



highlands & islands skills  
(CIC)

**Global Centres of Excellence  
A Summary of Case Studies**

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# Executive Statement

The Highlands and Islands is entering a period of unprecedented infrastructure development, and the skills system must rise to meet that opportunity.

Our ambition for a National Infrastructure Skills Centre is to build a training and innovation facility of comparable scale and capability to the strongest examples operating internationally. The following summary case studies show what that standard looks like and, in the context of Scotland's workforce demand, provide a clear justification for an equivalent facility in the Highlands.



This document brings together a summary of our case studies which examine some of the most capable training centres in the world, some of which I have had the privilege of visiting personally in my career to date. Each has been reviewed for what it can teach HI-Skills and Stakeholders about design, operational models, funding, governance, industry collaboration and long term environmental and financial sustainability. The purpose of these is to support decision making for HI-Skills at every stage from concept through to delivery, to ensure we build on evidence and learned experience rather than assumption or preference.

These examples highlight the level of investment and capability that other regions and countries commit to their workforce. They also underline the scale of the gap we intend to close.

Our approach is to design the Centre around the needs of Scotland, the employers who will rely on it, the workforce who will train within it and the long term economic value it will generate for the region. We are building something tailored to the realities of working in the north of Scotland, its geography, industries and labour market. The Highlands and Islands and Scotland as a whole, face a once in a generation infrastructure pipeline. With the right support, this project will create a skilled workforce pipeline that strengthens Scotland's productivity, improves safety and creates a future focused skills system to meet the opportunities in the decades to come.

Callum Mackintosh  
Director



# 3t



**Location:** Multiple centres across the United Kingdom

**Sector Focus:** Oil and gas, wind, power, utilities & marine training.

One of the UK's largest industrial training providers in the energy and safety-critical sectors. 3t operates centres in North Shields, Aberdeen, Middlesbrough, Manchester and London. 3t delivers more than 600 accredited courses spanning offshore survival, working at height, rope access, fire and emergency response, mechanical and electrical skills and a wide range of OPITO, GWO, IRATA, ECITB and City & Guilds programmes.

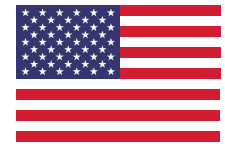
Its facilities are largely designed from scratch for delivering specialist course delivery on a large scale. They train tens of thousands of delegates globally each year in centres equipped with simulators, emergency response rigs, confined space units, mechanical workshops and realistic practice environments designed to reflect sector conditions.

3t's Aberdeen centre (ex-Survivex) is a strong example of what high quality delivery looks like in a safety-critical environment. It brings together advanced simulation, realistic offshore survival infrastructure, specialist mechanical and electrical workshops and a tight relationship with local employers. It shows what is possible when a training provider designs a facility around the needs of a specific regional economy. Aberdeen proves the value of situating capability close to the workforce and aligning training with the industries that dominate a region.

Yet Aberdeen also illustrates the limitation. It exclusively serves the North Sea energy cluster as it is built around offshore survival and oil and gas-derived competencies. So while 3t demonstrates what excellent practice looks like, it strengthens the argument that Scotland clearly has the background to design and operate best-in-class training facilities.



**LOCAL 150**  
INTERNATIONAL UNION  
OF OPERATING ENGINEERS



**Location:** Wilmington, Illinois, USA

**Sector Focus:** Heavy equipment operation, construction, drilling, and civil engineering trades

**Cost:** \$50 million (£37 million) **Established:** 2001 **Expanded:** 2025

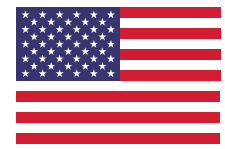
The William E. Dugan Training Centre is the flagship training arm of the International Union of Operating Engineers Local 150, one of the largest operating engineer unions in the United States, representing around 23 000 members across northern Illinois, northern Indiana and western Iowa.

Here, a comprehensive workforce development system is managed, focused on developing skilled professionals in heavy equipment operation, equipment maintenance, drilling, and construction inspection. The core training model combines paid on-the-job experience, structured classroom learning and practical field instruction across multiple trades with each apprenticeship typically spanning 4-5+ years and exceeding 6000 hours of hands-on work.

This Training Center sits on over 300 acres, with more than 39,000sqm of indoor facilities, including classrooms, welding and simulator labs, material testing spaces, a 200-seat auditorium and more than 200 pieces of equipment available for real-world practice. Instructors are on site six days a week to support both apprentices and experienced journey workers.

Its programmes are deliberately industry aligned, with curriculum and proficiencies designed to mirror employer expectations and regulatory requirements. What makes ASIP excellent is its earn-while-you-learn model and depth of resources. Trainees gain paid work experience with skilled mentors, supported by extensive classroom and field instruction. The scale of the training centre means learners can access advanced technologies and equipment simulators, not just theoretical lessons, preparing them for complex construction environments.





**Location:** Albany, Oregon, United States  
**Sector Focus:** Plant, Utilities and Civil Construction  
**Cost:** Not Disclosed     **Established:** 2016

The Knife River Training Center (KRTC) in Albany, Oregon, is a purpose-built facility dedicated to heavy equipment operator training that stands out for its year-round capability and integration of advanced technology into practical learning. It was developed and funded by Knife River Corporation, a major US construction materials and contracting group, to address the chronic skills shortage in earthmoving, grading and construction equipment operation in the Pacific Northwest and beyond.

At the heart of the centre is an 80,000 sq ft pressurised, heated air dome, one of the largest of its kind in the world, which enables heavy equipment training in a controlled environment regardless of weather conditions. This indoor space, combined with outdoor arenas, allows learners to practise machine operation, site sequencing, excavation and grading tasks throughout the year. The centre supports GNSS-enabled grade control systems indoors, meaning that operators can learn and apply advanced precision techniques that mirror real-world job requirements.

The overall site spans approximately 230 acres, including outdoor training grounds, simulation zones such as “Sim Town” for staged hazards & scenarios, classrooms, maintenance bays and administrative buildings. This scale allows for a progression from fundamental machine control to advanced integrated site tasks, supporting both novice learners and experienced operators seeking upskilling.

KRTC’s training model blends hands-on practice with technology integration. Learners first gain basic machine familiarity before progressing to scenarios that require graded precision and situational awareness under supervision. This staged approach improves safety outcomes, enhances operator competence and accelerates readiness for field deployment. The program supports a mix of individuals including apprentices, career changers and employer-sponsored trainees.

The Training Center demonstrates how scale, carbon-neutral facilities and technology adoption can significantly elevate the quality and consistency of training. Its combination of indoor dome capability, expansive outdoor sites and structured progression from basic to advanced skills positions it as a leading model for others aiming to build robust, future-ready skilled worker pipelines.





**Location:** Multiple sites across Sweden

**Sector Focus:** Plant, Civil Construction and specialist trades

**Cost:** Not Disclosed      **Established:** 2012

ME-skolan is an industry-led training model operated by Maskinentreprenörerna, the Swedish construction and plant contractors' association. It exists to address workforce demand by delivering consistent, high-quality training for machine operators and civil construction roles, with industry retaining direct control of standards, curriculum and outcomes.

Rather than a single flagship campus, ME-skolan operates through a network of regional training sites across Sweden. Each site is equipped with live training grounds, modern equipment and classroom facilities integrated with practical activity. Training is structured around realistic work tasks, with significant time spent on doing real work under close instructor supervision.

Although industry owned, ME-skolan is not a closed system. It delivers upper secondary education, adult education and reskilling programmes, with many adult learners accessing provision through municipal adult education funding. This creates an open-access model while maintaining strong industry governance.

Competence is defined in practical terms, including productivity, accuracy, safe machine operation, machine care awareness and professional behaviours on site. Assessment is based on demonstrated ability rather than time served or accumulation of certificates. Industry involvement is structural, influencing curriculum content, equipment selection and training priorities to ensure alignment with real site conditions and work pipeline.

ME-skolan demonstrates that great industry governance can strengthen relevance and consistency without centralisation, and that adult education can maintain high practical standards when competence is culturally embedded rather than administratively assessed.



**Location:** Glasgow, Scotland

**Sector Focus:** Advanced manufacturing, digital factory systems, process innovation

**Cost:** £42 million      **Established:** 2023

The National Manufacturing Institute Scotland (NMIS) is Scotland's industry-led centre for advanced manufacturing excellence, blending skills, innovation, research and real-world industry problem-solving to strengthen competitiveness and future workforce capability. The NMIS HQ occupies a 11,500 sqm operationally carbon neutral campus on a 7.5-acre site within the Advanced Manufacturing Innovation District Scotland (AMIDS) near Glasgow Airport. NMIS is operated by the University of Strathclyde, part of the UK's High Value Manufacturing Catapult and supported by the Scottish Government, Scottish Enterprise and Skills Development Scotland.

NMIS is structured as an integrated network of world-class facilities, each addressing different facets of modern manufacturing: the Advanced Forming Research Centre for forged and formed components, the Digital Factory for connected and data-driven production systems, the Digital Process Manufacturing Centre for intelligent and automated process improvement, the Lightweight Manufacturing Centre for sustainable materials development, and the Manufacturing Skills Academy for workforce capability building. This multi-node model ensures skills, R&D and industry collaboration sit inside one coherent ecosystem.

The Manufacturing Skills Academy provides training and upskilling for individuals and teams at all career stages, aligned to the needs of digital and advanced manufacturing, leadership, data analytics and wider emerging competencies. Its continuous professional development programmes help employers adopt technologies such as robotics, digital twins and smart-factory systems while supporting Scotland's wider productivity and net-zero ambitions.



**Location:** Castleford, England and across Europe

**Sector Focus:** Energy & Utilities

**Cost:** Not Disclosed      **Established:** 2018

The Omexom Institute is a network of purpose-built technical training centres operated by Omexom, the VINCI Energies brand focused on energy infrastructure services including power generation, transmission, distribution and low-carbon systems. The Institute was initiated in 2018 to build technical capability and accelerate the energy transition through skills development aligned with real industry needs.

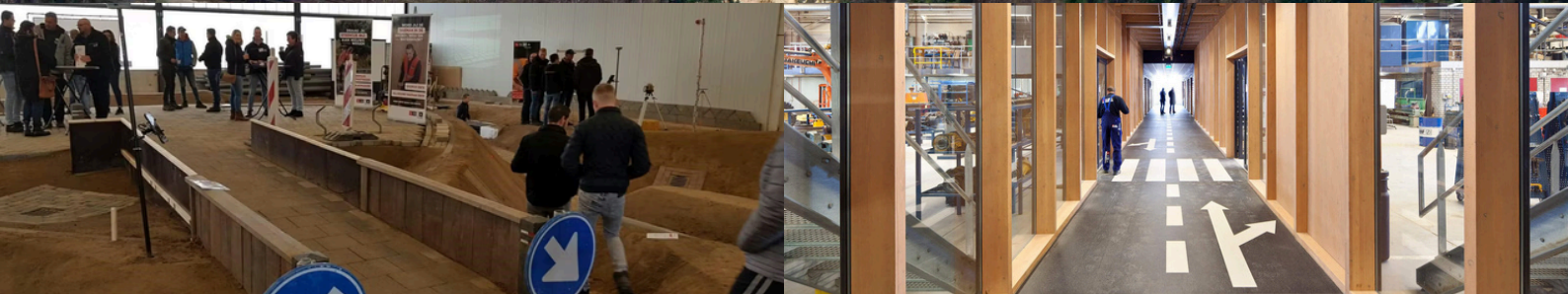
Rather than a single campus, the Institute comprises an international network of training centres, totaling 13 facilities worldwide, each embedded within Omexom's regional operations and shaped around local market requirements. This network combines classroom learning, practical workshops, e-learning and immersive tools such as virtual reality simulations to reflect real-world energy infrastructure environments from substations and overhead lines to emerging electric mobility infrastructure.

Individual facilities vary in scale and focus, but a strong theme across the network is hands-on, practical, accredited training. For example, the Omexom Institute in Castleford, West Yorkshire in the UK includes modern classrooms, VR suites and practical bays for substations, overhead lines and underground cabling, designed to train up to around 100 new industry entrants per year and provide ongoing refresher training for hundreds more across Omexom's workforce.

The Institute's curriculum aligns tightly with Omexom's project needs and sector safety standards, covering topics such as photovoltaic systems, public lighting, overhead line inspection, substation safety, self-consumption and electric mobility infrastructure. Training is delivered to Omexom employees, customers and partners, ensuring competencies are strengthened across the value chain while supporting net-zero and infrastructure programme delivery.

By embedding training within an international network yet tailoring content to national energy markets, the Institute ensures technical skills enhancement is tightly connected to real projects and technologies driving the energy transition, strengthening workforce capability across continents.





**Location:** Harderwijk, The Netherlands

**Sector Focus:** Infrastructure, plant, maritime, and offshore industries

At 75 years old, SOMA is the most established vocational training provider serving the Dutch infrastructure, construction and technical sectors. Based centrally in the Netherlands and operating nationally across multiple locations, SOMA trains thousands of learners each year, from entry level operatives to experienced professionals requiring upskilling, certification or progression into supervisory roles.

The organisation operates at scale. Its offer spans short duration compliance and safety training through to multi-year vocational programmes aligned with nationally recognised qualifications. This allows SOMA to serve both immediate employer needs and longer-term workforce development, a balance many training centres fail to achieve. Learners include young people entering the sector, adult returners, and industry workers retraining as technology, regulation and sustainability demands evolve.

What sets SOMA apart is its strong employer relationships and practical bias. Training is designed around real industry tasks, equipment and operating conditions rather than classroom learning. Instructors are occupationally competent industry experts with sector credibility and programmes are shaped in direct response to employer demand. This keeps content current and outcomes relevant, particularly in infrastructure, vertical transport, maritime and offshore disciplines.

SOMA has also moved early on future skills. Its portfolio increasingly reflects the shift toward zero emission construction, electrification and safer, more regulated working environments.



**Location:** Nether Langwith Quarry, Mansfield

**Sector Focus:** Roadbuilding, asphalt Paving, mineral products production

**Cost:** Not Disclosed      **Established:** 2020

The Tarmac National Skills and Safety Park is an industry-leading training facility owned by Tarmac and based at Nether Langwith Quarry near Mansfield in Nottinghamshire. Designed to support skills development across the construction materials and quarrying sectors, the Park occupies a 60 acre site and was officially opened in 2020.

Purpose-built for practical, hands-on learning, the Park integrates classroom spaces with multiple specialist areas including a road-building training zone, material handling and maintenance workshops, heavy plant operator environments, and an occupational hazard area for real-world behavioral safety development. Training is delivered via a third party contractor, Cetora. The facility can train up to around 70 people per day, and its operational competence team engages over 2 500 learners per year through apprenticeships, professional operator programmes and refresher safety courses.

The design reflects Tarmac's philosophy that competence in construction and mineral products work is best developed through applied experience rather than purely theoretical academic instruction.

Training is geared towards apprentices, graduates entering the sector, existing employees seeking upskilling, and those retraining from other industries, blending safety, technical skills and behavioral competence vital for modern construction workplaces.

By situating training within an active quarry and equipping students with real plant and task simulations like the real scenario confined spaces rig, Tarmac ensures learners move into the workforce with competence and confidence, reducing on-boarding time on live sites and strengthening employer trust in training outcomes.

The Tarmac National Skills and Safety Park stands out for marrying significant physical scale with immersive, employer-aligned training on a modern and impressively well thought out site.



**Location:** Ilford, East London

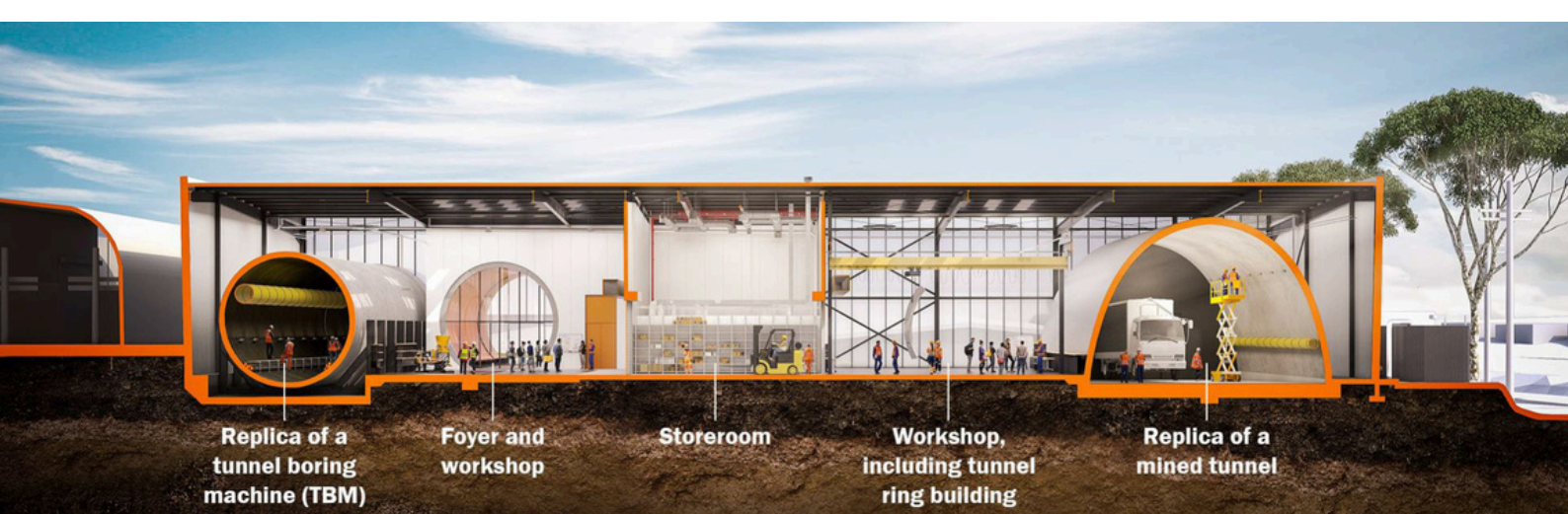
**Sector Focus:** Tunnelling, underground construction, safety-critical training

**Cost:** £13 million      **Established:** 2011

The Tunnelling and Underground Construction Academy (TUCA) is a purpose-built 3,500sqm specialist training centre in Ilford, East London, established by Crossrail Ltd to tackle a critical skills shortage in tunnelling and underground construction within the UK infrastructure sector. Funded as part of the Crossrail Skills and Employment Strategy, TUCA was conceived to ensure the workforce had the competencies required to tunnel in London clay delivering one of Europe's largest transport programmes and to leave a durable skills legacy for the wider industry. Its creation involved direct collaboration with CITB, technical input from major tunnelling contractors including the BMW joint venture and oversight from Crossrail's Project Delivery Partner. This industry-led development approach ensured that the facility was designed around real project needs rather than generic training models.

TUCA's facilities replicate operational underground environments, incorporating full-scale tunnel mock-ups & track installations. These environments enable trainees to gain practical, hands-on experience that mirrors live construction conditions, moving beyond classroom instruction into scenario-based, competency-focused learning. Courses cover essential tunnelling and safety requirements such as tunnel entry procedures, emergency response and the Tunnelling Safety Training Scheme (TSTS), now widely recognised across UK tunnelling contracts as a baseline industry requirement.

During the Crossrail construction period, TUCA trained tens of thousands of workers, delivering several thousand training units annually at peak. Its contribution extended beyond entry-level competence, supporting supervisory development, safety programmes and specialist tunnelling skills that directly improved workforce capability across the supply chain. Following Crossrail's delivery phase, operational responsibility transitioned to Transport for London, with training delivery supported by 3rd party training partners, ensuring the centre remains relevant for future major programmes including HS2, Thames Tideway and broader underground infrastructure projects.



holmesglen



**Location:** Melbourne, Victoria, Australia

**Sector Focus:** Tunnelling and underground construction, civil infrastructure skills

**Cost:** \$16 million AUD (£7.9 million) **Established:** 2020

The Victorian Tunnelling Centre (VTC) at Holmesglen Institute in Melbourne, Victoria, is a purpose-built 5,000sqm world-class training facility focused on underground construction and tunnelling skills. Established in response to Victoria's unprecedented pipeline of major infrastructure projects such as the Metro Tunnel, Suburban Rail Loop, West Gate Tunnel and North East Link, the VTC fills a critical skills gap in advanced civil construction training within Australia. Crucially, the centre was developed in partnership with CYP Design and Construction, the Metro Tunnel Project's main contractor consortium comprising John Holland, Lendlease and Bouygues whose technical input shaped the training environments and operational realism.

Unlike typical classrooms the VTC immerses learners in realistic environments with full-scale replica tunnels including a mined three-lane road tunnel and a tunnel boring machine (TBM)-sized rail tunnel, alongside cutting-edge simulators and mixed reality training technologies. These facilities allow trainees to practise real tunnelling tasks safely, from TBM operation and long drilling to shotcrete application and underground emergency procedures, in a controlled setting that mirrors live project conditions.

VTC is designed to train up to around 5 000 students annually, spanning new entrants, tradespeople, engineers and managers needing tunnelling competencies, safety certifications and specialist construction licences. Its curriculum combines accredited vocational qualifications, safety-critical induction training, high-risk work licences and practical workshops, making it relevant both for immediate workforce deployment and longer-term professional development.





**Location:** Vancouver Island, BC, Canada  
**Sector Focus:** Plant, Utilities and Civil Construction  
**Cost:** Not Disclosed    **Established:** 2018

Vancouver Island University (VIU) delivers a well-established training programme that is widely regarded as a benchmark for realism, learner readiness and employment outcomes. Although situated within a public university, the programme is explicitly designed to meet regional infrastructure and construction labour demand rather than academic progression. British Columbia is seeing a similar demand for operatives over the next decade to what we are in Scotland. BC expects 4,350 new plant operator jobs with 600 of those being on Vancouver Island alone.

Engagement and outreach are supported through VIU’s annual Heavy Metal Rocks event, alongside a collaboration with the BC Road Builders Association through its Roadshow programme. This initiative uses a mobile training trailer that travels to more than 100 locations, engaging directly with school leavers, Indigenous communities, veterans, women and people under 40.

VIU’s training model follows a simulation-led progression approach, with learners developing baseline competence in simulators before moving onto live plant. This accelerates skill acquisition, improves safety outcomes, reduces plant damage and allows instructors to focus on performance rather than familiarisation.

Vocational training is delivered from a dedicated outdoor site of approximately 40 acres, supported by workshops, classrooms and simulator suites. The scale of the site allows learners to develop competence in grading, excavation, loading, haulage and sequencing activities that closely mirror live civil engineering operations. This enables repeated practice and progressive skill development in a realistic environment rather than constrained or artificial exercises.

The programme operates on an open-access model, supported by public funding with employer participation. It is designed as a pathway into employment rather than a short-course or ticket-based offer. Graduate employment outcomes are consistently reported as strong, reflecting close alignment with industry demand.

VIU demonstrates that a public institution can deliver large-scale, realistic plant training with modern methods and open access, without compromising on competence. Its primary limitation is geographic reach, as it is remote for many learners and focused primarily on civils rather than a broader multi-trade construction skills stack.







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