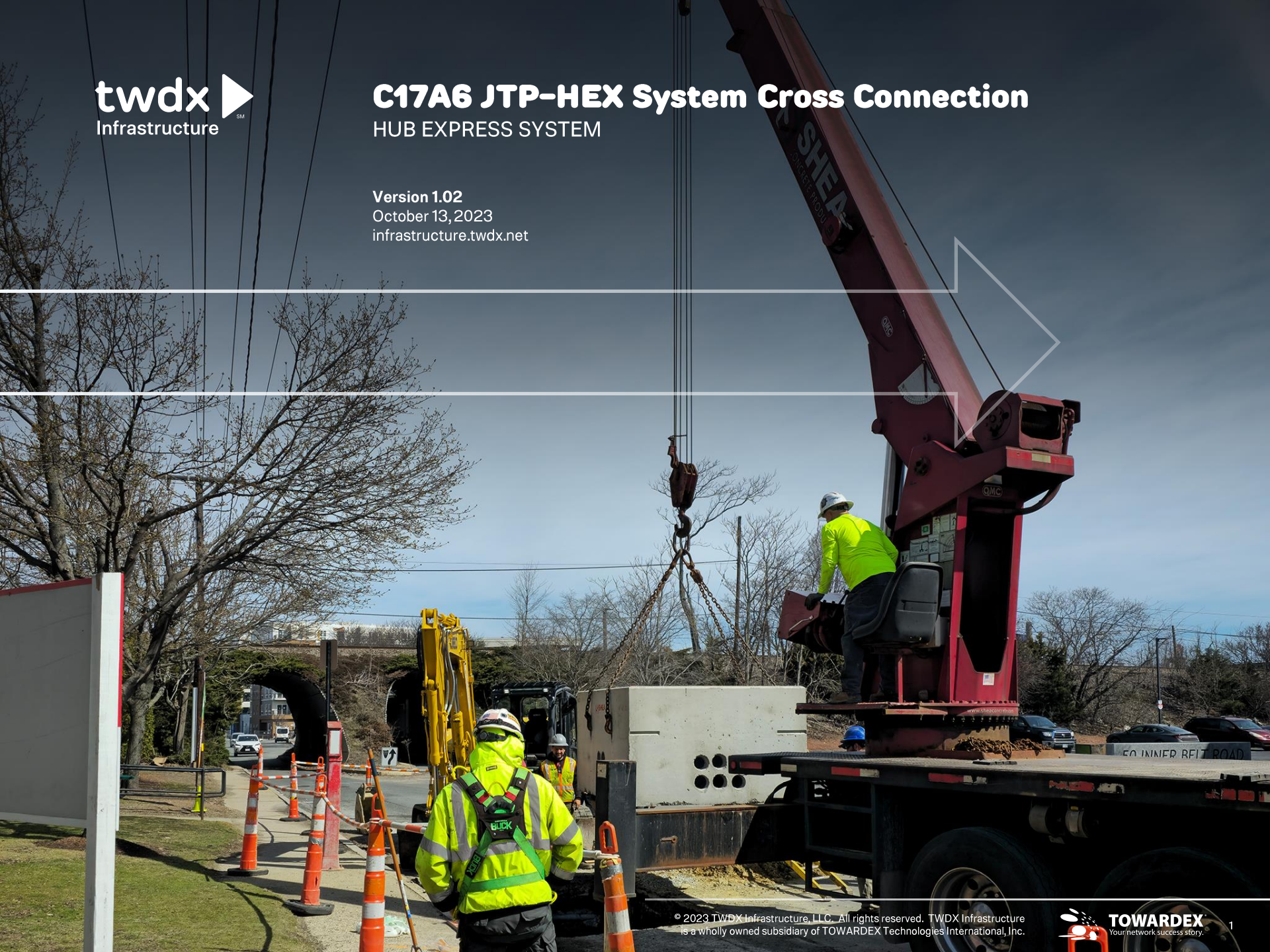




C17A6 JTP-HEX System Cross Connection

HUB EXPRESS SYSTEM

Version 1.02
October 13, 2023
infrastructure.twdx.net



About the JTP-HEX System Cross Connection

The Boston metropolitan area is enjoying a renaissance in ICT investments. With the launch of the new **Amitié** submarine cable and challenges facing existing facilities in Downtown Boston becoming more urgent and intractable, Somerville's Inner Belt is experiencing a boom in renewed telecom and new international connectivity developments.

In particular, international networks and the Big Tech companies are driving new demands for *hyperdense* network interconnections. However, because existing conduits in Boston are lacking adequate access for these new entrants, networks are turning to the **Hub Express System (HEX)**, as HEX is Boston's only purpose-built open-access utility for data centers and internet networks.

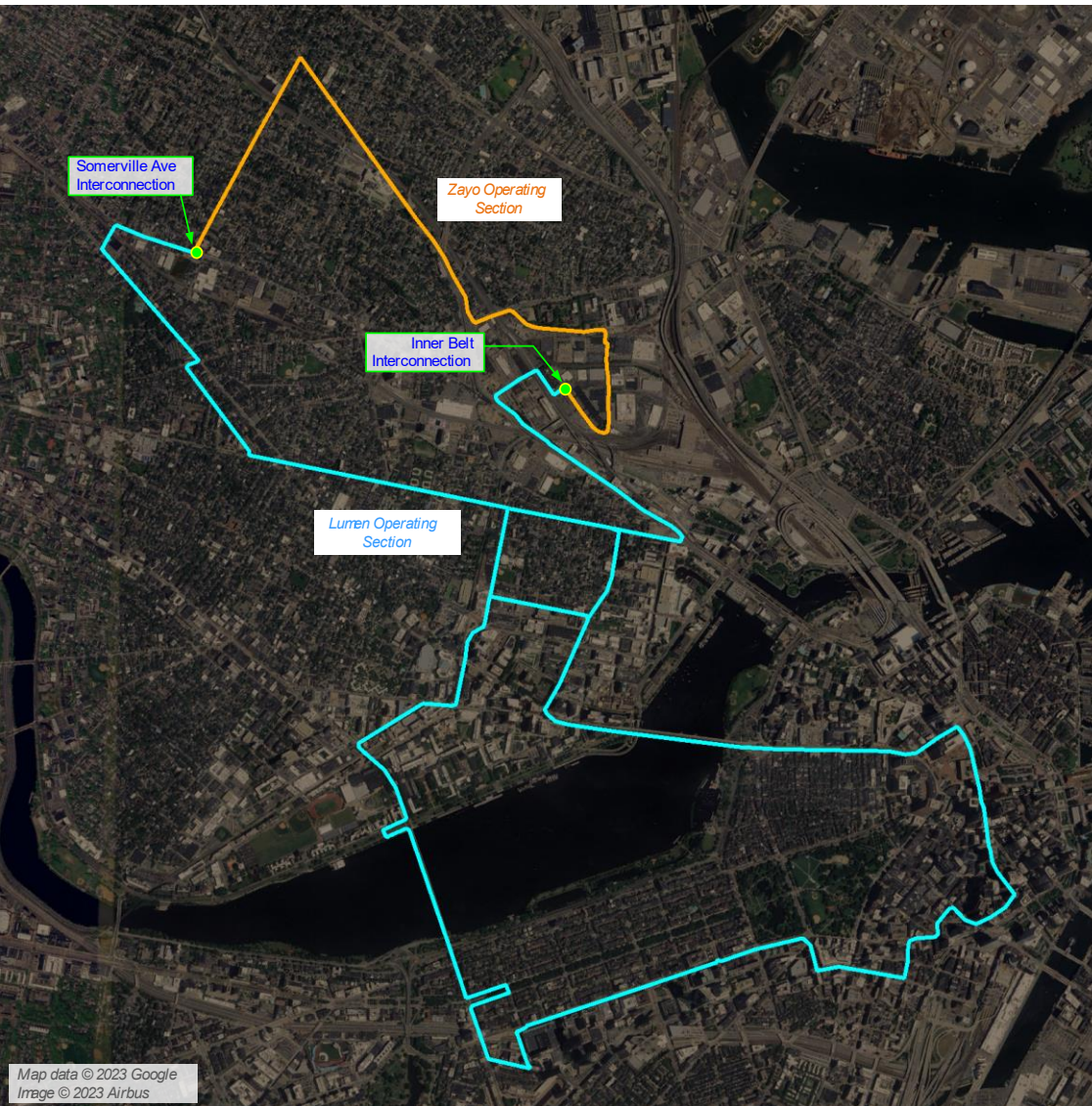
Because HEX is enabling new entrants to essentially become their own network provider for themselves, these networks are placing bulk orders for dark fiber and long-haul capacities from carriers that are located in Boston's existing fiber loop known as the **Joint Trench Partners (JTP)** system. This is placing capacity strains on the physical interconnections that are tying HEX and JTP together.

To meet this ever-increasing demand for network interconnections and to ease access for member networks of the JTP system to use HEX facilities, **TWDX Infrastructure**, on behalf of the project owner **TOWARDEX**, and in coordination with **Zayo**, is constructing a massive underground "system cross connection" between the two utilities.

For background information:

- 📄 Learn more about HEX at towardex.com/go/hex
- 📄 Visit the project site at infrastructure.twdx.net

Understanding JTP Conduit System



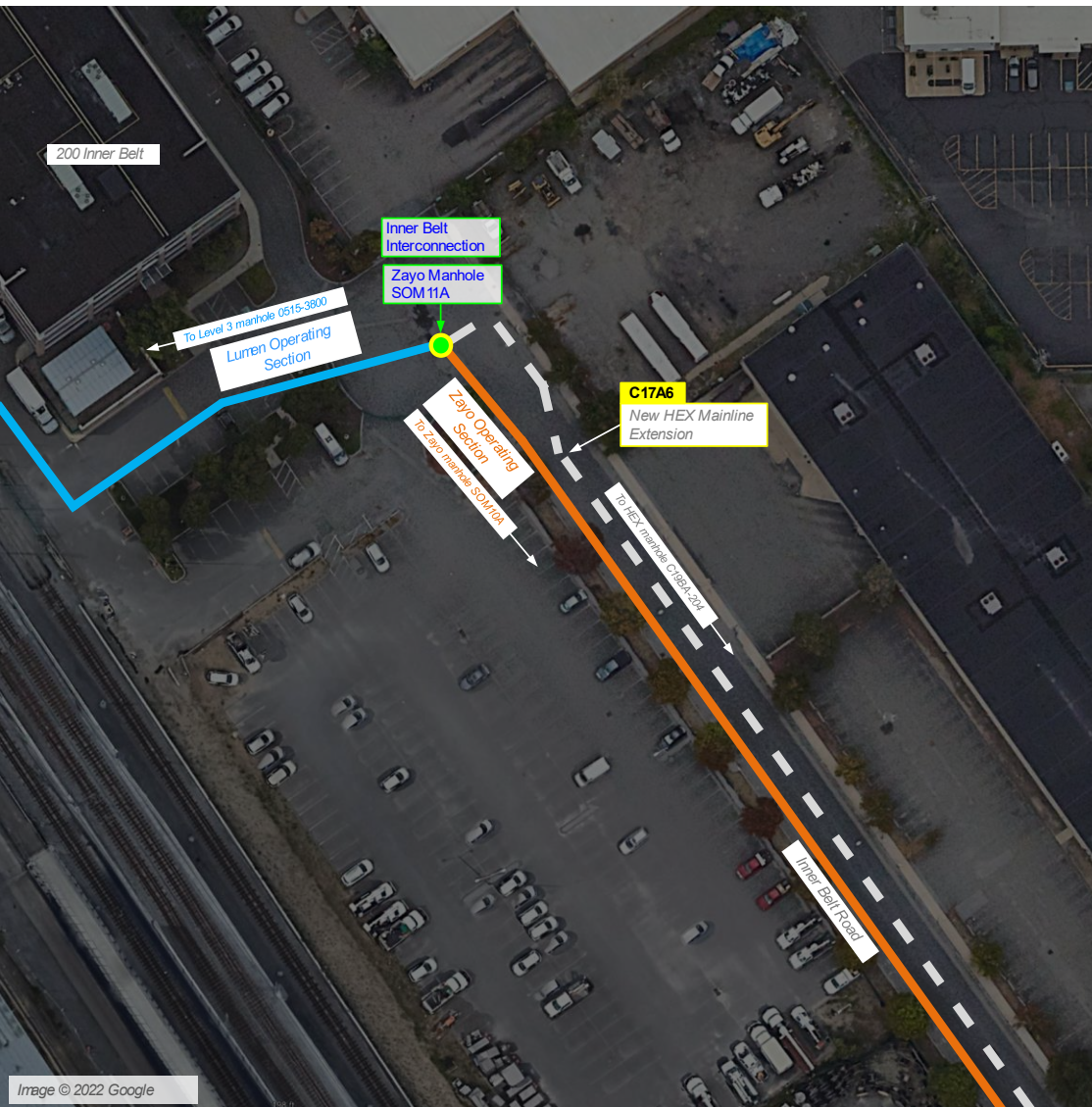
Constructed between 1999 and 2003, the JTP conduit system was built by Level 3 Communications (now Lumen) and Metromedia Fiber Networks (now Zayo).

The massive conduit system is divided into two sections: **Lumen Operating Section** and **Zayo Operating Section**.

The two operating sections of the JTP system are connected together at the following junction points:

- **Somerville Avenue Interconnection**
- **Inner Belt Interconnection**

Inner Belt Interconnection

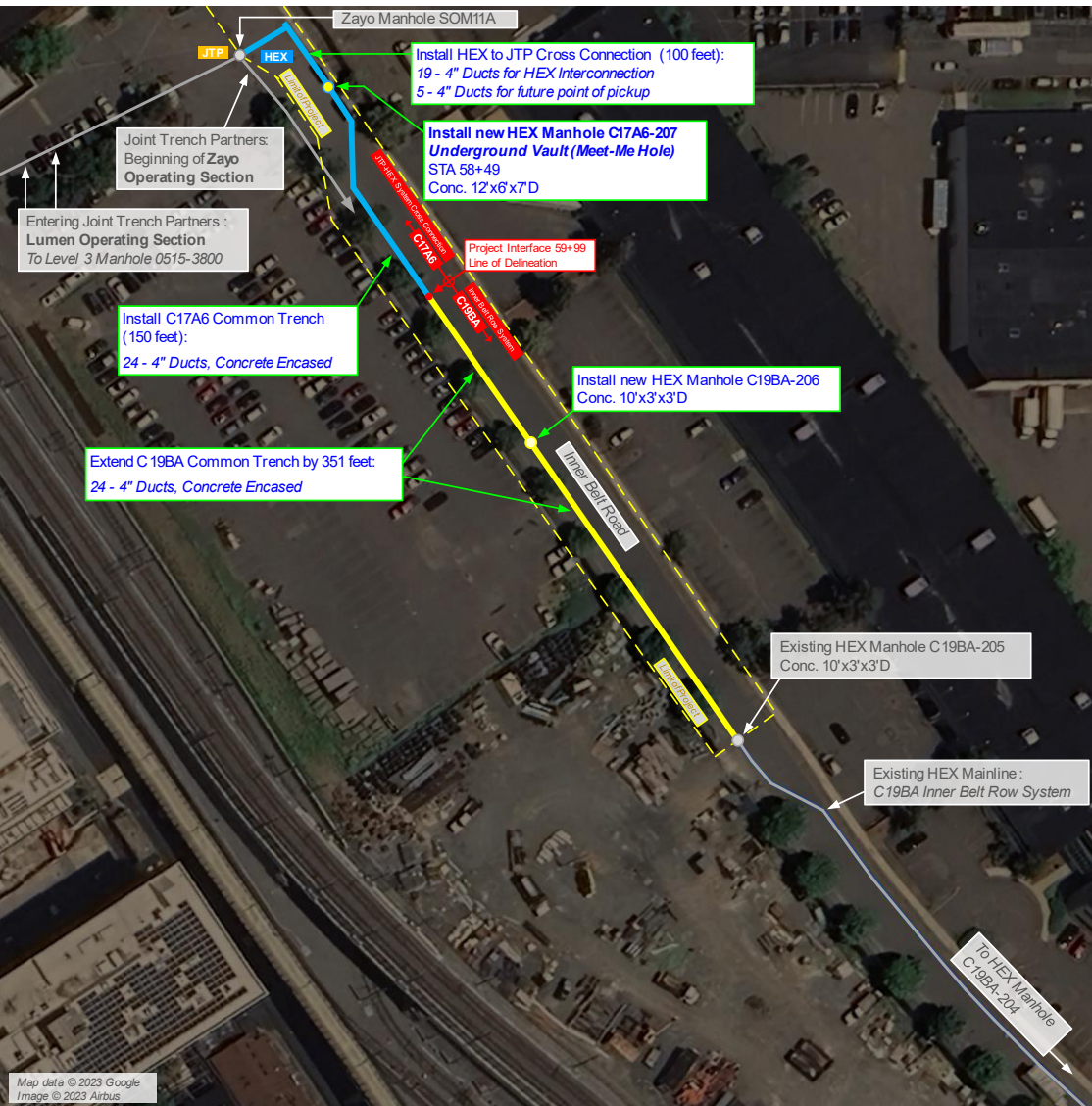


The **Inner Belt Interconnection** functions as the eastern interconnection which connects Lumen and Zayo operating sections of the JTP system together.

The point of connection occurs at Zayo manhole SOM11A, where its west wall represents the beginning of the Lumen / Level 3 system, and its south wall represents the beginning of the Zayo system.

The **JTP-HEX System Cross Connection** project will extend the HEX conduit system to the end of Inner Belt Road and tie it directly into the Inner Belt Interconnection area.

C17A6 Project Overview



A largescale internet backbone interconnection is in the making.

For the first time in 20 years, through cooperation between TOWARDEX and Zayo, the Inner Belt Interconnection is getting a new makeover.

TWDX Infrastructure will extend the HEX conduit system by 500 feet to the end of Inner Belt Road, and connect it to Zayo manhole SOM11A, where both Lumen and Zayo operated sections of the JTP system begin.

This new interconnection will, for the first time, allow members of the Lumen Operating Section to directly connect into HEX. With this new development, members of the Level 3 duct system can now seamlessly access the HEX system without having to seek additional conduit rights.

Over 19 – 4" conduits will connect the systems together, more than doubling the network capacity for data centers and transatlantic cable operators in the Inner Belt area.

Using MaxCell, the project will add 147 new subducts for fiber optic cables between HEX and JTP systems.

Understanding C17A6 Common Trench

Transmission vs. Interconnection

Common Trench is configured differently for *Transmission* and *Interconnection* sections of the project, which are described as follows:

- 'Transmission' refers to the HEX primary duct system ("utility main" or "trunk line") which is being extended to the end of the Inner Belt Road.
- 'Interconnection' refers to the duct bank which connects the first HEX manhole onto the JTP system at the Inner Belt Interconnection area.

Joint Trench Partaking

A portion of the HEX Common Trench has been allocated for **Joint Network Facilities (JNF)**, where 1.25" conduits are made available on a first-come, first-serve basis for joint trench customers. In addition, for a limited time while the street is open, carriers may also request to build their own conduit into the Common Trench.

TWDX Infrastructure administers the joint trench solicitation and partaking process for the HEX system. For information about participating in the joint trench, including deadlines for registering your interest, please review the project's [Common Trench Letter](#).

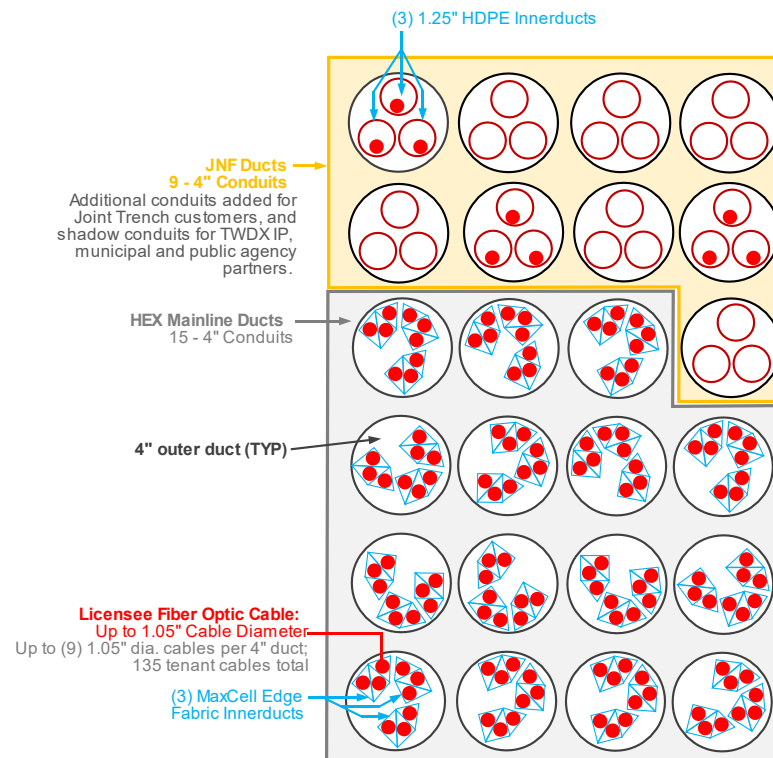


Transmission Common Trench Detail



HEX Common Trench along 121–200 Inner Belt Road will be 24–4" conduits, as follows:

- 15–4" ducts for HEX Mainline, subdivided using MaxCell (135 subducts)
- 27–1.25" subducts for Joint Trench customers & shadow conduits

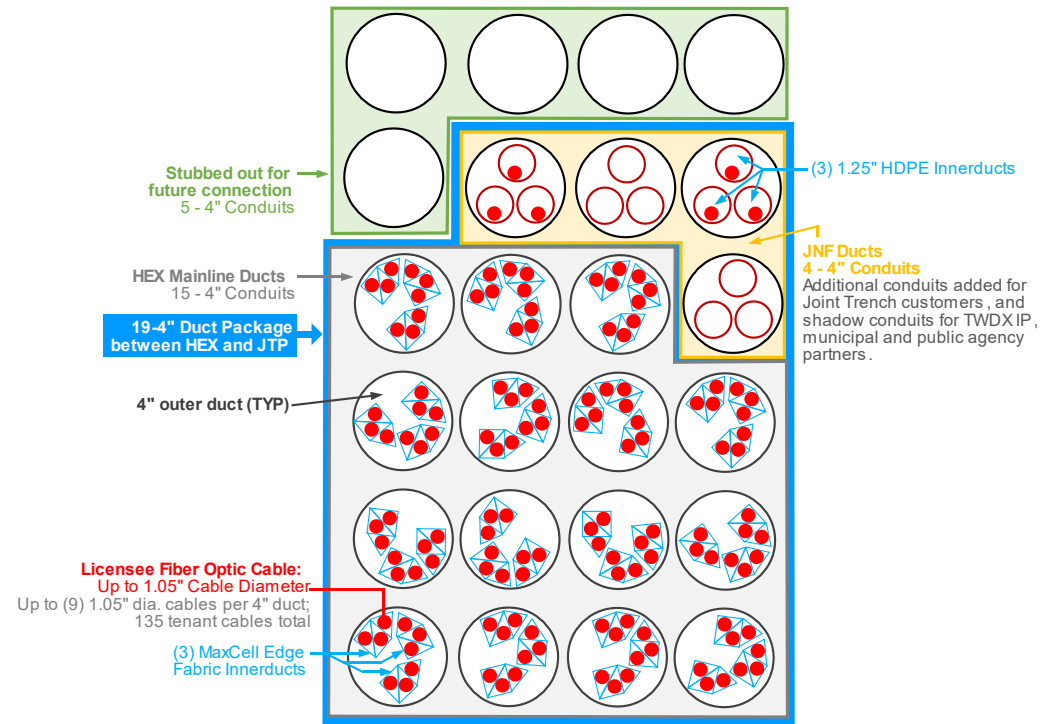


Interconnection Common Trench Detail



HEX Common Trench for interconnection into JTP is divided as follows:

- 15—4" ducts for HEX Mainline, subdivided using MaxCell (135 subducts)
- 12—1.25" subducts for Joint Trench customers & shadow conduits
- 5—4" ducts stubbed out at point of pickup for laterals



New HEX Manhole C17A6-207

New Underground Cable Vault C17A6-207

A new underground vault designated as HEX Manhole C17A6-207 will be built nearby at the Inner Belt Interconnection area. It will facilitate cable routing & jointing by network developers as they cross between JTP and HEX duct systems.

The new vault will be 12'x6'x7'D in size and will connect into C19BA Inner Belt Row System via transmission duct package of 24-4" conduits.

Project engineers have designated this new vault as a *Meet-Me Hole*, providing managed and secure facilities for tenants to install splice cases and slacks for their networks. The next nearest Meet-Me Hole is C19BA-204 located about 1,000' away.



Underground Vault Enhancements



HEX Manhole Operations

Access and work inside HEX cable vaults are highly regulated, which only TWDX Infrastructure and permitted personnel can access. By maintaining well-managed, secure and clean environment in our underground vaults, customers benefit from increased safety, security and reliability in operating their backbone networks. Additionally, by maintaining clean vaults, we maximize the availability of physical space, reducing manhole congestions and clutter.

Furthermore, HEX Underground Vaults are design rated to be watertight, gas-tight and rodent resistant at all times. **This means that all duct openings are strictly regulated and managed.**

Roxtec, Inc. has been selected to provide cable transit management and sealing of all duct openings in HEX Underground Vaults. **Roxtec Transit Operate** will be used to facilitate ongoing inspections and maintenance.

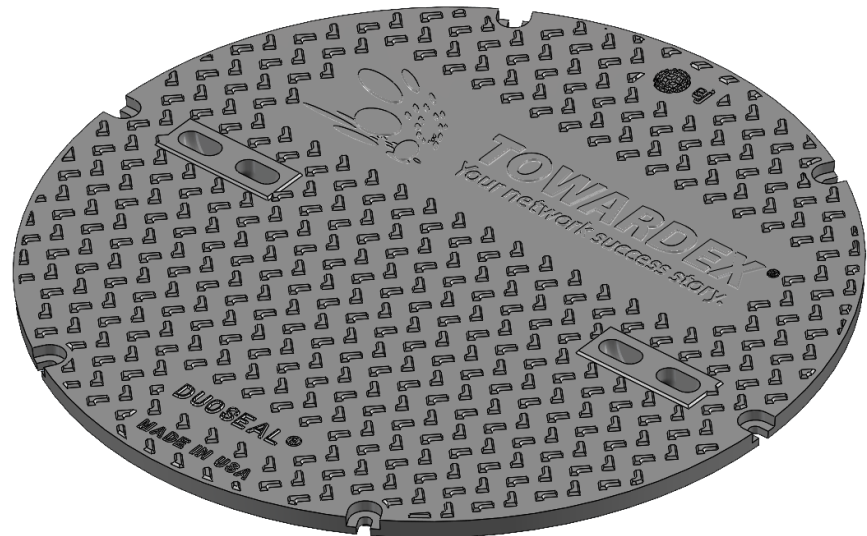
Underground Vault Enhancements

New Manhole Covers for HEX Underground Vaults

To enhance infrastructure security and enforcement of permit-to-work policies, starting with this project, TWDX Infrastructure will begin installing new locking manhole covers.

These new covers are developed for the HEX system by **EJ Group** and will feature locking bolts from **Bryce Security Fastener** to deny unauthorized entry, and will be watertight at up to 118' of waterhead, completely eliminating stormwater inflow from the street. These new covers will be installed in regulated HEX Underground Vaults, such as Meet-Me Holes.

For code requirements, these covers cannot be installed in facilities which cannot be certified to be gastight, or where presence of potentially dangerous or explosive atmosphere is expected (i.e. pull boxes and manholes for electric system interconnections).



Construction Workflow

Street Opening and Utility Work

TOWARDEX received siting approval and permit from the City of Somerville for the project in September 2023. TWDX Infrastructure will mobilize and commence work on the week of October 23, 2023.

Crews will start the project by constructing the new HEX underground vault and connecting it to Zayo manhole SOM11A. Crews will then stand down for the Winter Moratorium and construction of the 500' transmission line extension will begin in 2024.

Manhole Installation

Shea Concrete Products, Inc. of Amesbury, Massachusetts has been selected for precast cable vault and installation. Contractor working for TWDX Infrastructure will dig the vault pit and install trench protection to prevent cave-ins. Areas surrounding the manhole will be backfilled with excavatable Controlled Density Fill (CDF) to meet compaction requirements for traffic loading, while allowing re-excavations to later add additional conduits into the manhole.

Duct Bank Installation

All duct banks will be encased in min. 3,000 psi concrete. All ducts approaching the underground vault must be installed with trench protection, and duct banks within 5 feet of a pull box manhole shall use concrete reinforcement.

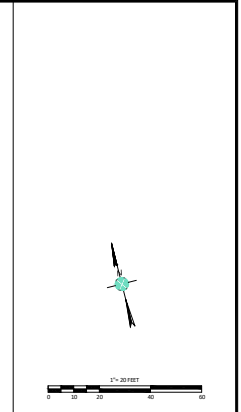
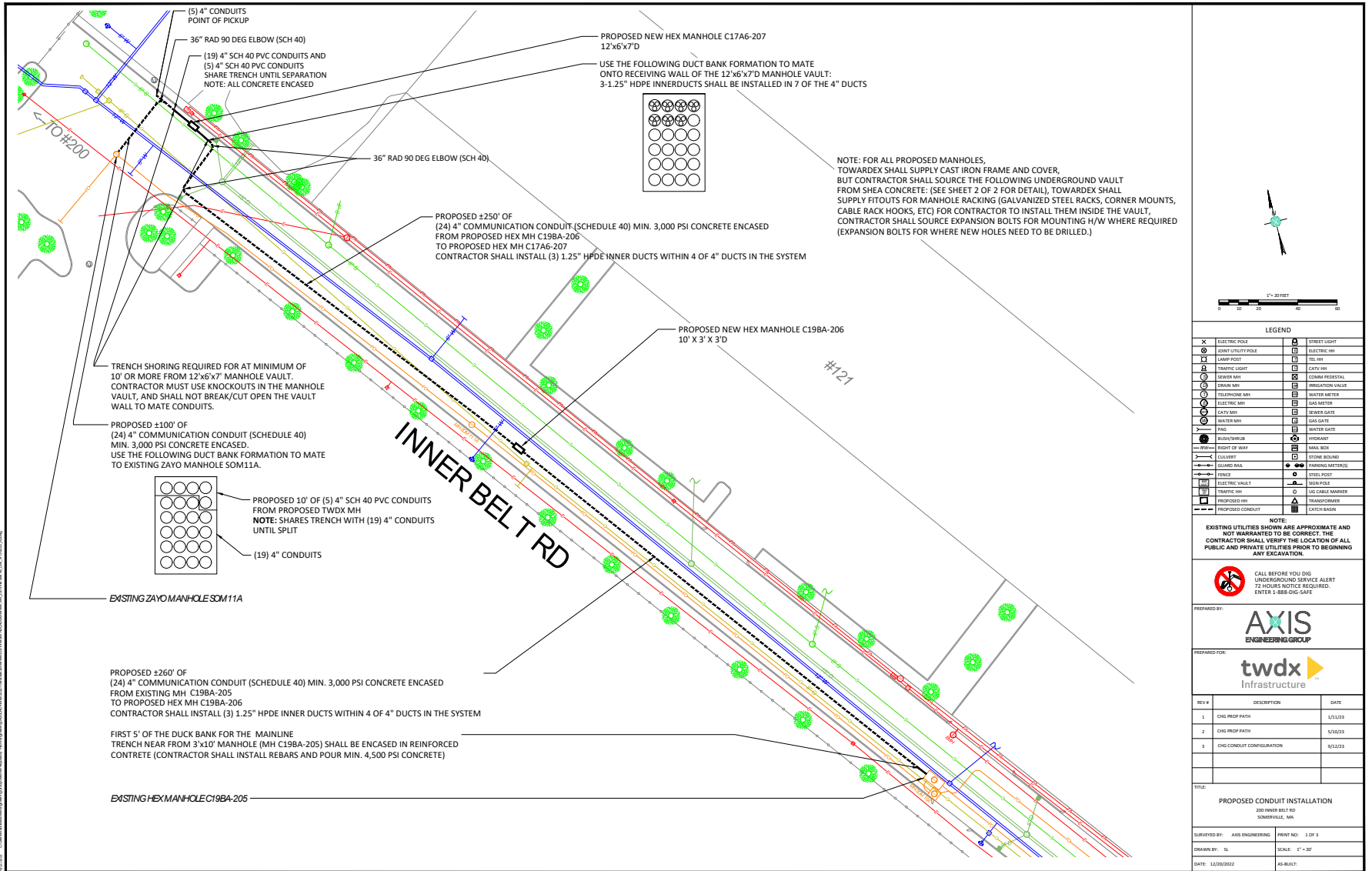
Zayo Manhole SOM11A

In coordination with Zayo, TWDX Infrastructure will mate new conduits from the HEX system into Zayo manhole 11A located at the Inner Belt Interconnection area.

In addition, TWDX Infrastructure will furnish an approved environmental cleanup vendor to purge and clean out manhole SOM11A, as over 2 feet of spoils and contaminants have been piling up in the manhole during its past 20 years of service. All rehabilitation work in manhole 11A shall be performed under the direction and supervision of Zayo authorized personnel.



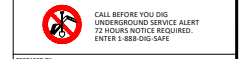
Conduit Placement Plan



LEGEND

X	ELECTRIC POLE	⊠	STREET LIGHT
⊕	JOINT UTILITY POLE	⊠	ELECTRIC MH
⊕	DUMP PILE	⊠	TELE MH
⊕	TRAFFIC LIGHT	⊠	CATV MH
⊕	SEWER MH	⊠	COMMA PREDESTAL
⊕	STEAM MH	⊠	REGULATION VALVE
⊕	TELEPHONE MH	⊠	WATER METER
⊕	ELECTRIC MH	⊠	GAS METER
⊕	CATV MH	⊠	SEWER GATE
⊕	WATER MH	⊠	GAS GATE
⊕	WATER GATE	⊠	WATER GATE
⊕	FLAG	⊠	WATER GATE
⊕	ROADWAY	⊠	ROADWAY
⊕	RIGHT OF WAY	⊠	MAIL BOX
⊕	DRIVEWAY	⊠	STONE BOUND
⊕	GUARD RAIL	⊠	PARKING METERS
⊕	SENSE	⊠	STEEL POST
⊕	ELECTRIC VAULT	⊠	STONE PILE
⊕	TRAFFIC MH	⊠	LOG CABLE MARKER
⊕	PROPOSED MH	⊠	TRANSFORMER
⊕	PROPOSED CONDUIT	⊠	SAFETY BARRI

NOTE:
EXISTING UTILITIES SHOWN ARE APPROXIMATE AND NOT WARRANTED TO BE CORRECT. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL PUBLIC AND PRIVATE UTILITIES PRIOR TO BEGINNING ANY EXCAVATION.



PREPARED BY:
AXIS
ENGINEERING GROUP

PREPARED FOR:
twdx
Infrastructure

REV #	DESCRIPTION	DATE
1	CHG PROP PATH	1/11/23
2	CHG PROP PATH	5/28/23
3	CHG CONDUIT CONFIGURATION	9/13/23

TITLE:
PROPOSED CONDUIT INSTALLATION
300 INNER BELT RD
SOMERVILLE, MA

SURVEYED BY: AXIS ENGINEERING PRINT NO: 1 OF 3
DRAWN BY: SL SCALE: 1" = 20'
DATE: 12/08/2022 AS-BUILT:



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:



811
or 888-DIG-SAFE (344-7233)

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

Corporate Headquarters:

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