



Guide to Utility Conduit Licensing

HUB EXPRESS SYSTEM

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infrastructure.twdx.net

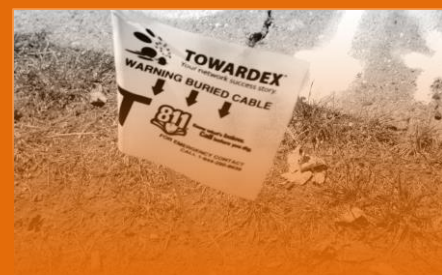


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Table of Contents



Conduit Licensing Requirements
Page 7



Getting Started with Conduit Licensing
Page 18

Hub Express System — A New Generation of Competition and Connectivity
Page 3



Commercial Terms for Conduit Licensing
Page 11



Licensee Operating Rules and Regulations
Page 22





Hub Express System — A New Generation of Competition and Connectivity

More Diverse: Since Level 3 and MFN completed the Joint Trench Partners (JTP) conduit system in 2003, there have not been any new significant developments of telecommunications infrastructure in Boston.

To ensure the continued growth of internet traffic and enable a new generation of competition and connectivity in our region, **TOWARDEX** is embarking upon the construction of the **Hub Express System** ("HEX") to massively increase fiber optic capacity for internet backbone traffic in Boston.

Embrace Boston: With Facebook and Orange's partnership to deploy the 6,800 km Amitié Transatlantic Cable System between Boston and France, we will no longer remain as a 'stub' for the global internet infrastructure. In light of this positive development, we're making a long term investment in Boston's fiber optic infrastructure to embrace our region's new role as an international transit hub for the global internet traffic.

The HEX Conduit System is providing a much more direct route (detour reduction by up to 45-50%) from downtown Boston to Somerville's Inner Belt, where terrestrial cable routes feeding the transatlantic landing station in Lynn arrive.

Lowest latency for the region's digital economy: The HEX Conduit System will eliminate detours and directly connect downtown Boston and Cambridge to Somerville's Inner Belt, providing low latency *LAN-like* connectivity (≤ 0.02 milliseconds) to over 324,000 sq. ft of data centers in Somerville.

This portion of the project is being developed under telecommunications licensing from the MBTA to provide two new shortened fiber routes out of Inner Belt, utilizing the surrounding railroad rights-of-way.



A New Joint Use Communications Trench

Network Neutrality for All: TOWARDEX began constructing the Hub Express System to solve the challenges that competitive ISPs and data centers faced in getting access to our region's fiber and interconnection facilities. Our mission is to promote a fair, free and open internet for everyone in Boston.

Accordingly, to encourage competition and guarantee assured access to our region's fiber infrastructure, the HEX Conduit System is built for multi-tenancy and is neutrally made available for lease by other ISPs and network providers.

To ensure that fair access to our infrastructure is provided on a competitively neutral and nondiscriminatory basis under the pro-competitive spirit of the Telecommunications Act of 1996, TOWARDEX has created a new wholly owned subsidiary called **TWDX Infrastructure, LLC**, to operate the HEX Conduit System.

Multi-Conduit, Multi-Cable Fiber Optic System: The HEX Conduit System is a 'joint-use' fiber optic trench consisting of up to fifteen (15) 4" ducts in mainline sections. **MaxCell Edge Innerduct System** is used to provide cable-occupant equivalent capacity of up to 135 single occupancy ducts, while taking significantly less space on the road by simplifying the footprint of our duct bank.

Underground Vaults: Manholes and underground vaults are critical nexus for modern day communications. TWDX Infrastructure engineers have strategically designated certain manholes as '**Meet-Me Holes**', where large underground vaults (between 10'x5' to 12'x8' sizes) are used to permit tenants to install their fiber enclosures and make cross connects between each other.

To minimize disruption to public roads, remaining manholes which are not designated as Meet-Me Holes are constructed strictly for maintenance and cable transit, and use the smallest vault size (4'x4' TYP) required to accommodate the duct bank.



Helping Customers to Build a Better Internet

Infrastructure Support: For tenants of the HEX Conduit System, TWDX Infrastructure is your single point of contact for customer support, access, installation and maintenance services.

Pursuant to Section 4 of the **Project Charter of the Hub Express System**, TWDX Infrastructure has been designated as the **Joint Trench Administrator** for the purposes of managing and lawfully regulating all aspects of operations over the Absolute Property of TOWARDEX Technologies International, Inc. and its Hub Express System assets and facilities.

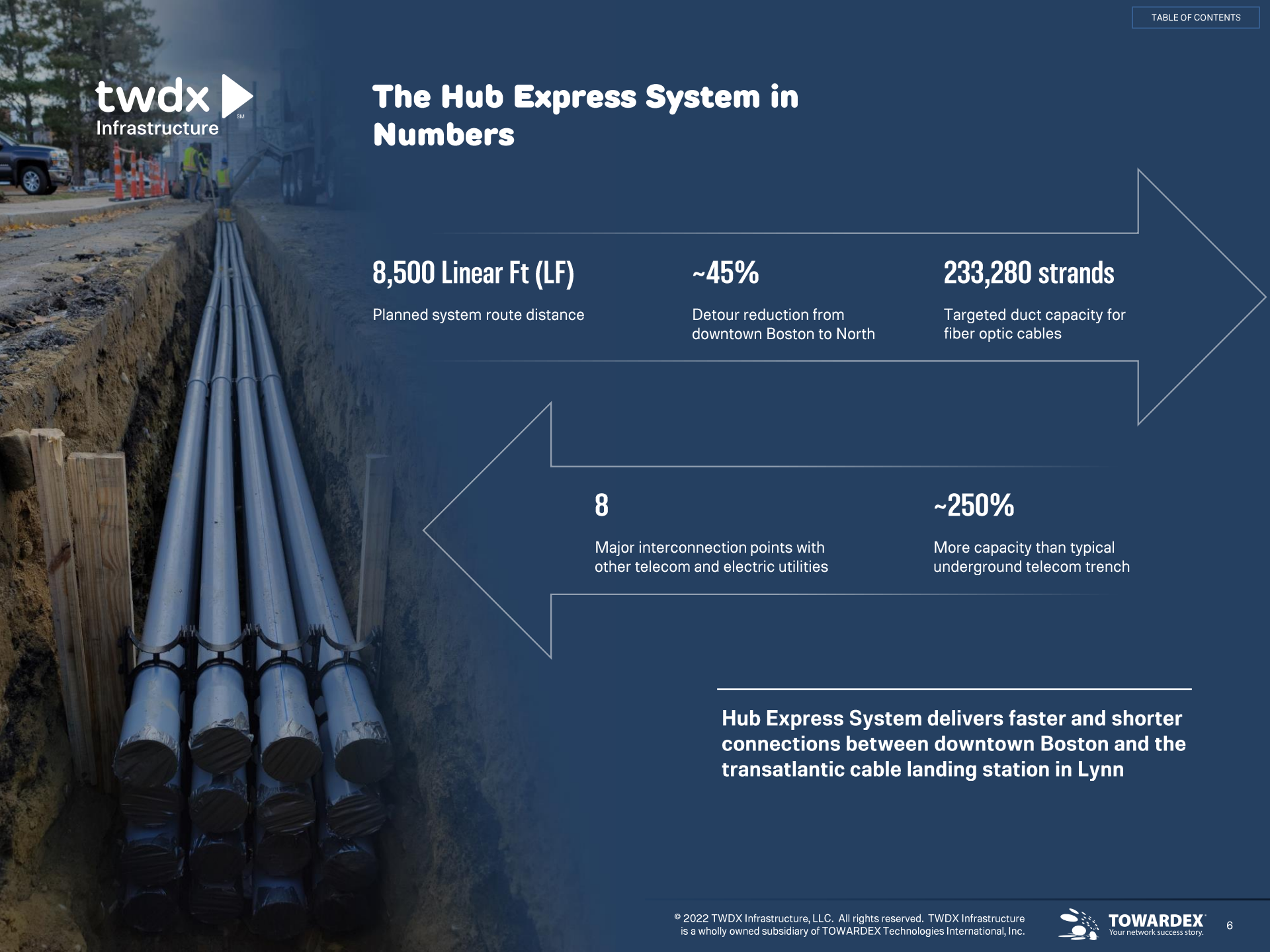
Interference and Improvement Works: For utility relocation and largescale construction projects, TWDX Infrastructure will typically appoint an outside construction firm as the project manager and liaise between the project team, stakeholders, local authorities and affected tenants during the engagement.

Plant Protection: As part of our plant protection duties, TWDX Infrastructure hires utility locating companies and responds to Dig Safe tickets and locate requests concerning the HEX Conduit System. Furthermore, TWDX Infrastructure crews perform weekly road patrols to visually inspect the extent of the trench system to check for problems, such as signs of ground settlement (e.g. voids, fatigue cracking of road surface) and ensuring that all manholes are securely closed.

TWDX Infrastructure also works closely with local authorities and City Engineers to ensure a State of Good Repair for public infrastructure occupied by our utilities, such as repairs for road quality issues occurring over our utility cuts or right-of-way.



The Hub Express System in Numbers



8,500 Linear Ft (LF)
Planned system route distance

~45%
Detour reduction from downtown Boston to North

233,280 strands
Targeted duct capacity for fiber optic cables

8
Major interconnection points with other telecom and electric utilities

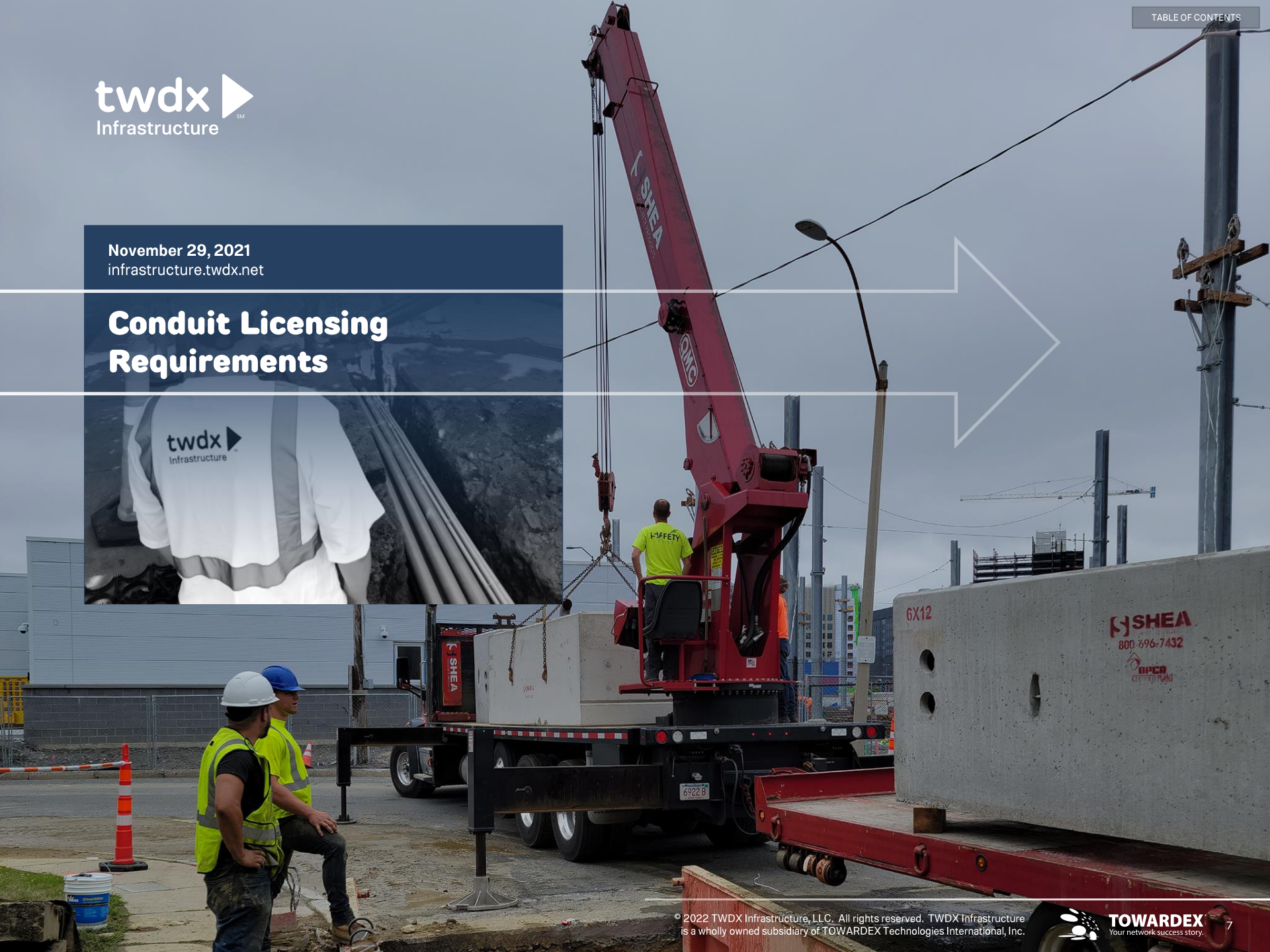
~250%
More capacity than typical underground telecom trench

Hub Express System delivers faster and shorter connections between downtown Boston and the transatlantic cable landing station in Lynn



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Conduit Licensing Requirements



Requirements for Conduit Licensing

TOWARDEX licenses excess conduit capacities installed in underground utilities and rights-of-way it owns, as follows:

Who it is for and who can apply:

TOWARDEX only licenses conduit capacity to eligible Telecommunications Carriers that are licensed by the Massachusetts Department of Telecommunications and Cable (MDTC). This generally means you will need to be either a CLEC or incumbent telecom carrier licensed to operate in the Commonwealth of Massachusetts.

TOWARDEX does not license any utilities or conduit capacities to entities which are not licensed to operate in Massachusetts under the MGL c.159 Common Carriers provisions.

Furthermore, Licensees are required to obtain permission from the authority having jurisdiction to occupy the streets or public right-of-way. Depending on the jurisdiction at the location of lease, you may need to first go through a certification process, and/or satisfy bond requirements, obtain a license or a Revocable Consent prior to installing fiber optic cable.

Tax compliance:

As a condition of being permitted to occupy TOWARDEX owned utilities residing in a municipality's Inalienable Property, each Licensee is required to fully comply with all applicable tax obligations at the location of occupancy, including tangible personal property tax (TPP) for all of Licensee's personal property effects and facilities installed within the HEX Conduit System.

New Licensees must also furnish to TOWARDEX, a Certificate of Good Standing – Tax Compliance from the Massachusetts Department of Revenue, and Good Standing Certificate from the Secretary of the Commonwealth of Massachusetts.

If the Licensee is found delinquent in its tax obligations to authorities having jurisdiction over the HEX Conduit System, TOWARDEX may deny entry, suspend or revoke the Conduit License and require the Licensee to vacate the conduit system at its full expense.



Insurance Requirements

Each Licensee operating in TOWARDEX owned utilities is required to maintain minimum insurance coverages as follows:

Commercial General Liability Insurance:

For personal injury, bodily injury and property damage in an amount not less than \$1,000,000 per occurrence and \$3,000,000 in the aggregate covering all work performed on over or adjacent to TOWARDEX right-of-way and/or facilities, including:

- All operations;
- Contractor liability;
- Coverage for XCU hazards (explosion, collapse and underground & damage to underground property)

Automobile Liability Insurance:

Including the use of all vehicles owned, non-owned, leased and hired, in an amount not less than \$1,000,000 combined single limit covering all of the work.

Workers Compensation Insurance:

Including Employees, Liability Insurance, as provided by MGL c.152, as amended, covering all of the work.

Umbrella Liability Insurance:

In an amount not less than \$5,000,000 per occurrence covering all of the work.

“All Risk” Property Insurance:

Covering all of Licensee’s personal property effects and facilities located in the HEX Conduit System.



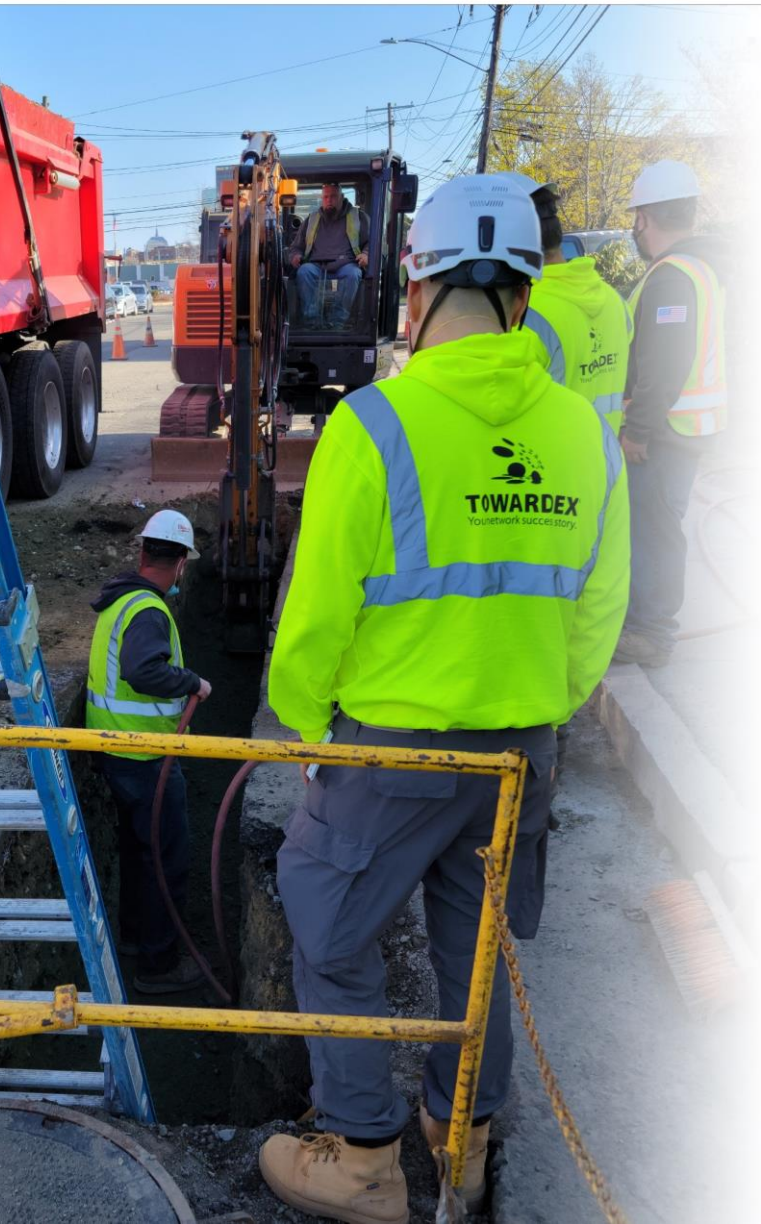
Insurance Requirements (cont'd)

Railroad Protective Liability Insurance:

For Licensees working in any sections of the HEX Conduit System within a live loading influence zone of a railroad; and absolutely required (no exceptions) for any Licensees working in HEX System Section C19D3. The insurance must be purchased by the Licensee or its contractor performing work in the name of MBTA and any other involved Railroad Company(s) at the location of work. Contact the Leasing Office at utility-licensing@towardex.com or your TWDX Infrastructure point of contact for assistance on specific requirements.

Additional Insured:

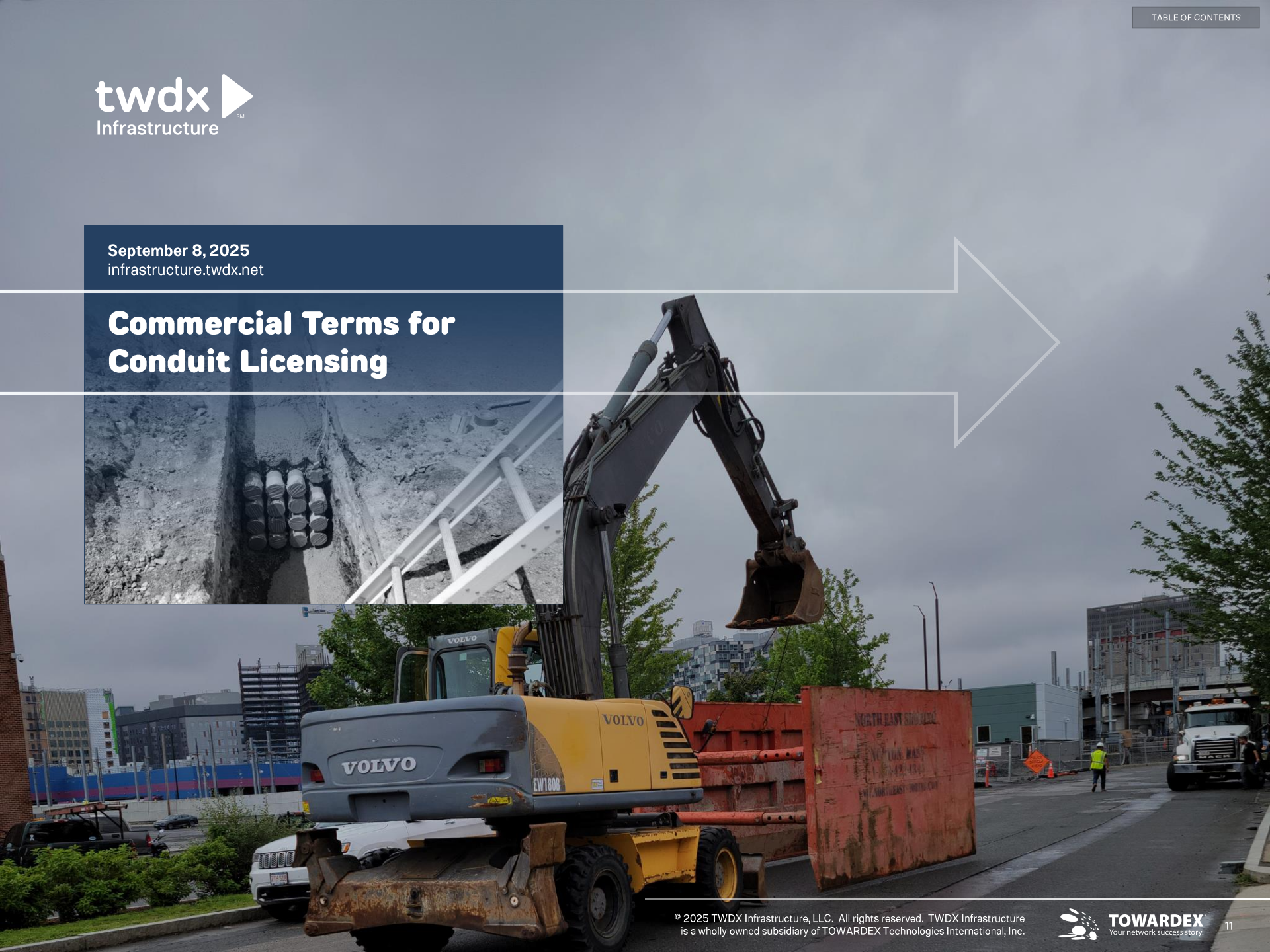
All insurance policies must name TOWARDEX Technologies International, Inc. and TWDX Infrastructure, LLC as additional insured as their interest appears and waive any rights of subrogation against the parties hereto.





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Commercial Terms for Conduit Licensing



Overview of Commercial Terms



The commercial terms for the HEX Conduit System, including rates, terms and conditions are developed in accordance to the **Project Charter of the Hub Express System** and applicable laws and regulations concerning a utility under the Telecommunications Act of 1996, which is any person who owns or controls or shares ownership or control of poles, ducts, conduits or rights-of-way used for wire communications.

TOWARDEX is the owner and the Licensor of the HEX Conduit System and is a Massachusetts-based Competitive Local Exchange Carrier (CLEC) regulated in accordance to MGL c.159 § 19F.

TWDX Infrastructure (known as Joint Trench Administrator) is a wholly owned subsidiary of the Licensor, duly authorized to manage its Absolute Property, which includes all facilities of the HEX Conduit System.

Access must be provided on a competitively neutral and nondiscriminatory basis:

TWDX Infrastructure is required to provide access to Licensor's Absolute Property to telecommunications providers on a competitively neutral and nondiscriminatory basis in accordance to provisions of 47 USC § 224, MGL c.166 § 25A and 220 CMR 45.00 rules.

Rates charged to licensees:

Lease rates charged to licensees shall be just and reasonable, not to exceed the capital and operating expenses, and investment costs by the utility in appurtenances not used by or useful to the licensee. Conduit lease rates are documented and published in this publication hereunder, which is also posted on TWDX Infrastructure's website, and licensees shall be provided with no less than 60 days notice prior to any change in attachment rates, terms or conditions.

Further, because the Licensor is a utility who also engages in the provision of telecommunications services, the Licensor shall also impute to its costs of providing such services an equal amount to the attachment rate which is published herein. TOWARDEX is prohibited from apportioning or reserving itself a "free" conduit or duct capacity, at the expense of other ratepayers or licensees of the HEX Conduit System.

Conduit Rental and License

Conduit License:

TOWARDEX licenses conduit capacity in 1.05" cable diameter quantities. Each License is a permission to install, occupy, maintain and remove a fiber optic cable sized up to 1.05" in outer cable diameter. Tenants are not permitted to install innerducts— TOWARDEX will provide Licensor-owned innerducts for cable installation and occupancy.

Pricing per Linear Foot (LF) covers the costs of Licensee's occupancy in the HEX Conduit System, but cannot be more than the proportionate share of capital and operating expenses.

Per-Strand Multiplier in MBTA Right-of-Way:

Any installation involving MBTA's right-of-way may incur additional fees and multiplier rates in accordance to state agency's own leasing policies, in addition to standard conduit leasing fees.

Use of Underground Vaults:

The Conduit License also governs Licensee's use of TOWARDEX owned underground vaults, manholes and handholes. This includes installation of enclosures, slacks, conduit penetrations and transit rights at each manhole.

Licensee will be charged a fee for every manhole or underground vault it needs to install enclosure(s), and for any cable slacks over 25' to transit through the manhole (i.e. any excess slacks to facilitate future ring-cut or lateral attachment would be charged a fee).

No Subleases, No Reservation of Conduit Capacities:

Licensed conduit capacities are only for the purpose of the Licensee to install its own fiber optic cable. Licensee is expressly prohibited from assigning, subleasing, subletting, transferring or encumbering the Conduit License, or any interest therein.

In addition, licensees may not "reserve" conduit capacities or otherwise "hoard" extra capacities for future use. TOWARDEX may terminate the Conduit License with written notice, when a Licensee fails to begin occupying its Licensed Facilities within 120 days after Commencement Date.



License Rates



Item	Rates
Conduit Lease Per Foot ¹	\$1.54 per Linear Foot / Year
Manhole / Vault Use Fee ²	\$500 per year
Transverse Crossing For each crossing of any bridges, railroads or highways	\$1,366.52 per year
Annual Escalation	3% or CPIU (whichever is higher)
License Application Fee	\$65 NRC for each new License or Amendment request
Structural Review Fee ³	\$250 NRC
Manhole Survey Charges ⁴	\$500 NRC for every manhole crossed by Licensee's cable
Inspection Fee ⁵	Min. \$1,500 per 8-hour shift (7:30 AM – 3:30 PM) on Business Days Covers up to 2 simultaneous manhole openings or work sites

¹ Higher rates (priced by ICB) apply if the installation involves MBTA right-of-way, due to the addition of state agency fees. Rates for Conduit Lease Per Foot are determined by computing for Revenue Required (RR) using the following formula:

$RR = \text{Rate Base} * \text{Rate of Return} + \text{OPEX} + \text{Annual Depreciation Expense} + \text{Any Taxes Passed to Ratepayers}$
Rate Base is capital costs of the system construction; allowed Rate of Return is 10%.

For TIA Members, Rate Base is adjusted to only cover the reasonable costs required to install and make-ready a new 3-cell bank of MaxCell sleeve to provide the attachment.

² Charged if Licensee installs an enclosure or leaves a cable slack over 25' in a TOWARDEX owned manhole.

³ Structural Review Fee is assessed to review any new construction, work plan or MOP, including manhole breakout requests / duct penetrations and so forth.

⁴ One-time fee charged at the execution of Conduit License to conduct field surveys for Licensee's cable installation.

⁵ No work shall be performed on the HEX Conduit System without a TWDX Infrastructure inspector present at each job site. The Inspection Fee covers for the labor cost of mobilizing TWDX Infrastructure day shift crews to provide escort and inspections on-site, and also covers for the cost of investments required in crew training and safety programs.

Above prices are standard Lease Rates and the most common Ancillary Fees. Contact TWDX Infrastructure for ICB construction, design services and any additional ancillary fees to support Licensee's conduit occupancy, which are typically quoted by materials, labor and on hourly or per-project basis. Examples of additional ancillary fees include: overtime inspector costs, cost/material + 10% fees, etc.



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Getting Started with Conduit Licensing



Getting Started with Licensing Process

1. Find out where and how much conduit you're looking to lease:

You need to tell us the location, length and quantity of the conduit capacity you're looking to lease.

Visit <https://infrastructure.twdx.net/#projects>, click on the System Section you're looking to occupy, then click on "As Builts."

Each As-Builts page contains detailed drawings showing the location of the conduit system, as well as a Google Earth KMZ file describing the System Section, and copies of any relevant land deeds or publicized underlying agreements at the area.

2. Email us of your desire to license capacity from the HEX Conduit System:

Send our Leasing Office an email at utility-licensing@towardex.com with the following information:

- Your company's legal entity name and address and contact information.
- Location, length and quantity of the conduit capacity you're looking for as identified above.
- Identifier numbers of all manholes/underground vaults you're looking to install a cable slack or fiber optic enclosure (rather than simply transiting through the manhole). Manhole identifiers are found on the As Builts information.
- Mfr. make and model of the fiber optic cable and # strands to be installed for each proposed License.

Based on the information you send us, our Leasing Office will send you an estimate of commercial terms and pricing for your proposed License, based on Lease Rates set forth on [Slide 14](#).

Getting Started with Licensing.. (cont'd)

3. Execution of the Conduit License:

Once both parties are satisfied with the proposed commercial terms, and the Licensee has met Good Standing Requirements as discussed on next page, and furnished Insurance Certificates as required on [Slide 9](#), the parties will then execute the Conduit License.

Upon execution by both parties, the Commencement Date will be established where conduit capacity will be made available to the Licensee for occupancy.



Good Standing Requirements

If you are a new Licensee, we will also need to verify that your company is properly licensed and qualified to work in the public ways, prior to our leasing discussions advancing any further:

Qualifications to affix and run wires on Public Ways:

Tell us if you're an ILEC, CLEC or otherwise eligible telecommunications provider licensed in the Commonwealth of Massachusetts and listed on MA Department of Telecommunications and Cable (MDTC)'s website. If you're not on their published list, we can't provide you with a Conduit License.

We'll also need to confirm that you're a utility company permitted to work in the public ways by the City or authority having jurisdiction at the location of your proposed lease. You'll need to confirm that you're bonded and insured to open Street Occupancy Permits with the authority.

If you're planning to build new lateral or a subsidiary line that will be owned by you, but interconnects into the HEX Conduit System, per state law, you will need to be a member utility of the [Dig Safe System](#) before we approve any such interconnection.

Good Standing Requirements for new Licensees:

- We'll need a copy of Certificate of Good Standing – Tax Compliance from the MA Department of Revenue and Good Standing Certificate from the Secretary of the Commonwealth of Massachusetts.
- If you have outstanding obligations with the municipality at the location of lease, such as unpaid fines or fees, open permit violations, unpaid or never paid personal property tax, etc., you'll need to resolve all of these issues before you can enter into a Conduit License.
- If TOWARDEX makes reasonable determination that you're a high risk tenant (e.g. from credit references, news that you're under bankruptcy protection, or you're an existing or past customer with history of unpaid bills or late payments, etc.):

You may be required to "bond" (i.e. guarantee the payment through a Performance Bond from a surety company) your license obligations for a period determined by TOWARDEX.



January 14, 2022
infrastructure.twdx.net

Licensee Operating Rules and Regulations



Accessing the HEX Conduit System

Required Forms with TWDX Infrastructure:

Prior to entering the HEX Conduit System, Licensee must first obtain the following permits from TWDX Infrastructure:

- [Form NC-2: Utility Work Permit](#)
- [Form NC-7: Confined Space Entry Permit](#)

Completed forms must be submitted to cmc@towardex.com for approval and issuance of Permit Number. You should submit the required forms at least 72 hours prior to access.

NOTICE

TWDX Infrastructure will NOT issue Utility Work Permit to any entities which are listed on the OSHA Severe Violator Enforcement Program (SVEP) Log. Any previously approved contractor who is listed on SVEP will be removed from the Approved Contractor list.

If the Licensee is listed on the SVEP Log, none of its employees will be permitted access to the HEX Conduit System for any reason. Licensee may engage TWDX Infrastructure to provide field inspections at Licensee's expense, until it is delisted from SVEP.

For emergencies (fiber cut, etc.), Licensees must call the Joint Trench Helpdesk at 617-863-8325, or email plantmaster@towardex.com for immediate mobilization. TWDX Infrastructure will dispatch inspectors to the site typically within 4 hours during an emergency.

Required Permits with Authorities Having Jurisdiction (AHJ)

Prior to accessing any parts of the HEX Conduit System, Licensee at its sole cost, is required to obtain all appropriate permits from the applicable authorities at the work site, including Street Occupancy Permit.

Licensee is also required to file Traffic Management Plan (TMP) at its own cost, with the appropriate authority. If any excavation or street disturbance is involved Licensee must notify Dig Safe at least 72 hours prior to work.

Accessing the HEX Conduit Sys.. (cont'd)

Working in HEX System Section C19D3 or within MBTA Zone of Influence:

If any work involves access into MBTA Zone of Influence or HEX System Section C19D3, Licensee must (no exceptions, even for emergencies) notify TWDX Infrastructure to obtain a License with MBTA Realty. Licensee will also be required furnish all applicable insurance to MBTA (including Railroad Protective Liability) and obtain licenses as required to access any TOWARDEX facilities installed inside MBTA property.

Licensee may also be required to reimburse TWDX Infrastructure to cover Force Account debits for Roadmaster and Railroad Operations to support Licensee's project, such as costs for Railroad Worker Protection, flaggers, Weekend Diversions, dispatching, etc. as deemed necessary by MBTA to ensure the safety of work crews and the traveling public.



Safety in the HEX Conduit System

Personal Protective Equipment (PPE):

All personnel performing work at the job site (including Licensee and its employees and sub contractors) must be wearing all necessary PPE at all times while working in the HEX Conduit System. This equipment shall include, at minimum, a hardhat and reflective safety vest, regardless of the scope and type of work being performed that involves TOWARDEX owned utilities. Other safety equipment shall be added as required to perform the work in accordance with all local, state and federal requirements in effect.

Entering a HEX manhole:

When entering any HEX handhole or manhole, entrants must erect manhole guardrail and barricade off the area to prevent unauthorized entry or accidental fall into the manhole.

Under no circumstances shall any person enter a HEX manhole without a TWDX Infrastructure inspector on site, and at no time, shall any HEX manhole remain unattended with its manhole cover open. Further, all entrants of the HEX Conduit System must follow safety regulations concerning Permit Required Confined Space as discussed in next slides.



Permit Required Confined Space

Permit Required Confined Space in the HEX Conduit System:

HEX branch line or maintenance access manholes can be small and shallow, usually at sizes of handholes (e.g. 4' X 4', 3' X 3', etc.). Most of these handholes are usually not considered to be Permit Required Confined Space ("PRCS"), unless the bottom floor of the vault is 5' or more in depth from the ground surface level.

However, several HEX mainline manholes are large underground utility vaults (e.g. 10' X 5' to 12' X 8', etc.) and are absolutely classified as PRCS. Further, any structure of the HEX Conduit System which meets the definition of PRCS as provided by 29 CFR 1910.146, and any HEX manhole which is described to be deeper than or equal to 5' in depth are statutorily classified as PRCS and entrants must follow all established safety rules and regulations governing entry into a Permit Required Confined Space, as described on the next slide.

Prior to entering a PRCS:

All persons, prior to entering a PRCS on the HEX Conduit System, shall fill out all blue shaded fields on the [Form NC-7 Confined Space Entry Permit](#) and submit it to TWDX Infrastructure for approval and issuance of a Permit Number. **No entry into PRCS can be made without a valid Permit Number issued.** Licensee or the Permittee shall identify Authorized Entrants and Authorized Attendants for the work being requested on the Permit, and shall confirm and attest that it has obtained and prepared all of the identified equipment and reviewed checklists as required by the Permit.



Permit Required Confined Space (cont'd)

Entering a PRCS:

Prior to entering a PRCS, Licensee must make available a copy of the approved **Form NC-7 Confined Space Entry Permit** with a valid Permit Number. This permit shall be posted in a conspicuous manner at the work site and/or be easily accessible to all persons at the site.

Only person(s) listed under **Authorized Entrants** in the permit may enter PRCS. Prior to any person entering the PRCS, preliminary atmospheric readings using approved 4 gas meter must be taken, and all identified hazards must be controlled prior to entry. All stratified atmospheric readings from the 4 gas meter must be recorded on the **Form NC-7** permit posted at the work site, and updated frequently while entrant(s) remain in the PRCS, at minimum frequency of at least once every 20–30 minutes.

Any person entering a PRCS must be wearing safety harness, rescue ropes, approved 4 gas meter, safety helmet and any other safety devices in accordance to regulations in effect. **The entrant must be connected to an approved emergency personnel rescue system.**

While working in the PRCS, whenever atmospheric readings exceed acceptable safety limits, the entrant shall immediately vacate the PRCS and no person shall re-enter until the manhole is thoroughly ventilated and all identified hazards have been controlled.

No person may enter a PRCS without a TWDX Infrastructure inspector trained in confined space operations (the "Entry Supervisor") present at the work site. At no time shall an entrant remain in PRCS without authorized attendant(s) or Entry Supervisor present on site.

NOTICE

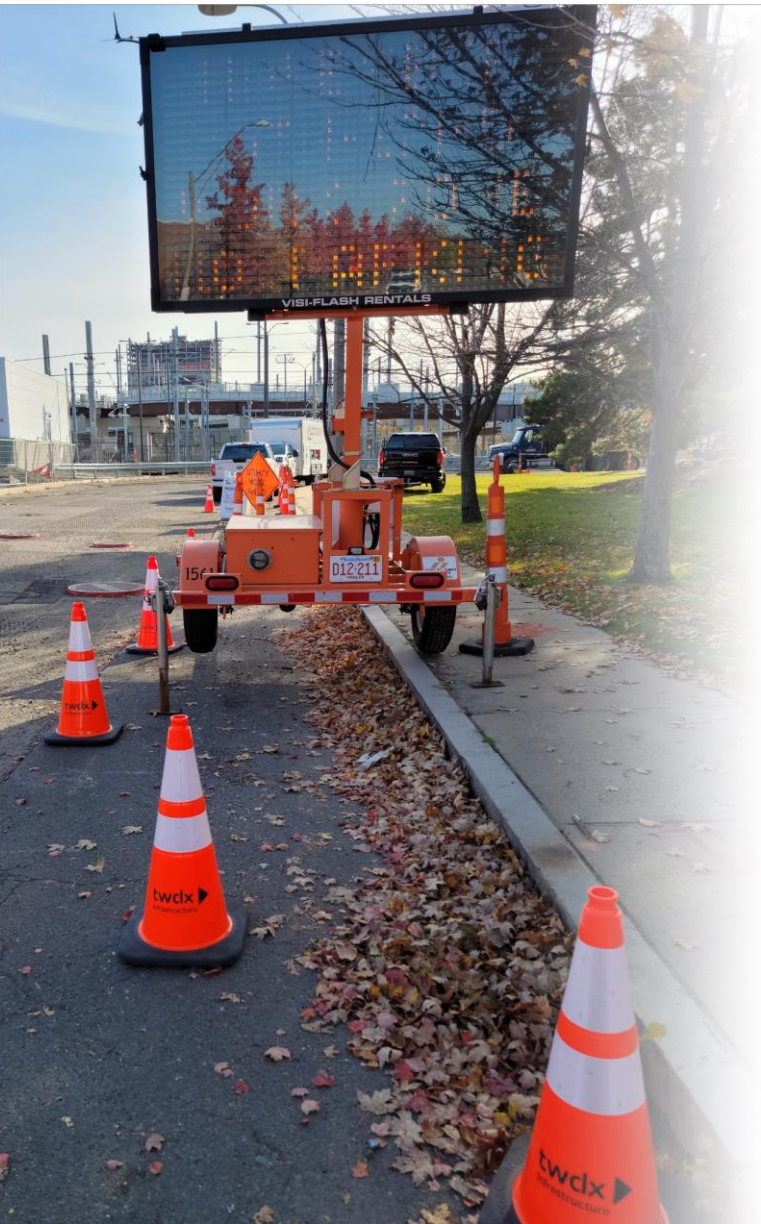
Licensees of the HEX Conduit System are reminded that grossly negligent, willful or repeated violation of safety regulations is considered to be *Default in Covenants* under the *Revocable License for Conduit Occupancy*, and TOWARDEX may deny access, restrict or suspend Licensee's work in the Absolute Property, or terminate the License for cause by giving written notice to the Licensee.

Temporary Traffic Control Plans

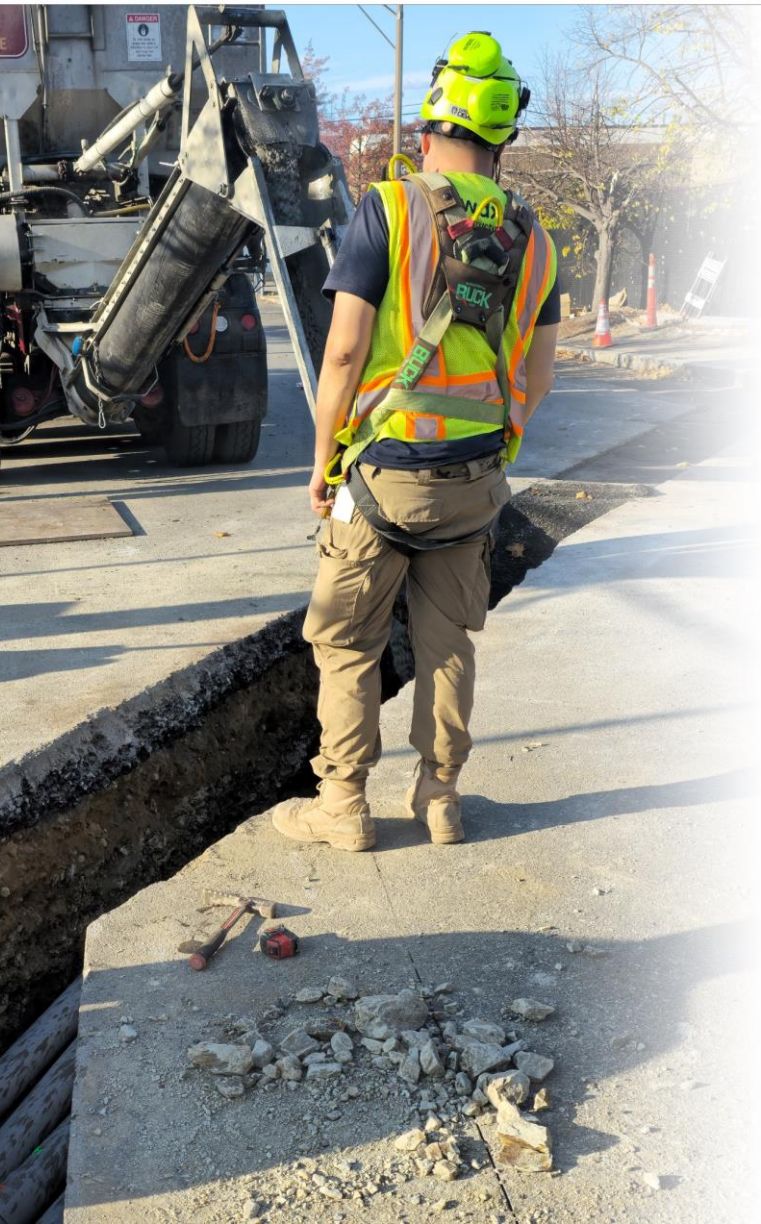
Traffic Control and Police Detail:

Licensee is required (at its own cost) to furnish and erect all applicable traffic control devices and signage in accordance to the approved **Traffic Management Plan (TMP)**, **FHWA Manual on Uniform Traffic Control Devices (MUTCD)** and **Massachusetts Amendments to the 2009 MUTCD** when working in TOWARDEX owned underground utilities.

Licensee is also required (at its own cost) to arrange police detail. No work shall be performed at any TOWARDEX owned utilities in a public right-of-way without a uniformed police officer present at the job site, in accordance to requirements of AHJ. Failure to follow these guidelines will result in TWDX Infrastructure inspector calling in police detail and Traffic Engineer to secure the job site. Licensee will be billed for all police escort, labor, service and dispatch costs when TWDX Infrastructure is mobilized to secure traffic and provide roadway protection at the work site.



Working in the HEX Conduit System



TWDX Infrastructure Escort and Quality Inspection:

Throughout the HEX Conduit System, licensees are not permitted to conduct any work without a TWDX Infrastructure inspector present at the job site. Upon approval of the Form NC-2, Licensee will be charged an Inspection Fee at rates set forth in the Conduit License.

Additional costs associated with routine or emergency work for conduit occupancy such as overtime inspector costs and any other cost pertaining to the protection of all of Licensee's facilities will be billed directly to the Licensee. In addition, any cost incurred to correct any sub standard condition left by Licensee and/or their sub contractor will be billed directly to the Licensee.

Use of Contractors and Vendors:

TWDX Infrastructure requires Licensees of the HEX Conduit System to only utilize contractors, construction and fiber optic maintenance vendors which are authorized to perform work in the HEX Conduit System and TOWARDEX owned underground utilities.

Contact the Joint Trench Helpdesk at plantmaster@towardex.com to receive the current list of approved vendors.

TWDX Infrastructure Inspector and Directions of AHJ at Work Site:

When in the opinion of the TWDX Infrastructure Inspector or AHJ (including police officers at job site, city and/or state Engineer, etc.) that the Licensee's operation constitutes hazard to traffic, public, or structural safety, the Licensee is required to fully comply with directions of such authority, including suspension of work during certain hours and removal of equipment from the right of way.

Working in the HEX Conduit Sys.. (cont'd)



Manhole Sediments / Water:

As a condition of being permitted to enter and work inside TOWARDEX owned underground utilities, Licensee is required to comply, at its own expense, with all applicable laws, including those relating to the protection of the health, safety and the environment. This is especially important for utility manholes, which often fill up with water depending on the preceding weather and local water table at the soil underneath. When the Licensee is pumping out a HEX manhole, Licensee must manage its discharge and any waste in full compliance with all applicable laws and environmental regulations in effect.

In the event that Licensee is found dumping sediment or hazardous waste directly into the public street or storm drain in violation of environmental regulations, Licensee will be held liable for all liabilities resulting from such violation, including any fines, civil penalties and clean up costs, etc. TOWARDEX reserves the right to deny access, suspend, or terminate the Conduit License if the Licensee is found grossly negligent, willful, or repeated in violation of environmental regulations while working in the HEX Conduit System.

Post Work:

Licensee is required to remove all of its work equipment and temporary traffic control and safety devices immediately upon conclusion or termination of the Permit covering Licensee's access and work in the HEX Conduit System.

If it becomes necessary for TWDX Infrastructure or regulatory authority (such as traffic department or department of public works) to remove any construction warning devices or their appurtenances from the project due to negligence by the Licensee, Licensee will be billed for all reasonable costs for this work.

HUB EXPRESS SYSTEM



Shadow Conduit Policy

For each construction of the HEX Conduit System, TWDX Infrastructure engages with the local authority during the design process to meet our obligations under Dig Once and "shadow" conduit policies, as follows:

Municipalities with City Shadow and/or Dig Once Policies:

TWDX Infrastructure will design the HEX Conduit System section in accordance with the municipality's Dig Once and City Shadow policies in effect. These activities include, publicly notifying all other telecommunications utilities to join in under a "joint trench" construction with TOWARDEX as the lead company.

TWDX Infrastructure will liaise with the local authority and project stakeholders to deliver a combined duct bank for our joint trench customers and to the satisfaction of the municipality.

HEX Mainline Joint Trench Detail:

In a typical joint trench detail, (15) 4" ducts are installed for the HEX Conduit System's mainline section, then additional 4" ducts are added as ordered by each joint trench customer. Finally, any "shadow" conduits required by the municipality (e.g. (4) 1.25" HDPE ducts) will be added in accordance to the engineering requirements set forth by the City Engineer.

Typically, joint trench customers are required to cover costs to have their own separate manhole installed, away from the HEX Conduit System's mainline— the customer's 4" duct will break away from the mainline trench to lead into the manhole owned by the customer, instead of terminating into HEX Conduit System's mainline underground vault.

Where applicable, TWDX Infrastructure will propose to construct a separate 4' X 4' communications manhole which would terminate all 4" ducts owned by different joint trench customers, as well as "shadow" conduits required by the City. This 4' X 4' manhole will operate independently of the HEX Conduit System; however, upon request, TWDX Infrastructure will construct interconnection conduits to the nearest HEX mainline underground vault (typically 12' X 8' – 10' X 5').

Joint trench customers may also elect to lease innerduct capacity from HEX mainline ducts— in such an arrangement, separated manhole would only be required if the customer requirements cannot be met using HEX Conduit System's mainline underground vaults.



Shadow Conduit Policy (cont'd)

Municipalities without Dig Once Policies:

Because HEX Conduit System is a multi-tenant, open-leasing communications utility built to promote competition and lower the barrier for entry to all telecommunications providers in Boston, it already meets several Dig Once practices in the industry. Unless the municipality provides a statutory process to solicit a joint trench partaking, or another utility company reaches out during the early design phase of a project, TWDX Infrastructure will not make an effort to organize a joint trench construction.

Municipalities without policies requiring installation of "shadow" conduits:

Where feasible, TWDX Infrastructure will voluntarily construct additional (4) 1.25" HDPE ducts to function as "shadow" conduits or provide minimum of two (2) innerducts for the benefit of the municipality's public use on mainline sections. For branch lines and subsidiary duct banks (e.g. laterals, interconnection ducts, etc.), "shadow" conduits are not voluntarily constructed unless it makes sense to do so under generally applicable engineering practices.

For constructions upon the Public Way where TOWARDEX has obtained a Grant of Location as provided by MGL c.166 § 22, upon request, and where additional "shadow" conduits have been voluntarily constructed as provided in the above paragraph, TOWARDEX may elect to donate such voluntarily constructed "shadow" conduits to the municipality for the benefit of the public interest, as may be provided by law and applicable municipal codes, charter or ordinances (i.e. through an approval via statutory procedure and/or by the City Council as required to accept donations made for a public purpose).

For constructions upon municipally owned land that is not a Public Way, both parties will seek an agreement to grant encroachment for the HEX Conduit System as may be provided by law, such as an Easement Agreement. Unless the municipality chooses to reject, and where additional "shadow" conduits have been accommodated into the design, TOWARDEX will typically propose to grant the use of two (2) 1.25" ducts or innerducts of equivalent capacity to the municipality for public purposes, at no cost or financial responsibility to the municipality. Such provisions are generally incorporated into the agreement providing for the said encroachment, such as an easement granting the location for the HEX Conduit System.



Contacts

Hub Express System Inquiries:

Leasing Office and Conduit Licensing Inquiries:
Permitting and Access Requests:

utility-licensing@towardex.com
cmc@towardex.com

Joint Trench Helpdesk:

Contact	Gavin Schoch General Manager
Hours Office Hours	Monday – Thursday 10:30 AM – 4:30 PM
Phone	617-863-8325
Email	plantmaster@towardex.com
Address	TWDX Infrastructure, LLC 70 Inner Belt Road, Suite M1 Somerville, MA 02143

Utility Locating:



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State law requires that you notify Dig Safe® at least 72 hours prior to any excavation (MGL c.82 § 40A).

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