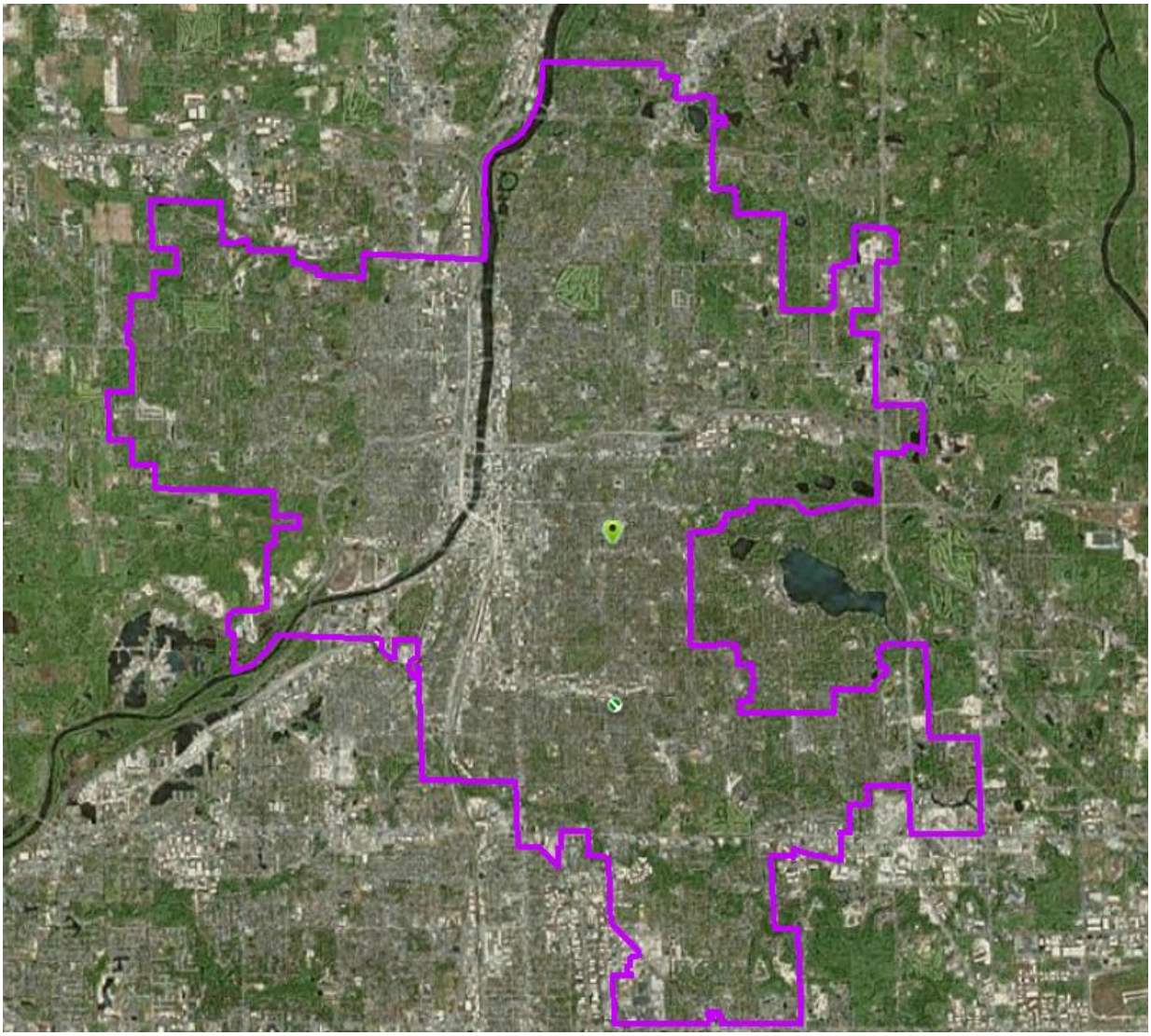
Pole Line and Duct System Rate Study 2017
City of Grand Rapids, Michigan



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1. PREFACE

The City of Grand Rapids owns, operates, and maintains a substantial Street Lighting System, which covers nearly the entire geographical area of the City. This Street Lighting System is comprised of pole lines (utility poles, etc.) and a duct system (pipe, manholes, etc.). These assets allow for power and communication lines to be systematically distributed throughout the City's network of streets. When this expansive pole line and duct system was constructed, the City had the foresight to design it with excess capacity. Through the years, the City of Grand Rapids has allowed others to occupy City pole lines and ducts with little or no fees, until FY2012. There are numerous entities that utilize the System including City departments, governmental agencies, institutions, private industries, and utilities. It is common practice with other utility companies, such as Consumers Energy and AT&T, to charge their users an annual fee for use of their infrastructure. These fees generally allow the requesting entity to place communications cables in the ducts or on the poles of the host company.

In FY2012 a Rate Study was conducted in order to establish User fees for attachments and duct use. That FY2012 Rate Study was approved by the City Commission, after a public hearing, and rental fees were invoiced. This FY2017 Rate Study follows the same format as the FY2016 Rate Study.

2. BACKGROUND

In July, 2011, the Grand Rapids City Commission adopted Ordinance No. 2011-29, amending the Code of the City of Grand Rapids to create the "Pole Line and Duct System" utility. Section 2.405 of that ordinance requires that users of the System pay user charges to be annually established by City Commission resolutions, which are to be based on recommendations of the City's Chief Financial Officer, City Manager, and City Attorney. That recommendation is to be based on a study prepared by the System staff in coordination with the City's Chief Financial Officer and City manager. Subsection 2.405(a) of that ordinance provides:

> (a) The Users of the System shall pay User charges established as set forth below. User charges shall be charged to all System Users within or without the corporate limits of the City. User charges shall reflect the proportionate cost of constructing, installing, operating, repairing, maintaining, replacing, and improving the System. It is desirable that User rates, fees and charges provide sufficient revenues to cover the costs relating to the System including, but not limited to: (i) debt service on any debt of the System, (ii) costs of acquiring, constructing, installing, operating, maintaining, repairing, replacing, extending or enlarging, the System or any portion thereof, (iii) depreciation of any portion or all of the System; (iv) a reasonable rate of return on the System's investment; (v) debt service or operational coverage that is required under the terms of any System debt, is required by other applicable law, or as is reasonable practice for such systems, and (vi) all costs relating to billing and collecting any User charges. The User charges shall include fees for application to Use the System, inspection and verification fees for ensuring compliance with System standards, and the pass-through of "make ready costs" as explained in subsection 2-404(a)(6). However, User charges may be established with consideration to the rates, fees and charges of other providers of poles, pole lines, and duct facilities and with consideration to any regulations that, while not applicable to

the system, are applicable to other poles, pole lines, and duct facilities.

This rate study examines the System's costs as required by subsection 2.405(a). However, it also reports the rates imposed by other providers of pole lines and ducts. This is key, for three reasons. First, it serves as a reasonable comparison and operates as a "check" of sorts on the reasonableness of the City's rate. Second, if the City were to impose rates higher than competing rates, current City customers may choose other providers of those services. At the very least it could dissuade others from using the system. Third, and most importantly, during the consideration of the ordinance representations were made that, at least initially, the City's rates would not exceed those of other similar providers. This was important to current City customers and, perhaps, also to the City Commission which sought to avoid being under the "market" and thereby unfairly competing, while also not taking advantage of current customers with rates over the "market."

3. EXECUTIVE SUMMARY

In July of 2011, the Grand Rapids City Commission adopted the "Pole Line and Duct System" utility ordinance to better regulate the excess capacity on its pole line and duct system. The City recognized that it had allowed system users to occupy these facilities with little or no fees, which was inconsistent with the standard operations of other similar utility providers. This System has value to Users because it allows them access throughout the City without digging in the roadways for their own infrastructure, or obtaining private utility easements. Where the duct system is not accessible, the City's pole line system is available for pole attachments by System Users. System Users, as described in this report, include institutions, governmental agencies, communication companies, utilities, and others. Attached is a known list of System Users as Exhibit A.

This study considered the City's costs of construction, depreciation, maintenance, administration, and return on investment in determining proposed User fees. The fees were developed based on the guidelines prepared by the Federal Communication Commission (FCC) and the Michigan Public Service Commission (MPSC). These guidelines were used to help establish a reasonable "market" rate as they govern many other providers of similar services in Michigan. As a result, the proposed User fees for the City have been determined, for the most part, to be in line with user fees charged by similar utilities in Michigan.

The first step in obtaining an update to the user rate for FY2017 is calculating the Annual Carrying Charge (ACC). This rate is based on the percentage of expenses directly related to providing service as compared to the total infrastructure cost. For the Pole Line System, the user expense for the system accounts for 31.23% of the total infrastructure cost, and for the Duct System the user expense accounts for 10.24% of the total infrastructure cost. Applying that percentage to the cost per asset (i.e. poles and ducts), the user rates are obtained, which is provided as a cost per unit. As a result of studying the actual applicable costs, while comparing these costs to the overall industry rates, this study recommends the adoption of the following User fees for the City FY2017:

Pole Attachment	$3.74/pole
Full 4" Duct	$4.55/foot

1” Inner duct	$0.76/foot

Use of (1) 12/10mm microduct in a 1” duct containing an existing fiber	$0.38 per foot*
Use of (1) 12/10mm microduct in a 1” duct with (3) total microducts	$0.25 per foot**

***** The User will provide the 12/10mm for this application
** The User will provide the (3) 12/10mm for this application and received rental credit for the first year to cover the material cost of the spare microducts placed

4. DEFINITIONS

The following definitions shall apply to terms used in this Rate Study. Other terms shall be as defined in the Ordinance.

Carrying Charge: an accounting tool which provides a method of allocating the annual cost of operating a system based upon a percentage of the total infrastructure investment.

Duct: a pipe owned by the City placed under or above the surface of the ground for the purpose of providing space for the placement of power or communications cables or wires. This term is synonymous with Conduit.

Duct Bank: an underground group of pipes arranged in a defined array or pattern, and encased in concrete. Refer to drawings D3 and D4, and photographs P3 through P8.

Duct Riser: a transition system used to provide aerial cable access to the underground ducts. Refer to photograph P13.

Handhole: a shallow access hole large enough for a hand to be inserted for maintenance, repair, and access to the ducts and its contents.

Innerduct: a small (1” to 1¼” in diameter) plastic pipe that is installed in a duct (in groups of 4, 5, or 6) for the purpose of housing multiple cables in one duct. Refer to drawing D3 and photographs P9 and P11.

Make-ready: the cost associated with preparing a pole for a requesting party to be able to make an attachment to a pole. These costs often include correcting potential safety violations in order to maintain compliance with the National Electrical Safety Code (NESC), or relocating other attachments to make room for the new attachment.

Manhole: an underground concrete chamber built in-place or delivered to the site for the purpose of providing regular access to the ducts. Refer to drawing D2 and photographs P4, and P9 through P12.

Microduct: a small pipe that is installed in innerduct to further subdivide the duct for the purpose of housing multiple communications cables in one innerduct.

Ordinance: the City of Grand Rapids Ordinance #2011-29 adopted in 2011 to establish the System.

Pole: a City owned utility or street lighting pole.

Pole Attachment: a physical attachment of a cable or device to a wooden City pole. The attachment shall meet the space and elevation requirements of the City, and of the National Electrical Safety Code. Refer to photograph P2.

Pole Attachment Rate: the annual User fee per pole attachment as approved by the City Commission.

Pole Line: two or more poles in a row or otherwise in proximity to one another such that power or communications cables or wires could be strung from one of the poles to one or more other poles.

Rate: the rate applicable for a particular Use of the System.

Revenue Bond Act: the 1933 PA 94, as amended, MCL 141.101 *et seq*.

System: the Grand Rapids Pole Line and Duct System consisting of all poles, pole attachments, ducts, pipes, works, instrumentalities, copper communications cable innerducts, lines, fiber cable, traffic signals, electric power lines and equipment, contract rights, and properties now or hereafter existing, used or useful in connection with such facilities and equipment.

Use: the use of pole lines, ducts, pipes, equipment or other parts of the System by attaching or installing wire, fiber cable, channels, antennas or other lines or equipment on or within such parts of the System and includes even such wire, fiber channels, antennas or other lines or equipment that is not operated until such time as it has been removed or is permitted by the City to stay in place even though it is not operated.

User charge: a fee or charge payable by a User for Use of any part of the System or for costs related to that Use.

User: the person or company who owns the wires, fiber, antennas, or other lines or equipment placed on or within any portion of the System or a person or company other, than the owner of the premises who, according to the provisions of the Ordinance, has the responsibility to pay rates, fees and charges for the Use of any portion of the System.

5. POLE LINE AND DUCT SYTEM DESCRIPTION AND RATE METHODOLOGY

The following study will examine annual rate adjustments to the FY2016 fees established for use of both the Pole Line assets and Duct System assets. The basis for each calculation is derived from the guidelines prepared by the Federal Communication Commission (FCC) and the Michigan Public Service Commission (MPSC). These guidelines were used to help establish a

reasonable "market" rate as it governs many other providers of similar services in Michigan. Other methodologies were examined and determined to not provide the desired industry acceptance and the resulting fees were not market competitive.

The City of Grand Rapids owns, operates, and maintains a substantial Street Lighting System. The City's poles, wires, and duct system cover nearly the entire geographical area of the City. By nature of its planned construction, this pole line and duct system has excess capacity which has been utilized by others including City departments, governmental agencies, institutions, private industries, and utilities.

Traditionally, other utilities, such as Consumers Energy and AT&T, provide these services and have charged a fee for use of their infrastructure. These fees generally allow the requesting company or entity to place communications cables in the ducts, or on the poles of the host company. Through the years, the City of Grand Rapids has allowed others to occupy City pole lines and ducts with little or no fees.

This FY2016 rate study will incorporate the City costs associated with the Pole Line and Duct System through the end of FY2015. The User Fees associated with this rate study will be assessed in FY2017 and include charges for the use of the City Pole Line and Duct System as compiled at the end of FY2016.

6. POLE

6.1. POLE CARRYING CHARGE RATE CALCULATION

The carrying charges include the City Pole administrative, maintenance, depreciation expenses, return on investment, and taxes. The City of Grand Rapids FY2015 costs are shown below for each aspect of the carrying charge.

Administration

The administrative actual for FY2015 is $273,934. This reflects 6.6% of the Pole Line system infrastructure costs of $4,173,000. The 6.6% figure falls within the typical range for providing these services.

Maintenance

The maintenance actual for FY2015 is $888,093. This reflects 21.3% of the Pole Line system infrastructure costs of $4,173,000. The 21.3% figure falls within the typical range for providing these services.

Depreciation Expense

The depreciation expense will be set at 2.5% on an average life of the Pole Line being 40 years. The 2.5% depreciation rate is in line with industry standards and realistic expectations for our region's climate.

Return on Investment

Return on investment will be based on the use of the average Bond Buyer Index over one year, plus 1%. The average for this past year was 3.83% and with the 1% added, the return on investment figure that will be used is 4.38%. This is a commonly accepted method for determining the return on investment.

Taxes

The City has no cost associated with taxes.

The total carrying charge rate is calculated through the summation of its costs as follows:

Administration	6.6%
Maintenance	21.3%
Depreciation expense	2.5%
Return on investment	4.83%
Total carrying charge rate	35.17%

6.2. POLE ATTACHMENT RATE CALCULATION

6.2.1. Pole Attachment Rates

The guideline used for the basis of establishing the annual rates for parties to attach to the Signals and Lighting poles was established by the Federal Communication Commission (FCC) and Governed by Section 224 of the Communications Act of 1934, 47 U.S.C. §224. Section 224 was amended by the Telecommunications Act of 1996 and by several modifications by the FCC since 1996. It is further noted that the State of Michigan has certified to the FCC that it regulates pole attachments in Michigan, which is handled by the Michigan Public Service Commission (MPSC). Though the MPSC is vested with complete power and jurisdiction to regulate all public utilities in the state, this power does not extend to municipally owned utilities. Thus, the FCC guideline will be used as the basis for preparing the rate calculations and the MSPC rates will be used as the market rate comparison.

As a guideline, the preparation of a rate schedule, using the formulas prepared by the FCC, provides the base line for the initial User fees established by the System. Further comparing this calculated rate with other local utility rates allows adjustment to establish a just and reasonable User fee for the pole attachments.

6.2.2. Federal Communication Commission Pole Attachment Formula

The pole attachment formula that was prepared by the FCC governs the maximum pole attachment rate for those pole attachments subject to FCC regulation. The FCC provides two formulas for calculating attachment rates. The first is related to attachments by cable TV companies. The second, detailed below, relates to telecommunication carriers and is more applicable to the City's Pole Line System and was used in the establishment of the initial rate.

The pole attachment rate calculation is as follows:

(Space Factor) x (Net cost of a Bare Pole) x (Carrying Charge Rate) = Maximum Rate

Each of these values will be explained separately and then applied to the City's values to determine the City's maximum rate.

Space Factor

The space factor is the amount of usable space on an average pole. The space factor is calculated as follows: (Values used for the City Poles is shown in italics)

$$\frac{\left[\textit{Space Occupied}\ (1') + \left[\frac{\frac{2}{3}\ \textit{Usable Space}\ (13.5)}{\textit{No.of Attaching Entities}\ (5)}\right]\right]}{[\textit{Average Height of Pole}\ (37.5)]} = \textit{Space Factor Pole Height}$$

or

$$\frac{\left[1 + \left[\frac{\frac{2}{3} * 13.5}{5}\right]\right]}{37.5} = 0.075$$

Space Factor = 0.075

- **Space Occupied =** The presumptive amount of space occupied by an attachment on a pole is 1 foot, per the National Electrical Safety Code (NESC).

- **Usable Space =** In lieu of actual measurements, due to the vastness and variance of the System, 13.5 feet is used as the average amount of usable space per pole for those poles used for pole attachments as recommended by the FCC guidelines.

- **Number of Attaching Entities** = The FCC presumptive average for the number of attachers is five (5) for urbanized areas.

- **Average Height of Pole =** The average amount of unusable space on a pole is 24 feet, per the FCC presumptive averages. The average pole space reserved for ground clearance is 18 feet as required by the National Electrical Safety Code (NESC). The remaining 6 feet is reserved for the electrical distribution system per the NESC. The summation of the useable space (13.5') and unusable space (24') results in an average height for a pole of 37.5', all derived from the FCC guidelines.

Bare Pole

The net cost of a bare pole has ranged in price from a low of $425 to a high of $1,400 over the past five years. The average over that period of time is $1,070. This variance in cost is related to the fluctuation in the availability of materials influenced by economic conditions, natural disasters and industry demand. In addition the quantity, class, length, and shipping costs significantly vary based on the needs for any given pole.

Carrying Charge Rate
The carrying charge rate is explained in the previous carrying charge section and is calculated to be 35.17%.

The resultant pole attachment rate calculation is as follows (Values used for the City Poles is shown in *italics*):

(Space Factor) x (Net cost of a Bare Pole) x (Carrying Charge Rate) = Maximum Rate
(0.075) x ($1,070) x (35.71%) = ($28.23)

The maximum rate is therefore $28.23 per attachment per year. The current rate approved by the Michigan Public Service Commission for AT&T is $1.73 per year, and for Consumers Energy is $3.74 per year.

It is recommended in this rate study that the City continue with the User fee that was in effect for FY2015 in the amount of $3.74 per pole attachment per year.

Proposed FY2017 Pole attachment User fee = $3.74 per pole attachment per year

6.2.3. Pole Attachment Process and Make-Ready Costs

A pole attachment proposal process that is similar to the practice that is currently in use by Consumers Energy will be referenced in the Utility permit application. This process will require applications for new attachments to City poles to complete an application, and as part of that application, pay an engineering review processing fee in the amount of $55 per pole. The purpose of this fee is the reimbursement of engineering costs associated with verifying the space and capability of the pole attachment within the capacity for that particular pole, without causing code violation or over taxing the pole. (This fee is based on historical engineering costs for performing this work.) These costs will be better tracked so that, in future years, they are more reflective of actual costs. This rate study recommends maintaining the $55 per pole engineering review processing fee for FY2017.

As part of the engineering review process, any cost to prepare a pole for the requesting user, also known as make-ready costs, by the City will be defined and payment of those fees will be required prior to issuance of a permit to attach.

6.3 MICRO-CELLS on City Poles

In accordance with a **Nonexclusive Micro-Cell License Contract** with the City of Grand Rapids, the placement of Micro-Cell antennae and related equipment, defined in the **Placement Permit** provided in conjunction with the License Contract, the City shall assess an annual attachment fee as they relate to the attachment of the defined equipment on the City Poles.

6.3.1 Placement Permit

Defined in the Placement Permit provided under the provisions of the Micro-Cell license contract, the details of the antennae and related equipment shall be reviewed by the City of Grand Rapids Street Lighting Department for compliance with City Code and standards. A one-time fee for the review process will be assessed in the amount of $150 per pole. This fee covers the costs associated with the engineering review of the proposed installation. Following the engineering review process, costs to prepare a pole for the requesting user, (also known as make-ready costs) will be defined and payment of those fees will be required prior to issuance of a permit to attach. See section 13

6.3.2 Pole Attachments

As defined in the Rate Study subsection 8.1 Poles, attachment to City poles is confined to wooden poles, however, Micro-Cell attachments shall be the sole exception. This exception is for the benefit of the City in meeting the ever demanding requests for broadband deployment throughout the City. Pole attachments defined under the Micro-Cell license contract shall consider all City Poles for antennae and related equipment installation, but will not allow cable or wire spans between poles.

6.3.3 Pole Attachment Fee

The licensee requesting attachment to City Poles shall pay fees for the use of the pole in accordance with the License Contract, the annual fee will be calculated based on the pole type used for each installation. The method for calculating the rental fees is related to a modification of the FCC calculations outlined in subsection 6.2.2 – FCC Pole Calculation Formula. This modified formula is defined as:

Pole Type	(Space Factor)	x	(Net cost of a Pole)	x	(Carrying Charge Rate)	=	Annual Rate
Fiberglass	(1)	x	($2,670)	x	(35.17%)	=	($939.14)
Ornamental	(1)	x	($5,850)	x	(35.17%)	=	($2,057.67)
Square Tapered Steel	(1)	x	($5,525)	x	(35.17%)	=	($1,943.35)
Wood	(1)	x	($1,070)	x	(35.17%)	=	($376.36)

Space Factor: Only one Micro-Cell per pole.
Net Cost of a Pole: The net cost of a pole in place
Carrying Charge: an accounting tool which provides a method of allocating the annual cost of operating a system based upon a percentage of the total infrastructure investment.

7. DUCT

7.1. DUCT CARRYING CHARGE RATE CALCULATION

The carrying charges include the City Duct administrative costs, maintenance costs, depreciation return on investment, and taxes. Each cost associated with the Carrying Charge is detailed with the FY2015 cost for the City of Grand Rapids.

Administration
The administrative actual for FY2015 is $147,503. This reflects 0.88% of the duct infrastructure costs of $16,675,256. The 0.88% figure falls within an acceptable range for providing these services.

Maintenance
The maintenance actual for FY2015 is $421,602. This reflects 2.53% of the duct infrastructure costs of $16,675,256. The 2.53% figure falls within an acceptable range for providing these services.

Depreciation Expense
The depreciation expense will be set at 2% on an average life of the duct being 50 years. The 2.0% depreciation rate is in line with industry standards and realistic expectations for our region's climate.

Return on Investment
Return on investment will be based on the use of the average Bond Buyer Index over one year, plus 1%. The average for this past year was 3.83% and with the 1% added, the return on investment figure that will be used is 4.83%. This is a commonly accepted method for determining the return on investment.

Taxes
The City has no cost associated with taxes.
The total carrying charge rate is calculated through the summation of its costs as follows:

Administration	0.88%
Maintenance	2.53%
Depreciation expense	2.0%
Return on investment	4.83%
Total carrying charge rate	10.24%

7.2. DUCT USER RATE CALCULATION

The following sections demonstrate the calculations for determining the User fees for the use of the City Duct System based on the Federal Communications Commission guidelines.

7.2.1. Duct User Fees

It is proposed to use the Federal Communications Commission guidelines as the basis for establishing the annual rate for Users to use space within the City Ducts. The guideline, used for the basis of establishing the annual rates for parties to use the City Ducts, was established by the Federal Communication Commission (FCC) and Governed by Section 224 of the Communications Act of 1934, 47 U.S.C. §224. Section 224 was amended by the Telecommunications Act of 1996 and by several modifications by the FCC since 1996. It is further noted that the State of Michigan has certified to the FCC that they regulate duct user fees in Michigan, which is handled by the Michigan Public Service Commission (MPSC). Though the MPSC is vested with complete power and jurisdiction to regulate all public utilities in the

state, this power excludes municipally owned utilities. Thus, the FCC guideline will be used as the basis for preparing the rate calculations.

As a guideline, the preparation of a rate schedule using the formulas prepared by the FCC, provides the base line for the initial User fees established by the System. Further comparing this calculated rate with other local utility rates allows adjustment to establish a just and reasonable User fee for the duct usage.

7.2.2. Federal Communication Commission Duct Use Formula

The Duct use formula is based on the usable space in each duct. The formula reads as follows (Values used for the City Ducts is shown in *italics*):

(% of Duct Capacity) x (Net Linear Cost of Duct) x (Carrying Charge Rate) = Maximum Rate/Linear Foot or

(0.17) **x** ***($43.58)*** **x** ***(10.24%)*** **=** ***($0.76)***

- three (3) microducts added to a % of Duct Capacity = The City street lighting ducts mainly consist of 4" duct and the typical innerduct configuration is placing six (6) one inch innerducts in the 4" duct. This would therefore provide for a Capacity percentage of 17% for a single cable installation. The placement of microduct further increases the capacity, with a single microduct, added to an existing innerduct with a fiber cable, equaling one half the single cable rate and vacant innerduct, equaling one third the single cable rate.

Net Linear Cost of Duct = As determined in the attached spreadsheet, the Net Linear Cost of the 4" duct with the innerducts, as derived from the construction over a five year period (2008 thru 2012), is $43.58 per foot.

Carrying Charge Rate = The carrying charge rate as calculated in the Carrying Charge section is 10.24%.

Maximum Rate/Linear Foot = This equates to a Maximum Rate per Linear Foot for the use of a 1" inner duct of $0.76 per linear foot.

This rate study reflects a $0.05 rate decrease in the rental rate for a 1" duct compared to the rate established for FY2015.

It is recommended in this rate study that the City establishes a compromised duct usage rates as follows:

Use of 1" duct	$0.76 per foot
Use of a full 4" duct	$4.55 per foot

Use of (1) 12/10mm microduct in a 1" duct containing an existing fiber	$0.38 per foot*
Use of (1) 12/10mm microduct in a 1" duct with (3) total microducts	$0.25 per foot**

***** The User will provide the 12/10mm microduct for this application
** The User will provide the (3) 12/10mm microduct for this application and received rental credit for the first year to cover the material cost of the spare microducts placed

7.2.3. Duct Use Permit and Make-Ready Costs

The permitting fee associated with the application for placement of facilities within the ducts is proposed to be waved at this time.

As part of the permit process, a manhole racking policy will be attached to the permit. This racking policy must be strictly adhered to prevent the User from losing access to use the conduit, and having the City request removal of their facilities for violations. A copy of that manhole racking policy is attached. In addition all installation must include a #10 insulated copper tracer wire in the duct system.

7.2.4. Duct Use for Current Agreements

Current agreements in effect at the time of this rate study with current Duct Users will be honored by the City. No new individual agreements will be considered. The Ordinance and Rate Study shall be the preferred method.

8. SYSTEM DATA

The following sections summarize the current Pole Line and Duct System assets.

8.1. Poles:

The system is comprised of approximately 4313 wooden poles. (The City only allows attachments on their wooden poles.) The average cost of a wooden pole, as derived over the period of 2008 thru 2012, is $1,070. (This average is recalculated every five years.)

8.2. Ducts:

The City ducts consist of:

FY 2014	FY 2015	
878	895	Manholes
294	305	4x4 Handholes
236,227’	242,634'	Duct Linear Footage
477	498	Building Entrance Ducts
42,063’	43,601'	Building Entrance Duct Footage
213	215	Duct Risers
12,360’	12,392'	Duct Riser Footage
333,499’	333,499'	Innerduct Linear Footage

8.2.1. Inventory of Duct Banks

INVENTORY ELECTRIC AND COMMUNICATION DUCT BANKS

DUCT BANK CONFIGURATION	LINEAR FOOTAGE	FY2014 INSTALLATION COST PER LINEAR FOOT	UPDATE FY2015 CHANGE IN LINEAR FOOTAGE	UPDATE FY2015 INSTALLATION COST PER LINEAR FOOT	EXTENDED COSTS
(24) 3.5" DUCTS CE	2748	$100			$274,800
(20) 3.5" DUCTS CE	324	$90			$29,160
(18) 3.5" DUCTS CE	1090	$85			$92,650
(16) 3.5" DUCTS CE	125	$75			$9,375
(12) 3.5" DUCTS CE	103	$65			$6,695
(9) 3.5" DUCTS CE	30	$55			$1,650
(4) 3.5" DUCTS & (6) 3.5" TILE DUCTS CE	243	$70			$17,010
(3) 3.5" DUCTS CE	740	$30			$22,200
(16) 3" DUCTS CE	737	$49			$36,113
(12) 3" DUCTS CE	1466	$37			$54,242
(8) 3" DUCTS CE	958	$25			$23,950
(6) 3" DUCTS CE	4964	$19			$94,316
(6) 3" & (6) 4" DUCTS CE	579	$65			$37,635
(6) 3" DUCTS & (16) 3.5" TILE DUCTS CE	511	$115			$58,765
(5) 3" DUCTS CE	324	$16			$5,184
(4) 3" DUCTS CE	5199	$13	-282	$13	$63,921
(4) 3" DUCTS & (16) 3.5" TILE DUCTS CE	185	$108			$19,980
(3) 3" DUCTS CE	1863	$11			$20,493
(3) 3" DUCTS & (6) 4" DUCTS CE	925	$60			$55,500
(2) 3" DUCTS CE	428	$8			$3,424
(2) 3" DUCTS & (4) 4" DUCTS CE	236	$45			$10,620
(6) 2" DUCTS & (9) 4" DUCTS CE	200	$83			$16,600
(4) 2" DUCTS & (8) 4" DUCTS CE	30	$76			$2,280
(4) 2" DUCTS & (4) 4" DUCTS DB	84	$38			$3,192
(4) 2" DUCTS & (2) 4" DUCTS DB	21	$28			$588
(2) 2" DUCTS & (4) 3" DUCTS CE	50	$21			$1,050
(2) 2" DUCTS & (1) 3" DUCTS CE	3	$12			$36
(1) 2" DUCT & (4) 4" DUCTS CE	214	$44			$9,416
(1) 2" DUCT & (2) 3" DUCTS CE	259	$12			$3,108
(1) 1" DUCT & (3) 2" DUCTS & (3) 4" DUCTS CE	133	$45			$5,985
(4) 3.5" TILE DUCTS CE	3152	$35	+246	$35	$118,930
(6) 3.5" TILE DUCTS CE	6799	$45			$305,955
(8) 3.5" TILE DUCTS CE	913	$55			$50,215

(10) 3.5" TILE DUCTS CE	236	$65			$15,340
(12) 3.5" TILE DUCTS CE	325	$75			$24,375
(14) 3.5" TILE DUCTS CE	159	$85			$13,515
(18) 3.5" TILE DUCTS CE	526	$105			$55,230
(24) 3.5" TILE DUCTS CE	42	$135			$5,670
(32) 3.5" TILE DUCTS CE	518	$155			$80,290
(48) 3.5" TILE DUCTS CE	71	$175			$12,425
(1) 4" DUCT CE	1166	$10	-245	$10	$9,210
(1) 4" DUCT DB			+36	$6	$216
(2) 4" DUCTS & (1) 6" DUCT CE	70	$22			$1,540
(2) 4" DUCTS CE	3722	$15	+52	$15	$56,610
(2) 4" DUCTS DB	3606	$10.39	+1296	$17.45	$60,082
(3) 4" DUCTS CE	1799	$30	+68	$30	$56,010
(3) 4" DUCTS DB	152	$15			$2,280
(4) 4" DUCTS CE	44242	$40	+4816	$49	$2,005,664
(4) 4" DUCTS DB	1631	$20			$32,620
(5) 4" DUCTS CE	675	$45			$30,375
(6) 4" DUCTS CE	87159	$49.55	+448	$64.57	$4,347,656
(6) 4" DUCTS DB	100	$30			$3,000
(7) 4" DUCTS CE	410	$55			$22,550
(8) 4" DUCTS CE	7534	$60			$452,040
(9) 4" DUCTS CE	21003	$65	-45	$65	$1,362,270
(10) 4" DUCTS CE	2857	$70			$199,990
(11) 4" DUCTS CE	264	$75			$19,800
(12) 4" DUCTS CE	10154	$80			$812,320
(13) 4" DUCTS CE	76	$85			$6,460
(14) 4" DUCTS CE	99	$90			$8,910
(15) 4" DUCTS CE	2089	$95			$198,455
(16) 4" DUCTS CE	5248	$100			$524,800
(18) 4" DUCTS CE	124	$110			$13,640
(20) 4" DUCTS CE	181	$120			$21,720
(22) 4" DUCTS CE	20	$125			$2,500
(24) 4" DUCTS CE	2934	$130			$381,420
(25) 4" DUCTS CE	260	$140			$36,400
(2) 5" HDPE DUCTS DB	453	$25			$11,325
(4) 5" HDPE DUCTS DB	495	$50			$24,750
(3) 6" DUCTS CE	191	$45			$8,595
TOTAL					**$12,375,091**

CE – CONCRETE ENCASED
DB – DIRECT BURIED

8.2.2. Inventory of Duct Riser

INVENTORY ELECTRIC AND COMMUNICATION DUCT FOR RISERS

DUCT BANK CONFIGURATION	LINEAR FOOTAGE	FY2014 INSTALLATION COST PER LINEAR FOOT	UPDATE FY2015 CHANGE IN LINEAR FOOTAGE	UPDATE FY2015 INSTALLATION COST PER LINEAR FOOT	EXTENDED COSTS
(1) 1" DUCT DB	34	$3			$102
(1) 1.25" DUCT DB	64	$3			$192
(1) 2" DUCT & (2) 3" DUCTS CE	20	$12			$240
(1) 2" DUCT & (2) 3.5" DUCTS CE	21	$14			$294
(1) 2" DUCT & (1) 4" DUCT DB	712	$15			$10,680
(1) 2" DUCT & (2) 4" DUCT CE	36	$27			$972
(1) 2" DUCT & (3) 4" DUCT DB	14	$25			$350
(1) 2" DUCT & (4) 4" DUCT CE	66	$44			$2,904
(1) 2" DUCT CE	111	$6			$666
(1) 2" DUCT DB	431	$4			$1,724
(2) 2" DUCTS & (1) 4" DUCT CE	32	$16			$512
(2) 2" DUCTS & (2) 4" DUCT CE	56	$48			$2,688
(2) 2" DUCTS CE	20	$12			$240
(2) 2" DUCTS DB	98	$8			$784
(3) 2" DUCTS & (1) 4" DUCT CE	24	$22			$528
(4) 2" DUCTS DB	42	$16			$672
(1) 3" DUCT CE	33	$8			$264
(1) 3" DUCT DB	3	$6			$18
(2) 3" DUCTS & (2) 4" DUCTS CE	98	$28			$2,744
(2) 3" DUCTS & (4) 4" DUCTS CE	39	$44			$1,716
(2) 3" DUCTS CE	236	$14			$3,304
(2) 3" DUCTS DB	19	$12			$228
(4) 3" DUCTS & (2) 4" DUCTS CE	75	$40			$3,000
(4) 3" DUCTS CE	258	$28			$7,224
(4) 3.5" DUCTS CE	70	$40			$2,800
(1) 4" DUCT CE	88	$9			$792
(1) 4" DUCT DB	2493	$8.99	+92	$8.99	$23,239
(2) 4" DUCTS CE	1842	$20			$36,840
(2) 4" DUCTS DB	527	$15			$7,905
(3) 4" DUCTS CE	127	$25			$3,175
(4) 4" DUCTS CE	2313	$45	-60	$45	$101,385
(6) 4" DUCTS CE	2208	$50			$110,400
(8) 4" DUCTS CE	150	$60			$9,000
TOTAL DUCTS FOR RISERS					**$337,582**

CE – CONCRETE ENCASED
DB – DIRECT BURIED

8.2.3. Inventory of Duct for Building Entries

INVENTORY COMMUNICATION DUCT FOR BUILDING ENTRIES

	FY2014		UPDATE FY2015		
DUCT BANK CONFIGURATION	LINEAR FOOTAGE	INSTALLATION COST PER LINEAR FOOT	LINEAR FOOTAGE	INSTALLATION COST PER LINEAR FOOT	EXTENDED COSTS
(1) 2" DUCT & (3) 4" DUCTS CE	2	$22			$44
(1) 2" DUCT DB	325	$4	+29	$4	$1,416
(2) 2" DUCTS DB	49	$6.50	+32	$6.50	$527
(1) 3" DUCT & (2) 4" DUCTS CE	13	$21			$273
(1) 3" DUCT DB	288	$5			$1,440
(2) 3" DUCTS CE	486	$14			$6,804
(3) 3" DUCTS CE	29	$18			$522
(9) 3" DUCTS CE	53	$45			$2,385
(1) 4" DUCT CE	985	$10	-136	$10	$8,490
(1) 4" DUCT DB	4548	$6	+2337	$14.45	$61,057
(2) 4" DUCTS CE	24263	$15	+73	$15	$365,040
(2) 4" DUCTS DB	1760	$10.39	+378	$10.39	$22,214
(3) 4" DUCTS CE	6397	$30	-927	$30	$161,100
(4) 4" DUCTS CE	1790	$40	+9	$40	$71,960
(4) 4" DUCTS DB	27	$20	+18	$20	$900
(6) 4" DUCTS CE	548	$49.47			$27,110
(8) 4" DUCTS CE	41	$60			$2,460
(9) 4" DUCTS CE	30	$65	+45	$65	$4,875
(12) 4" DUCTS CE	109	$80			$8,720
TOTAL COMMUNICATION DUCT FOR BUILDINGS					**$747,337**

CE – CONCRETE ENCASED
DB – DIRECT BURIED

8.2.4. Inventory of Innerduct

INVENTORY INNERDUCT

INNERDUCT SIZE AND CONFIGURATION	FY2014 LINEAR FOOTAGE	FY2014 INSTALLATION COST PER LINEAR FOOT	UPDATE FY2015 LINEAR FOOTAGE	UPDATE FY2015 INSTALLATION COST PER LINEAR FOOT	EXTENDED COSTS
(1) 0.5" INNERDUCT	10	$2.5			$25
(1) 1" INNERDUCT	2492	$3.00			$7,476
(1) 1.25" INNERDUCT & (3) 1" INNERDUCT	565	$7.00			$3,955
(1) 1.25" INNERDUCT	2358	$3.00	+88	$3.00	$7,338
(1) 1.25" INNERDUCT & (1) 1" INNERDUCT	649	$6.00	+340	$6.00	$5,934
(1) 1.25" INNERDUCT & (2) 0.75" INNERDUCT	1154	$7.00			$8,078
(1) 1.25" INNERDUCT & (2) 1" INNERDUCT	3719	$7.00	+188	$7.00	$27,349
(1) 1.25" INNERDUCT & (3) 1" INNERDUCT	5280	$7.50			$39,600
(1) 1.25" INNERDUCT & (1) 1" INNERDUCT & (2) 0.75" INNERDUCT	683	$4.50			$3,074
(1) 1.5" INNERDUCT	1090	$3.50			$3,815
(1) 1.5" INNERDUCT & (1) 1" INNERDUCT	343	$4.00			$1,372
(1) 1.5" INNERDUCT & (2) 0.75" INNERDUCT	3806	$4.00			$15,224
(1) 1.5" INNERDUCT & (2) 1" INNERDUCT	3466	$4.50			$15,597
(1) 1.5" INNERDUCT & (3) 1" INNERDUCT	990	$4.50			$4,455
(1) 1.5" INNERDUCT & (1) 1" INNERDUCT & (2) 0.75" INNERDUCT	199	$5.00			$995
(1) 1.5" INNERDUCT & (2) 1" INNERDUCT & (2) 0.75" INNERDUCT	39	$5.00			$195
(1) 2" INNERDUCT	3073	$3.00			$9,219
(1) 2" INNERDUCT & (1) 1.5" INNERDUCT	168	$8.00			$1,344
(1) 2" INNERDUCT & (2) 1.5" INNERDUCT	349	$10.00			$3,490
(1) 2 CELL (1.25") INNERDUCT	1246	$6.00			$7,476
(1) 2 CELL (1.25") INNERDUCT & (1) 1" INNERDUCT	481	$9.00			$4,329
(1) 2 CELL (1.25") INNERDUCT & (1) 1.25" INNERDUCT	3299	$9.00			$29,691
(1) 2 CELL (1.25") INNERDUCT & (1) 2 CELL (1") INNERDUCT	10	$11.00			$110
(1) 2 CELL (1.25") INNERDUCT & (1) 3 CELL (1") INNERDUCT	77133	$11.00	-1748	$11.00	$829,235
(1) 2 CELL (1.25") INNERDUCT & (2) 1" INNERDUCT	175	$9.50			$1,663
(1) 2 CELL (1.25") INNERDUCT & (2) 1.25" INNERDUCT	80	$9.50	-20	$9.50	$570
(1) 2 CELL (1.25") INNERDUCT & (3) 3 CELL (1") INNERDUCT	294	$24			$7,056

(1) 3 CELL (1") INNERDUCT	3482	$5.50	-15	$5.50	$19,069
(1) 3 CELL (1") INNERDUCT & (1) 1" INNERDUCT	1926	$6.50	+28	$6.50	$12,701
(1) 3 CELL (1") INNERDUCT & (1) 2 CELL (1") INNERDUCT	584	$11.00			$6,424
(1) 3 CELL (1") INNERDUCT & (2) 1" INNERDUCT	1233	$10.50	-532	$10.50	$7,361
(1) 3 CELL (1") INNERDUCT & (3) 1" INNERDUCT	562	$11.00			$6,182
(2) 1" INNERDUCT	4472	$3.50	-66	$3.50	$15,421
(2) 1.25" INNERDUCT	737	$4.00	-9	$4.00	$2,912
(2) 1.25" INNERDUCT & (1) 1" INNERDUCT	100	$5.50	+54	$5.50	$847
(2) 1.25" INNERDUCT & (2) 1" INNERDUCT	7750	$5.26	+14520	$7.66	$151,988
(2) 1.25" INNERDUCT & (3) 1" INNERDUCT	2317	$6.50			$15,061
(2) 1.25" INNERDUCT & MAXCELL	8	$7			$56
(2) 1.5" INNERDUCT	322	$3.00			$966
(2) 1.5" INNERDUCT & (1) 0.75" INNERDUCT	319	$3.50			$1,117
(2) 1.5" INNERDUCT & (1) 1" INNERDUCT	112	$4.00			$448
(2) 1.5" INNERDUCT & (2) 1" INNERDUCT	2071	$5.00			$10,355
(2) 2" INNERDUCT	233	$5.00			$1,165
(2) 2 CELL (1.25") INNERDUCT	51454	$11.00	-409	$11.00	$561,495
(2) 3 CELL (1") INNERDUCT	93373	$11.00	-1581	$11.00	$1,009,712
(2) 3 CELL (1") INNERDUCT & (1) 1" INNERDUCT	1050	$12.00			$12,600
(3) 1" INNERDUCT	12584	$5.50	+2277	$4.40	$79,231
(3) 1.25" INNERDUCT	5530	$5.50	+191	$5.50	$31,466
(3) 1.25" INNERDUCT & (1) 1" INNERDUCT	341	$6.00			$2,046
(3) 1.5" INNERDUCT	371	$4.50			$1,670
(3) 2 CELL (1.25") INNERDUCT	346	$18.00			$6,228
(3) 2 CELL (1.25") INNERDUCT & (5) 1" INNERDUCT	1102	$23.00			$25,346
(3) 2 CELL (1.25") INNERDUCT & (6) 1" INNERDUCT	1338	$24.00			$32,112
(4) 1" INNERDUCT	22218	$6.00	+65	$6.00	$133,698
(4) 1.25" INNERDUCT	775	$6.00	+90	$6.00	$5,190
(5) 1" INNERDUCT	2277	$6.50	-51	$6.50	$14,469
(6) 1" INNERDUCT	1075	$7.00			$7,525
MAXCELL	286	$6.00			$1,716
TOTAL INVENTORY INNERDUCT					**$3,215,238**

8.2.5. Duct System Inventory Summation

The inventory of the Duct infrastructure consists of the following infrastructure categories:

DUCT BANKS	$ 12,375,091
DUCT TO RISERS	337,590
DUCT FOR BUILDING ENTRIES	747,337
INNERDUCT	3,215,238
TOTAL DUCT INFRASTRUCTURE	$ 16,675,256

9. SUPPORTING DATA

9.1. Poles: Administration Costs

No.	Description	Amount
7020	Permanent Employees	113,950
7055	Time & One-Half	17,375
7105	Employers Social Security	10,530
7110	Hospitalization Insurance	24,673
7115	Retiree Health Care	15,886
7120	Retirement Fund Contribution	26,221
7135	Unemployment Compensation	180
7150	Longevity Pay	-
	Total Personnel Services	**$208,815**
7520	Supplies	3,801
8510	Postage	9
	Total Supplies	**$3,810**
9480	Computer Services	40,279
8010	Contractual Services	37,127
8450	Claims	5,608
8400	Insurance Premiums	680
8500	Telephone	-
9470	Vehicle Usage/Car Mileage	2,031
9110	Other Travel & Training	936
9130	Local Business Expense	333
9150	Memberships	3,107
9650	Bad Debt Write-Offs	-
	Total Other Services & Charges	**$90,100**
	Grand Total	**$302,725**

9.2. Poles: Maintenance Costs

No.	Description	Amount
7020	Permanent Employees	169,243
7025	Act.Assignment	45
7055	Time & One-Half	46,640
7105	Employers Social Security	16,928
7110	Hospitalization Insurance	42,497
7115	Retiree Health Care	23,594
7120	Retirement Fund Contribution	38,866
7135	Unemployment Compensation	268
7150	Longevity Pay	-
7165	Shift Differential	68
	Total Personnel Services	**$338,148**
7520	Supplies	73,623
7670	Clothing	-
	Total Supplies	**$73,623**
8010	Contractual Services	129,788
8450	Claims	5,608
8400	Insurance Premiums	680
8500	Telephone	-
9340	Maintenance Service	4,359
9430	Buildings Rentals Or Lease	34,918
9470	Vehicle Usage/Car Mileage	1,004
	Total Other Services & Charges	**$176,356**
9760	Equipment	10,738
9880	Construction In Progress	6,947
	Total Capital	**$17,685**
	Grand Total	**$605,813**

9.3. Duct: Administration Costs

No.	Description	Amount
7020	Permanent Employees	61,357
7055	Time & One-Half	9,356
7105	Employers Social Security	5,670
7110	Hospitalization Insurance	13,286
7115	Retiree Health Care	8,554
7120	Retirement Fund Contribution	14,119
7135	Unemployment Compensation	97
7150	Longevity Pay	-
	Total Personnel Services	**$112,439**
7520	Supplies	2,047
8510	Postage	5
	Total Supplies	**$2,051**
9480	Computer Services	21,689
8010	Contractual Services	19,992
8450	Claims	3,019
8400	Insurance Premiums	366
8500	Telephone	-
9470	Vehicle Usage/Car Mileage	1,094
9110	Other Travel & Training	504
9130	Local Business Expense	179
9150	Memberships	1,673
9650	Bad Debt Write-Offs	-
	Total Other Services & Charges	**$48,516**
	Grand Total	**$163,006**

9.4. Duct: Maintenance Costs

No.	Description	Amount
7020	Permanent Employees	91,131
7025	Act.Assignment	32
7055	Time & One-Half	25,114
7105	Employers Social Security	9,115
7110	Hospitalization Insurance	22,883
7115	Retiree Health Care	12,705
7120	Retirement Fund Contribution	20,928
7135	Unemployment Compensation	342
7150	Longevity Pay	-
7165	Shift Differential	37
	Total Personnel Services	**$182,286**
7260	Supplies	39,643
7680	Clothing	-
	Total Supplies	**$39,643**
8180	Contractual Services	69,886
8355	Claims	3,019
8450	Insurance Premiums	366
8500	Telephone	-
9300	Maintenance Service	2,347
9410	Buildings Rentals Or Lease	18,802
9440	Vehicle Usage/Car Mileage	541
	Total Other Services & Charges	**$94,961**
		-
9760	Equipment	5,782
9800	Construction In Progress	3,741
	Total Capital	**$9,523**
	Grand Total	**$326,413**

9.5. Pole Bond Costs

THE RATE OF RETURN ON EQUITY SHALL BE ONE PERCENT MORE THAN THE AVERAGE BOND BUYER'S INDEX OF MUNICIPAL BONDS FOR THE PREVIOUS TWELVE MONTHS

BOND BUYER'S INDEX OF 20 MUNICIPAL BONDS

DATE	RATE	DATE	RATE
2014-Jul-03	4.31%	2015-Jan-01	3.56%
2014-Jul-10	4.38%	2015-Jan-08	3.42%
2014-Jul-17	4.36%	2015-Jan-15	3.29%
2014-Jul-24	4.29%	2015-Jan-22	3.36%
2014-Jul-31	4.33%	2015-Jan-29	3.36%
2014-Aug-07	4.31%	2015-Feb-05	3.49%
2014-Aug-14	4.24%	2015-Feb-12	3.60%
2014-Aug-21	4.21%	2015-Feb-19	3.62%
2014-Aug-28	4.17%	2015-Feb-26	3.62%
2014-Sep-04	4.09%	2015-Mar-05	3.68%
2014-Sep-11	4.14%	2015-Mar-12	3.62%
2014-Sep-18	4.17%	2015-Mar-19	3.52%
2014-Sep-25	4.11%	2015-Mar-26	3.52%
2014-Oct-02	4.11%	2015-Apr-02	3.49%
2014-Oct-09	4.01%	2015-Apr-09	3.49%
2014-Oct-16	3.87%	2015-Apr-16	3.45%
2014-Oct-23	3.90%	2015-Apr-23	3.52%
2014-Oct-30	3.90%	2015-Apr-30	3.62%
2014-Nov-06	3.98%	2015-May-07	3.74%
2014-Nov-13	3.98%	2015-May-14	3.74%
2014-Nov-20	3.93%	2015-May-21	3.81%
2014-Nov-27	3.94%	2015-May-28	3.73%
2014-Dec-04	3.83%	2015-Jun-04	3.81%
2014-Dec-11	3.65%	2015-Jun-11	3.87%
2014-Dec-18	3.65%	2015-Jun-18	3.79%
2014-Dec-25	3.65%	2015-Jun-25	3.80%
		52 WEEKS	**3.83%**

9.6. Duct Bond Costs

THE RATE OF RETURN ON EQUITY SHALL BE ONE PERCENT MORE THAN THE AVERAGE BOND BUYER'S INDEX OF MUNICIPAL BONDS FOR THE PREVIOUS TWELVE MONTHS

BOND BUYER'S INDEX OF 20 MUNICIPAL BONDS

DATE	RATE	DATE	RATE
2014-Jul-03	4.31%	2015-Jan-01	3.56%
2014-Jul-10	4.38%	2015-Jan-08	3.42%
2014-Jul-17	4.36%	2015-Jan-15	3.29%
2014-Jul-24	4.29%	2015-Jan-22	3.36%
2014-Jul-31	4.33%	2015-Jan-29	3.36%
2014-Aug-07	4.31%	2015-Feb-05	3.49%
2014-Aug-14	4.24%	2015-Feb-12	3.60%
2014-Aug-21	4.21%	2015-Feb-19	3.62%
2014-Aug-28	4.17%	2015-Feb-26	3.62%
2014-Sep-04	4.09%	2015-Mar-05	3.68%
2014-Sep-11	4.14%	2015-Mar-12	3.62%
2014-Sep-18	4.17%	2015-Mar-19	3.52%
2014-Sep-25	4.11%	2015-Mar-26	3.52%
2014-Oct-02	4.11%	2015-Apr-02	3.49%
2014-Oct-09	4.01%	2015-Apr-09	3.49%
2014-Oct-16	3.87%	2015-Apr-16	3.45%
2014-Oct-23	3.90%	2015-Apr-23	3.52%
2014-Oct-30	3.90%	2015-Apr-30	3.62%
2014-Nov-06	3.98%	2015-May-07	3.74%
2014-Nov-13	3.98%	2015-May-14	3.74%
2014-Nov-20	3.93%	2015-May-21	3.81%
2014-Nov-27	3.94%	2015-May-28	3.73%
2014-Dec-04	3.83%	2015-Jun-04	3.81%
2014-Dec-11	3.65%	2015-Jun-11	3.87%
2014-Dec-18	3.65%	2015-Jun-18	3.79%
2014-Dec-25	3.65%	2015-Jun-25	3.80%
		52 WEEKS	**3.83%**

9.7. City Duct Costs Averaging Comprised Over 2008 thru 2012

STREET LIGHTING DUCT COST AVERAGING ESTABLISHED IN FY2012

PROJECT	DUCT CONFIGURATION BUILT ON THIS PROJECT	CONFIGURATION COST PER FOOT	ONE DUCT PER FOOT COST	AVERAGE PER FOOT COST PER PROJECT	MANHOLE WITH PACKAGE COST	HANDHOLE WITH PACKAGE COST	INNER-DUCT PER FOOT COST
CSO#4 & 5 - FRANKLIN ST	6 4 3	41 35 20	$6.83 $8.75 $6.67	$7.42			$10.00
FTWM #2 - WEALTHY ST	6	50	$8.33	$8.33	$8,600	$3,000	
INDIAN MILL CREEK – TAMARACK AVE.	6	85	$14.17	$14.17	$10,750	$3,750	
MONROE – FRANK TO PALMER	6	60	$10.00	$10.00	$8,670		$10.50
CSO#11 – DIVISION & HALL	12 6 8	80 48.5 60	$6.67 $8.08 $7.50	$7.42	$11,925	$3,970	$8.00
FTWM #1 – WEALTHY ST	13 2 4 6 8 9	110 30 44 64 83 85	$8.46 $15.00 $11.00 $10.67 $10.38 $9.44	$10.82	$7,300		
LEXINGTON – SEWARD	6	40	$6.67	$6.67	$8,100	$2,900	$5.00
GRANDVILLE AVE.	6	50	$8.33	$8.33		$3,400	$5.50
CHERRY – DIVISION TO SHELDON	2 4 6	35 45 50	$17.50 $11.25 $8.33	$12.36	$9,300		$10.00
COMMERCE AVE.	15 14 13 12 11 10 9 7 6 4	93 91 83 80 74 72 64 53 48 37.5	$6.20 $6.50 $6.38 $6.67 $6.73 $7.20 $7.11 $7.57 $8.00 $9.38	$7.17	$7,365		$6.30
IONIA – FULTON TO FOUNTAIN	9 6	66 50	$7.33 $8.33	$7.83	$21,608		$8.25
BRIDGE ST	16 14 12 10 8 6 4 2	97 92 75.75 71.7 55.5 42.5 31.4 18.2	$6.06 $6.57 $6.31 $7.17 $6.94 $7.08 $7.85 $9.10	$7.14	$8,558	$5,555	$10.25
CSO#10 – HALL ST	12 6 7	90.1 55.1 59.1	$7.51 $9.18 $8.44	$8.38	$7,550		
FIVE YEAR AVERAGE COSTS				**$8.93**	**$9,975.10**	**$3,762.50**	**$8.20**

10. NET LINEAR COST OF DUCT CALCULATION

The cost for one linear foot of 4" duct is calculated using the cost averages prepared for FY2015. (See the CITY DUCT COST AVERAGE Section 9.7; this cost average is updated every five years.) In the preparation of this cost, the construction costs associated with the building of the duct, the manholes and handholes associated with the duct, the engineering, and the innerduct placed in the duct are incorporated in this foot.

There are 242,634 linear feet of duct, 895 manholes, and 305 handholes. By dividing the 895 manholes into the linear feet of duct, we obtain the average footage between manholes of 271 feet. By dividing the 305 handholes into the linear feet of duct, we obtain the average footage between handholes of 796 feet.

The average cost of a manhole with the hardware package that resides within it is $9,975. A typical manhole is shared by both the electrical and communications systems. Therefore, it is assumed that 50% of the cost of the manhole is to be associated with communications, resulting in a cost of $4,987.50 for each manhole. With an average footage between manholes of 271 feet, we find the cost of the manhole distributed over the 271 feet to be $18.40 per foot.

The average cost of a handhole with the hardware package that resides within it is $3,762. A typical manhole is shared by both the electrical and communications systems. Therefore, it is assumed that 50% of the cost of the manhole is to be associated with communications, resulting in a cost of $1,881. With an average footage between handholes of 796 feet, we find the cost of the handhole distributed over the 796 feet to be $2.36 per foot.

The resultant net cost of construction of a 4" duct with manholes, handholes, and innerduct is the summation of the duct per foot cost ($8.93 from Section 9.7) plus the manhole cost per duct foot ($18.54), plus the handhole cost per duct foot ($2.34), plus the innerduct per foot cost ($8.20). This results in a total cost of $37.89.

Engineering associated with the construction costs averages 15% of the construction cost. This includes both design phase services and construction phase services. Therefore, 15% of the calculated construction cost of $37.89 per foot results in a cost of $5.68 per foot for engineering and design services.

In summary the total linear cost for a 4" duct with manholes, handholes, innerduct, and engineering is:

Construction cost duct, manhole, handhole, and innerduct	**$37.89**
Engineering costs	**$ 5.68**
Total linear cost for 4" duct	**$43.58/foot**

11. SUMMARY

In the interest of complying with the "Pole Line and Duct System" utility ordinance that was established in July of 2011, this Pole Line and Duct System Rate Study was completed to establish the User fees for use of its assets. Previously the City recognized that it had allowed system users to occupy these facilities with little or no fees, which was inconsistent with the standard operations of other similar utility providers. This System has value to Users because it allows them access throughout the City without digging in the roadways for their own infrastructure, or obtaining private utility easements. Where the duct system is not accessible, the City's pole line system is usually available for pole attachments by System Users. System users, as described in this report include institutions, governmental agencies, communication companies, utilities, and others.

This study considered the City's costs of construction, depreciation, maintenance, administration, and return on investment in determining these proposed User fees. These fees were developed based on the guidelines prepared by the Federal Communication Commission (FCC) and the Michigan Public Service Commission (MPSC). These guidelines were used to help establish a reasonable "market" rate as it governs many other providers of similar services in Michigan. As a result, the proposed User fees for the City have been determined, for the most part, to be in line with user rates charged by similar utilities in Michigan.
The study demonstrated the methodologies for calculating the rates, comparing market rates, and proposing Grand Rapids User fees. As a result of studying the actual applicable costs, while comparing these costs to the overall industry rates, this study recommends the adoption of the following User Fee Schedule for FY2017.

12. USER FEE SCHEDULE

Pole Line & Duct System	**Description**	**Rate**	**Unit**
	Pole Attachment	$3.74	Per foot
	Full 4" Duct	$4.55	Per foot
	1" Duct	$0.76	Per foot
	Microduct with existing cable	$0.38	Per foot
	Microduct in empty inner duct	$0.25	Per foot

Micro-Cells Pole ***(Required Nonexclusive Micro-Cell License Contract)***	**Description**	**Rate**	**Unit**
	Fiberglass	$939.14	Per pole
	Ornamental	$2,057.67	Per pole
	Square Tapered Steel	$1,943.35	Per pole
	Wood	$376.36	Per pole
	Placement Permit	$150.00	Per permit
	Inspection Fees	$55.00	Per pole
Annual License Fee			
	Year 1	$1,580.00	Term #1
	Year 2	$1,611.60	
	Year 3	$1,643.83	

The Tenant shall pay to the City a user fee for use of the pole attachment and duct system in the amount established in the rate study schedule. If the Tenant fails to pay any user fees within 30 days of the invoice date, the users shall be assess 2% of the balance and late fee of $38.00. The fee schedule pursuant to this paragraph is listed above.

13. MICRO-CELL INSTRUCTION AND POLICY

Any tenant requesting attachment to City Poles must:

- The Nonexclusive Micro-Cell License Contract must be sign before any Placement Permit Application can be submitted.
- Completion of the Placement Permit Application. (See Exhibit A)
- All fees must be paid in full before issuance of permit(s), outstanding payment will delay the issuance of permit(s).
- Annual license and pole rental fee will be pro-rated the first year.

14. EXHIBIT A –MICRO-CELL PLACEMENT PERMIT APPLICATION

MICRO-CELL PLACEMENT PERMIT APPLICATION INSTRUCTIONS AND PROCEDURES

Licensee Responsibility

1. The licensee is responsible to perform an engineering analysis to determine the placement of the attachment on the pole, in accordance with the provisions of the National Electrical Safety Code (NESC).
2. The licensee, if necessary, must make arrangements with the other attachment owners to move/transfer their facilities in order to meet the NESC requirements.
3. Licensee must mark the micro-cell equipment with Licensee's name and provide a toll-free number to call for assistance. The markings shall be large enough to be read from the ground.

Instructions, Required Documents and Fees

1. **Application and Permit:** Prepare and submit micro-cell application and permit proposals prior to performing any work on the City's poles. Please register online by going to https://inspections.grcity.us/citizenaccess/ or click on the link On Line Registration
    a. Fully complete the Business Information.
    b. Fully complete the Contractor Information.
    c. One placement permit per pole type and up to 20 placement permits per Contract.

2. **Proposal Plan:**
    a. Site plan/location
    b. Define the equipment to be placed, including the size, color, design, identifying tags, equipment manufacturer, equipment specification, etc.
    c. Describe how the equipment will be affixed to the City Property.
    d. Describe the manner in which power and any other needed services will be provided to the micro-cell equipment, including any wiring, duct or conduit to be used.
    e. Provide photographs of the proposed equipment.

f. Provide drawing(s) detailing the placement of the equipment with details on powering, communication backfeed, and means of affixing the equipment and associated components.
g. Sign the completed application prior to submittal.

3. Approval Process:

a. Lighting, Signals, and Signs department will review the completed application materials and provide for reviews by other City staff within 15 City business days.
b. Within 20 business days of receipt of a fully completed application, the Lighting, Signals and Signs department will issue a placement permit.
c. All micro-cell equipment shall be placed, installed, operated, maintained, repaired, replaced, and improved only as provided in the placement permit.
d. Licensee shall provide as-built drawings to the City promptly after completion of each installation. Any deviation from any requirement in a placement permit shall breach the Contract.

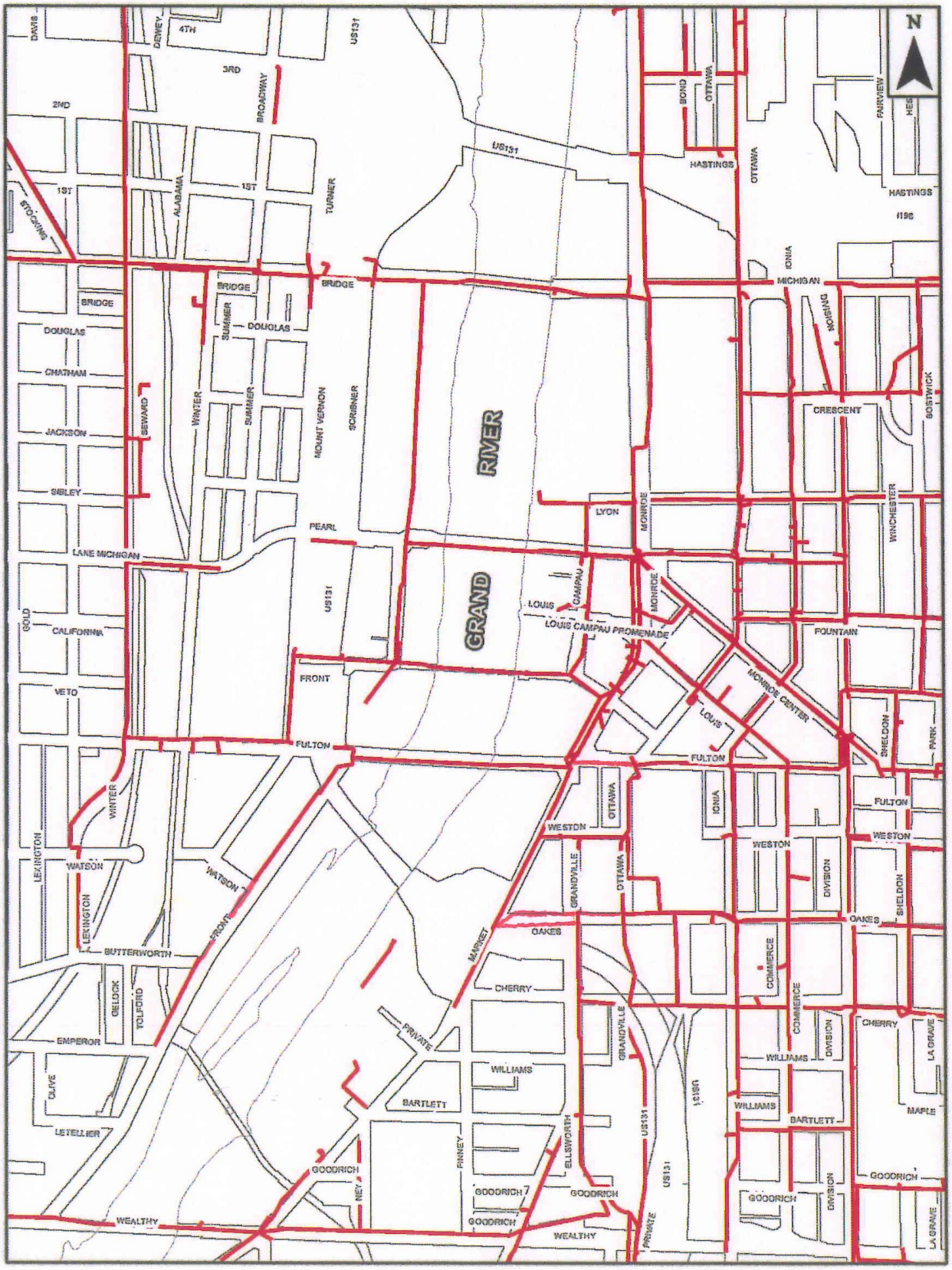
4. Fees:

a. Pole Inspection Evaluation Fees ($55.00 per pole)
b. Placement Permit Application Fees ($150.00 per permit)
c. Pole inspection evaluation and placement permit application fees are nonrefundable.
d. Annual license fee: see ***User Fee Schedule section 12***
e. Annual pole rental fee based on type: see ***User Fee Schedule section 12***

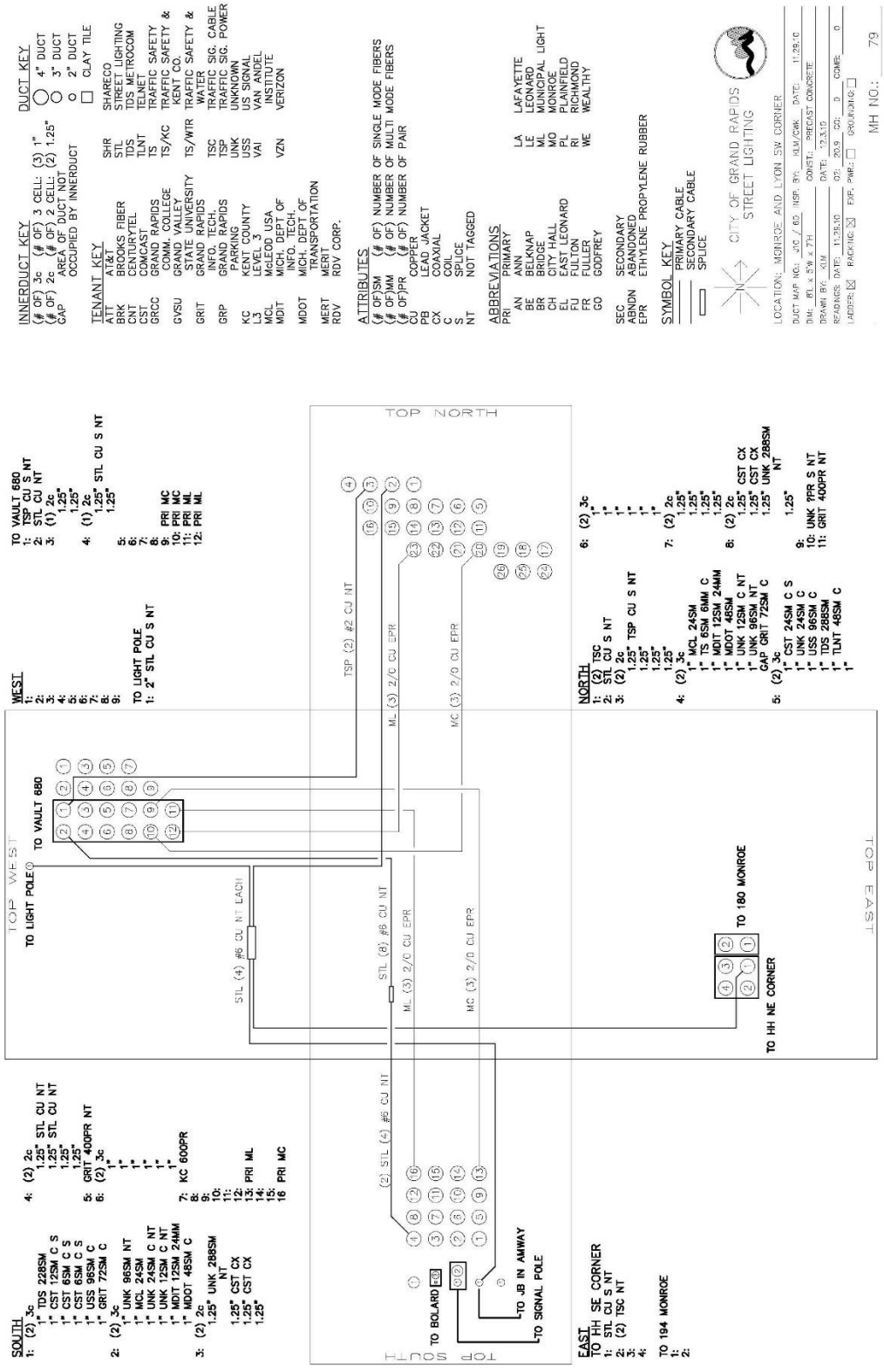
Current User List
123.NET
Amway
AriaLink
AT&T
Borgess Health
CenturyLink
Comcast
Flexco
First United Methodist Church
GR IT
GR Parking
GR Parks & Recreation
GR Traffic Safety
GR Traffic Safety / Water
GRCC
GVSU
Interurban Transit Partnership
Kent County
Kent County / GR Traffic Safety
Macatawa Bank
MDIT
MDIT / GR Traffic Safety
MDOT
MDOT & Others
Merit
Metro Health
RDV
Spectrum Health
TDS Metrocom
Telnet
Unidentified Cable
US Signal
Van Andel Institute
Verizon
Zayo

15.DRAWINGS

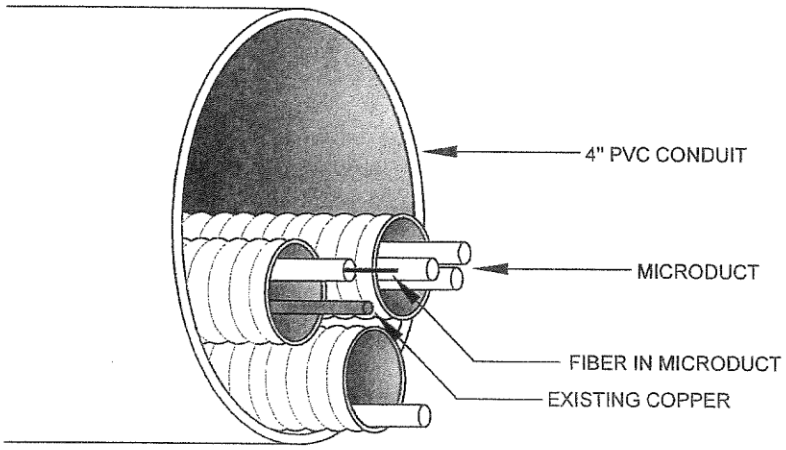
D1 Downtown Duct Route Map

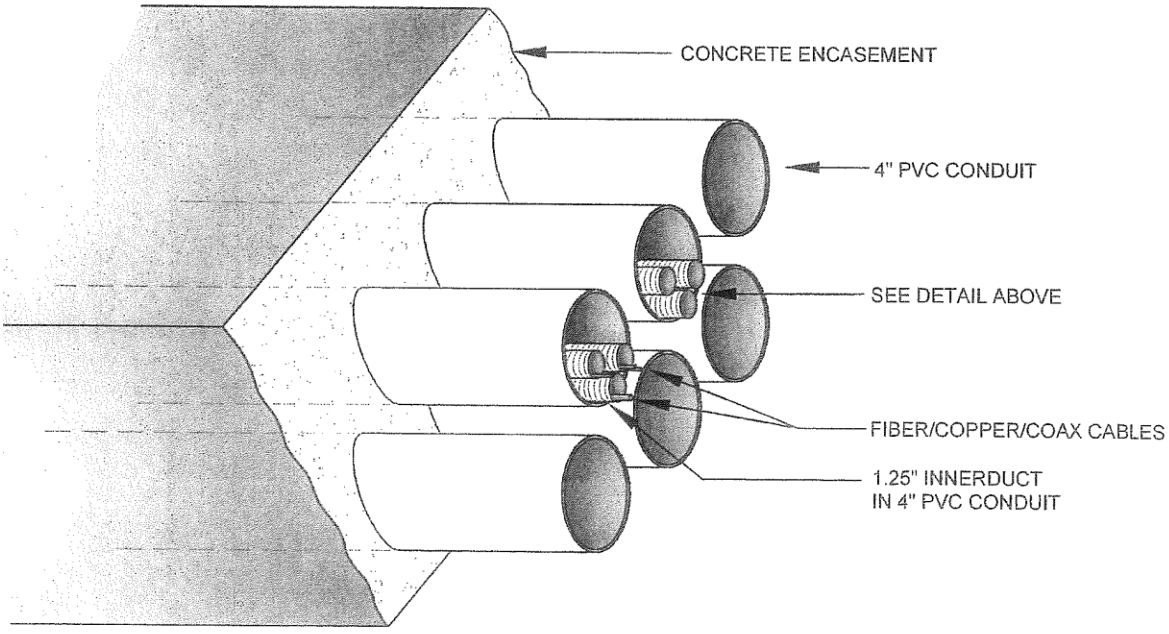


D2 Typical Manhole Butterfly Fold-out

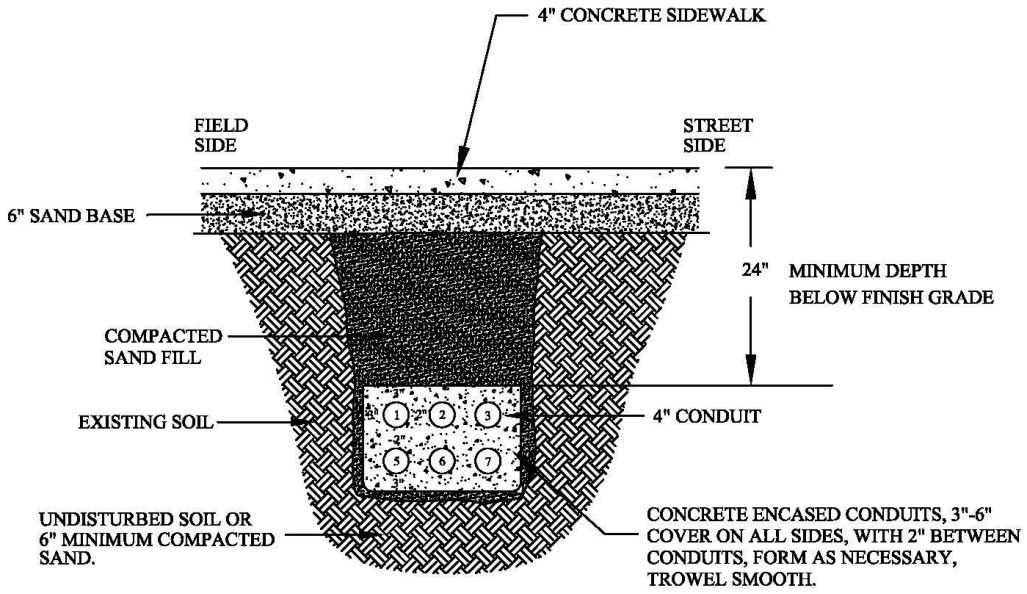


D3 Duct Bank Detail



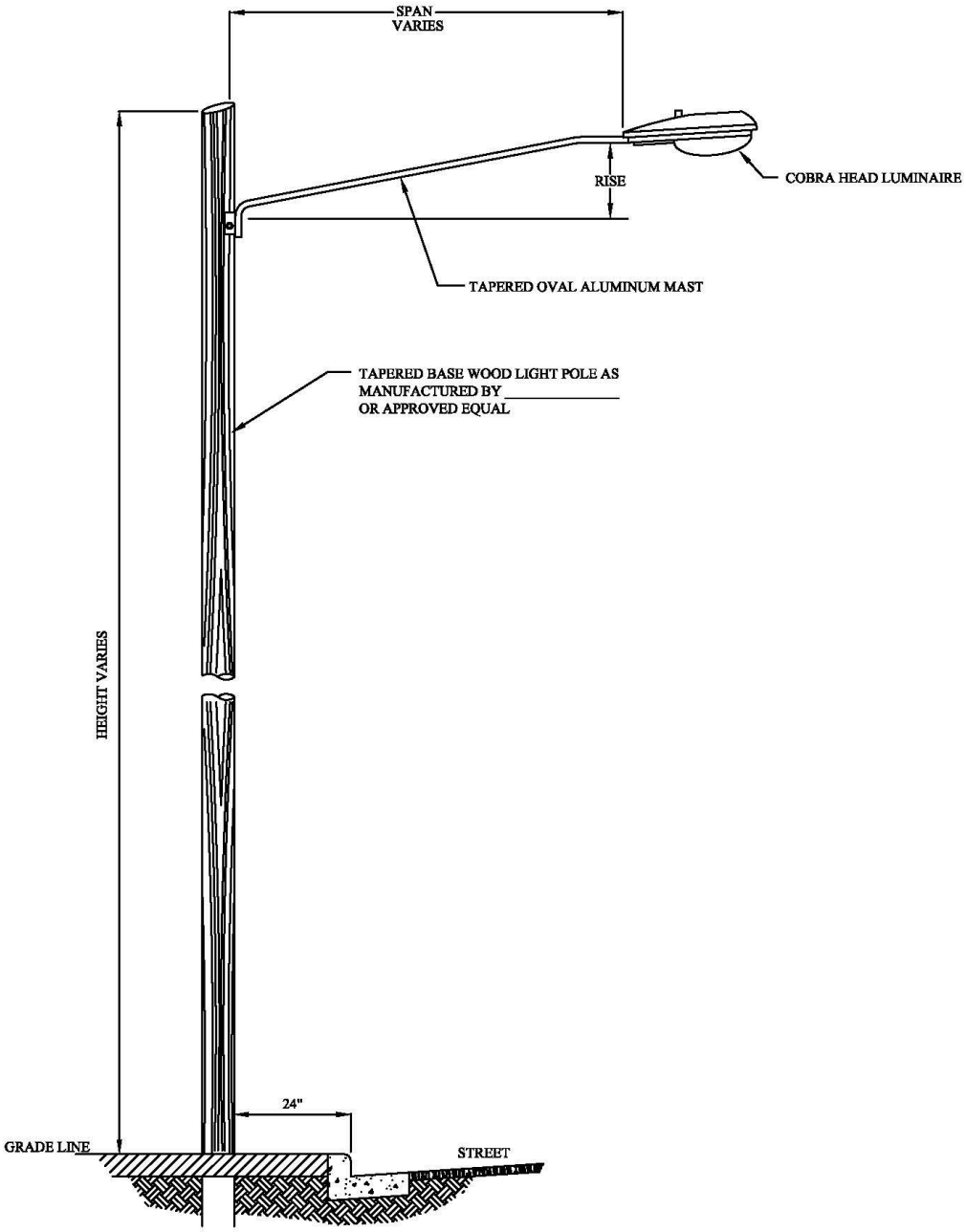


D4 Duct Bank Section



DUCT BANK SECTION
(SHOWN UNDER SIDEWALK)

D5 Wood Pole with Cobra Head Luminaire

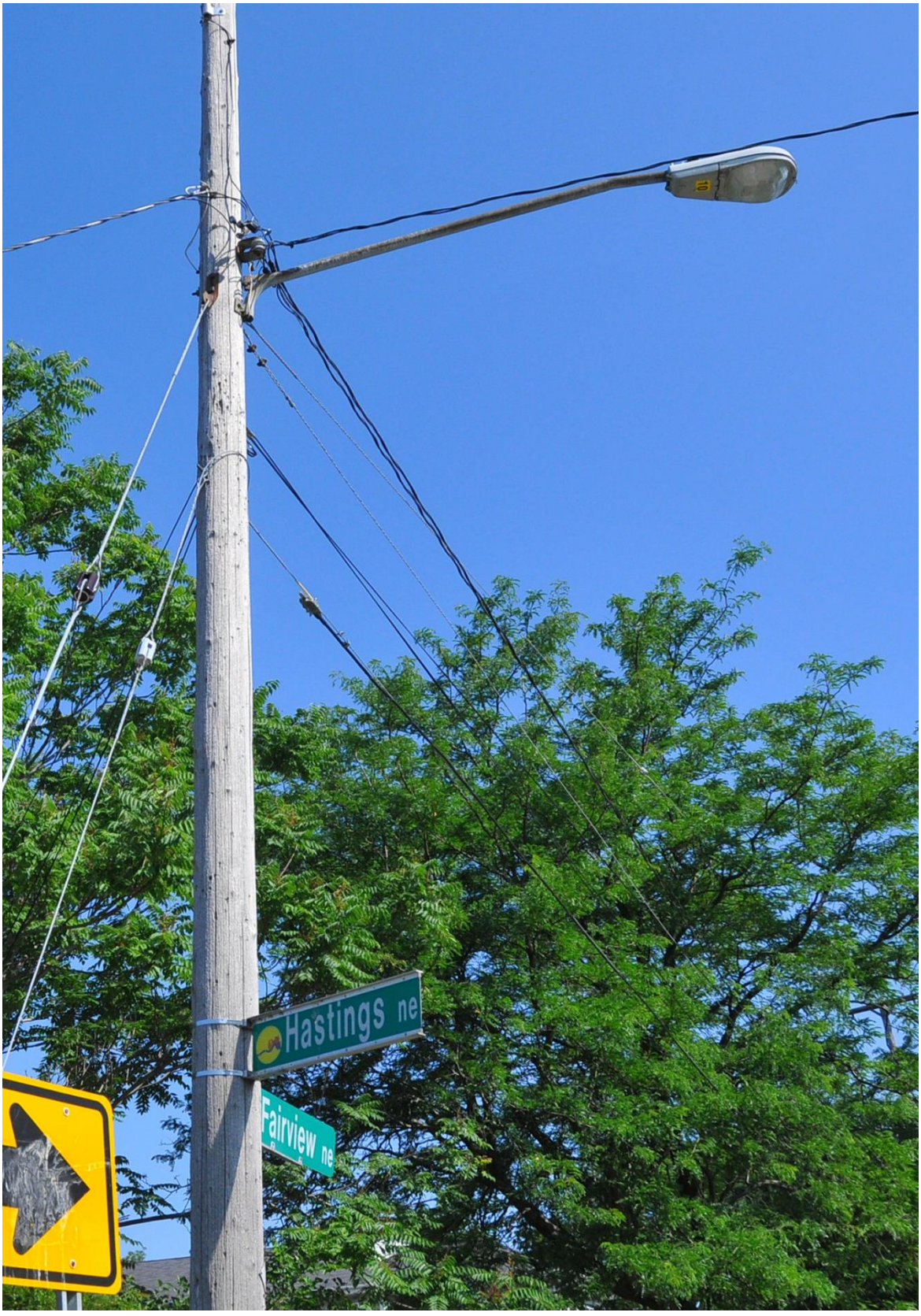


WOOD POLE WITH COBRA HEAD LUMINAIRE

NOT TO SCALE

16. INFRASTRUCTURE PHOTOGRAPHS

P1 Wood Pole with Cobra Head Luminaire



P2 Typical Pole Attachment

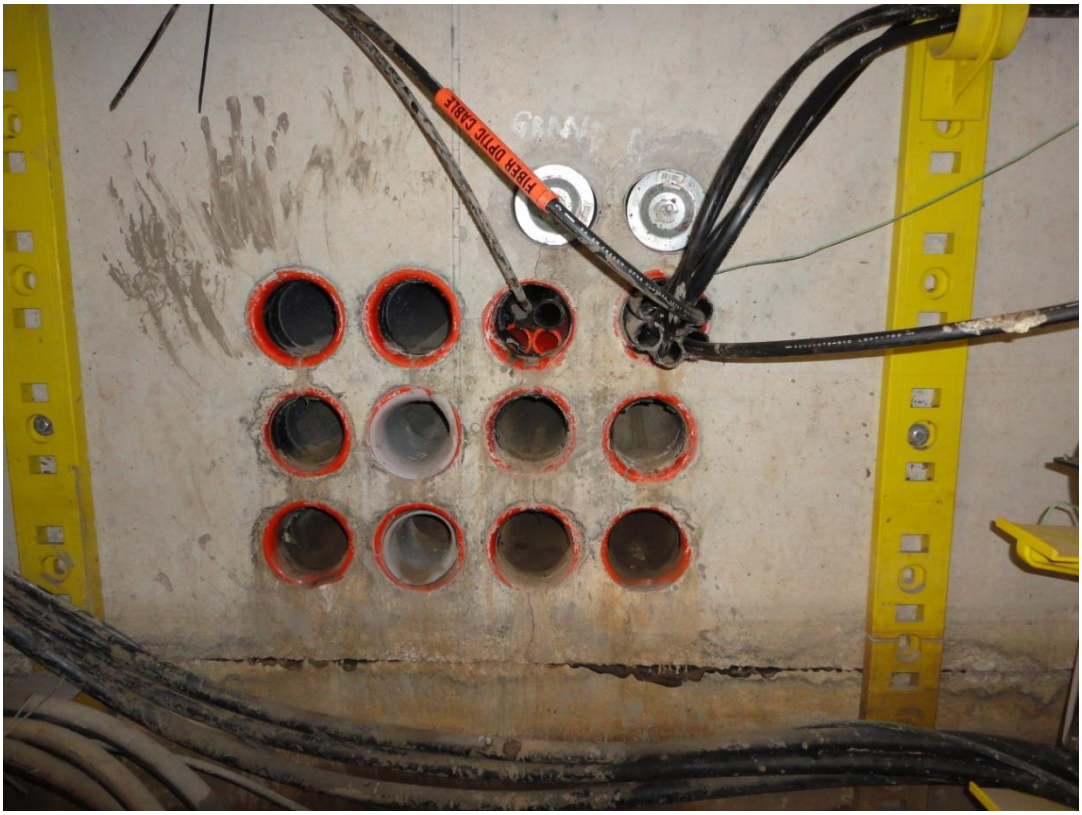
P3 Duct Installation in Ann Street Bridge

P4 Duct Installation in Division Avenue & Buckley Street

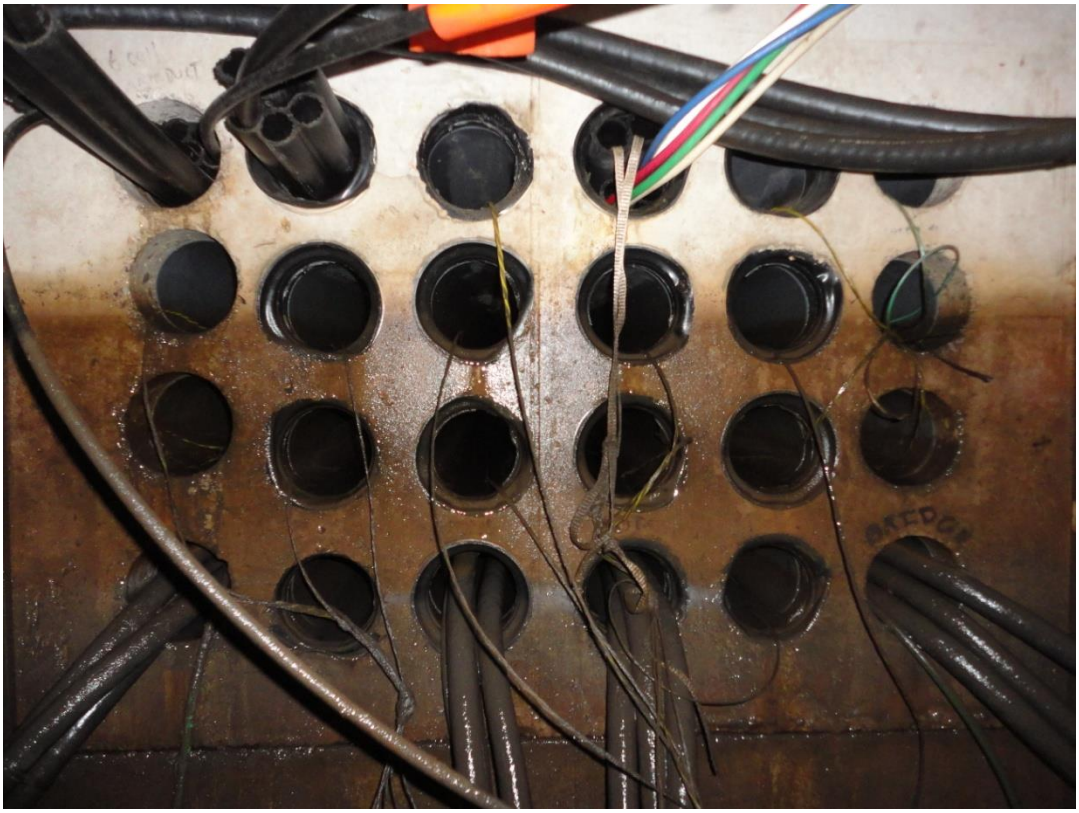
P5 Duct alongside Storm Sewer under US131

P6 ***Duct Installation in Wealthy Street***

P7 Manhole Interior 1



P8 Manhole Interior 2



P9 ***Manhole Interior Access 1***

P10 ***Manhole Interior Access 2***

P11 ***Duct Riser***

CITY OF GRAND RAPIDS
SIGNALS AND LIGHTING
MANHOLE RACKING POLICY

The placement of cabling through the City conduit/manhole system requires that users adhere to industry standards in the installation of those cables within the system. Inspections by the City will consist of review of the following items for compliance:

- Cable enters the manhole and is directed to the sidewalls for racking on the stanchions within the manhole. Attachment to the stanchions will be made by tie wraps or straps that securely hold the cable in place.
- Cable shall have a label on it that identifies the facility owner, what type of cable it is, and the telephone number of the facility owner.
- Cable shall not cross over or impede the moving of any other cable within the manhole system. Slack coils and splice cases shall be neatly tied back to the walls.
- No cable shall be lying on the floor of the manhole.
- Location of cables in the manholes will be based on function of the facility. Primary cables will be placed in the lowest level of the manhole, with secondary the next level up, and communications cables will be as high as practical in the manhole.
- Cables placed in inner duct shall use the smallest inner duct available for the size of cable that is being placed.

As defined in the permit issued for cable placement within the City Conduit System, as-built drawings reflecting the cable placement shall be sent to the City. A spot review of the installation, as reflected by the as-builts will be conducted. Any violation of the Manhole Racking Policy will be noted and a notice will be sent to the facility owner. The violation shall be corrected within thirty (30) days or the facility owner may be required to remove the cables, at the discretion of the City.