



# CITY of NOVI CITY COUNCIL

**Agenda Item 5  
August 13, 2018**

**SUBJECT:** Approval to purchase seven (7) LaserFlow Non-contact Velocity Sensor sanitary sewer flow meters from Hamlet Engineering Sales Company, in the amount of \$143,675.00.

**SUBMITTING DEPARTMENT:** Department of Public Works, Water and Sewer Division

**CITY MANAGER APPROVAL:** 

|                               |  |
|-------------------------------|--|
| <b>EXPENDITURE REQUIRED</b>   | <b>\$ 143,675.00</b>                           |
| <b>AMOUNT BUDGETED</b>        | <b>\$ 199,000 (FY 2017-18 Budget Rollover)</b> |
| <b>APPROPRIATION REQUIRED</b> | <b>N/A</b>                                     |
| <b>LINE ITEM NUMBER</b>       | <b>592-592.00-986.001</b>                      |

## **BACKGROUND INFORMATION:**

The Water and Sewer Division is planning the installation of seven new sewer flow meters at strategic locations throughout the city to improve flow-metering accuracy. The LaserFlow meter is a non-contact device, which means it does not touch the liquid measured, reducing the labor intensive cleaning and maintenance of the meter otherwise needed. Instead, one or more laser beams focus on varying points within the stream of flow to determine the velocity. Enclosed in the packet is a map of proposed locations of the meters.

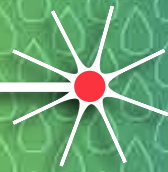
Each meter will be equipped with a cellular modem allowing remote monitoring of flows. This will allow staff to perform routine monitoring of the system, and identify unusual or adverse conditions, such as system surcharging (system backup), effectively improving response times to these situations before they become a major problem. Staff will also be able to review data collected to help recognize areas that may be allowing rainwater or groundwater into the system, identifying future pipe or manhole repairs needed.

Hamlet Engineering Sales Company (HESCO) is the sole manufacturer's representative of LaserFlow meters in Michigan (see the attached letter from Teledyne ISCO, the manufacturer of the equipment).

**RECOMMENDED ACTION:** Approval to purchase seven (7) LaserFlow Non-contact Velocity Sensor sanitary sewer flow meters from Hamlet Engineering Sales Company, in the amount of \$143,675.00.

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# LaserFlow™



**A Non-Contact Flow Meter for Open Channel Flow Monitoring**



# LaserFlow is built on a strong history of water and wastewater monitoring innovations

With the breakthrough technology of LaserFlow, the first and only non-contact device to penetrate the water to record velocity, Teledyne Isco has revolutionized the water and wastewater monitoring industry. More than 40 years ago, founder Dr. Allington recognized the need for open channel flow measurement at the time the Clean Water Act of 1972 and the National Pollution Discharge Elimination System (NPDES) were introduced in the United States. This was the beginning of a successful advancement of innovations resulting in a number of patents and products leading to the LaserFlow's development.

## Early Innovations

The 1970s and 1980s included many firsts: introducing the first Isco flow meter, the first automatic wastewater sampler, and first bubbler flow meter on the market. Innovations launched in the 1990s included the first flow meter to print reports for permit compliance, a sampler with non-contact liquid detection and sample volume control, first stackable module flow system, and Flowlink data management software. In the 2000s, the stackable modular flow system was expanded with greater flow measurement and remote communication technologies. By the mid-2000s, the first smart and expandable compliance meter with multiple measurement technologies and interface was launched. In the 2010s, LaserFlow, the first and only non-contact flow meter that measures true velocity of water below the surface was launched. In a few short years, it has redefined the industry standard by excelling in a wide range of applications with precise velocity and level measurement. The evolution of successful products is a testament to Teledyne Isco's attentiveness to customers' needs.

## Industry Leader

Teledyne Isco has been a leading manufacturer and supplier of durable, reliable in-plant and field instruments for monitoring water quality and pollution. These products include refrigerated and portable automatic wastewater samplers, open channel flow meters with acoustic Doppler area velocity, ultrasonic, bubbler, and submerged probe measurement technologies and Flowlink® software for comprehensive flow data handling and analysis.

## Water and Wastewater Monitoring Expert

Teledyne Isco combines a dedicated workforce with a progressive, vertically integrated ISO 9001 manufacturing operation. The dedicated facility combines research, engineering, sales, service, and manufacturing including plastic molding, machine shop and assembly operations.

Following Dr. Allington's lead and the ongoing dialogue with users, Teledyne Isco continues to build upon a rich history of pioneering products leading up to the release of the LaserFlow non-contact velocity sensor. It is this ongoing tradition of innovation that allows Teledyne Isco to meet your water and wastewater monitoring needs now and well into the future.

## Widest application range

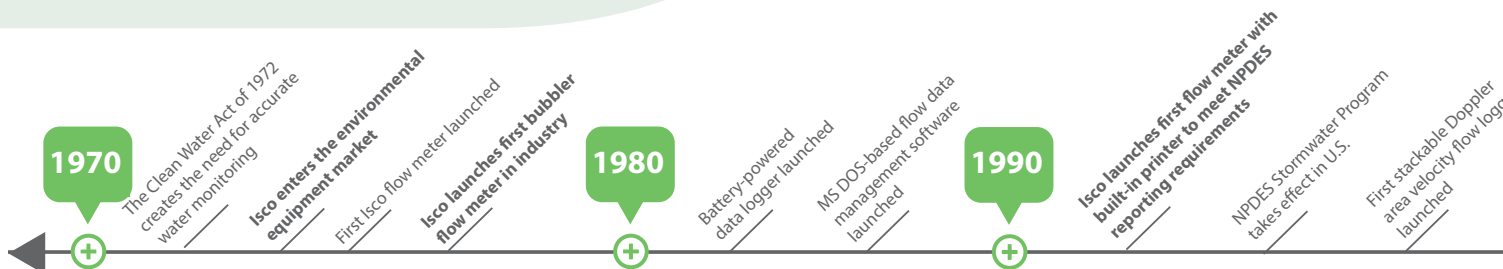
With the widest level and velocity range, the Laserflow is suitable for most open channels.

## Minimal cost of ownership

The construction of the LaserFlow offers lasting durability, while the above water installation limits the need for routine cleaning, maintenance and site visits, saving time, money, and resources.

## Effortless data collection

With Teledyne Isco's remote communication options and Flowlink Global software you can monitor any data, anywhere, anytime, on any device.



## Easy installation and maintenance

The Teledyne Isco hardware makes installation easy. Removal and redeployment is simple from street level. Mounted above the water, the LaserFlow can eliminate confined space entry for maintenance.

## Ease of calibration

Velocity measurement at single or multiple points below the surface eliminates the need for manual profiling. Ultrasonic signal strength validates level measurement while the Doppler power information of the return signal ensures an accurate velocity reading and allows the user insight into changing pipe hydraulics over time.

## Accurate measurement regardless of flow conditions

From bidirectional flow, varying flow speeds and liquid levels, including submerged conditions, the LaserFlow continues to perform accurately by automatically adjusting to these changing conditions.



# LaserFlow™

## Non-Contact Velocity Sensor



2000

Stackable concept expanded to additional ultrasonic flow measurement and communications  
Pulse doppler flow meters introduced

Server-based flow data management software launched

Flowlink (Web user interface) launched

2010

Smart, expandable permanent signature flow meter with interface options launched

Teledyne Isco launches LaserFlow, first non-contact AV sensor using laser technology in industry

Web UI updated Flowlink for multiple operating systems, web browsers and mobile devices

Teledyne Isco Environmental Products Milestones

# The only non-contact flow measurement device to read below the surface.

LaserFlow's revolutionary non-contact area velocity measurement technology is without equal. It is the only non-contact area velocity sensor to measure velocity below the surface of the water. The continuity equation can be used to introduce the theory of operation of the LaserFlow.

The wetted area is defined as the cross-sectional area that is filled with the water (flow rate) that is being measured. By measuring the depth of the water, and knowing the dimensions of the channel, the wetted area can be calculated. With the LaserFlow, this depth is measured using an ultrasonic sensor that bounces a sound wave off the surface of the water to determine the depth of the channel.

$$Q = A \times V$$

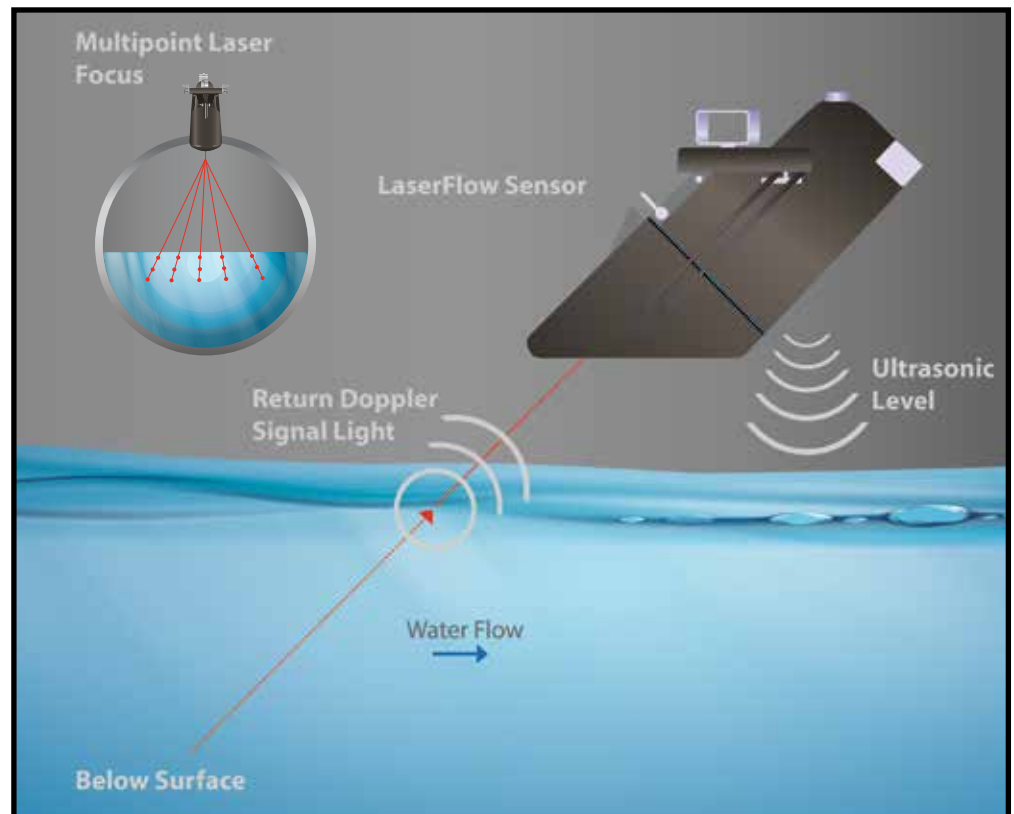
(Flow) (Wetted Area) (Velocity)

The revolutionary development of the LaserFlow sensor is how the velocity measurement is collected. By using the level measurement information collected by the ultrasonic sensor, the LaserFlow sensor focuses a laser beam below the surface of the water. The frequency of the scattered light will shift from the transmitted signal.

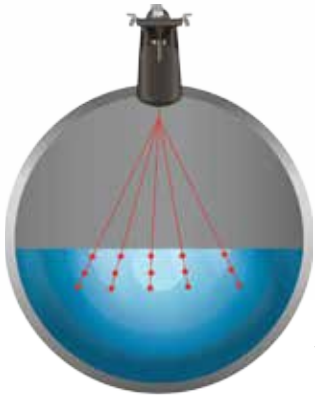
Supports Widest Application Range

Easy Installation and Maintenance

Accurate, Verifiable Measurement



# Why choose LaserFlow?



**Multiple point  
velocity  
measurement**



**Single point  
large pipe**



**Single point  
small pipe**

## Acquire precise readings

Laserflow, the only non-contact velocity sensor that reads below the surface, provides maximum precision by taking velocity measurements at single or multiple points, producing the most accurate mean velocity reading. Multipoint measurement minimizes the effects of turbulence in the water by performing a horizontal scan at different depths. This advancement eliminates the need for time consuming manual profiling prior to installation.

## Durable construction

Like all Teledyne Isco products, the LaserFlow is durably constructed for lasting performance. Due to the non-contact nature of the LaserFlow, interaction with flow is not common in normal conditions. However, in surcharged flow conditions, the LaserFlow's rugged construction and submersible enclosure with IP68 ingress protection will keep the electronics protected. The angled body of the LaserFlow allows condensation to easily run off, not interfering with level measurement. Composed mainly of ABS and SST, the LaserFlow is chemical, heat, and corrosion resistant.

## Bidirectional flow measurement

The LaserFlow can measure bidirectional flow caused by tidal influence, heavy rain, or a higher level in the merging line downstream.

## Eliminate measurement issues in wet environment with optical clarity system

Eliminate measurement difficulties in moisture-rich conditions. Performance is never interrupted, even in less than ideal conditions, with the LaserFlow's advanced optical clarity system. This automatic feature detects the slightest amount of condensation on the window of the sensor, then activates the optical clarity system to clear the window insuring velocity measurement is never compromised.



# Teledyne Isco Flowlink® software packages available for your data collection needs

## Flowlink

Teledyne Isco's comprehensive Flowlink® software provides the tools to manage all of your flow monitoring data. The software is specifically designed for desktop computers in the office and notebook computers in the field. To collect data, the software communicates via USB connectivity, Ethernet and cellular modem (CDMA or GSM). Once the data is retrieved, the software has built in tools for evaluating site conditions, data analysis and reporting.

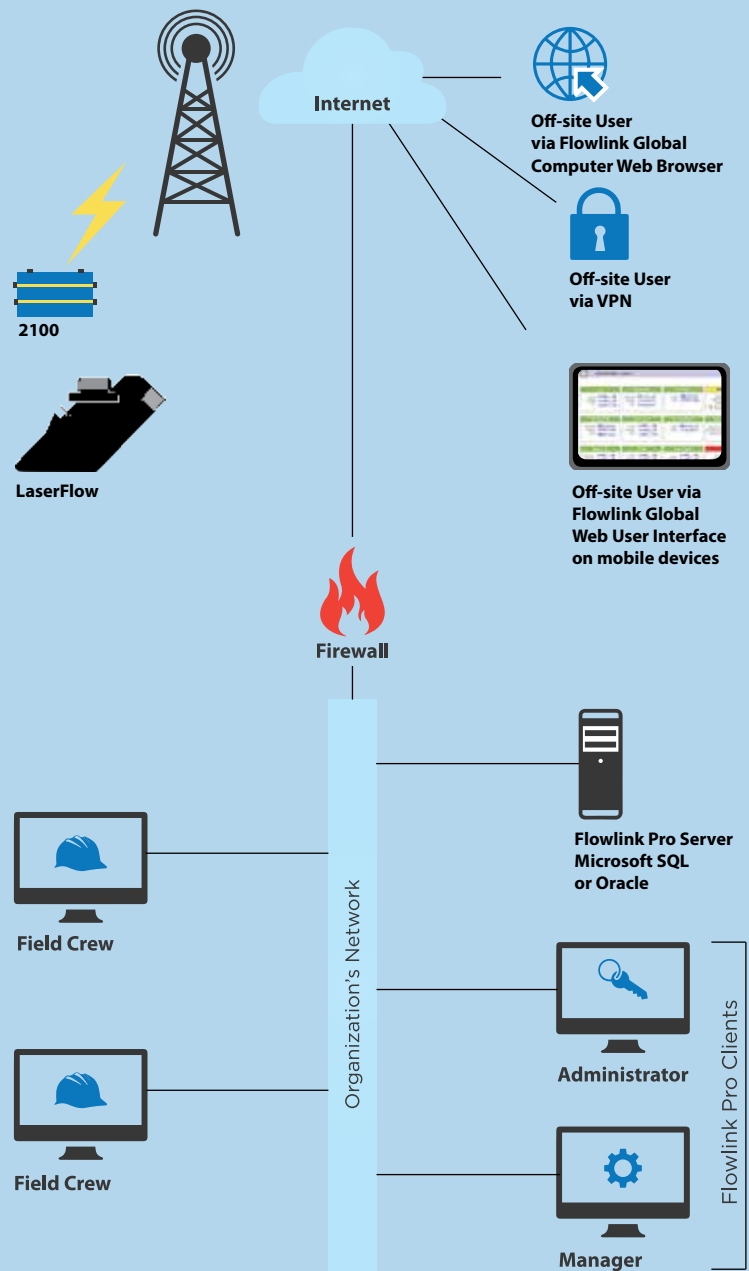
## Flowlink Pro

Flowlink Pro Software is a server based application that supports automatic transmission of data from field devices. The use of this software package eliminates the need for site-to-site data collection visits that cost time and money. This client server configuration accepts "pushed data" from meters or equipment with cellular modems via the Internet for hands-off data collection. The software package includes the built-in data analysis tools that are included in the standard Flowlink package as well as advanced server-based alarm notifications.

## Flowlink Global





Flowlink Global is a Web User Interface (Web UI) that enables multiple users to simultaneously monitor and service sites in your Flowlink Pro database from their desktop computers, laptops, or mobile devices. This web interface supports Windows or iOS operating systems and a variety of web browsers including Internet Explorer, Safari, Google Chrome, Mozilla Firefox and Opera.

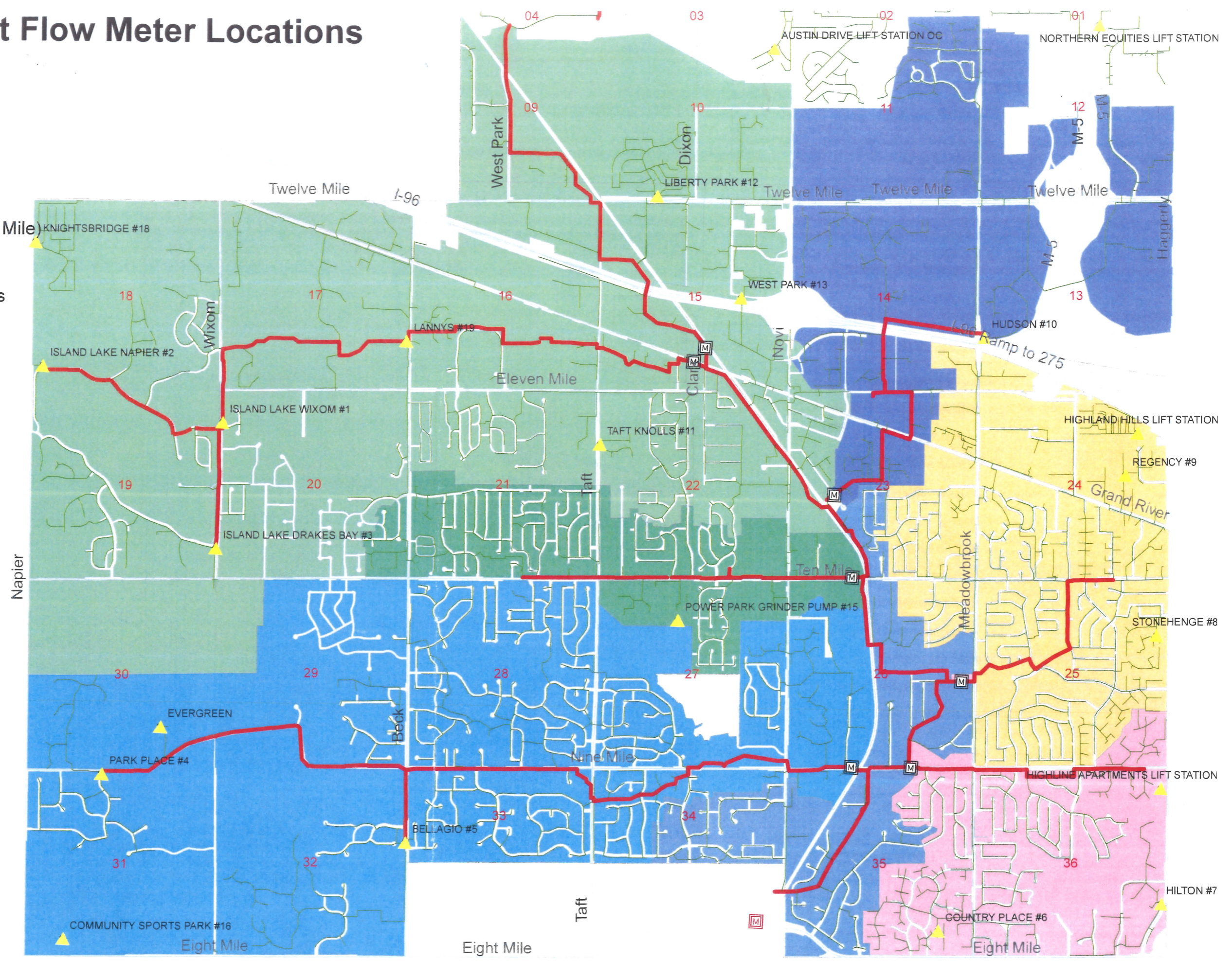
Typical Flowlink Pro Flow Data Communication System



# Proposed Permanent Flow Meter Locations

## Legend

-  Sanitary Lift Station
-  Outlet Flow Meter Location (Eight Mile)
-  Permanent Meter Location
-  Proposed Hydraulic Model Extents
- Walled Lake-Novl WWTP Area
- ELWH
- Hudson
- Interceptor South
- Nine Mile
- Simmons
- Turtle Creek
- Willowbrook





January 31, 2018

To Whom It May Concern

This is to certify that Teledyne Isco is the sole manufacturer of Teledyne Isco automatic wastewater sampling and flow monitoring equipment. These items include but are not limited to flow meters, LaserFlow™, samplers, rain gauges, connecting cables, and associated hardware, as well as, operation software. These parts can be obtained either direct from Teledyne Isco or through our local representative, Hamlett Engineering Sales Company (HESCO).

Hamlett Engineering Sales Company (HESCO) with offices located at 28838 Van Dyke Avenue, Warren MI 48093, is an exclusive Teledyne Isco Sales Representative and Distributor for State of Michigan (lower peninsula only) as defined in the Teledyne Isco Domestic Sales Representative and Distributor Agreement, dated September 1, 2014.

Respectfully,



Sharon Fischer  
Quotations, Submittals, & Contracts Specialist  
Teledyne Isco, a business unit of Teledyne Instruments, Inc.



***Knowledgeable • Professional • Attentive • Likeable***

28838 Van Dyke • Warren, MI 48093

Phone: 586.978.7200 • Fax: 586.978.2200

[www.hesco-mi.com](http://www.hesco-mi.com)

Tuesday, July 31, 2018

Ben Croy  
45175 W Ten Mile Rd  
Novi, MI 48375

**RE: Flow Metering Quote**

Ben,

Here is the quote for the Laser flow equipment. We are providing two quotes. one for the equipment and one for the installation and data services ongoing. The PO for equipment would be issued to Teledyne Isco and the PO for installation would be issued directly to HESCO.

Please call or email if you have questions

Best regards,

*Kevin Livingston*

Kevin Livingston, P.E.

HESCO

E-mail: [Kevin@hesco-mi.com](mailto:Kevin@hesco-mi.com)

Tel:(586)978-7200

Fax:(586)978-2200



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Tuesday, July 31, 2018

|         |  |          |  |
|---------|--|----------|--|
| To:     | Novi, City of<br>Ben Croy<br>45175 W Ten Mile Rd<br>Novi, MI 48375 | RFQ #:   | Verbal   |
|         |  | Quote #: | 0680970654KSL<br>Please refer to this number when ordering |
| Phone:  | 248-343-1303   |          |  |
| Fax:    |  |          |  |
| E-mail: | bcroy@cityofnovi.org   |          |  |

**PRICE QUOTE  
Flow Metering Quote**

| Item | Description   | Qty  | Unit Price  | Subtotal    |
|------|---|------|-------------|-------------|
| 1.00 | Teledyne Isco<br><br>68-2160-060-ISCO3171<br><br>2100<br><br>Portable 2160 LaserFlow™ System. This system includes TIENet® 360 LaserFlow Sensor with 32.8 ft (10 m) cable, remote Ultrasonic level sensor with 10 m cable, 2160 LaserFlow module, 2191 Battery module with carrying handle and suspension strap. The system includes one 2100 Series maintenance kit, instruction manual, and coupon for free Isco Open Channel Flow Measurement Handbook. Requires wall mount or temporary mount for LaserFlow sensor, Flowlink software and computer connect cable. | 7 EA | \$12,380.00 | \$86,660.00 |
| 2.00 | Teledyne Isco<br><br>60-2004-006<br><br>2191 Battery Module. Includes 2 battery holders<br><br>60-2004-006: 2191 Battery Module. Includes 2 battery holders.  | 7 EA | \$764.00    | \$5,348.00  |

| Item | Description   | Qty  | Unit Price | Subtotal    |
|------|---|------|------------|-------------|
| 3.00 | <p>Teledyne Isco</p> <p>68-2000-108</p> <p>2103g GSM Modem Communication Module</p> <p>2100 Series 3G GSM Cellular Modem Module with bolt-on manhole antenna. Provided as a stack on module to 2100 series systems, powered from the module stack. GSM cellular data service paid for by Owner. Provides wireless "push" data transmission, dial up and download capability, and text message alarming.</p> | 7 EA | \$2,600.00 | \$18,200.00 |
| 4.00 | <p>Teledyne Isco</p> <p>60-4354-023</p> <p>Signature Meter</p> <p>60-4354-023 - TIENet® 350 Area Velocity sensor with plug and 10 m (32.8 ft) cable. Surcharge Kit</p>  | 7 EA | \$1,850.00 | \$12,950.00 |
| 5.00 | <p>Teledyne Isco</p> <p>68-3000-061</p> <p>68-3000-061</p> <p>Scissors Ring for 50 inch to 54 inch diameter pipes. Includes base section, scissors mechanism, one pair of 7.5 inch extensions, one pair of 20 inch extensions, and one pair of 30 inch extensions.</p> <p>used for surcharge AV sensor</p>  | 7    | \$756.00   | \$5,292.00  |
| 6.00 | <p>Teledyne Isco</p> <p>60-4364-003</p> <p>2100</p> <p>60-4364-003 - Permanent wall mount for TIENet™ 360 LaserFlow™ sensor.</p>  | 7 EA | \$606.00   | \$4,242.00  |

| Item | Description   | Qty  | Unit Price | Subtotal   |
|------|---|------|------------|------------|
| 7.00 | Teledyne Isco<br>60-4368-020<br>68-2000-020<br>Horizontal sensor mount bracket for TIENet 310<br>Ultrasonic level | 7 EA | \$81.00    | \$567.00   |
| 8.00 | Teledyne Isco<br>68-2540-280<br>Flowlink Global<br>1 Year Subscription<br>for access of 1 database                | 1 EA | \$1,200.00 | \$1,200.00 |

|                              |                     |
|------------------------------|---------------------|
| Subtotal                     | \$134,459.00        |
| Taxable Subtotal             | \$0.00              |
| Sales Tax [6.0000%]          | \$0.00              |
| Misc. Charge                 | \$0.00              |
| Shipping & Handling Best Way | \$696.00            |
| <b>Grand Total</b>           | <b>\$135,155.00</b> |

| <b>Terms &amp; Conditions</b>           |  |
|---|--|
| <b>Proposed Shipping Date</b> 2-4 Weeks | <b>Payment Terms</b> Net 30                        |
| <b>Shipping Method</b> Best Way         | <b>Shipping Terms</b> Prepaid and Added to Invoice |
| <b>F.O.B.</b> Factory                   | This Quotation is valid until 8/30/2018.           |

If favored with an Order, please make the Purchase Order out to:  
Teledyne Isco  
P.O. Box 82531  
Lincoln, NE 68501  
and email or fax it to HESCO at (586) 978-2200 for order entry and processing  
Thank you for your inquiry!



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Tuesday, July 31, 2018

Ben Croy  
45175 W Ten Mile Rd  
Novi, MI 48375

**RE: Flow meter data/maintenance services**

Ben,

This quotation is for the proposed field services that will be required once the meters are installed.

the PO should be issued to HESCO and we will provide the service and invoice you monthly as our services are utilized

Thanks

Best regards,

*Kevin Livingston*

Kevin Livingston, P.E.  
HESCO  
E-mail: [Kevin@hesco-mi.com](mailto:Kevin@hesco-mi.com)  
Tel:(586)978-7200  
Fax:(586)978-2200



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| Phone:  | 248-343-1303   |          |  |
| Fax:    |  |          |  |
| E-mail: | bcroy@cityofnovi.org   |          |  |

**PRICE QUOTE**  
**Flow meter data/maintenance services**

| Item | Description  | Qty  | Unit Price | Subtotal |
|------|--|------|------------|----------|
| 1.00 | HESCO<br><br>Hesco Data Services<br><br>Data Hosting Service<br><br>Cell phone modems will push data on a 1-hour basis to HESCO Hosted FloLink Pro Site, data will be stored and backed up on HESCO hosted servers<br><br>Customer will be billed monthly per meter at the rate quoted | 7 EA | \$30.00    | \$210.00 |

| Item | Description   | Qty    | Unit Price | Subtotal   |
|------|---|--------|------------|------------|
| 2.00 | <p>HESCO</p> <p>Field Service</p> <p>Field Service Technician</p> <p>The services of a HESCO field services technician to perform the following as needed tasks:</p> <p>Site Identification, meter location and suitability evaluation - HESCO will visit potential installation sites, determine suitability for installation and identify manhole for installation</p> <p>Meter Installlation assitance - HESCO will provide a single field service technician to install the flow meters. City of Novi will be responsible for providing confined space entry personnel and traffic control</p> <p>Flow Meter Training - HESCO will provide training on FloLink Software, 2150 AV meters, and 2160 Laser Flow meters</p> | 4 days | \$1,500.00 | \$6,000.00 |
| 3.00 | <p>HESCO</p> <p>Field Service - CSE Crew</p> <p>Ongoing Meter Maintenance</p> <p>HESCO will provide maintenance service to the City of Novi as required to either calibrate and verify operation of the Laser flow meters or to provide corrective service if a data technician determines that a meter needs attention. Consumables such as batteries will be billed at cost plus 15%</p>  | 1 EA   | \$550.00   | \$550.00   |

|                              |                   |
|------------------------------|-------------------|
| Subtotal                     | \$6,760.00        |
| Taxable Subtotal             | \$0.00            |
| Sales Tax [0.0000%]          | \$0.00            |
| Misc. Charge                 | \$0.00            |
| Shipping & Handling Best Way | \$0.00            |
| <b>Grand Total</b>           | <b>\$6,760.00</b> |

| <b>Terms &amp; Conditions</b>                                  |  |
|--|--|
| <b>Proposed Shipping Date</b> Weeks After Approval of Drawings | <b>Payment Terms</b> Net 30                        |
| <b>Shipping Method</b> Best Way                                | <b>Shipping Terms</b> Prepaid and Added to Invoice |



|                       |  |
|-----------------------|--|
| <b>F.O.B.</b> Factory | This Quotation is valid until 8/30/2018. |
|-----------------------|--|

If favored with an Order, please make the Purchase Order out to:

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Warren, MI 48093

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Thank you for your inquiry!