



# A2MC

# Communications Services Relocation

## Project Plan for Relocating Larcom Building Communications Service Entrances and Rooms

This project plan describes the challenges, timelines and necessary changes to the communications service entrances, rooms and services in use at the Larcom Building because of conflict with the construction of the new police, court and IT building on the Ann Arbor Municipal Center site.

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# EXECUTIVE OVERVIEW

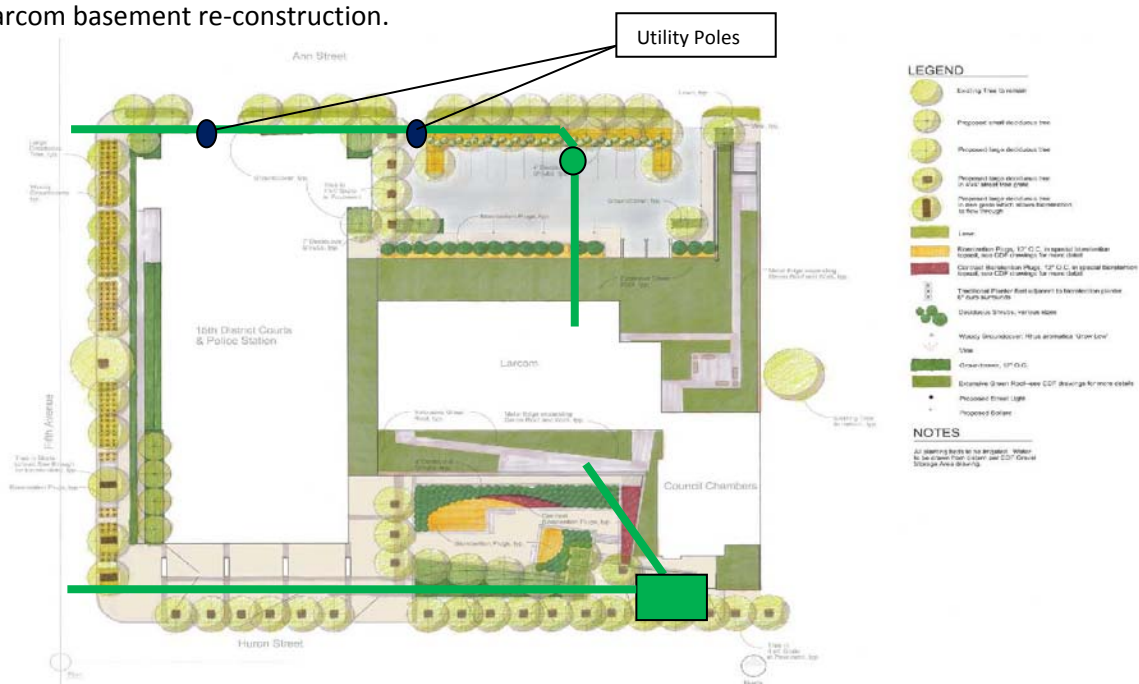
## SUMMARY

In June 2008, with construction of the new Police, Court and IT building on the horizon, staff began investigating the impact of anticipated construction on the existing communications services in use at the Larcom Building. This project is the vehicle for identifying and relocating all communications services including data, voice, radio, signals and cable services from areas where they will be impacted by the planned construction to locations where they will remain operational during the construction phase and thereafter. Several of these relocated services will need to be extended, either directly or indirectly to the new IT Datacenter in the Police, Court and IT building.

The primary goal of this project is to facilitate the relocation of these services with a minimum impact on City services and operations prior to the start of construction of the Police, Court and IT building. This is a critical path project that needs to be completed prior to the beginning of any major construction on the Ann Arbor Municipal Center site.

Today communications services enter Larcom through two underground entry points; one located on the north side (E. Ann St.) and one the south side (E. Huron St.) of the building. These communications services terminate at several locations inside Larcom. Services from the Comcast Institutional Network (I-Net) enter from the north, and the City data and traffic signals network enter through the south. Both networks terminate in the City Datacenter on the first floor. The first floor intermediate distribution frame (IDF) is located in a wiring closet in the Police Datacenter on the first floor of Larcom. All telephone services, including AT&T Centrex, local & long distance, terminate in the "Phone Equipment Room" located in the south-east section of the Larcom basement, attached to the old dispatch center. Cable services terminate in the "Pump Room" also located in south-east section of the basement and adjacent to the phone equipment room.

Both communications services entry points and the underground vaults used to serve them are in the proposed construction zone; the north side vault lies in the proposed parking lot and the feeds cross through the proposed rainwater garden while the south side vault lies directly under a proposed footing. The services currently in the "Phone Room" also need to be relocated to accommodate the proposed Larcom basement re-construction.

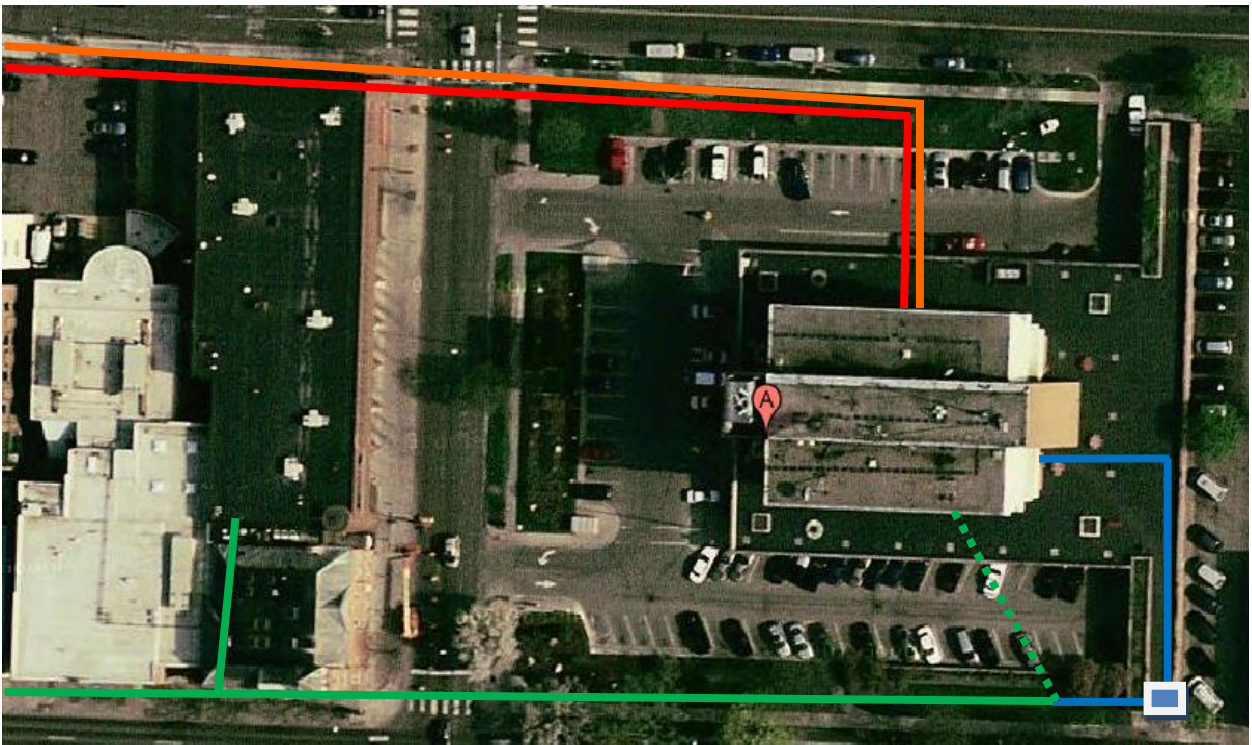


Aerial view of the Ann Arbor Municipal Center site with the north and south service vaults and routes in green

## GENERAL SERVICES RELOCATION PLAN

The overall plan for communication services relocation is to:

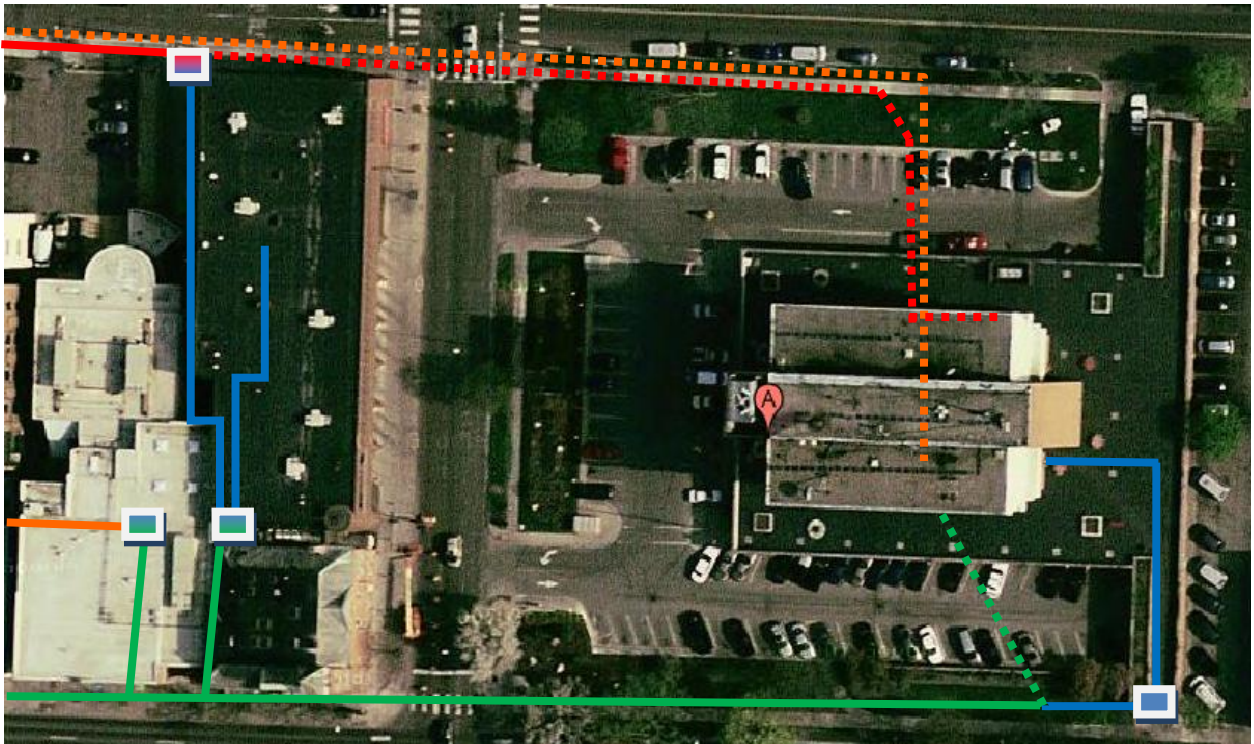
- 1) Prepare alternate access route. Extend the south side telephone vault to the east side fire pump station, located in a protected area outside of the Larcom Building, by installing a field networking cabinet in the fire pump room and installing conduit along the roof of the Police Garage to an entry point perpendicular to Room 023 - Central Electronics Bank Room (CEB) (see Exhibit B: Proposed Basement Layout). Extend the existing seven (7) fiber cables to the field networking cabinet, located in the Fire Pump Room, and use the cabinet as a fiber aggregation point. Extend the aggregated fiber to the CEB and the 1<sup>st</sup> floor IDF, through the Room 026 - Pump Room, where de-aggregation electronics will be located. Have AT&T extend a parallel phone service by performing a "bridge tap" on the 1600 pair phone line cable and route that to the CEB where it will be punched down and available for transfer of service.



The lines above illustrate the current south-side configuration in green and the proposed in blue. The dotted-lined service will be abandoned. The orange is existing County and red is existing I-Net.

- 2) Shut down the Phone Room. Terminate unused services and move in-use services to either the CEB, Pump Room or to the first floor datacenter via the 1<sup>st</sup> floor IDF in the Larcom Building.

- 3) Create additional Network Hubs in Fire Station 1 and the Hands-On Museum. Reroute the City's I-Net to the basement of Fire Station 1 and then extend 80+ active strands to the 3<sup>rd</sup> floor of Fire Station 1. Aggregate the 80+ live strands in use today to a 40Gbit connection and route down the existing 24/6, running from Fire Station 1 to Larcom, to the new field cabinet on the east side of the Larcom, accessing the datacenter through the new conduit and fiber assemblies and finally terminating in the Larcom datacenter. Reroute dark fiber from the County connection through the Hands-On Museum providing connectivity for Washtenaw County to the City-County datacenter. Cross-connect the County's fiber in the Hands-On-Museum to the existing City 24/6 fiber run (providing internet access to AADL\*). Connect the County network to Larcom from the Hands-On Museum along the extended south-side conduit run to the City-County datacenter along the same path as used above. Route Firestation-1 2<sup>nd</sup> Floor IDF to 3<sup>rd</sup> Floor IDF. Using analog to fiber conversion electronics, extend the 900 pair TIE line via fiber back to the CEB, where the required fiber to analog equipment will convert the fiber back to an analog phone service.

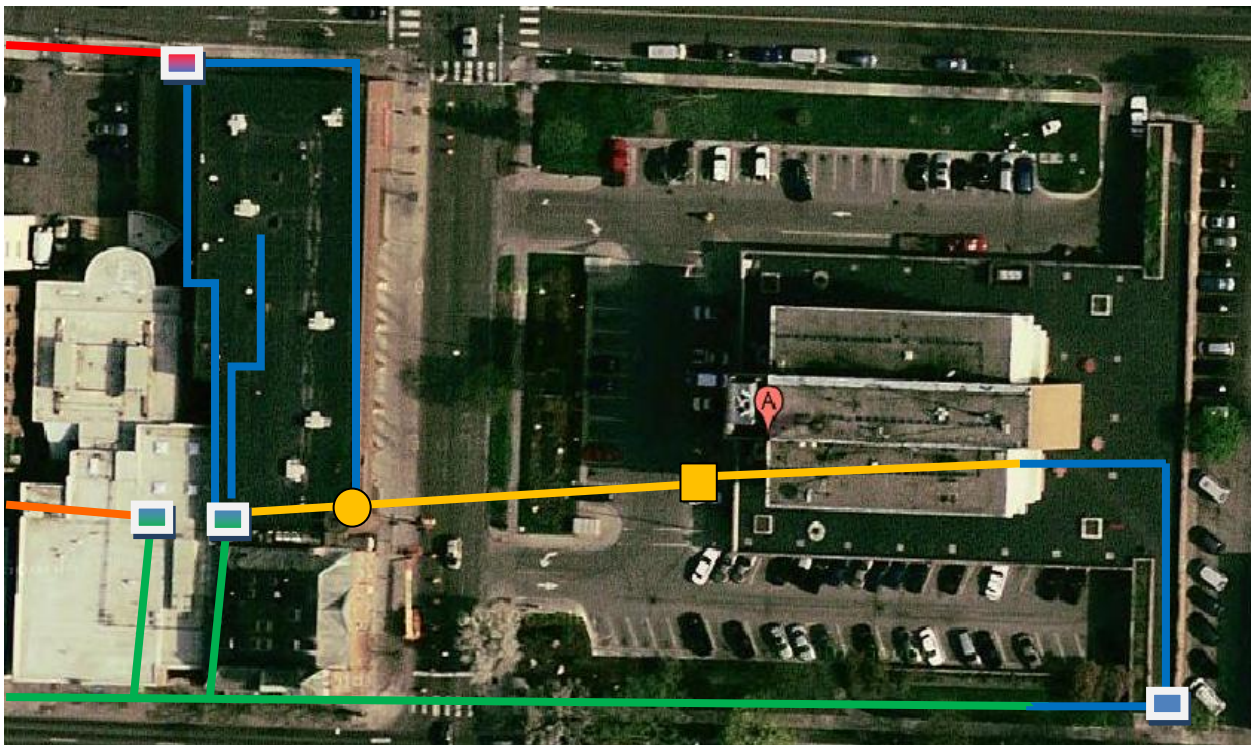


The lines above illustrate the existing configuration in green, the north side I-Net in red, County in orange, and the proposed connections in blue. The dotted-lined services will be abandoned.

\*The Ann Arbor District Library's internet connection via the Hands-On-Museum will need to be temporarily relocated to the i-Net to allow for the relocation of the "tail" of the 24/6 fiber run currently providing service. Once the relocation to the CEB is complete, it will be switched back.

4) Complete new Data Center connectivity:

- a. Conduit will be installed between the IDF on the 1<sup>st</sup> floor of Larcom and the new datacenter in the Police, Court and IT Building
- b. Conduit will be installed between the CEB and the datacenter in the Police, Court and IT Building
- c. Conduit will be installed between the CEB and the “Meet Me” Networking Room in the Police, Court and IT Building
- d. A new manhole will be installed, located on 5<sup>th</sup> Ave. across from the Police, Court and IT Building.
- e. 3 X 4” conduit runs will be installed between the new manhole on 5<sup>th</sup> and the “Meet Me” Networking Room in the Police, Court and IT Building.
- f. The remaining dark fiber from the I-Net will be run from the IDF on the 3<sup>rd</sup> floor of Fire Station 1 to the “Meet Me” Networking Room in the Police, Court and IT Building where they will be extended to the data center.
- g. Connect County and Fire Station 1 fiber to new inter-building fiber plant and extend to the data center.
- h. Extend the data services from the IDF on the 1<sup>st</sup> floor of Larcom to the data center at the Police, Court and IT Building.
- i. Extend necessary phone services from the CEB in the basement of Larcom to the “Meet Me” Networking Room at the Police, Court and IT Building.



This drawing illustrates the updated configurations in blue and the new connections to the data center in the Police, Court and IT building in yellow. The red is the unchanged I-Net, green is the unchanged City Data & Signals and orange is the existing County fiber. New County fiber locations are TBD but will use both the east and west entrances.

## Site Assessments and Detailed Plans

### SOUTH TELEPHONE VAULT SITE ASSESSMENT

The south side entry is located north of the sidewalk off of Huron, at the base of the promenade stair on the east side of the Larcom building. This is a very large vault that requires special safety equipment and training to enter. This vault enters Larcom through the police locker room and extends through the CEB Room to the Pump Room where it meets the vertical pathway to the 1<sup>st</sup> floor IDF and the Data center.

The south side vault contains:

- 1600 pair of copper lines from AT&T. This is the City's entire Centrex phone system and also carries all 911 calls to 911 Dispatch Call Center
- 1 X 24 SM/6 MM fiber cable to Hands on Museum via the 5<sup>th</sup> and Huron Vault, which acts as a distribution point for fiber and provides internet access to the AADL
- 1 X 24 SM/6 MM fiber cable to EOC via the 5<sup>th</sup> and Huron Vault
- 1 X 30 SM/6 MM fiber cable to the 5<sup>th</sup> and Huron Vault serving signals near S. State and University
- 1 X 18 SM/6 MM fiber cable to the 5<sup>th</sup> and Huron Vault serving Water Utilities
- 1 X 24 MM fiber cable to the 5<sup>th</sup> and Huron Vault serving Division and Huron Signals
- 1 X 48 SM/48 MM fiber cable to the 5<sup>th</sup> and Huron Vault spliced out to serve City Center, Division & Huron Signals, 2000 South Industrial and Wheeler Center via other City conduit runs
- 1 X 12 SM/ 12 MM fiber cable to 721 Main St.

The south side vault is fed from:

- The 5th & Huron fiber vault
- AT&T Central Office building located directly across Huron.

The south side vault feeds to:

- Central Electronic Bank (CEB) Room
- Phone Room
- First floor IDF via the vertical riser system located above the Phone Room
- Datacenter in Larcom via the first floor IDF

## **SOUTH TELEPHONE VAULT SERVICES RELOCATION PLAN**

### **Conduit Extension**

The key to relocating the south telephone vault, and for providing communications services to Larcom during construction will be to extend the existing south side conduit infrastructure east of the existing location to a field networking cabinet in the fire pump room and installing conduit along the roof of the Police Garage to entry points perpendicular to CEB. These service entrances will enter the garage at roof-level inside of the Police Garage. The conduits will then run into the east side of the Larcom building, where they will enter the basement at ceiling level. The conduits will then route to the CEB or Pump Room where they will either terminate or extend to the first floor IDF for termination in the City data center.

Two types of services will need to be extended to Larcom; fiber and copper.

The copper service conduit run will consist of a 4" conduit extension running east to either the property line or the fire pump room, where it will turn 90° to the west and run to one of the service entrances described above.

In the Fire Pump Room, located outside the southeast side of the Police Garage, an above ground networking cabinet will be installed that will house power, climate control, fiber and networking electronics. This above ground networking cabinet will be the aggregation point for extended south side and redirected north side fiber services.

The fiber service conduit runs will consist of two 4" conduit extensions that parallels the copper services conduit run, except that it will extend east to the above ground networking cabinet, where services will first be aggregated, and then from there to the Larcom building where it will enter the premises through one of the conduit entrances.

### **Relocate 1600 pair of copper line service from AT&T**

A parallel 1600 pair AT&T service will be installed in the CEB and terminated on its east wall. The 1600 pair copper line will feed through the copper conduit system to the south vault. Once located in the south vault, this parallel service will be "bridge tapped" to the existing AT&T service providing a duplicate, live AT&T service.

### **Relocate Seven Fiber Cables Containing 156 SM/96 MM**

Fiber to provide the services from the six fiber cables described above will be configured first to run from the above ground networking cabinet back to first floor data center, via conduit to the CEB and Pump Room. This run may consist of one or more physical fiber cables. Once in the data center, these services will be prepared for cut over. Each of the six fiber cables will then be brought to the above-ground networking cabinet where they will be patched in and their services then switched over.

### **Relocate 24 SM/6 MM Fiber Cable Containing Ann Arbor District Library's Internet Connection**

Reroute the tail of one 24 SM/6 MM fiber cable from the Hands-On Museum to the CEB to access the CEB via the extended south-side conduit run, through the Fire Pump Room, across the Police Garage and to the CEB and Pump Room. Relocate the AADL Internet connection during the reroute.

## PHONE ROOM SITE ASSESSMENT

The Phone Room is located in the basement of the Larcom building approximately in the center of the building. It is accessed through a south side door directly north of the "old" dispatch area. The Phone Room is adjacent Pump Room on the east and a Police Department room on the west.

The Phone Room contains:

- 1 large cable consisting of 1600 copper pair AT&T fed to a MDF/IDF Rack located in the front of the room
- 1 large 400 pair TIE line punched down on the east wall and cross-connected to an circuits on the large MDF/IDF. This TIE line is used to extend AT&T services to Fire Station 1 and has several 800 MHz circuits that will need to be identified
- Equipment Blocks along the remainder of the east wall and the north wall with TIE cable terminals to the main MDF
- Relay racks and circuit pack self-standing in the back of the room
- 4 T-1 lines; one PRI for the call center, 1 Milan LEIN, 1 Saline LEIN, 1 U of M LEIN
- 1 X 24 Port BayStack switch serving LEIN Customers
- 2 X 24 Port Extreme Switches with data drops to clients in the basement
- In floor conduit for delivery of voice and data services to the basement

The Phone Room is fed from:

- South Telephone Vault

The Phone Room feeds to:

- First floor data center via the 1<sup>st</sup> floor IDF.
- All floors of Larcom through a riser cable system to IDFs on each floor, located on the north and south sides of the floors.
- North Telephone Vault via a cable tray through adjacent Mechanical Room and then north from there to the conduit entry located in the Mechanical room on the northeast side of the Larcom basement.



## PHONE ROOM RELOCATION PLAN

### Data Services Relocation

The following data services will be re-demarcated from the Phone Room to the CEB by where duplicate services will be available on the 1600 pair of AT&T copper:

- 7 T-1 lines
  - One (1) PRI for the call center
  - Three (3) PRI for the VoIP System (to be installed in August 2008)
  - 1 T1 Circuit Milan LEIN
  - 1 T1 Circuit Saline LEIN
  - 1 T1 Circuit U of M LEIN

Demarks for these services will be extended to the 1<sup>st</sup> floor data center and connected to:

- 1 X 24 Port BayStack switch serving LEIN Customers
- Existing VoIP and data networking equipment located in the datacenter

The following data services will be relocated from the Phone Room to the 1<sup>st</sup> floor datacenter by rerouting their network connections to the 1<sup>st</sup> floor IDF:

- 1 Fiber run between U of M and the City, extending U of M's public safety network for LEIN use

The following equipment will remain in use and in the Phone Room until it is shutdown.

- 2 X 24 Port Extreme Switches with data drops to clients in the basement
- In floor conduit for delivery of voice and data services to the basement
  - Data services running through in-ground conduit
  - Analog phone services running through in-ground conduit

### AT&T Services Relocation/Abandonment

The AT&T Services located in the Phone Room will generally be abandoned after being relocated to the CEB:

- 1 large cable consisting of 1600 copper pair AT&T will be abandoned.
- Feeds from IDF Rack will be extended to the CEB where they will be relocated next to the CEB's duplicated AT&T service.
- 1 large 400 pair TIE line punched down on the east wall and cross-connected to an circuits on the large MDF/IDF will be abandoned after the service has been relocated in the CEB
- Equipment Blocks along the remainder of the east wall and the north wall with TIE cable terminals to the main MDF and relay racks and circuit pack self-standing in the back of the room will be abandoned after the AT&T services have been relocated to the CEB.

## NORTH TELEPHONE VAULT SITE ASSESSMENT

The north side entry is serviced on the outside by a manhole and small underground vault located south of the sidewalk and north of the parking lot approximately 40 ft west of the driveway off Anne. St.

The north side vault contains:

- Abandoned CTN coaxial cable
- 384 pair of Comcast I-Net cable
- 2 X Coaxial cables providing Comcast cable services to the Larcom building
- 400 pair "TIE" phone cable (extends service from the Phone Room)
- 2X 24 MM fiber cables feeding Washtenaw County and Fire Station 1

The north side vault is fed from:

- Eastern of the two north poles
- Fire station 1 (underground)

The north side vault feeds to:

- Data center in Larcom via basement northeast mechanical room
- Pump Room
- Phone Room

## **NORTH TELEPHONE VAULT SERVICES RELOCATION PLAN**

### **Emergency Operations Center IDF Expansion**

The key component to relocating the communications services from the north telephone vault is to create fiber distribution point that can serve as a fiber hub, be free of construction zone impacts and still have access to the extended conduit run servicing the South Telephone Vault. The Emergency Operations Center (EOC) IDF, located on the 3<sup>rd</sup> floor of the EOC, can serve this purpose. The EOC IDF will be equipped with electronics that provide fiber aggregation services and analog-to fiber services. There will be conduit access to the conduit serving the South Telephone Vault and have access to a new man-hole to be located in front of the EOC on 5<sup>th</sup> Ave.

### **I-Net Services Relocation**

The I-Net services relocation cannot be implemented without any major service interruptions. The I-Net aerial fiber run will have to be cut from City Hall and pulled back to the basement of Fire Station 1. From the basement of Fire Station the I-Net the 80 strands of live fiber will be extended to the third floor of Fire Station 1 where it will be tipped and be aggregated to single link 40Gb link, run to the CEB, extended through the riser cable into the 1<sup>st</sup> floor datacenter and patched down. Once this is complete, the service will be transferred over.

Once the new datacenter is constructed, but prior to the actual datacenter move, the remaining 120 or so strands of “old-now dark” fiber will be extended from the basement of Fire Station 1 along a conduit run west under Anne St to 5<sup>th</sup> Ave where it will sweep south and continue to the new hand hole located across from the new PD/Court/IT facility. From there it will route to the new “Meet Me” room located on the first floor of the Police, Courts and IT Building where it will be cross connected, providing a redundant I-Net connection.

### **AT&T Services via 900 Pair TIE Line Relocation**

Active lines including phone, T1 and radio services, from the 900 pair TIE service will be identified and converted to run over a fiber pair to the CEB. The pair will run through the conduit serving the South Telephone Vault to the CEB where those services will be converted back to analog services and cross-connected to the relocated AT&T MDF .

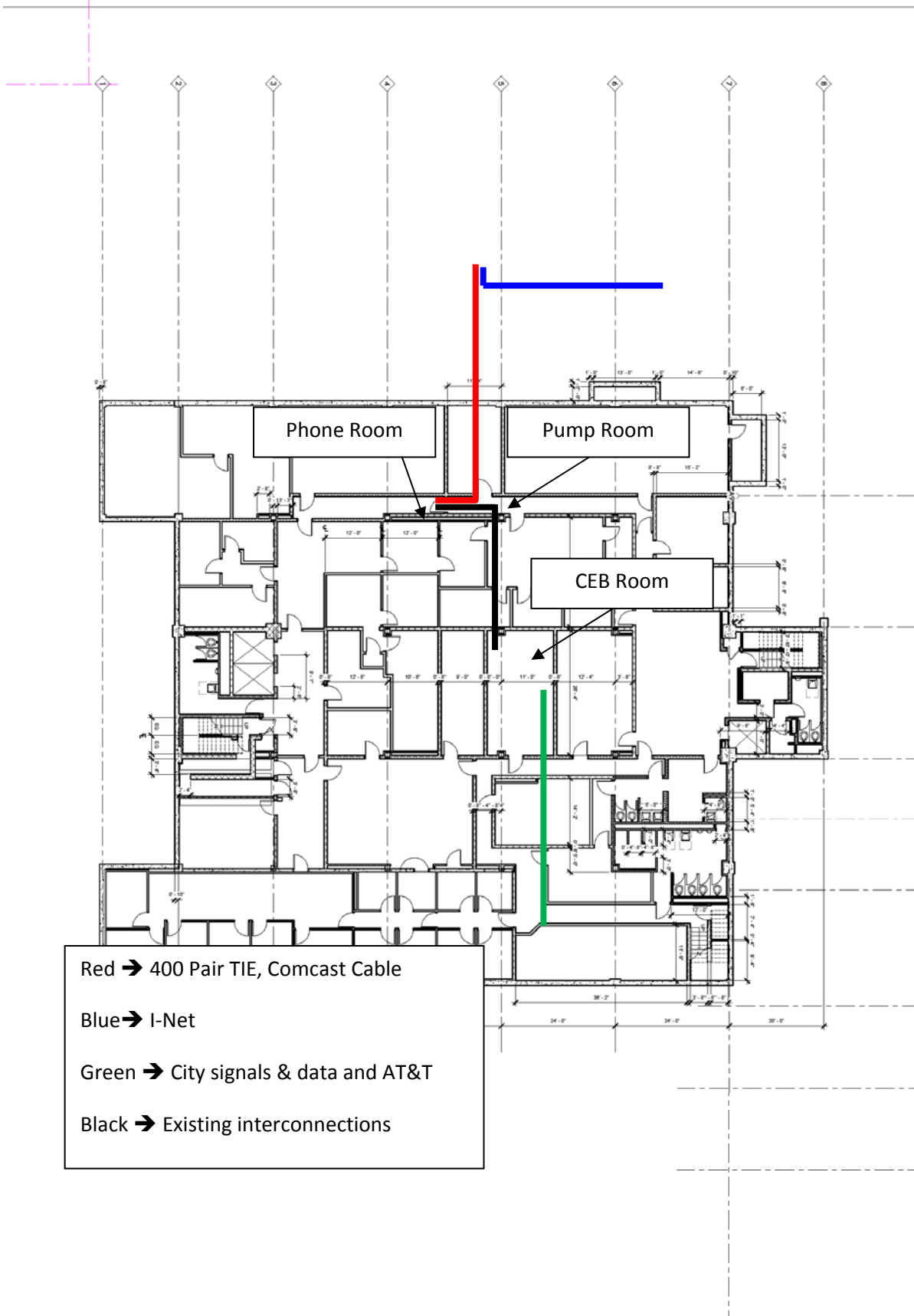
### **Multi-Mode Fiber Services Relocation**

1 X 24 MM fiber cable feeding Fire Station 1 will be extended to route through the extended south-side conduit to the IDF on the 1<sup>st</sup> floor of Larcom and into the 1<sup>st</sup> floor datacenter and the 1 24 MM fiber from Washtenaw County will be decommissioned after the services are rerouted to the 1 18 SM/ 6 MM fiber running from the Hands-On Museum to the datacenter City-County.

### **Cable Services Relocation**

Comcast Cable Services will be reinstalled at the Fire Pump Room and run through the new service entrances to the CEB and then the Pump Room will they will be distributed through an existing coaxial network.

# Exhibit A: Existing Basement Layout



# Exhibit B: Proposed Basement Layout

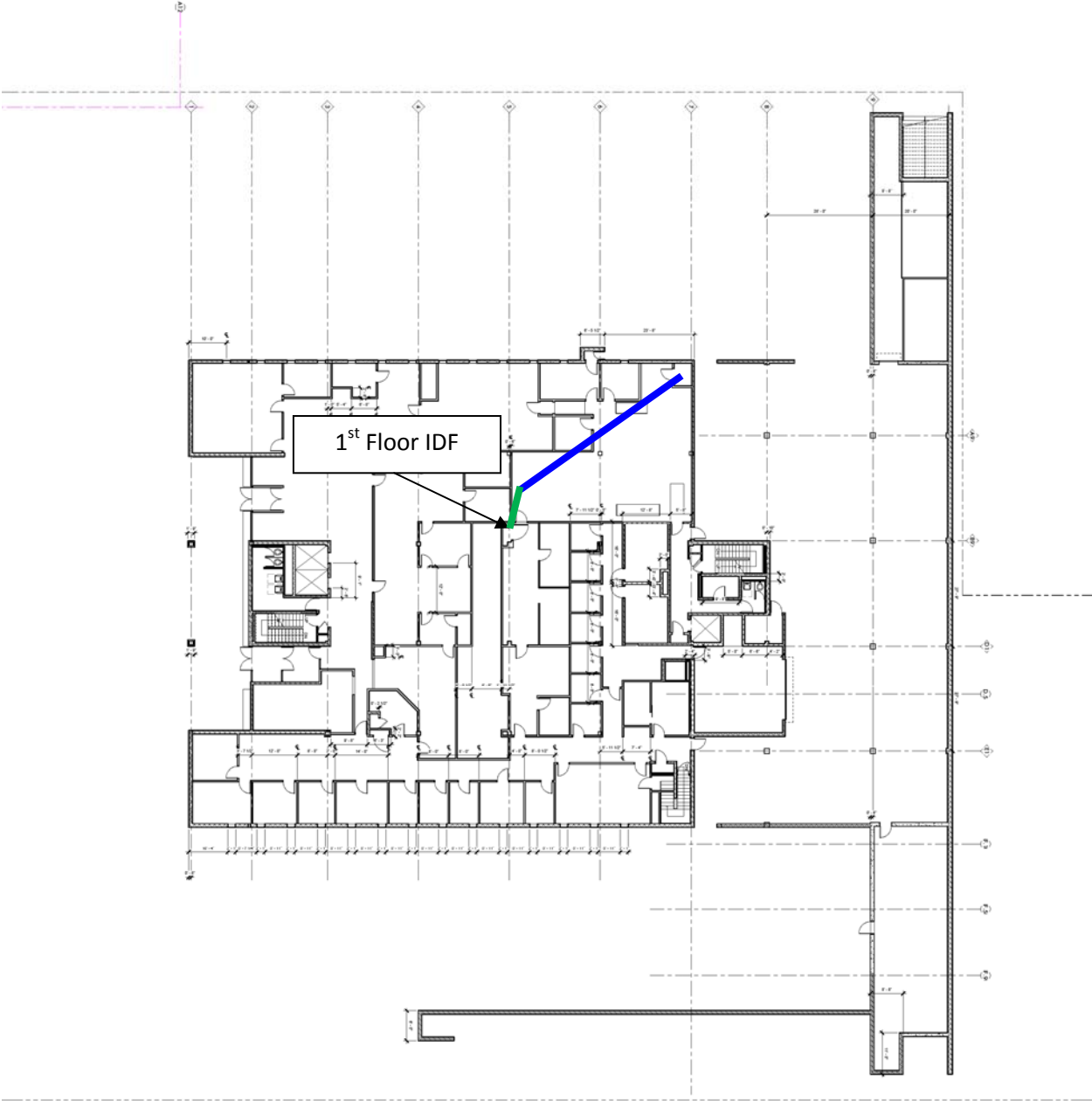


Blue → New conduit runs from east side of Larcom

Orange → New conduit runs to “Meet Me” and City data center

Black → Existing interconnections

# Exhibit C: Existing First Floor Layout



Blue → I-Net  
Green → City signals & data and AT&T

# Exhibit D: Proposed First Floor Layout

