrances
- **MaxLube** – Lubricant for MaxWrap
- **Fiber Pulling Grips**






Future Network Flexibility



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