

Cable Bus

The Benefits & Practical Use of
Cable Bus Feeder Systems



Agenda

- Introductions
 - What is Cable Bus?
 - Overview & Typical Applications
 - Cable Bus Alternatives
 - Benefits
 - Innovative Use of Cable Bus
 - When to Consider Cable Bus
-



Introductions

- United Wire & Cable
- Established 1984 as a continuation of GE Canada's Wire & Cable division
- Evolved into specialists in Power Feeder Systems

Henry Quach, P.Eng, M.Eng
henryq@unitedwc.com
905-771-0099 x223
Technical Manager

Bill Baldasti
billb@unitedwc.com
905-771-9750
General Manager



What is Cable Bus?

- A Power Feeder System that is engineered & manufactured to the individual needs of each project.
- Designed to carry power as efficiently as possible.
- Ships complete for on-site assembly and includes:
 - Drawings & Assembly Manual specific to each specific project
 - Multi-layered enclosures
 - Unarmoured Power Cables
 - Bond Wire
 - Cable Terminations and Lugs
 - Cable Clamping System
 - Fire Barrier Seals
 - Top Hats / Junction Boxes
 - Preassembled Transition Plates



Typical Cable Bus Overview

Covers

All-aluminum covers are secured with self-tapping screws. Covers provide both mechanical protection to the electrical conductors and ventilation to achieve free air ampacity rating.

Tool Free Design

Hardware was designed using feedback from clients to make installation fast and easy. The spring-loaded bolts ensure ideal and flexible placement of the cables without any tools. Self-centering and serrated wing nuts need only be finger tightened, resulting in a tool-free install.

Cable Clamps

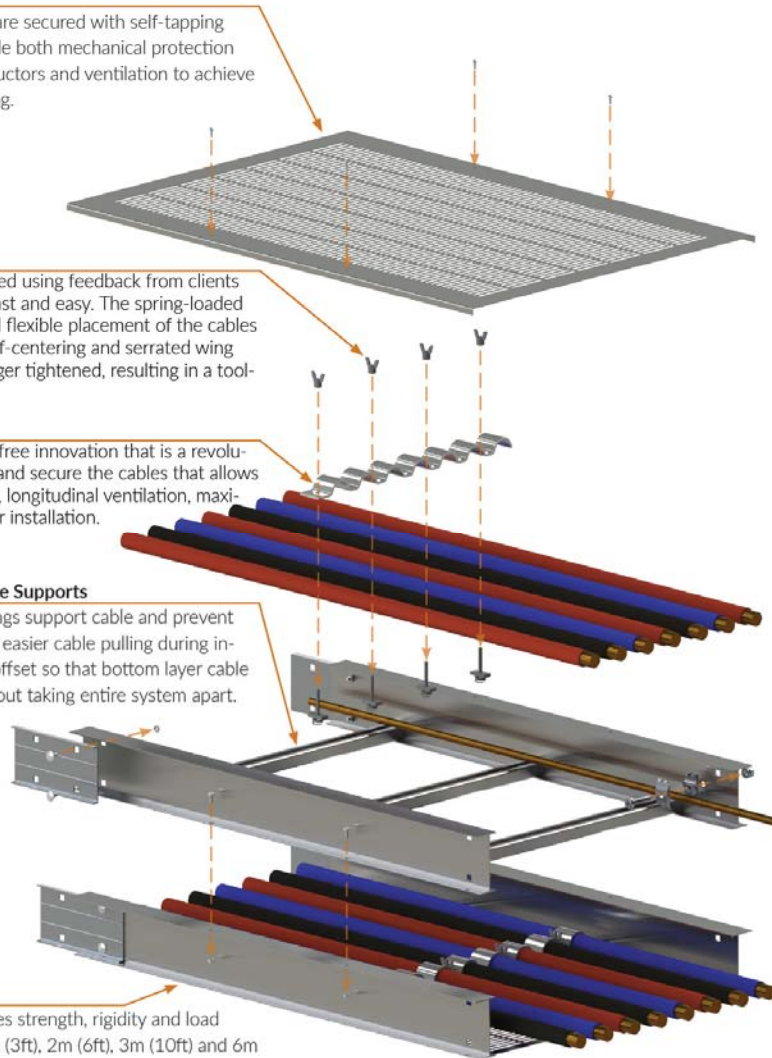
Cable clamp is a tool-free innovation that is a revolutionary way to space and secure the cables that allows for maximum support, longitudinal ventilation, maximum safety and easier installation.

Aluminum Rung Cable Supports

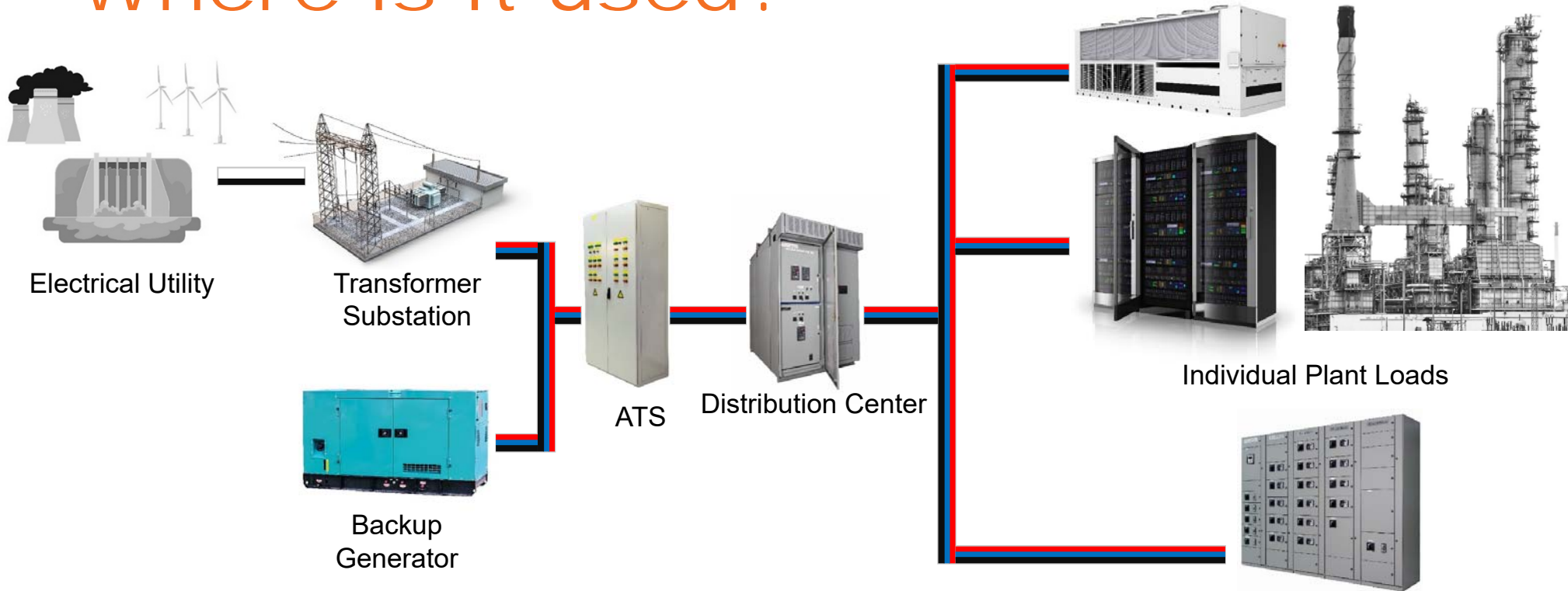
Smooth aluminum rungs support cable and prevent sag while allowing for easier cable pulling during installation. Rungs are offset so that bottom layer cable can be accessed without taking entire system apart.

Side Rails

I-Beam design provides strength, rigidity and load bearing. Comes in 1m (3ft), 2m (6ft), 3m (10ft) and 6m (20ft) lengths.



Where is it used?



Motor Control Centre



What does Cable Bus replace?

Cable bus is designed to technically and economically replace the following installation types:

- Bus Duct
- Underground Duct Bank
- Teck & Tray
- Conduit & Wire



Benefits of Cable Bus

- Free Air Cable Rating
- High Current Loads
- Reduced Power Losses
- Cost Efficient
- EMF Suppression
- Simplified Installation
- Expandability



TREFOIL CABLE CONFIGURATION

A 3 Phase-4 wire 347/600V **MAXIAMP** Cable Bus system carrying 2500 amps in ideal trefoil formations



Benefits of the System

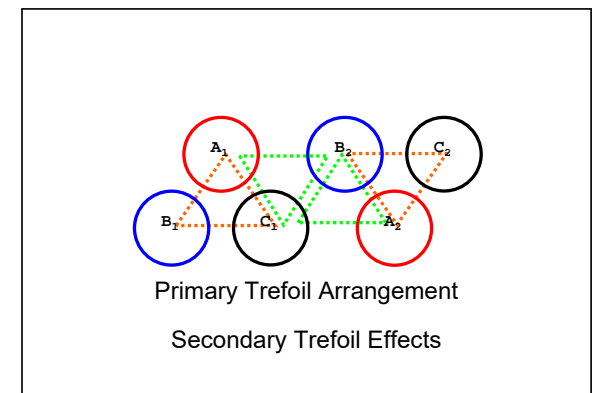
- High Current Loads
- Reduced Power Losses
- EMF Suppression
- Cost Efficient
- Simplified Installation
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Size of Conductor	350 MCM	500 MCM	750 MCM	1000 MCM		
Number of Cables per Phase	2	1000	1200	1500	1800	
	3	1500	1800	2300	2500	
	4	2000	2400	3100	3500	
	5	2500	3100	3900	4500	
	6	3000	3700	4700	5500	
	7	3500	4300	5400	6500	
	8	4000	4900	6200	7000	
	9	4500	5500	7000	8000	
	10	5000	6200	7800		9" Enclosure
	11	5500	6800	8000		12" Enclosure
	12	6000	7400			18" Enclosure
	13	6500	8000			24" Enclosure
	14	7000				30" enclosure
	15	7500				36" Enclosure
	16	8000				3-Tier 30"

Cable Operating Temperature: 75°C, Ambient Temperature: 30 ° C, 3-Wire System
600V System

Benefits of the System

- High Current Loads
- Reduced Power Losses
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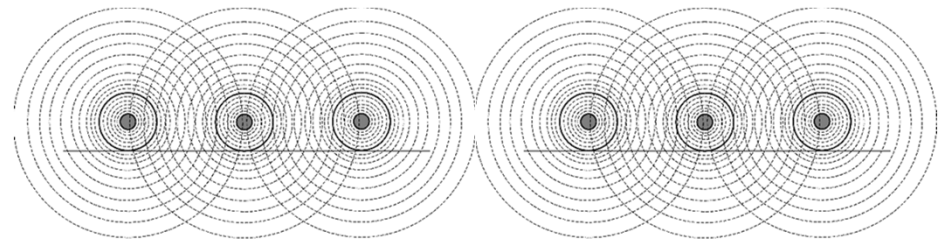


As a result of the uniquely computer generated arrangement of cables
an optimal balance of electrical fields is achieved
lowering system impedance and optimizing load sharing.

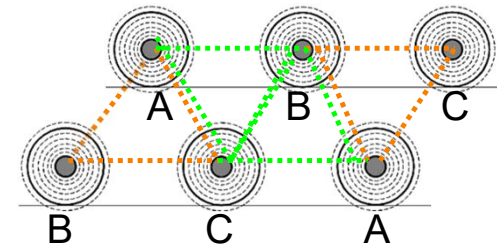


Benefits of the System

- High Current Loads
- Reduced Power Losses
- **EMF Suppression**
- Cost Efficient
- Simplified Installation
- Expandability



Traditional Cables



Virtually eliminates interference created by power cable generated electrostatic and electromagnetic fields



Slide 11

BB9 Change the order of the benefits bullets .. so that EMF comes rights after reduced power loss
Bill Baldasti, 10/12/2017

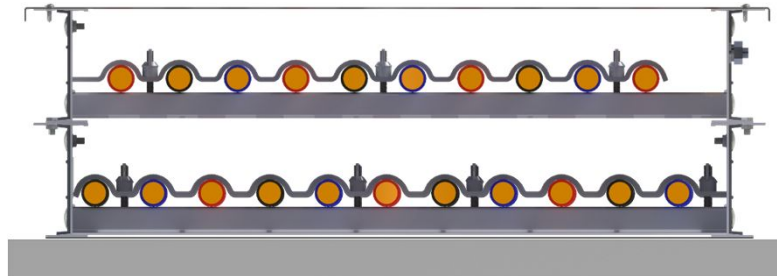
Benefits of the System

- High Current Loads
- Reduced Power Losses
- EMF Suppression
- **Cost Efficient**
- Simplified Installation
- Expandability
- Free Air Rating: Smaller or Fewer Cables
- Simple Installation: Lower Labour Costs
- System Flexibility supports last minute “on-site” modifications
- Maintenance free



Benefits of the System

- High Current Loads
- Reduced Power Losses
- EMF Suppression
- Cost Efficient
- **Simplified Installation**
- Expandability



Step 6: Place the cover and lock in

Step 5: Pull in the next level of cables and lock in

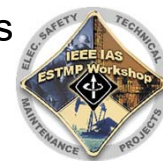
Step 4: Place next level of enclosure

Step 3: Pull in the lower level of cables and lock in

Step 2: Set up the lower level of the enclosure

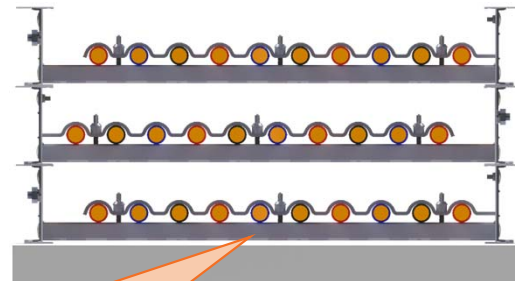
Step 1: Set up the support structures

The System design facilitates the effortless installation and replacement of circuits



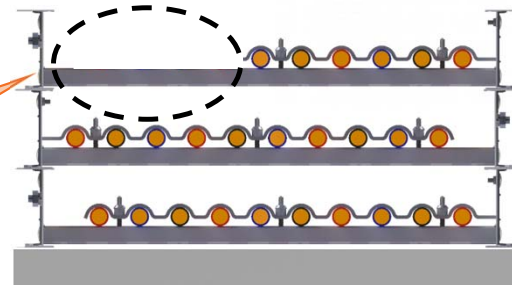
Benefits of the System

- High Current Loads
- Reduced Power Losses
- EMF Suppression
- Cost Efficient
- Simplified Installation
- **Expandability**

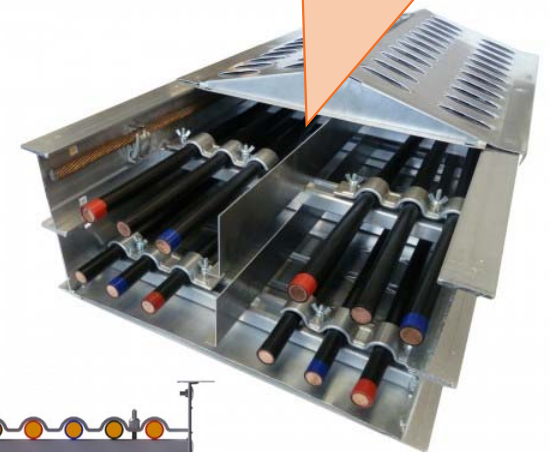


Modular 3rd Tray
Supports Larger
Demands

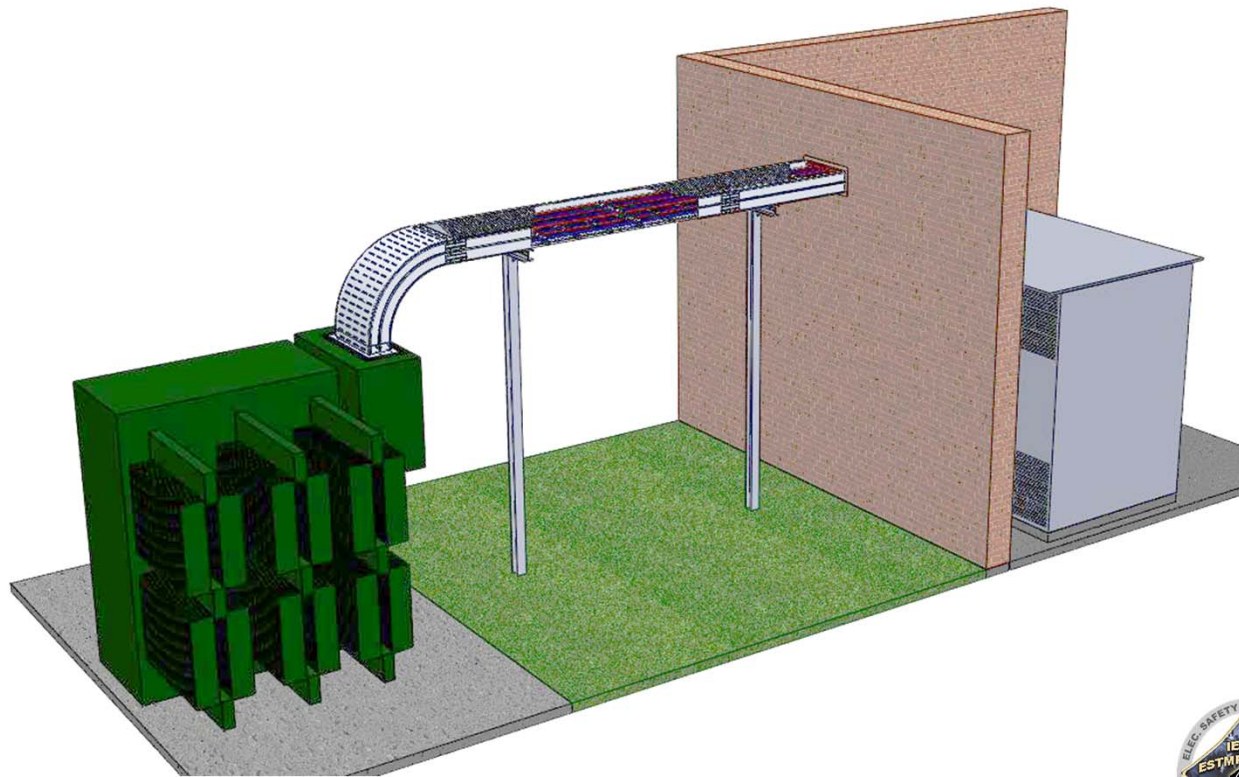
Future Growth



Cable Barriers enable
support for two systems
in a single enclosure

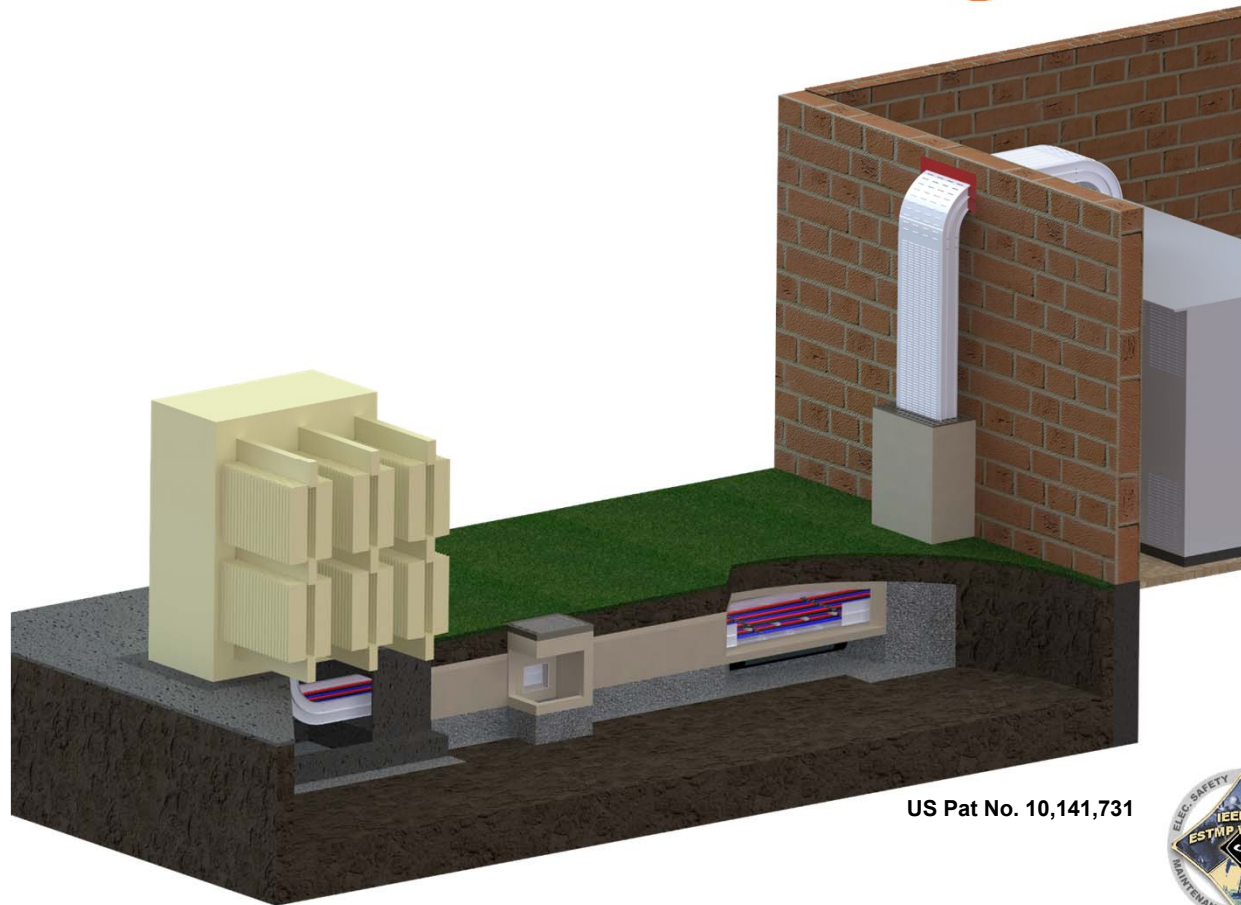


Typical Installation: Overhead





Innovative Uses: Underground



US Pat No. 10,141,731



Duct Bank Trade Offs

- Expensive to Design & Install
- Labour & Heavy Equipment Intensive
- Requires Extensive (Underground) Space
- Cables are subjected to heavy derating



Design Goals

1. Space
2. Ease of Installation
3. Maximize Efficiency & Minimize Waste
4. Reliability & Long Life
5. Safety



Design Goals

1. Space

- Precast trench requires significantly less space underground and can be installed at grade.

2. Ease of Installation

- Less Excavation
- Simple Cable Pulling
- Unarmoured Cable Terminations

3. Maximize Efficiency & Minimize Waste

- Free-Air ampacity rating maintained underground.

4. Reliability & Long Life

- Installation is maintenance free
- Trench, Conductors & Enclosure are all manufactured for long (40 year) lifespan

5. Safety

- Cable Bus clamps ensures maximum safety – even during short circuit forces.



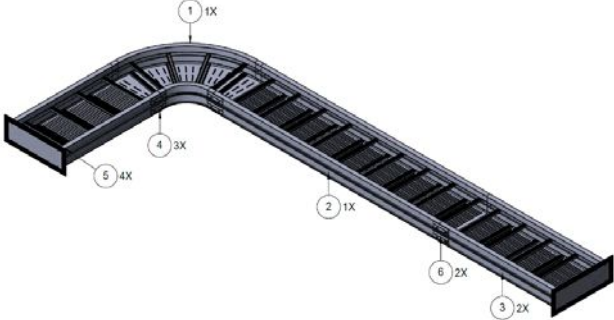
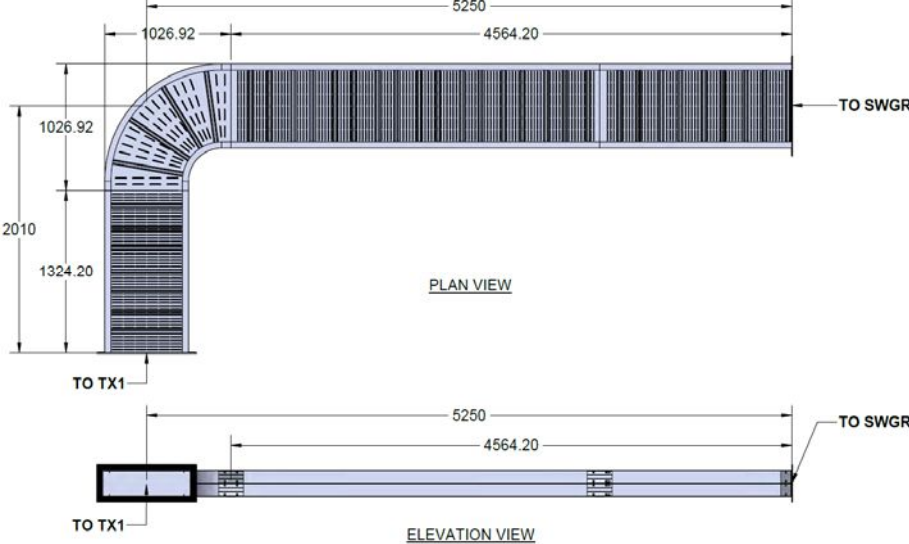
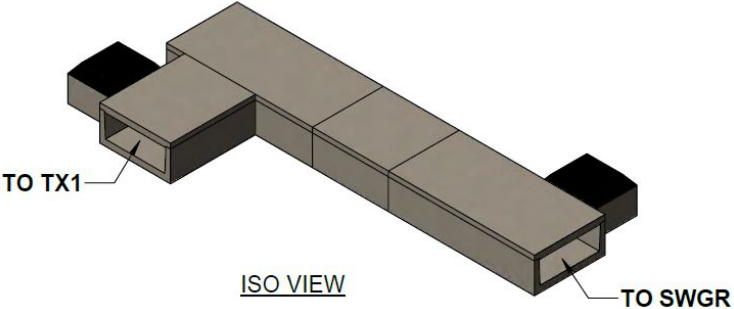
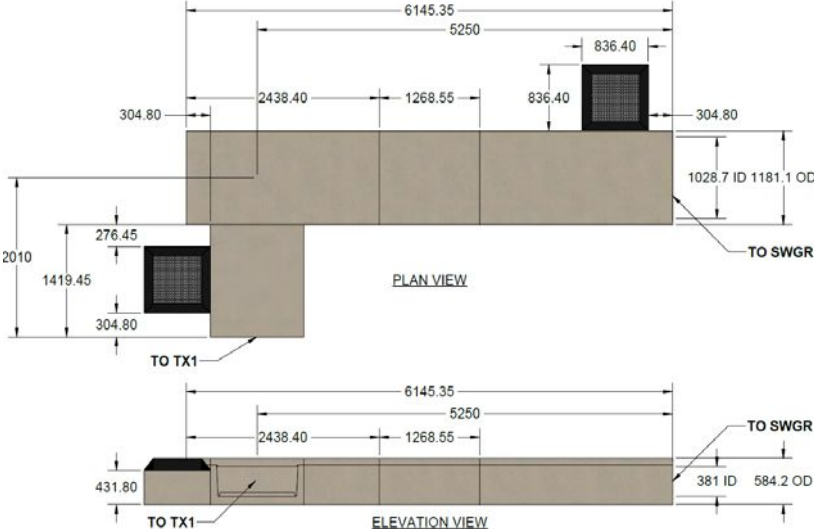


MAXIAMP[®]

UNDERGROUND

CASE STUDY

Drawings





Installation: Trench Preparation

Installation: Trench & Vents



Installation: Trench & Vents



Installation: MAXIAMP Enclosure





Installation: Cables & Clamps

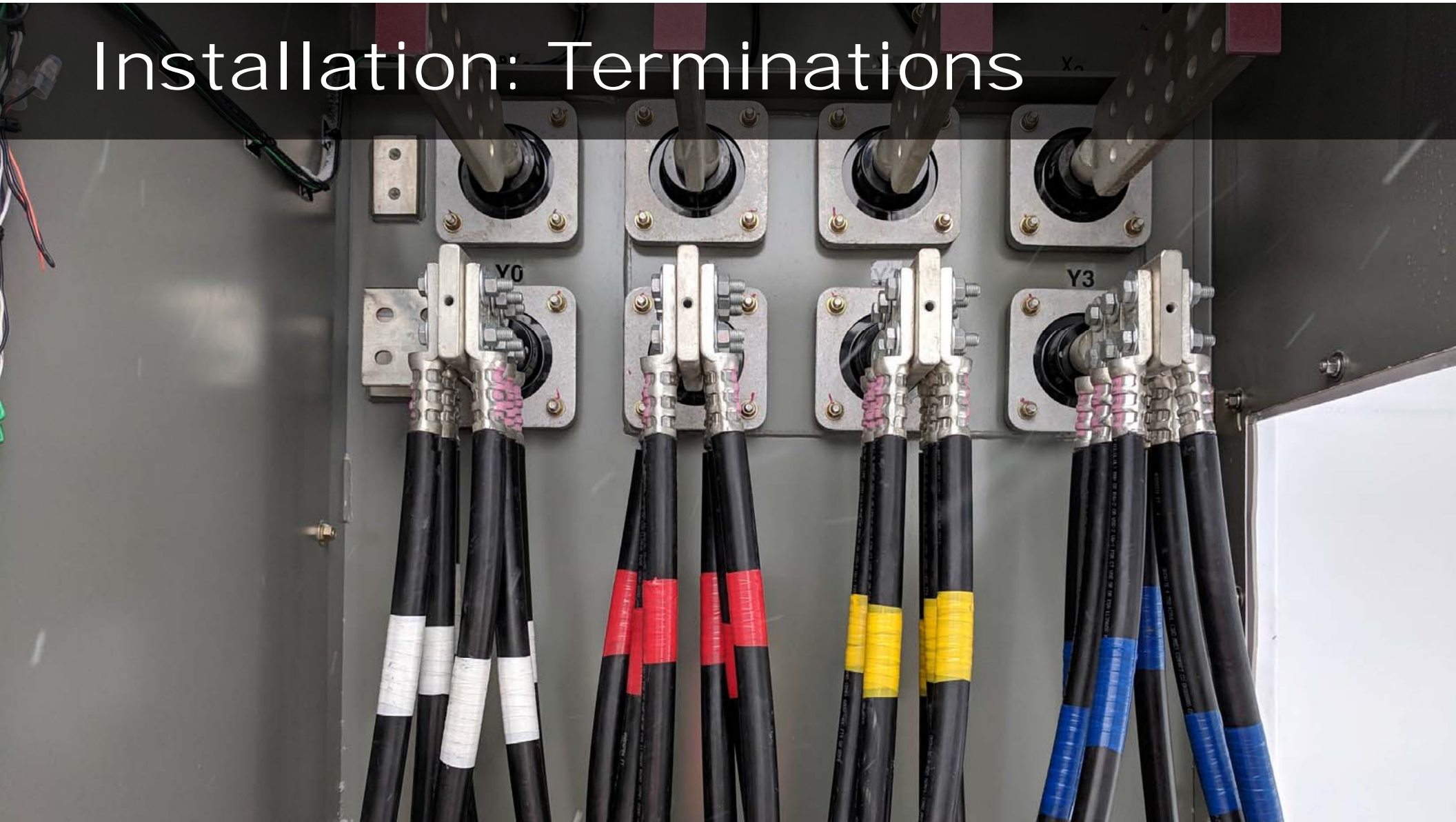


Installation: Bond Wire & Firestop

Installation: Lugs



Installation: Terminations



Consider Cable Bus For

Cable Bus is a very versatile power feeder solution. Some examples of common scenarios:

- **Higher Ampacities**
Free Air rating allows more efficient use of power conductors.
- **Reliable, Long Term Solution**
Cable Bus is an exceptionally reliable power feeder system and is virtually maintenance free.
- **Outdoor Installations**
Continuous conductors make Cable Bus impervious to moisture and the elements.
- **When space is limited underground!**

thank you

Questions?

www.MaxiampUnderground.com

www.unitedwc.com/maxiamp



1 West Pearce Street
Suite 303
Richmond Hill, ON
Canada L4B 3K3
www.unitedwc.com

sales@unitedwc.com

(905) 771-0099

(800) 265-8697

Fax: (905) 771-1658



The background of the slide is a dark, textured surface filled with numerous 3D question marks. The question marks are rendered in a dark gray color with a slight gradient, giving them a three-dimensional appearance as if they are floating or scattered across the space. The lighting creates soft shadows and highlights, emphasizing their form. The overall effect is a dense, monochromatic pattern of question marks.

Frequently Asked Questions

Why don't I just put a grate on top?

- **Cable Bus Systems maintain their free air rating via their ventilation capabilities.**
 - **Leaves / Dust / Debris will settle into trench over time, impairing ventilation.**
 - **Leads to a maintenance issue (live system!) or lower lifespan**
 - **No protection from rodents.**
-



What about frost?

- **MAXIAMP Enclosure is designed with min. 1 expansion joint per circuit to accommodate seasonal expansion/contraction.**
 - **Trench can be joined using embedded weld plates or advanced adhesives/sealants.**
 - **Successfully installed in Canada's Far North!**
-



What is the bending radius?

Available in 12" and 24" bending radius



What about Rodents & Critters?

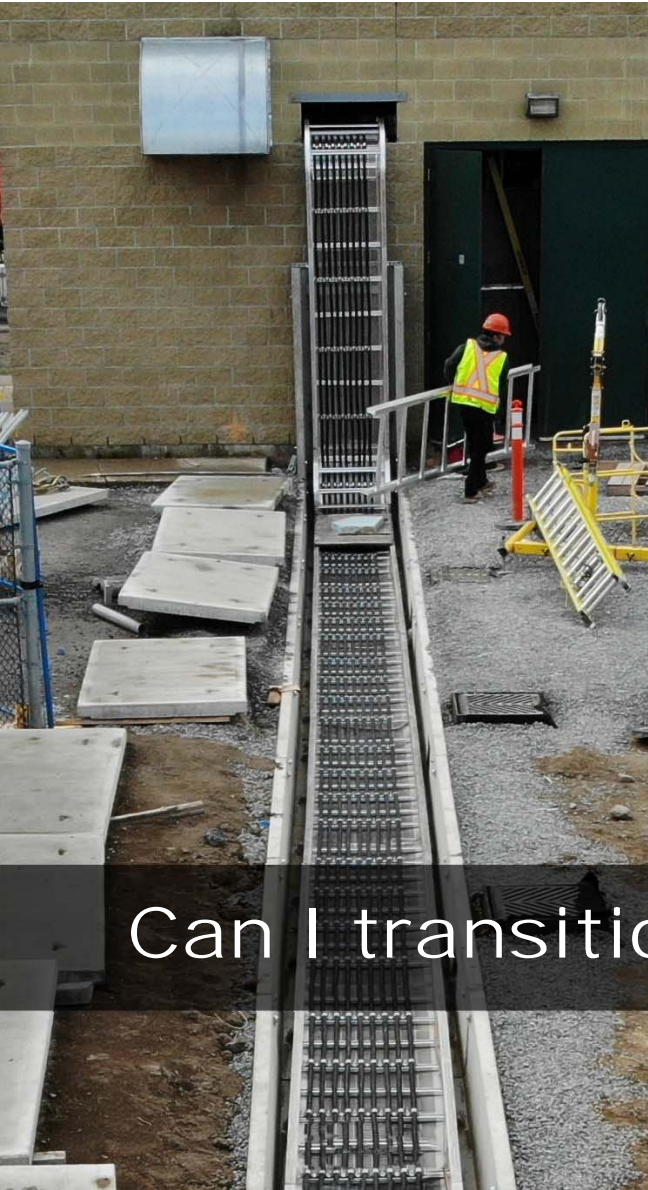
- Trench is cast with special grate at location of offset vents.
 - Prevents rodents, leaves and other debris from entering primary trench.
 - Raised slightly to prevent water from entering via offset vent.
-



What about Rain & Snow?

- **French Drain + Gravel below trench to facilitate drainage**
 - **Bottom of Trench & Vents are open to facilitate drainage**
 - **Energized MAXIAMP Underground generates heat**
-





Can I transition from underground to above grade?



What about crossing roadways?

Can a building penetration be performed below grade?

- **MAXIAMP Underground will include entrance plates + firestop + weatherproof gaskets + waterproof glands for building penetrations (where required)**
-



I would like to run underneath a raised E-House. Are lightweight lids available?

- **Lightweight Fibrelite trench lids are available where required.**
 - **Available in Pedestrian and H20 (highway) grade.**
-



Can I run multiple circuits within a trench?

- **Certain Cable Bus systems can run multiple circuits within a single enclosure.**
 - **Fittings are available to split circuits at the point of divergence.**
-



What about building retrofits? Do I have to dig up (failed) duct banks?

- **MAXIAMP Underground (installed at grade) requires little underground depth.**
- **Can often be installed OVER existing duct banks.**

