Hiko®
Power Engineering

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GOING UNDER GROUND

ISSUE #1
INFRASTRUCTURE

Urban growth, safety, resilience and aesthetics - the case for taking power infrastructure below the surface.

Bowthorpe® Lucy Electric NKT EFEN Langmatz

PFISTERER POLARIS insulect VERSATILITY VIA COLLABORATION Sieyuan

Providing quality connection solutions alongside these leading global brands.

Out of sight. Built to last.

New Zealand's cities are growing faster than the infrastructure built to serve them. The old model of pillar boxes at property boundaries, exposed connections on footpaths and above-ground assets in increasingly dense urban corridors, is under pressure from every direction.

Councils are tightening aesthetic requirements. Insurers and network operators are scrutinising the risk profile of surface-level assets in flood-prone and high-traffic areas. And the communities Hiko helps connect are asking, rightly, why the electricity infrastructure serving their street looks the way it does.

Going underground isn't a new idea. The engineering behind doing it well, is. This issue follows that thinking from the ground up: the civil structure you specify first, the service connections and distribution that sit inside it, and the LV joints that hold it together. From there the network climbs in voltage - to the cable cross-bonding and connector technology that carries straight into our next issue on jointing.

Each article is written for the people who make these decisions: asset managers thinking in 40-year horizons, project managers protecting their programme, design estimators working from approved libraries, and engineering consultants who need data, not promises.

Underground power infrastructure isn't new. The engineering thinking behind doing it right most certainly is.

How the products fit together, the underground system

This issue moves from the ground up. The civil structure first then the distribution, service connections and LV joints - less civil rework, simpler maintenance, a network ready for what's next. From there, the same underground thinking scales up in voltage, where our next issue picks up.

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Replaces above-ground boundary boxes. IP4X-rated, flood resilient.

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Hiko UDP In-Ground Distribution Box

Link switching and service supply up to 630A. Also housed in Langmatz pits. 1, 2, 3, or 6-way configurations.

04 LV JOINTING

Pfisterer ISICOMPACT L30/L40 Branch Joints

One-shear-bolt LV tap connections, with no exposed live parts. Also the U-Pillar's preferred branch-joint option.

05 CROSS BONDING BOXES

Insulect Link Boxes

Sheath earthing and cross bonding for MV-HV single-core cable runs. IP68 stainless steel, tested in Australia.

06 SHEAR BOLT CONNECTORS

Pfisterer SICON Stepless Shear Bolt Connectors

Terminals, connectors and cable lugs using screw technology. Nothing protrudes, and nothing has to be filed down.

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MV JOINTING

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- NKT 36kV Slipover joint
- Pfisterer 66kV MSA joint
- Pfisterer 33-66kV CONNEX Inner cone

Designed for the next 40 years. Not just installation day.

Underground projects that treat the civil structure and the electrical installation as separate decisions create constraints that compound over decades of asset life — often invisibly, until expansion or maintenance reveals what early integration would have prevented.

Langmatz Modular Structural Pits are engineered on a different principle: separate the structural load path from the electrical installation entirely. The pit carries the civil load, traffic, soil.

That separation is what makes the Langmatz system genuinely future-proof. When a network needs to stage installations across a subdivision rollout, when assets need to expand to accommodate EV charging or distributed generation, or when planned maintenance requires access without civil reconstruction, the Langmatz pit accommodates all of it. The benefit is invisible on completion.

The material choice matters

Langmatz pits are manufactured from structural foamed polycarbonate in a honeycomb modular design. Independent testing has confirmed the materials are non-toxic to groundwater, an important characteristic for assets placed in New Zealand's varied soil environments, including coastal and agricultural land. Lid classes run from Class B (8 tonne, footpaths) through Class E (40 tonne, carriageways), covering the full range of NZ network deployment environments.

Langmatz Modular Structural Pits and Equipment Vaults

WHEN TO SPECIFY

Most effective when included early in project planning, as part of a broader underground infrastructure strategy.

Retrofitting modularity is always more expensive than designing it in.

For asset managers

The 40+ year engineered lifespan matches the infrastructure horizon you're planning to. Non-toxic groundwater certification supports compliance in sensitive environments. Specifying Langmatz early means future upgrades, capacity increases, monitoring equipment, DER integration, don't require civil reconstruction.

For design estimators

Langmatz pits are the standard housing for the UDP product families. One civil product line accommodates multiple electrical configurations. Contact Hiko for dimensions, configuration options, and lead times.

The boundary box is history.

For decades, the service connection point at the property boundary has been primarily an above-ground box, exposed to vehicles, weather, and public access, containing live terminations at the point where network infrastructure meets private property.

The Hiko U-Pillar Underground Service Connection Box replaces it entirely. An IPX4 rated underground unit, housing all live terminations below ground, with a patented air-filled 'water-bell' chamber that protects fusegear continuously, even in flood conditions. The stand raises above ground for servicing without excavation. No exposed connections at property boundaries. Public and maintenance crews protected.

Patent No. 813092 was granted to Hiko in March 2025, confirming what the New Zealand market had already demonstrated: sales grew 250% in the year before patenting, and the design has since been approved in Powerco, Vector, Northpower and Network Waitaki. The Hiko U-Pillar is now patented in both New Zealand and Australia.

Hiko U-Pillar Underground Service Connection Box

Designed for the realities of NZ installation

The Hiko U-Pillar ships factory-tested, pre-terminated, and water-blocked. There is no on-site assembly. Installation is fast and consistent, critical when the same configuration needs to carry through 150 service connections on a single development, as it did at Limeburners Bay in Auckland.

The conduit variant provides 1-to-3-way internal connection routing for driveways and footpaths, without requiring the external tail connections that earlier service pillar designs relied on. That field refinement, developed with 2JC Electrical during the Limeburners Bay project is now standard.

01

ENHANCED SAFETY

All live terminations securely underground. No exposed connections at property boundaries. IPX4 rated. Arc Initiation Protected Zone.

02

FLOOD RESILIENCE

Patented air-filled water-bell chamber protects fusegear continuously, even in flood and tidal conditions. No loss of service during weather events.

03

FAST INSTALLATION

Factory-tested, plug-and-play. Arrives pre-terminated and water-blocked. Stand raises above ground for servicing, no excavation required.

> The Hiko U-Pillar removes the need for above-ground boundary boxes and unnecessary exposure or risk to the public, while allowing networks and authorised contracting staff to work safely above ground when they need to.

John Spence, Production & Design Manager
Hiko Power Engineering

Hiko UDP In-Ground Distribution Box

Hiko UDP In-Ground Distribution Box

INTERNAL DIMENSIONS

Hiko Code	Length	Width	Depth
UBxx05xx	400mm	400mm	700mm
UBxx07xx	800mm	400mm	700mm
UBxx11xx	800mm	650mm	700mm
UBxx10xx	800mm	800mm	700mm

PRODUCT FEATURES

- Up to 630A with industry-standard fusegear / switchgear
- 1, 2, 3, and 6-way distribution
- Operates continuously in flood conditions
- Langmatz structural pits: 40+ year engineered lifespan
- Non-toxic to groundwater (independently tested)
- Class B (8t, footpaths) through Class E (40t, carriageways)
- No concrete vault or collar required, reduces site time and cost
- Monitoring equipment can be accommodated

Future-proof the LV network. Eliminate above-ground risk.

Above-ground distribution infrastructure was never designed for the way New Zealand's cities are growing. Assets on footpaths, at lot boundaries and in dense urban corridors attract accidental vehicle damage, graffiti, vandalism — and the attention of councils asking whether this is the best the industry can do.

The UDP is Hiko's answer. It takes the same Langmatz structural pit from page 4 and turns it into a fully underground LV distribution and service-supply system — modular, flood-resilient, and invisible to the public.

The EFEN fusegear is housed horizontally under a watertight composite bell, ensuring continuous operation even in flood conditions. Lids are rated from Class B (8t, footpaths) through to Class E (40t, carriageways). The 400×400mm UDP model was released in direct response to network demand, smaller footprint, same performance.

When the network meets the public

Urban densification is reshaping where network assets live. As cities grow denser, assets increasingly share space with footpaths, property boundaries, and high-traffic pedestrian areas. The UDP places distribution equipment below ground level, removing exposed live components from public interfaces entirely. The result is cleaner streetscapes, reduced visual impact, and infrastructure that coexists with the communities it serves.

Monitoring equipment can be accommodated within the UDP configuration, an important consideration as NZ network operators move toward more LV network visibility. No concrete vault or collar is required, reducing on-site time and cost compared with traditional underground distribution approaches.

One bolt. No exposed live parts. Power restored faster.

Live low-voltage work carries risk that's easy to underestimate. Conventional LV branch jointing methods — whether compression connectors or split bolt — require insulation to be stripped and conductors exposed on the live network before connection. Each step introduces variability: the quality of the strip, the cleanliness of the conductor surface, the torque applied to the bolt. The Pfisterer ISICOMPACT branch joint removes most of that process.

A single shear-bolt clamps and connects all conductors simultaneously, with the correct torque determined by the bolt's design — the head shears at a defined torque, removing installer interpretation from the process entirely. Fully sheathed conductors are aligned and inserted with no exposed live parts. The moulded plastic body with hard resin fill meets international electrical safety standards and is built for long-term durability underground.

For networks where LV connections are being made regularly — new connections, staged subdivision releases, fault restoration — the ISICOMPACT branch joint reduces installation time and removes the variability that leads to premature joint failures. Fewer failures mean fewer unplanned outages. That's a SAIDI story, not just an installation convenience.

PRODUCT CODES

Hiko Code	Type	Main (mm²)	Branch
KP8033	L30 140/420	50–240	10–70
KP8053	L30 160/500	50–240	10–70
KP8034	L40 140/420	95–240	70–150
KP8064	L40 165/450	95–240	35-150 AL SE

WHEN TO SPECIFY

For asset managers

Consistent jointing quality is a direct input to SAIDI/SAIFI performance. The ISICOMPACT's single-bolt design removes installer interpretation from the process, the correct torque is built in. Fewer variables at the connection point means more predictable long-term network performance.

For project managers

Faster installation on live conductors means less time with crews on energised networks. The L30 and L40 cover the main and branch conductor sizes used across most NZ LV network configurations, reducing the number of joint types a crew needs to carry on site.

With no exposed live parts and less risk to crews, these connectors are faster and safer to install for LV work.

Pfisterer ISICOMPACT L30 LV Branch Joint

Protecting Cable Assets Where It Counts

Everything so far has been low voltage. This is where the network steps up. On long MV & HV single-core cable runs, induced sheath voltages drive circulating currents that reduce capacity and raise temperatures. Cross bonding is the established solution: sheaths are transposed between sections so induced voltages largely cancel, cutting circulating current while keeping standing voltages within safe limits.

The Insulect Cross Bonding Link Box is where that transposition happens — and in a cross bonding application, it carries more responsibility than in any other sheath earthing configuration. It must insulate transposed phases from one another inside the same enclosure, withstand a through-fault or internal arc, and remain fully sealed underground for the life of the asset.

The cross bonding link box range, available in New Zealand through Hiko, is designed, manufactured, and individually tested in Australia to exactly that brief — with more than twenty years of field service behind it.

Dielectric performance

For cross bonding applications, phase-to-phase insulation is as critical as phase-to-earth. The Insulect range is rated at 75 kVp phase-to-phase and 40 kV phase-to-earth impulse withstand — the higher phase-to-phase figure directly addresses the condition where transposed sheaths sit at different potentials inside the one enclosure. Integrated zinc-oxide, gapless sheath voltage limiters (SVLs), rated 20 kA with voltage options from 1.5 kV to 9.0 kV, clamp transient overvoltages before they can reach the cable sheath.

Insulect Cross Bonding Link Box

TWO BUILDS, CLEARLY DIFFERENTIATED

ULTRA — 316 stainless steel, for the most demanding installations. Rated 63 kA/1s short circuit and 40 kA/0.12s internal arc.

LITE — 304 stainless steel, where ease of handling and installation matters and site conditions are less arduous. Rated 40 kA/1s short circuit and 20 kA/0.12s internal arc.

Both models are rated to IP68, cover single-core (95–500 mm^2) and concentric (95–300 mm^2) bonding cables, and are configured for structure or pit mounting, above or below ground. Engineering compliance is to C55/4, the internationally referenced engineering recommendation for insulated sheath power cable systems.

Specifying for an MV & HV cable project?

If you're doing the technical due diligence on an HV underground cable installation — reviewing sheath earthing arrangements, checking fault withstand ratings, or developing a specification that has to pass a compliance review — the Insulect link box range is built to the level of detail that matters in that process.

FULL TECHNICAL DOCUMENTATION

Including the component materials specification, SVL discharge characteristic curves, and ordering configuration guide is available for download at hikopower.co.nz/insulect-link-boxes — or call us directly if you have application-specific questions.

Full thread, flush break, up to 36 kV.

Screw-type connectors have earned their place on cable jobs, and the Pfisterer SICON system refines the idea. Its defining feature is that the thread has no predetermined break points. That means the full thread length carries the load for whatever conductor size you put in it, so each cross-section gets the correct clamping force for that conductor — not a compromise set by a fixed weak point.

The Pfisterer SICON stepless shear bolt connector always shears flush at the surface of the clamp body, so nothing protrudes and nothing has to be filed down to fit a sleeve. Fitting is deliberately simple: no special tools required, the bolt shears flush at the clamp surface confirming the connection is complete, and the sheared-off remains stay with the tool for safe disposal. The compact body has rounded edges and flat transitions, so it suits both slide-on and shrink sleeves.

The connectors are contact-technology type-tested to IEC 61238-1, proven in joint tests to HD 629, and have passed an 18-month endurance test. It shares the shear-bolt logic of the ISICOMPACT branch joint — the bolt sets the torque, not the installer - applied across a far wider range, from LV right up to 36 kV. That makes it the natural last word before an issue devoted entirely to jointing.

SYSTEM DATA

Item	Rating / Detail
Voltage	Up to 36 kV
Testing	IEC 61238-1 (contact technology); HD 629 (joints); 18-month endurance test
Materials	Aluminium alloy connector; steel threaded stud; brass shear bolt; plastic centering sleeve
Sealing	Oil-stops on all listed connectors
Cable sections	Per EN 60228 (VDE 0295); solid, stranded, compressed, sector 90°/120°
Family	Branch connectors, in-line connectors, cable lugs

Branch Connector

In-line Connector

Cable Lugs

Case Study, Limeburners Bay, Auckland

IN PRACTICE

The network no one sees, but everyone needs.

Limeburners Bay is a 500+ home residential development in Auckland's north-west growth corridor. As a greenfield site, everything had to be built from scratch, including the entire electrical network that would power those homes.

This wasn't a simple extension of existing infrastructure. The subdivision was designed as an embedded reticulation network: a self-contained distribution system built privately before connecting to Vector's public grid. For 2JC Electrical, that meant designing and installing a complete medium-voltage ring main configuration, transformer installations, and low-voltage distribution across multiple staged releases, all while ensuring compliance with Australian and New Zealand standards.

Where Hiko came in

When 2JC Electrical needed ring main units (RMUs) for the medium voltage reticulation, they chose Lucy Electric RMUs supplied through Hiko. The RMUs were essential to the project's design, providing fault isolation, supply reliability, and flexibility as stages rolled out.

The low-voltage design incorporated approximately 290 Hiko U-Pillars across the development, one U-Pillar serving every two dwellings. On the face of it, service pillars are straightforward fused enclosures. But integrating them within an embedded network requires careful coordination of layout, clearances, and compliance.

During installation, 2JC Electrical identified that the standard meter tails approach wasn't optimal for site conditions. In response, the configuration was modified to route the service cable inside the U-pillar via conduit, a change that better aligned with the electrical reticulation design. Hiko's engineering team worked directly with 2JC Electrical to review and implement the field change, confirming compliance and ensuring it carried through consistently across the full development.

What this delivered

01

SEAMLESS GRID INTEGRATION

The network operates as a self-contained subdivision system, connected at a defined point to Vector's public distribution. Future-proofed for the community's long-term growth.

02

REDUCED PROJECT RISK

Proactive engagement meant technical questions got answered quickly and potential issues were resolved before they became programme delays.

03

SCALABLE, REPEATABLE DELIVERY

290 U-Pillars deployed across stages using a consistent, efficient installation methodology. The same approach is ready for the next development.

THE FULL CASE STUDY IS AVAILABLE FROM HIKO

The Limeburners Bay case study documents the complete project, embedded network design, U-Pillar integration, field configuration changes, and delivery outcomes. Email Hiko at sales@hikopower.co.nz for a copy or download at hikopower.co.nz.

Project snapshot

ELECTRICAL CONTRACTOR

2JC Electrical

DEVELOPMENT

Limeburners Bay, Auckland

DEVELOPER

Landstone Developments &
Aedifice Property Group

NETWORK OPERATOR

Embedded within Vector Network

SCALE

560 houses, two subdivisions, one street

HIKO EQUIPMENT

Lucy Electric Ring Main Units,
Hiko U-Pillars, Hiko LV Frames
with metering.

Safety by design. Not by accident.

Safety is the thread that runs through every product in this publication. Not as a compliance box to tick, but as a genuine design principle, and the primary argument for taking power infrastructure underground.

Above-ground network assets in public spaces carry a risk profile that grows as urban density increases. Exposed live connections at property boundaries. Switchgear accessible to pedestrians and vehicles. Maintenance access that requires working in traffic. None of this is resolved by painting a box a more visible colour.

Taking it underground removes the exposure. Langmatz Modular Structural Pits & Equipment Vaults separate the structural load path from the electrical installation entirely. Hiko's U-Pillar terminations sit below ground in a sealed, flood-resilient housing. Hiko's UDP fusegear operates under a watertight bell beneath load-rated lids. The Pfisterer ISICOMPACT branch joint makes its connection with no exposed live conductors at any point. The Insulect Cross Bonding Boxes ensure circulating currents are cancelled while keeping voltage within safe limits. Pfisterer SICON connectors make for a stong continuous system uncompromised by any fixed weak point.

For Hiko, this is what 'Think & Be Safe' means in practice.

Safety isn't a specification column in a product data sheet. It's the reason these products were engineered the way they were, and it's the reason they belong together in the same publication.

FIVE SAFETY IMPROVEMENTS UNDERGROUND INFRASTRUCTURE DELIVERS

Live terminations removed from public interfaces, no boundary box connections accessible to pedestrians or vehicles

Arc-flash risk reduced by keeping fusegear inside sealed, access-controlled enclosures at ground level

Flood resilience built in, the U-Pillar's water-bell chamber and UDP's watertight bell both operate continuously in flood conditions

Maintenance access designed for above-ground working, with raised stands and tool-free lid systems that don't require trench excavation

Consistent connection quality, Pfisterer ISICOMPACT branch joint removes the installer variability that leads to premature joint failures and unplanned outages

IN OUR NEXT ISSUE: **MV JOINTING**

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Built for New Zealand. 85 years in the making.

Hiko has supplied electrical network infrastructure in New Zealand for 85 years. We manufacture our own range — the U-Pillar, UDP, LV frames and distribution pillars in Christchurch, and distribute the global partner products that complete the system.

Every product earns its place by one test: does it perform in New Zealand conditions — coastal salt, high UV, seismic activity, flooding, temperature cycling.

Hiko lives by safely connecting communities to power the future, from our Auckland and Christchurch locations, and going underground is how we're doing more of it.

Hiko is proud to be certified to the following ISO standards:

Telarc. Registered cert TM — Environment ISO 14001

Telarc. Registered cert TM — Health & Safety ISO 45001

Telarc. Registered cert TM — Quality ISO 9001

Telarc. Integrated Systems Certification cert TM — ISO 9001 ISO 14001 ISO 45001

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