

Report No.: PLA-55-2019

Meeting Date: July 17th, 2019

Submitted by: Kelly Henderson, Planner

Subject: Applications for Draft Plan of Subdivision (39T-MC1902), Official Plan Amendment (OPA 45) and Zoning By-law Amendment (ZBA 14 2019); Stanlake Consulting – Douglas Stanlake on behalf of Brantam Developments Inc.

Recommendation:

THAT Report PLA-55-2019 be received for information.

Purpose:

The purpose of this report is to provide Council with background information regarding a proposed Draft Plan of Subdivision, Official Plan Amendment and Zoning By-law Amendment for a property that is located north of Oxbow and west of Komoka Road in the village of Komoka.

A location map is included as Attachment 1.

Proposal:

The purpose and effect of the Official Plan Amendment is to amend the land use schedule by adding a proposed collector road and to remove the aggregate overlay. Furthermore, the application proposes to re-designate the subject lands from Residential to Residential (single family dwelling) and Medium Density Residential. The applicants are proposing five Medium Density Residential blocks to permit a variety of housing types and to increase the overall density of the proposed Plan of Subdivision. Lastly, the Official Plan Amendment proposes to add a policy to amend Section 5.7.4 of Middlesex Centre's Official Plan to permit a limited number of garages on freehold residential lots to project 1.5 metres (4.9 feet) closer to the street line than the other components of the structure.

The purpose and effect of the Zoning By-law Amendment is to rezone the subject property from the Existing Use (EU) zone to several site-specific zones in order to accommodate the proposed residential uses.

The Plan proposes to create 173 building lots for single detached dwellings and blocks for future residential development on 20.77 hectares (51.3 acres) of land.

Background:

The subject lands are located within the Komoka and Kilworth Settlement Area in the Municipality of Middlesex Centre and situated to the west and north of the existing built-up area of Komoka. The subject property is located north of Oxbow and east of Komoka Road (County Road 16). The property is legally described as Part Lot 4, Concession 3, RP 33R-19922, Parts 1-3 (geographic Township of Lobo) in the Township of Middlesex Centre.

The property is surrounded by existing residential and agricultural uses and a few industrial uses to the south. The lands are currently designated 'Residential' by Middlesex Centre's Official Plan and zoned 'Existing Use' (EU) by Middlesex Centre's Comprehensive Zoning By-law. A portion of the subject property regulated by the Upper Thames River Conservation Authority (UTRCA).

In regards to the current applications, a pre-application meeting was held on April 11th 2018. The developer subsequently initiated a public consultation meeting held on March 13th 2019. A formal submission was made by the proponent, with the application deemed complete on June 6th, 2019. Subsequently, staff circulated the proposed application to area residents, and various agencies.

A public meeting of Council has been scheduled for the evening of Wednesday July 17th, 2019 in accordance with Sections 22, 34 and 51 of the Planning Act. The purpose of the meeting is to allow the applicant to present the proposal and solicit feedback from members of the public. Following the public meeting, a staff recommendation regarding the proposal will be presented to Council at a separate meeting.

A concept plan for the property is included as Attachment 2.

The Functional Servicing Report is included as Attachment 3.

A Planning Justification report is included as Attachment 4.

A Noise Study is included as Attachment 5.

A Transportation Study is included in Attachment 6.

Policy Regulation:Provincial Policy Statement (PPS):

According to Section 3 of the Planning Act, as amended, decisions made by planning authorities "shall be consistent with" the PPS. The principal policies of the PPS that are applicable to the proposed development include:

Section 1.1.1 of the PPS speaks to 'Healthy Livable and safe communities' and how they can be sustained. Section 1.1.1b) states that 'accommodating an appropriate range and mix of residential (including second units, affordable housing and housing for older persons), employment (including industrial and commercial), institutional (including places of worship, cemeteries and long-term care homes), recreation, park and open space, and other uses to meet long-term needs'.

1.1.3.1 Settlement Areas shall be the focus of growth and development, and their vitality and regeneration shall be promoted.

1.1.3.2 Land use patterns within settlement areas shall be based on:

a) Densities and a mix of land uses which:

1. Efficiently use land and resources;
2. Are appropriate for, and efficiently use, the infrastructure and public service facilities which are planned or available, and avoid the need for their unjustified and/or uneconomical expansion

Section 1.4 of the PPS speaks to 'Housing' and the requirement 'to provide for an appropriate range and mix of housing types and densities required to meet projected requirements of current and future residents'.

Section 1.6.6. of the PPS outlines the hierarchy for sewage and water services. Generally, the preferred method of servicing is full municipal services.

Section 1.6.7 of the PPS speaks to stormwater management and that planning for stormwater management shall:

- a) Minimize, or, where possible, prevent increase in contaminant loads;
- b) minimizing changes in water balance and erosion,
- c) not increasing risks to human health and safety and property damage;
- d) maximize the extent and function of vegetative and previous surfaces; and
- e) promote stormwater management best practices, including stormwater attenuation and re-use, and low impact development.

County of Middlesex Official Plan:

The principal policies of the County of Middlesex's Official Plan that are applicable to the proposed development include:

The subject property is designated Settlement Area by the County of Middlesex Official Plan. Section 3.2. of the Plan directs growth to settlement areas, and promotes a variety of housing types within Settlement Areas.

Section 2.3.7 of the County of Middlesex Official Plan speaks to housing policies, and states that, 'it is the Policy of the County to encourage a wide variety of housing by type, size and tenure to meet projected demographic and market requirements of current and future residents of the County.'

The County of Middlesex's Official Plan in section 2.4.5 discusses the servicing hierarchy similar to those discussed in the PPS. Specifically, the County encourages new development to proceed on the basis of full municipal services.

Middlesex Centre's Official Plan:

The principal policies of Middlesex Centre's Official Plan that are applicable to the proposed development include:

As mentioned above, Middlesex Centre's Official Plan designates the subject property as 'Residential', 'Medium Density Residential' and indicates that the property is within the settlement area boundary.

Section 5.2.1 of Middlesex Centre's Official Plan speaks to General Residential Policies, section 5.2.1 a) states, 'The Municipality will provide and encourage a wide variety of housing types, sizes and tenures to meet demographic and market requirements for the Municipality's current and future residents. Section 5.2.1 e) states, 'The Municipality shall support opportunities to increase the supply of housing through intensification, while considering issues of municipal servicing capacity, transportation issues, and potential environmental considerations.'

Section 9.3 of the Local Official Plan speaks to municipal infrastructure and servicing policies. These policies have a similar hierarchy as the PPS and the County Official Plan.

The Komoka-Kilworth area has a Secondary Plan, which provides a statement of objectives and policies, and a land use plan intended to guide and direct the nature of land development within the community. One of the goals of the Komoka-Kilworth Secondary Plan is to provide for an appropriate range and mix of housing types and densities. As well as to minimize the consumption of prime agricultural areas.

Section 5.7.4 of the Secondary Plan speaks to the intended built form for the Komoka-Kilworth Residential Area Policies. Specifically section 5.7.4 states;

- 'a) The types of housing, density of development and targeted housing mix within the Residential and Medium Density Residential designations on Schedule A-2 are as follows:

Use	Housing Mix Targets	Net Density (units per ha)
Low density residential (e.g. singles, semis)	60%	less than 20
Medium density residential (e.g. townhouses)	40%	20 to 50

The net density refers to the land area to be used for housing as well as the abutting local streets, but does not include major streets and other residentially associated land uses. Notwithstanding the housing mix targets and net density provisions, multiple dwellings shall be permitted in the Residential designation in accordance with Section 5.2.3.

b) Development proposals within areas shown as Medium Density Residential on Schedule A-2 shall:

- i) Provide for a diverse mix of multi-unit housing forms and choices to accommodate the needs and lifestyles of people at different stages throughout life.

c) all residential development shall ensure appropriate orientation and massing of residential buildings to provide adequate private and public open spaces and to facilitates the penetration of sunlight into these spaces.

d) Private garages for residential development shall not be located closer to the street than the habitable portion or porch on the main floor of the building and may be subject to maximum width and other requirements within the Municipality's Zoning By-law to limit the visual and streetscape impacts of garages and encourage a positive street frontage oriented to pedestrians, and shall have regard for the Municipality's Site Plan Manual and Urban Design Guidelines.

e) Entrance features to new residential neighbourhood development shall be encouraged, provided that the features are landscape-related and require minimal maintenance.'

Middlesex Centre's Comprehensive Zoning By-law:

As mentioned the subject property is zoned 'Existing Use' (EU) by Middlesex Centre's Comprehensive Zoning By-law. The applicant has proposed various site specific zones for the proposed blocks with the plan of subdivision.

The requested zoning for the proposed Freeholds is a site specific Urban Residential First Density (UR1-A) zone, based on the standards described below for the lands shown on the attached zoning schedules:

	UR1-A
Minimum Lot Area	360.0 m ² (3,875 ft ²)
Minimum Lot Frontage	12.0 m (39 ft)
Minimum front yard setback – porch or habitable portion of the dwelling	4.5 m (14.8 ft)
Minimum front yard setback attached garage	6.0 metres (19.7 ft), but not more than 1.5 m (4.9 ft) closer to the front lot line than the porch or habitable portion of the dwelling
Minimum side yard setback – interior lot	1.2 m (3.9 ft)
Minimum side yard setback – corner lot	1.2 m (3 ft) on both sides, except attached garages abutting the road
Minimum side yard setback – attached garages abutting the road	4.5 m (14.8 ft)
Minimum rear yard setback	6.0 m (19.6 ft)
Maximum lot coverage – building, including dwelling and attached garage for single storey	50%
Maximum lot coverage – main building, including dwelling and attached garage for all other dwellings	40%
Maximum lot coverage – main building, including accessory buildings and structures for single storey	53%
Maximum lot coverage – main building, including accessory buildings and structures for all other dwellings	43%

The requested zoning for the proposed Vacant Land Condo Single Family Units – Block 178 and 179, is a site specific Urban Residential First Density (UR1-B) zone to be compounded with a site-specific Urban Residential Third Density zone with a holding symbol (H6) to ensure a public site plan process. The site specific Urban Residential First

Density (UR1-B) zone is based on the standards described below for the lands shown on the attached zoning schedules:

	UR1-B
Special provision requested	Notwithstanding any other provisions of this By-law, multiple dwellings are permitted on a single lot in advance of the registration of a vacant land condominium plan against the land. All other provisions of this Zoning category must be adhered to as if the vacant land condominium plan, forming part of the condominium agreement that applies to the land is registered. This clause shall not apply after the registration of a vacant land condominium plan against the land.
Minimum Lot Area	360.0 m ² (3,875 ft ²)
Minimum Lot Frontage	12.0 m (39 ft)
Minimum side yard setback – interior lot	1.2 m (3.9 ft)
Minimum side yard setback – corner lot	3.0 m (9.8 ft) on the site abutting the road and 1.2 m (3.9 ft) on the other side
Maximum lot coverage – main building, including dwelling and attached garage	40%
Maximum lot coverage – all buildings, including accessory buildings and structures	43%

As mentioned the requested zoning for Block 179 is a site specific Urban Residential First Density (UR1-B) zone compounded with a site- Urban Residential Third Density (UR3-C) zone with a holding symbol (H6) in order to ensure a public site plan process. The site specific Urban Residential Third Density (UR3-C) zone is based on the standards described below for the lands shown on the attached zoning schedules:

	UR3-C
Permitted Uses	Accessory Use Townhouse Dwelling Multiple Unit Dwelling

Minimum Front Yard setback – Porch or habitable portion of the dwelling	4.5 m (14.8 ft)
Minimum Front Yard setback – attached garage	6.0 m (19.7 ft)
Minimum side yard setback – Townhouse dwelling	3.0 m (9.8 ft) on an interior lot, on a corner lot 4.5 m (14.7 ft) on the side abutting a street and 3.0 (9.8 ft) on the other side
Minimum side yard setback – Multiple unit dwelling	10.0 m (32.8 ft)
Minimum rear yard setback	6.0 m (19.7 ft)
Maximum lot coverage – habitable building(s)	40%
Maximum lot coverage – all buildings including accessory buildings	45%
Minimum Landscape Open Space	35%
Maximum Density	35 units/ha

The requested zoning for Block 180, which is proposed to accommodate townhomes only, is site specific Urban Residential Third Density (UR3-D) zone with a holding symbol (H6) in order to ensure a public site plan process:

As mentioned the requested zoning for Block 178 is compounded with a site-specific Urban Residential First Density (UR1-B) zone compounded with a site specific Urban Residential Third Density (UR3-D) zone with a holding symbol (H6) in order to ensure a public site plan process. The site specific Urban Residential Third Density (UR3-D) zone is based on the standards described below for the lands shown on the attached zoning schedules:

	UR3-D
Permitted Uses	Accessory Use Townhouse Dwelling
Minimum side yard setback – Townhouse dwelling	3.0 m (19.8 ft) on an interior lot, and 4.5 m (14.7 ft) on the side abutting a street and 3.0 (9.8 ft) on the other side on a corner lot
Minimum rear yard setback	6.0 m (19.7 ft)
Maximum lot coverage – habitable building(s)	40%

Maximum lot coverage – all buildings including accessory buildings	45%
Minimum Landscape Open Space	35%
Maximum Density	35 units/ha

The requested zoning for the proposed Block 177, which is proposed to accommodate townhomes, is a site specific Urban Residential Third Density (UR3-E) zone, based on the standards described below for the lands shown on the attached zoning schedules:

	UR3-E
Permitted Uses	Accessory Use Townhouse Dwelling
Minimum side yard setback – Townhouse dwelling	3.0 m (9.8 ft) on an interior lot, and 4.5 m (14.7 ft) on the side abutting a street and 3.0 (19.8 ft) on the other side on a corner lot
Minimum rear yard setback	6.0 m (19.7 ft)
Maximum lot coverage – habitable building(s)	40%
Maximum lot coverage – all buildings including accessory buildings	45%
Minimum Landscape Open Space	35% A minimum 15 m landscape open space area in width and parallel southerly from the existing railway right of way shall be maintained
Maximum Density	35 units/ha
Dwelling unit setback from rail line (minimum)	60 m (394 ft) from the exiting railway right of way in the absence of a combination safety berm and acoustical mitigation fence adjoining and parallel to the existing railway right of way, or 30 m (98 feet) in conjunction with a safety berm and acoustical mitigation fence

The requested zoning for Block 181, which is proposed to accommodate an apartment block, is a site specific Urban Residential Third Density (UR3-F) zone, based on the standards described below for the lands shown on the attached zoning schedules:

	UR3(F)
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Permitted Uses	Accessory Use Apartment dwelling
Minimum side yard setback	15 m (49 ft) on the north side and 5 m (16.4) on the south side
Minimum outdoor amenity area	N/A
Maximum Density	60 units/ha
Minimum landscaped Open Space	30%

Consultation:

Notice of the application has been circulated to agencies, as well as property owners in accordance to the requirements of the Planning Act.

Public Comments:

At the time of writing the subject report there were no comments received from the public.

Agency Comments:

The following comments were received at the time of writing this report:

The Canadian National Railway has reviewed the subject applications and noted the following:

- The CN line in proximity to this project is the Strathroy subdivision and is classified as a principle main line.
- The development site touches the CN right-of-way in the southwest corner. Most of the site is separated from the CN ROW by Oxbow Road.
- CN Rail has no objection to the OP Amendment and Zoning by-law Amendment for the project as currently presented
- The application for a Plan of Subdivision (Draft Plan of Subdivision (39T-MC1902), proposes to create 173 building lots for single detached dwellings and blocks for future residential development on 20.77 hectares (51.3 acres) of land.

CN Rail requests the following conditions on the Draft Plan of Subdivision:

- Safety setback of habitable buildings from the railway right-of-way to be a minimum of 30 metres in conjunction with a safety berm. The safety berm shall be adjoining and parallel to the railway rights-of way with returns at the ends, 2.5 metres above grade at the property line, with side slopes not steeper than 2.5 to 1.

- The Owner shall engage a consultant to undertake an analysis of noise. The study must be completed to CN's satisfaction and the mitigations recommended in the report are to be implemented in the site and building design.
- Ground-borne vibration transmission to be evaluated in a report through site testing to determine if dwellings within 75 metres of the railway rights-of-way will be impacted by vibration conditions in excess of 0.14 mm/sec RMS between 4 Hz and 200 Hz. The monitoring system should be capable of measuring frequencies between 4 Hz and 200 Hz, ± 3 dB with an RMS averaging time constant of 1 second. If in excess, isolation measures will be required to ensure living areas do not exceed 0.14 mm/sec RMS on and above the first floor of the dwelling.
- Any proposed alterations to the existing drainage pattern affecting railway property must receive prior concurrence from the Railway and be substantiated by a drainage report to the satisfaction of the Railway.
- The Owner shall be required to grant CN an environmental easement for operational noise and vibration emissions, registered against the subject property in favour of CN. This easement is required to be registered on title prior to approval of Plan of Subdivision.
- The Owner shall be required to enter into a development agreement with CN. This agreement must be registered on title prior to approval of Plan of Subdivision.
- The following clause should be inserted in all development agreements, offers to purchase, and agreements of Purchase and Sale or Lease of each dwelling unit within 300m of the railway right-of-way: "Warning: Canadian National Railway Company or its assigns or successors in interest has or have a rights-of-way within 300 metres from the land the subject hereof. There may be alterations to or expansions of the railway facilities on such rights-of-way in the future including the possibility that the railway or its assigns or successors as aforesaid may expand its operations, which expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the development and individual dwelling(s). CNR will not be responsible for any complaints or claims arising from use of such facilities and/or operations on, over or under the aforesaid rights-of-way."
- We would also advise the Proponent that CN undertakes technical reviews and the drafting of required legal agreements on a cost recovery basis at the Proponents expense.

The Canadian Pacific Railway has reviewed the subject applications and have advised; The proposed development is located adjacent to our Windsor Subdivision, which is classified as a Principal main line. Canadian Pacific Railway is not in favour of residential developments adjacent to or near our right-of-way as this land use is not compatible with

railway operations. The health, safety and welfare of future residents could be adversely affected by railway activities. However, to ensure the safety and comfort of adjacent residents and to mitigate as much as possible the inherent adverse environmental factors, we request that CP's standard requirements (attached) be considered as part of the City's review. The attached is based on a collaborative project by the Federation of Canadian Municipalities and the Railway Association of Canada, the Guidelines for New Development in Proximity to Railway Operations (<http://www.proximityissues.ca>).

The Conseil Scolaire Viamonde has reviewed the subject applications and have no concerns and/or comments.

Canada Post has reviewed the subject applications and will provide mail delivery service to the subdivision through centralized Community Mail Boxes (CMBs).

Location Map



458.6 0 229.31 458.6 Meters



Description:

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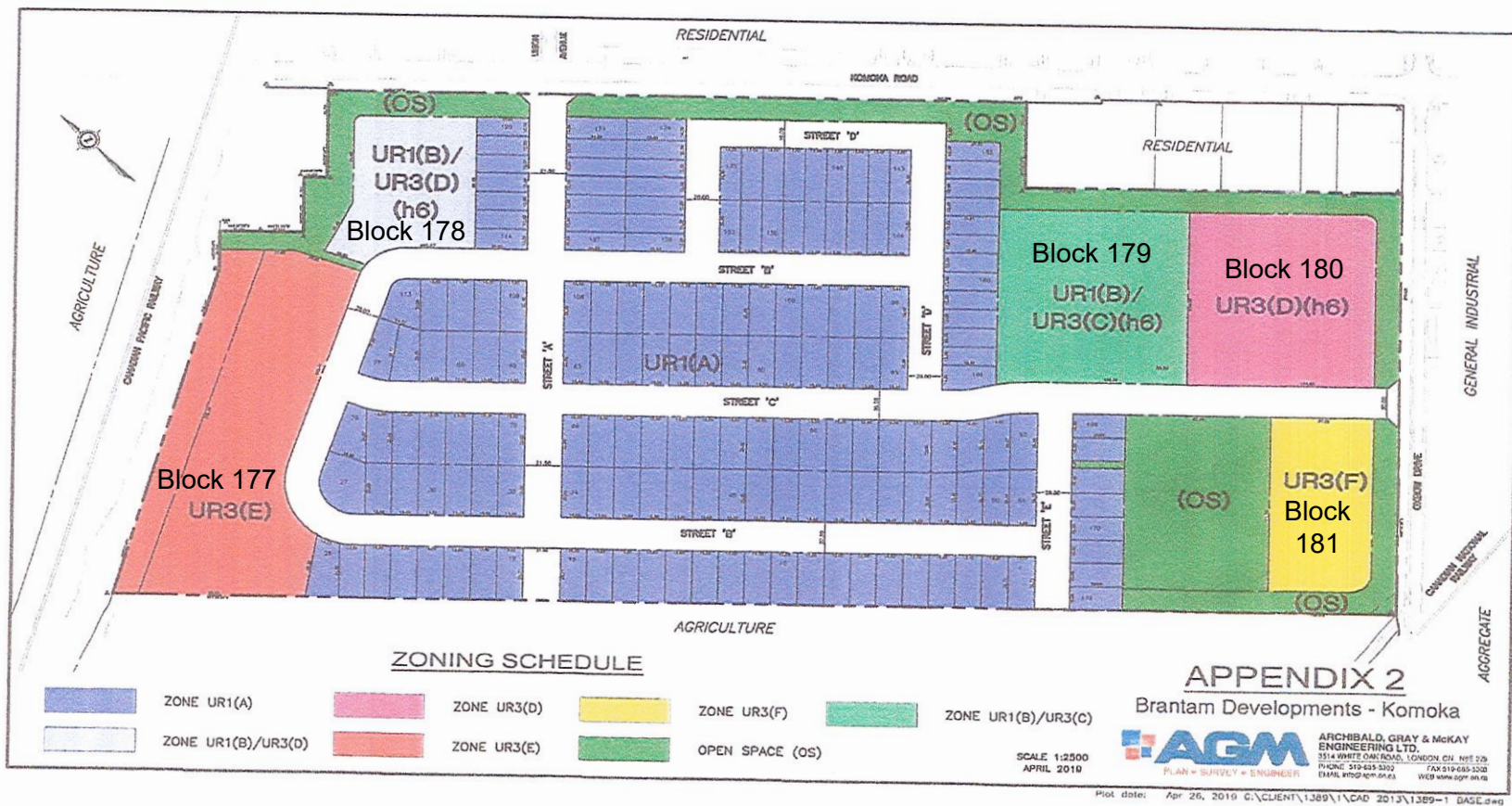
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Legend

Assessment Parcels



KOMOKA SUBDIVISION
FUNCTIONAL SERVICING
REPORT

Prepared For

BRANTAM DEVELOPMENTS INC.

April 24, 2019



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1.0 INTRODUCTION

This report was prepared in support of the proposed draft plan of subdivision application for the property owned by Brantam Developments Inc. The property is located west of Komoka Road and north of Oxbow Drive in the village of Komoka.

A topographic survey has defined the location of existing streets, watermains and storm sewers that service the surrounding area of the proposed subdivision. Using this information, the internal servicing requirement in reference to storm and sanitary sewers, watermain looping, stormwater management and roads have been established.

The purpose of this report is to present the proposed servicing strategies in support of the proposed subdivision. Consideration is also given to the possible development of the lands to the west.

All design will be in accordance with the Municipality of Middlesex Centre design standards.

2.0 LOCATION AND DESCRIPTION

The 20.78 hectare parcel of land proposed for residential development is situated at the northwest corner of Komoka Road and Oxbow Drive. The subject property abuts existing residential lots fronting Komoka Road, the Canadian Pacific Railway at the north limit of the property and agricultural lands to the west. (Figure 1)

The development will consist of 18.05ha of developable area for single family and medium/high density residential land use. The remaining lands will be utilized for an open space block designated for a stormwater management facility and additional open space blocks for a bypass conveyance system for external stormwater flows.

3.0 SUBDIVISION ACCESS

The subdivision will be accessible at two locations. The first will be off of Komoka Road in alignment with Union Avenue (Street 'A'). At this intersection, existing paved asphalt shoulders will be utilized to provide a left turn access into the new subdivision and the existing Komoka Station Subdivision (see Figure 2). Existing pavement markings will be obliterated and replaced where required to add the left turn lanes. The second access will be off Oxbow Drive (Street 'C').

A transportation impact study was prepared by Paradigm Transportation Solutions Limited and is available for review under separate cover. Middlesex Centre has requested that Oxbow Drive be upgraded to an urban cross section from Komoka Road to the subdivision entrance.

4.0 SANITARY SERVICING

There are existing sanitary sewers fronting the subdivision along Komoka Road and Oxbow Drive. The existing sanitary collection system takes flows south along Komoka Road to a pumping station located just north of Railway Avenue.

The proposed outlet for the subdivision will be to the existing 250mm diameter sewer on Oxbow Drive. The subdivision is expected to have a population with in the range of 819 to 850 people. As outlined below, the calculations have been completed in support of an 819 person population.

Land Use	Requirement	Units	Population
Single Family Lots	3 people/unit	174 Units	522
Block 176-180	2.4 people/unit	97 Units	233
Block 181	1.6 people/unit	40 Units	64

With an estimated population of 819 people and per capita daily flows of 350L/day, the peak flow from the development is estimated to be 12.44 L/s.

The existing 250mm diameter outlet on Oxbow Drive, and downstream sewers to the existing pumping station, have been verified to have sufficient capacity to convey the additional sanitary flows from the subdivision. See Appendix A for the Downstream Sewer Capacity Analysis.

Proposed sanitary sewers within the subdivision have also been sized to accommodate the possible future development of the 48.3ha of land to the west. See Sanitary Drainage Plan in Appendix A. The net developable area used for the site is 30.3ha (excluding berms, stormwater management blocks and bush area). Based on the Brantam Development land use density of 40 people/ha, the population for the future development has been estimated to be 1215 people. Should the development of these lands proceed, it is likely that sewer upgrades will be required to downstream sewers along Komoka Road and Oxbow Drive to provide additional capacity.

5.0 STORMWATER DRAINAGE

This section will detail the stormwater management strategy for the proposed development and the conveyance of external stormwater runoff through the site.

Hydrologic Modeling

Stormwater runoff was determined by hydrologic modeling using MIDUSS (Microcomputer Interactive Design of Urban Stormwater Systems). The program allows the user to test the impact on new and existing systems, utilizing accepted rainfall data to represent design storms of various durations and aid in the design of SWM facilities and other stormwater management features.

The Middlesex Centre IDF curve parameters were used for the rainfall data. The 3 hour, Chicago Storm Distribution model, with a time to peak ratio of 0.38, was used for determining peak flow rates to the SWM storage facilities. These flows were used to calculate storage requirements for meeting the targets for Stormwater Management.

The modeling parameters and Miduss output can be seen in the Appendices.

5.1. Existing Drainage

Pre development runoff for the subject lands, including external lands to the north and northeast, is directed westerly through the agricultural lands to a 750mm culvert. The culvert conveys drainage past the CN Railway located southwest of the site (Figure 3).

The external tributary area includes a 26.51ha area from the north. Runoff is conveyed to the site by an open bottom concrete culvert which allows the flows to pass under the CP Railway at the north boundary of the proposed development.

Runoff from 120.88ha of land from northeast of the site is conveyed along the perimeter of Komoka Station Subdivision via a flat bottom ditch, and supplementary ditch inlet catchbasins and storm sewers, to the east ditch on Komoka Road. Flows that exceed the capacity of the storm sewer and ditch on Komoka Road spillover into an existing 900mm x 1400mm elliptical culvert which outlets to the proposed site.

Komoka Station Subdivision was designed by others. Design materials indicate that the subdivision will contain major system runoff on site and therefore was not considered as an external area for pre or post development flows to the subject property.

External drainage also includes the east side of Komoka Road, from the CP Railway easement to the high point in the road. This 0.61ha area is assumed to enter the storm sewer for the 2 year

(minor system) storm. Flows exceeding this were considered for overflow onto the subject property.

The pre development drainage area under consideration for the subject site is 21.13 ha and includes the west side of Komoka Road. As mentioned, runoff is directed westerly through the agricultural lands to the west to a 750mm culvert. The culvert conveys drainage past the CN Railway located southwest of the site, ultimately to the open ditch on Oxbow Drive. Pre development runoff from the subject property are depicted in the table below.

Table 1 – Pre development Flows

Storm Event	Internal Flow (m³/s)	Total Flow (m³/s)
2 Year	0.290	1.160
5 Year	0.765	2.154
10 Year	1.112	2.718
25 Year	1.598	3.336
50 Year	1.940	3.890
100 Year	2.316	4.430
250 Year	3.612	6.267

See Appendix B for pre development modelling results.

5.2. Stormwater Management Plan

The design of the proposed stormwater management measures follows criteria presented in The Ministry of the Environment's *Stormwater Management Practices Planning and Design Manual* (2003), the Reference Manual for the Use of Precipitation Design Events in The Upper Thames River Watershed (December 2004), as well the *Stormwater Management Policy Manual* of Middlesex Centre. (June 2011).

Post development runoff for the majority of the development will be directed to a stormwater management facility (wet pond) to be located near the southwest corner of the development (Figure 4). The facility will provide quality and quantity control including peak flow control for all required storm events.

Runoff from external areas to the north and east, including the 26.51ha and 120.88ha external areas north of the Canadian Pacific Railway easement, will not enter the stormwater management pond. These flows will be conveyed through the site via a flat bottom diversion channel located along the perimeter of the development to a flow spreader; prior to exiting the site and traveling overland toward the existing 750 culvert (Figure 5).

5.3. Stormwater Management Pond

Drainage from an **18.09ha** will contribute flow to the proposed SWM Pond under post development conditions. The pond will outlet to the Oxbow Drive storm sewer and to the flow spreader.

5.3.1. Water Quality and Erosion Control

As outlined in the Ministry of the Environment's *Storm Water Management Practices Planning and Design Manual*, a Wet Pond receiving drainage from an area that is 55% impervious with an enhanced protection requires the storage of 190 m³/hectare for water quality enhancement.

The required storage volume is comprised of 150 m³/ha in the permanent pool (Dead Storage) and 40 m³/ha for extended detention (Active Storage for erosion control). The storage requirement for extended detention is alternatively the runoff for a 2 year rainfall event if the volume exceeds the 40 m³/ha criteria (per Policy Manual). The water stored in the extended detention zone is released over a 24 to 48 hour period.

5.3.2. Quantity Control

The stormwater management pond is to include additional storage to attenuate peak flow rates to predevelopment levels for the proposed development. The design storm events evaluated are the 2, 5, 10, 25, 50, 100 and 250-year storm events.

5.3.3. SWM Pond Configuration and Operation

The proposed SWM Block will accommodate a SWM Facility with a total storage volume of approximately 11,314m³ with a total depth of 3.30m, 1.3m deep for the permanent pool, and 2.0m deep for extended detention and flood control. The pond will include a 2.0m wide aquatic safety bench (10:1 slope) above the permanent pool, along with an overflow weir at the 3.30m level (Figure 6).

The permanent pool will provide a total of 2,822m³ (156.0 m³/ha) of storage, including 806 m³ within the Forebay. This exceeds the 150 m³/ha storage requirement.

The permanent pool depth of 1.30m is intended to ensure that the bottom of the facility is above the existing water table. The bottom of the facility will be at an elevation of 238.70 while the water table is approximately 237.50. A clay 'cap' is to be installed at the bottom of the pond to ensure that the pond will have no adverse impact on groundwater. Conversely, the groundwater will not affect the operation of the pond.

The storage in the pond is 3,031m³ (167.5m³/ha) for extended detention during the 2 year storm event as stipulated in the Middlesex Centre *Stormwater Management Policy Manual*. This far exceeds the 40m³/ha criteria. The runoff to the pond is approximately 3,344m³ during this

storm event with a peak discharge of $0.033\text{m}^3/\text{s}$. Approximately 70% (2200m^3) of extended detention storage will drain in 24 hours and the remainder will drain within 48 hours.

The additional storage will attenuate post-development peak flow rates to the predevelopment level for the 2, 5, 10, 25, 50, 100 and 250-year storm events.

A total active storage volume of $11,314\text{m}^3$ is available within the pond, which exceeds the storage requirement for all events including the 250 year design storm.

Table 2 - SWM Pond Performance

STORM EVENT	PREDEV. FLOW (m^3/s)	RUNOFF VOLUME (m^3/s)	DISCHARGE (m^3/s)	STORAGE (m^3)	WATER ELEVATION (m)	WATER LEVEL (m)
2 YEAR	0.290	3,340	0.033	3,031	240.79	0.79
5 YEAR	0.765	4,916	0.115	4,169	241.04	1.04
10 YEAR	1.112	5,895	0.131	4,998	241.21	1.21
25 YEAR	1.598	6,985	0.242	5,585	241.33	1.33
50 YEAR	1.940	7,816	0.318	6,008	241.41	1.41
100 YEAR	2.316	8,655	0.414	6,222	241.45	1.45
250 YEAR	3.612	10,800	0.497	8,103	241.79	1.79

* Storage volumes for peak flow control do not include dead storage in the permanent pool. The elevation of the pond at the top of the permanent pool is 240.00m.

Discharge from the pond will be controlled by a 150mm dia. and 450mm dia. outlet pipe draining to the Oxbow Drive storm sewer and the flow spreader respectively.

Table 3 – Outlet Breakdown

STORM EVENT	150 DIA. OUTLET (m^3/s)	450 DIA. OUTLET (m^3/s)	TOTAL DISCHARGE (m^3/s)
2 YEAR	0.033	0.000	0.033
5 YEAR	0.038	0.077	0.115
10 YEAR	0.041	0.090	0.132
25 YEAR	0.043	0.199	0.242
50 YEAR	0.044	0.274	0.318
100 YEAR	0.045	0.321	0.366
250 YEAR	0.050	0.448	0.497

5.3.4. Conveyance to Stormwater Management Pond

The storm sewer pipe network will convey minor system (2 year storm) flows to the forebay of the pond for the majority of the development. The storm sewer for the medium/high density block located directly south of the facility will require a private quality control unit at the pond inlet as it does not enter the forebay (Figure 6).

For storm events exceeding the 2 year storm event, an overland flow route has been developed to allow flows to enter the pond at two locations as shown on Figure 6.

5.4. Diversion Channel

Approximately 1.72ha of the development will be used for a channel to convey runoff around the site for drainage from external lands.

The diversion channel will convey flows for the 120.88ha and the 26.51ha external areas to the north east and north of the proposed site along with flows from Komoka Road (1.21ha) see Figure 5. In addition to these areas, there will be internal contribution from the backyards of south most lots along Street 'D' as well as major system flows from approximately 0.48ha of Street 'A'. The channel will have a 0.9m flat bottom and 3:1 maximum side slopes up to a height of 1.0m minimum (Figure 6B). This will provide approximately 0.10m of freeboard.

The channel will cross the right of way at both subdivision entrances, Streets A and D. The east entrance (Street A) will utilize a 900x1800 box culvert while the south entrance to the subdivision (Street D) will utilize two 900x1800 box culverts to convey flows past the crossing. As flows reach the downstream end of the channel, they will be dispersed by use of a flow spreader prior to exiting the site.

The proposed peak uncontrolled discharge leaving the site through the channel are:

Table 4 – Diversion Channel Flows

Storm Event	Outlet Flow (m³/s)
2 Year	1.099
5 Year	2.055
10 Year	2.528
25 Year	2.964
50 Year	3.296
100 Year	3.617
250 Year	4.515

See Appendix C for post development modelling results.

5.5. Summary

The proposed development will provide external flow conveyance through a diversion channel. The on-site Stormwater Management Pond will provide sufficient storage to limit discharge such that the total peak flow exiting the site to the west is below the pre development levels. The pond will also provide the 'Enhanced' level of water quality treatment required. Table 5 shows the reduction in peak flow from the site.

Table 5 – Peak Flow from Site to the West

Storm Event	Pond Discharge to Channel (m³/s)	Channel Flow (m³/s)	Post Development Peak Flow to Culvert (m³/s)	Pre Development Peak Flow (m³/s)
2 Year	0.000	1.099	1.099	1.160
5 Year	0.077	2.055	2.132	2.154
10 Year	0.090	2.528	2.618	2.718
25 Year	0.199	2.964	3.163	3.336
50 Year	0.274	3.296	3.570	3.890
100 Year	0.321	3.617	3.938	4.430
250 Year	0.448	4.515	4.963	6.267

5.6. Development of Property to the West

Should the 48.3ha property to the west be developed, modifications to the stormwater management facility will be required. The diversion channel outlet will be relocated to follow the Canadian National Railway easement down to the existing culvert. Relocating the channel will allow the pond to expand west. The footprint increase will depend on factors regarding these lands such as imperviousness and soil types.

6.0 Water Distribution

This section of the report summarizes the sizing and layout of the proposed watermain for the proposed development. As mentioned, the subdivision will include 174 single family lots located along internal streets, approximately 97 medium density condominium units and 40 high density apartment type units. The watermain will be sized to include a future population of 1215 people for the property to the west.

Existing watermain elevations were established from as constructed watermain information as well as existing topographic information. The preliminary proposed watermain elevations were assigned based on having 1.7m of cover below preliminary road profiles. The node locations were determined at intersections, multi-family block locations, and all key points (high point, low point and dead ends).

Design water demands were calculated for the subdivision and are provided in Appendix D.

6.1. Computer Model

Bentley's WaterCAD V8i water distribution modeling program was used to determine the required sizes of the watermain for the subdivision. The results of the computer model are provided in the Appendices.

A Hydraulic Grade Line of 285.0m was established based on the existing populations and static pressure information provided for the existing hydrant located at the north limit of the Komoka Road watermain (KO-2) and the first hydrant along Oxbow Drive, east of Komoka Road (KO-73). The fire hydrant flow tests were modeled and found to have an 11% maximum deviation from field results.

Table 6 – Model Calibration

Location of Hydrant Flow Test	Static Pressure (kPa)		Residual Pressure (kPa)		Description
	Actual	Modeled	Actual	Modeled	
Hyd KO-2	404.0	402.8	271.7	255.3	1178 USGPM @ KO-1
Hyd KO-73	408.2	409.0	301.3	268.5	1178 USGPM @ KO-72

The calibrated Hydraulic Grade Line was added to the model as the boundary condition for water supply from the existing system. The pipes for the subdivision were added to the model using the proposed draft plan as a base. Junction elevations and water demands were added along with initial pipe sizes and corresponding Hazen-Williams 'C' values.

The model was run several times and watermain sizes chosen to ensure that Pressure and Flow Requirements complied with the *Infrastructure Design Standards for Water Distribution System Design*. Design scenarios modeled included Average Day Demand (77 IGPD),

Maximum Hour, and Maximum Day Demand plus Fireflow. Water quality was also analyzed during average day demand for the subdivision, to ensure a turnover of less than 72 hours.

6.1.1. Proposed Watermain Sizes

There are existing watermain fronting the proposed subdivision in two locations, a 200mm diameter watermain on Komoka Road and a 150mm diameter watermain along Oxbow Drive. Both watermain will be used to feed the proposed development in order to create a looped system. The Oxbow Drive watermain will require upsizing to a 200mm diameter size. All pipe sizes are summarized in the table below.

Table 7 – Water Distribution Pipe Sizing

Street	Size	From	To
Oxbow Drive	200mm	Komoka Road	Street 'C'
Street 'A'	200mm	Komoka Road	Subdivision Limit
Street 'B'	200mm	Street 'D'	Street 'E'
Street 'C'	200mm	Street 'B'	Oxbow Drive
Street 'D'	200mm	Street 'B'	Street 'C'
Street 'E'	200mm	Street 'C'	Subdivision Limit
Komoka Road	250mm	Existing Tee at Union Ave to the Komoka Station Subdivision	Proposed Tee at Union Ave

6.2. External Lands

As previously mentioned, the model used for this report was processed with external demands. Existing properties fronting Oxbow Drive and Komoka Road were considered as well as future development to the west of the Brantam Property. Demands from these lands are reflected at Junctions J-1, J-8, J-52, J-53, J-54, J-55, J-56, J-60, J-64, J-65 and J-72.

6.3. Brantam Developments Subdivision

The water distribution system was modeled for complete build out. All existing and future external demands were included as outlined in Section 6.2. The layout plan of the computer model showing pipe and junction information can be seen in Figure 7. All of the results from the computer model are provided in Appendix E.

6.3.1. Average Day Demand

The first scenario computed for the water distribution model utilized the average day demands for the entire subdivision. All of the resulting pressures calculated were above the minimum and below the maximum requirements.

The lowest pressure calculated for the subdivision and external areas was 384.3 kPa (55.7 psi) and occurred at Junction 52 (J-52). The velocities calculated in the watermain within the subdivision range from 0.001 m/s to 0.130 m/s.

6.3.2. Maximum Hourly Demand

The second scenario computed for the water distribution model utilized a maximum hour peaking factor of 4.13 times the average day demand of 350 L/day (77 IGPD). All of the resulting pressures calculated were above the minimum and below the maximum requirements.

The lowest pressure calculated for the subdivision and external areas was 378.8 kPa (54.9 psi) and occurred at Junction 52 (J-52). The velocities calculated in the watermain within the subdivision range from 0.008 m/s to 0.537 m/s.

6.3.3. Maximum Day Demand plus Fire Flow

The water distribution model was then computed using a maximum day peaking factor of 2.75 times the average day demand of 350 L/day (77 IGPD). The model tested each junction to ensure that the maximum day demand plus fire flow of 75.77 L/s (1000 IGPD) could be sustained with a minimum pressure of 140 kPa (20 psi) at each junction.

The lowest pressure calculated during fire flow modeling in the subdivision is 255.1 kPa (37.0 psi) and occurred at Junction 52 (J-52). This occurs when a fire flow is applied to the hydrant located at Junction 52 (J-52). The maximum velocity computed in the subdivision is 2.42 m/s and occurs in the 200mm watermain Pipe 87 (P-87) and Pipe 86 (P-86).

6.3.4. Water Quality Analysis

The water quality analysis was modeled assuming all lots in the proposed Brantam Developments Subdivision have been built out. Input demands do not include any future development to the west.

When all lots have been built out within the subdivision, the water ages are all less than 72 hours. The maximum water age will be 44.65 hours at Junction 8 (J-8), the results are provided in Appendix F. Section 6.4 will detail analysis involving the phasing of the subdivision.

6.4. Brantam Developments – Phase 1

The water distribution system was also modeled with phase 1 only of the Brantam Developments subdivision (Figure 8). All of the results from the computer model are provided in Appendix G.

6.4.1. Average Day Demand

The first scenario computed for the water distribution model utilized the average day demands for phase 1. All of the resulting pressures calculated were above the minimum and below the maximum requirements.

The lowest pressure calculated for the subdivision and external areas was 384.7 kPa (55.8 psi) and occurred at Junction 52 (J-52). The velocities calculated in the watermain within phase 1 of the subdivision range from 0.001 m/s to 0.037 m/s.

6.4.2. Maximum Hourly Demand

The second scenario computed for the water distribution model utilized a maximum hour peaking factor of 4.13 times the average day demand of 350 L/day (77 IGPD). All of the resulting pressures calculated were above the minimum and below the maximum requirements.

The lowest pressure calculated for the subdivision and external areas was 384.1 kPa (55.7 psi) and occurred at Junction 52 (J-52). The velocities calculated in the watermain for the subdivision range from 0.001 m/s to 0.182 m/s.

6.4.3. Maximum Day Demand plus Fire Flow

The water distribution model was then computed using a maximum day peaking factor of 2.75 times the average day demand of 350 L/day (77 IGPD). The model tested each junction to ensure that the maximum day demand plus fire flow of 75.77 L/s (1000 IGPD) could be sustained with a minimum pressure of 140 kPa (20 psi) at each junction.

The lowest pressure calculated during fire flow modeling in the subdivision is 263.5 kPa (38.2 psi) and occurred at Junction 52 (J-52). This occurs when a fire flow is applied to the hydrant located at Junction 52 (J-52). The maximum velocity computed in the subdivision is 2.42 m/s and occurs in the 200mm watermain Pipe 87 (P-87) and Pipe 86 (P-86).

6.4.4. Water Quality Analysis

The water quality analysis was modeled for Phase 1 considering a 25%, 50%, 75% and 100% phasing build out.

When Phase 1 is constructed there will be 3 dead end locations.

- The north limit of Street B (temporary for phasing, J-32)
- The north limit of Street C (temporary for phasing, J-24)
- The west limit of Street E (connection for property to the west, J-8)

Based on analysis, there will be an automatic blow-off required at all three dead end locations. The automatic blow-offs will remain in place until all water ages are less than 72 hours in the system. Once this occurs, they will be removed and replaced with a standard 50mm blow-off. The automatic blow-offs located on Street B and C can be removed when phase 1 is approximately 50% built out, including the north most lots on Street B and C respectively. The automatic blow-off located at the west limit of Street E will need to remain in place until the subdivision is 100% built out.

In order to maintain water ages less than 72 hours, the three blow-offs should discharge water at a rate of 9.5 liters/second (150 Gallons/minute) each for 30 minutes a day.

Table 8 – Water Age Analysis (Phase 1)

Build Out	Max. Age At 72 hours	Location of Maximum Age	No. of operational blow-offs
25%	48.86 h	J-29	3
50%	54.91 h	J-29	1
75%	42.97 h	J-32	1
100%	62.74 h	J-8	0

When all lots have been built out in Phase 1 of the subdivision, the maximum water age in the system will be 62.74 hours, at Junction 8 (J-8). Results can be found in appendix H.

6.5. Water Distribution Summary

The proposed watermain for both phases of the Brantam Developments property has been sized to ensure that Pressure and Flow requirements comply with *Infrastructure Design Standards for Water Distribution System Design*. The modeling has demonstrated how the proposed watermain will have a three day turnover.

There will be upgrades required along Oxbow Drive from Komoka Road to Street ‘C’ and at the Komoka road and Union Avenue/Street ‘A’ intersection.

7.0 Conclusion

The proposed Brantam Developments Plan of Subdivision can be serviced by the existing sanitary sewers fronting the property at Oxbow Drive and Komoka Road along with available storm outlets. The exiting watermain fronting the property will require upgrades and provide for a looped connection to the development. All detailed engineering design will be completed in accordance with Middlesex Centre Infrastructure Design Standards.

We trust that this satisfies your requirements for Draft Condition approval. If you have any questions or require additional information please contact our office.

Prepared By:

Archibald Gray & McKay Engineering Ltd.



Lukas Grabowski, EIT



Steve Brown, P.Eng.
Engineering Design Manager

FIGURES



LAND USE SCHEDULE

 SINGLE FAMILY RESIDENTIAL	 MEDIUM DENSITY RESIDENTIAL	 OPEN SPACE
--	---	--

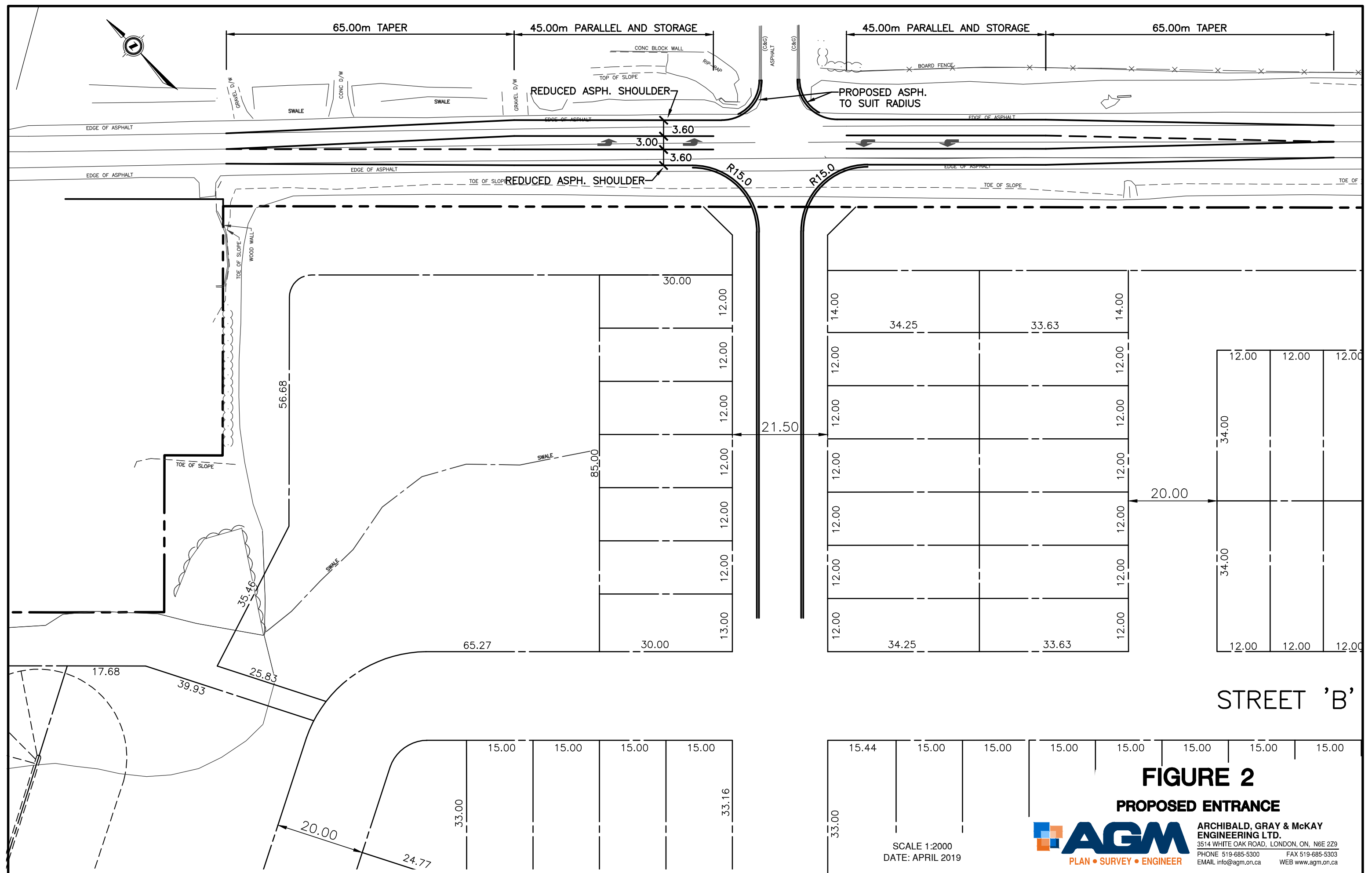
FIGURE 1 PROPOSED SUBDIVISION

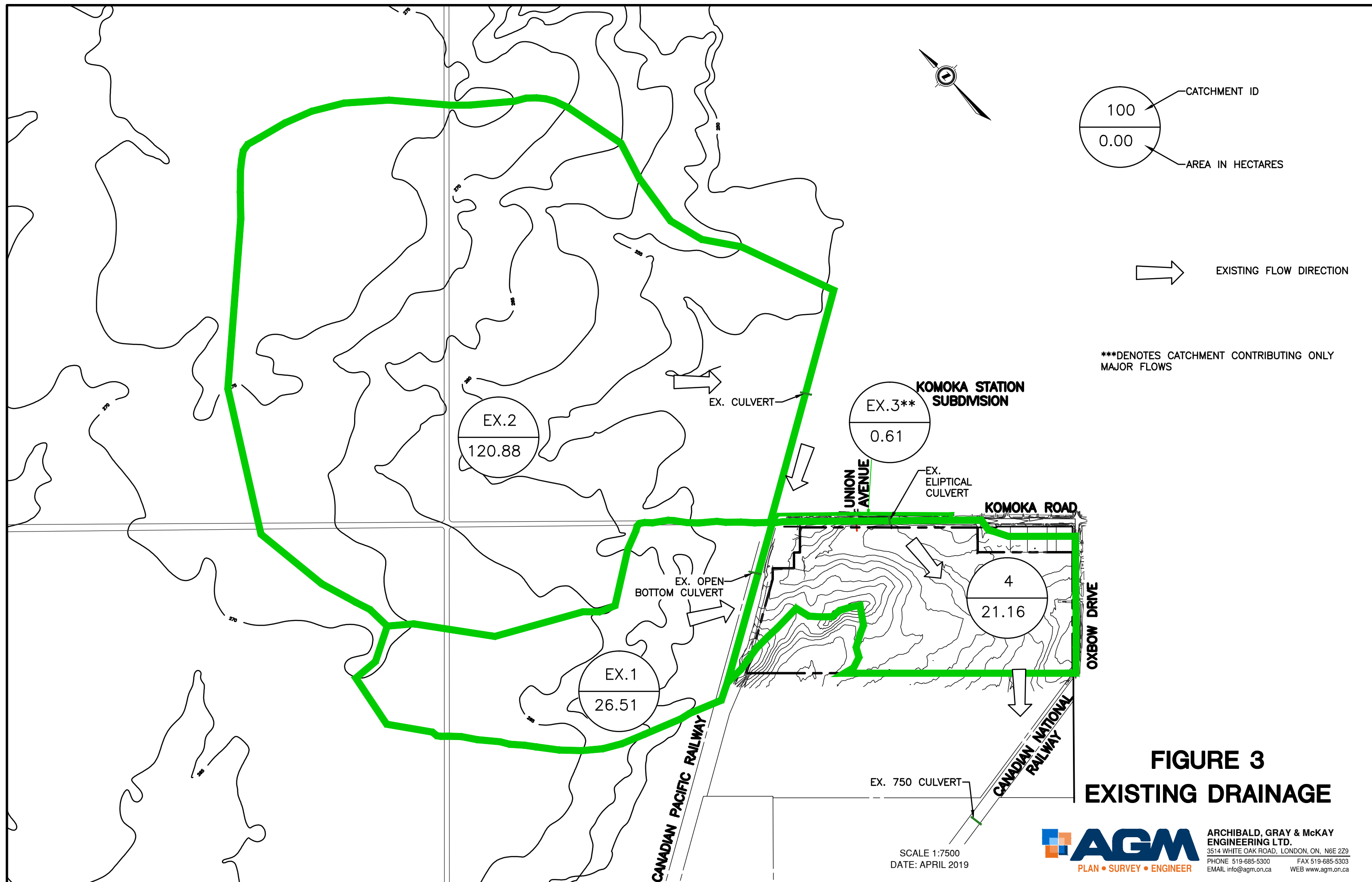
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DATE: APRIL 2019



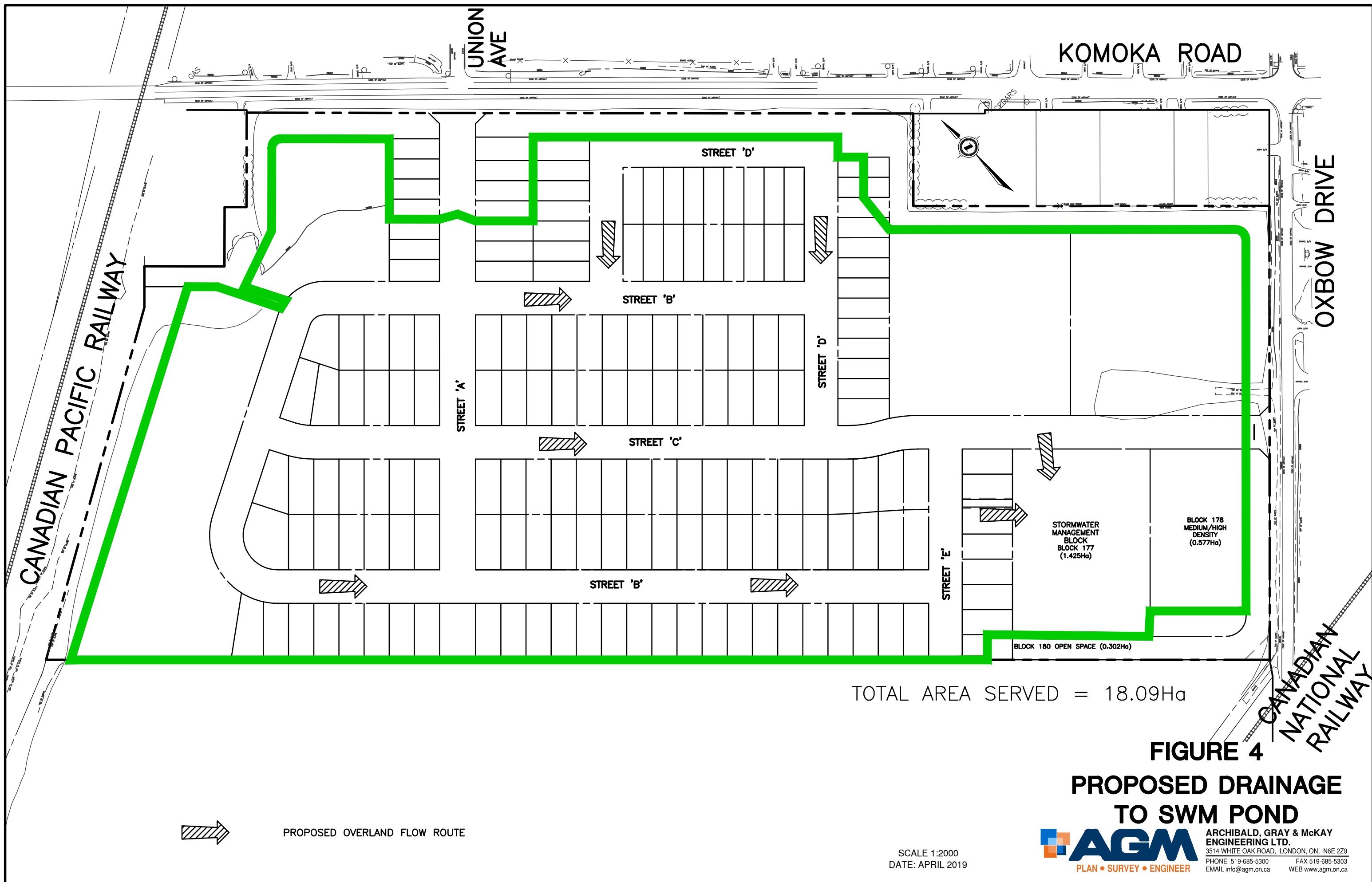
AGM
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**ARCHIBALD, GRAY & McKAY
ENGINEERING LTD.**
3514 WHITE OAK ROAD, LONDON, ON, N6E 2Z9
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**FIGURE 3
EXISTING DRAINAGE**



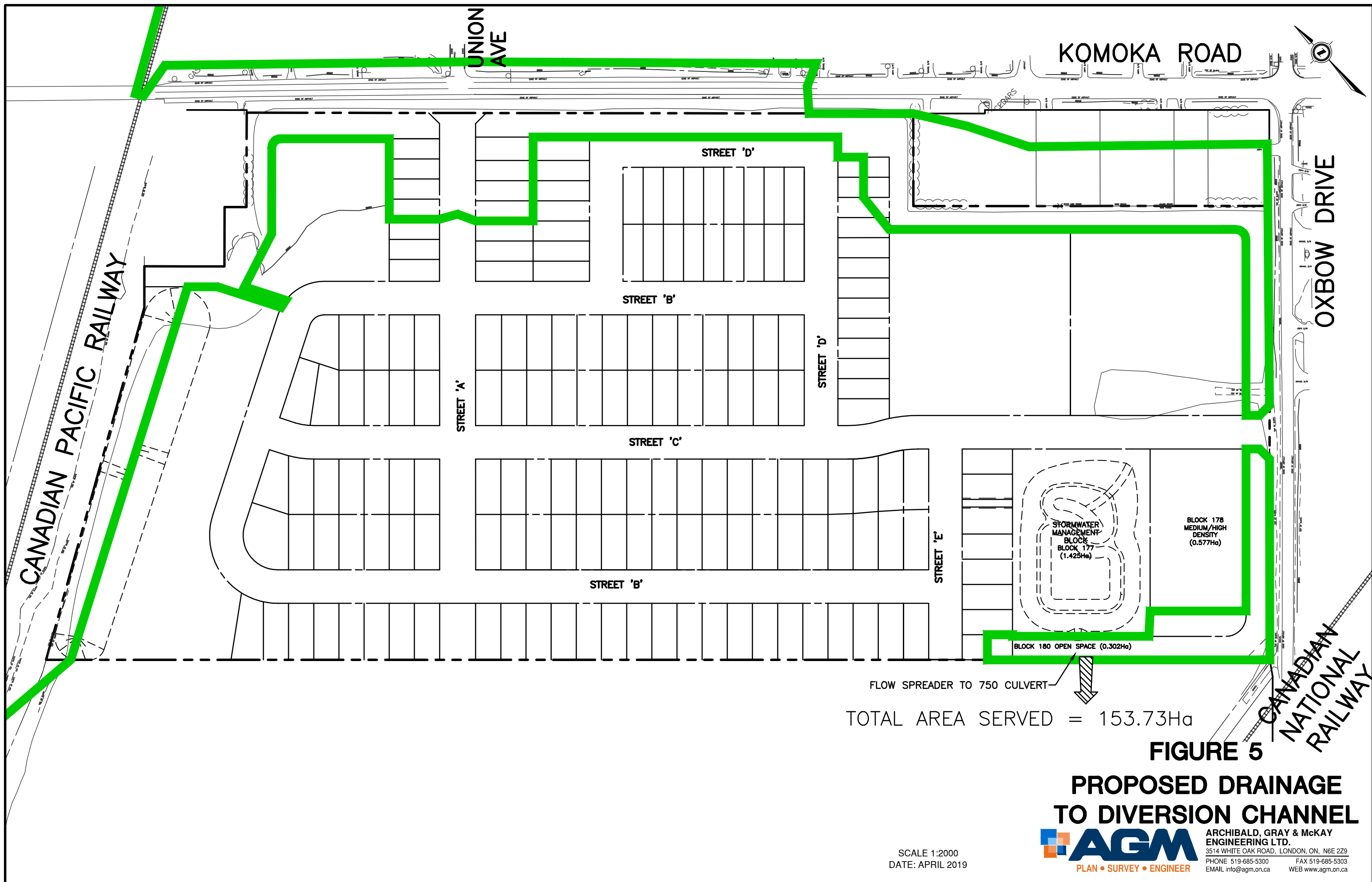


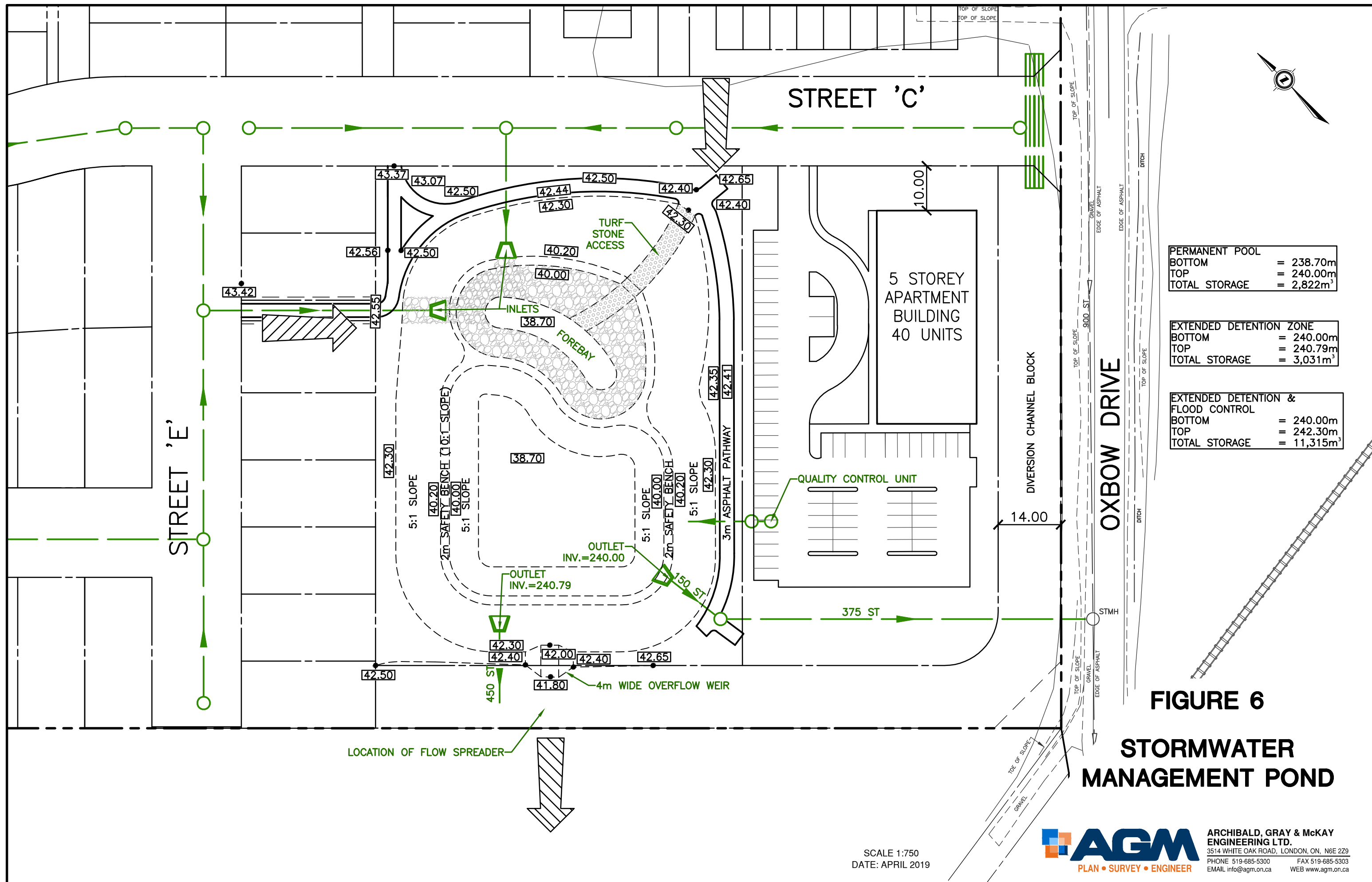
FIGURE 5

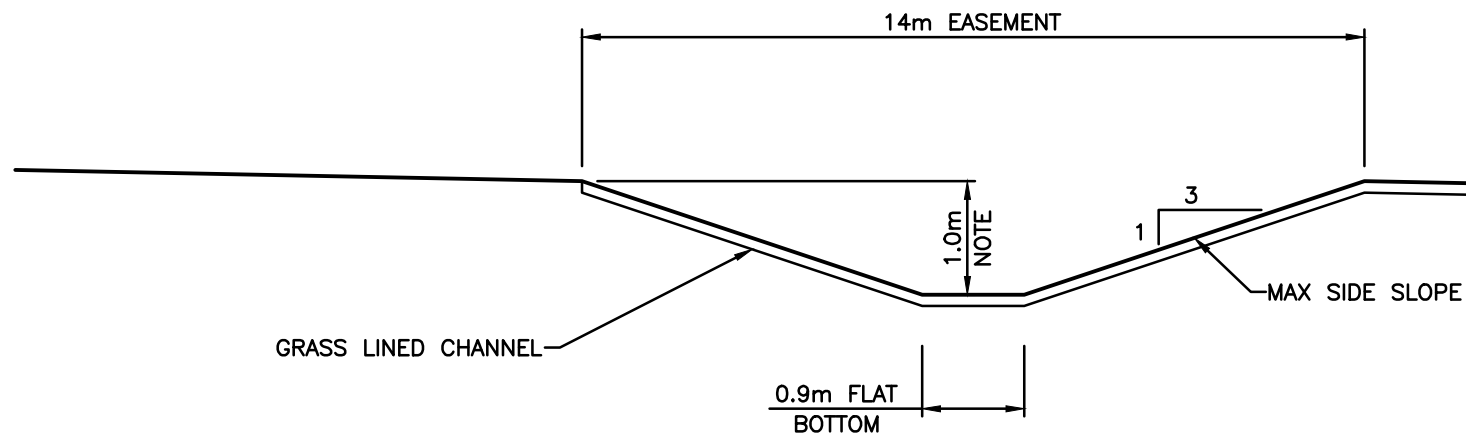
**PROPOSED DRAINAGE
TO DIVERSION CHANNEL**



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SCALE 1:2000
DATE: APRIL 2019





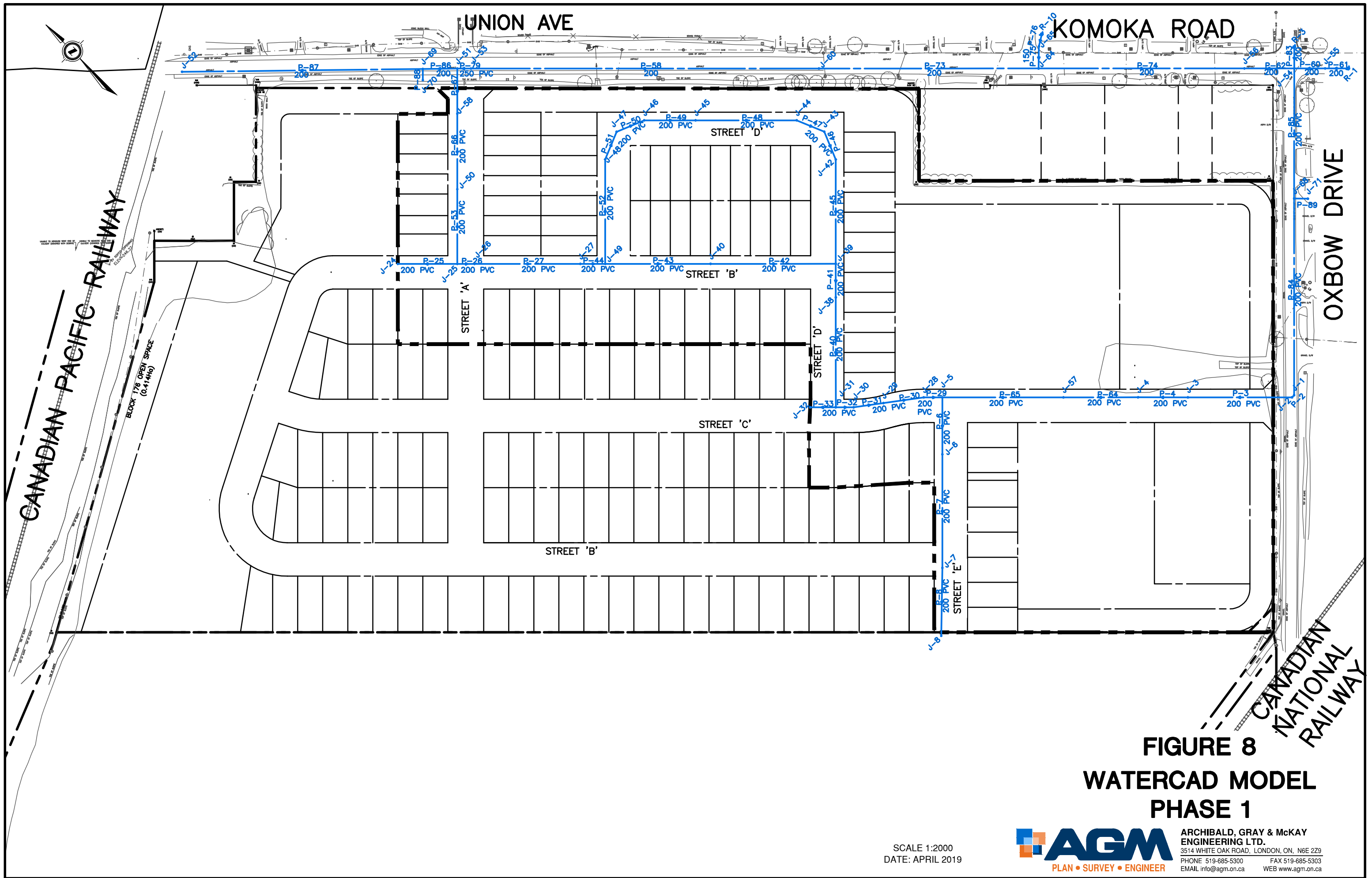
NOTE: DEPTH WILL VARY BASED ON BOUNDARY ELEVATIONS ON EITHER SIDE OF EASEMENT.
MINIMUM DEPTH IS 1.0m DOWNSTREAM OF CULVERT CROSSING KOMOKA ROAD.

FIGURE 6B DIVERSION CHANNEL CROSS SECTION

SCALE: NTS
DATE: APRIL 2019



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APPENDIX A

Sanitary Analysis

Internal Sanitary

RESIDENTIAL POPULATION DENSITIES

(B) LOT BASIS

Single Family

Medium Density

High Density

Commercial/Industrial

3 Persons per Lot

2.4 Persons per Unit

1.6 Persons per Unit

100 Persons per Ha

SANITARY SEWER DESIGN SHEET

MIDDLESEX CENTRE

KOMOKA SUBDIVISION

BRANTAM DEVELOPMENTS

AGM

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FLOW CRITERIA

Q = 0.00405 Litres/second/Capita (PROP)

Qinfilt = 0.1 Litres/second/Hectare (PROP)

Uncertainty factor 1.1

PF= 0.8 { 1 + [14 / (4 + P^0.5)] }

PF x Uncertainty Factor

PROJECT No.: 1389-1

DESIGNED BY: LRG

DATE: FEBRUARY 2019

CHECKED: DTW

APPROVED: SPB

LOCATION				AREA			POPULATION					SEWAGE FLOW							SEWER DESIGN					PROFILE							
AREA No.	STREET	FROM MH	TO MH	GROSS	DELTA ha	TOTAL ha	PER ha	PER LOT/UNIT	# of LOTS/UNIT	SUM POP	TOTAL POP	PEAKING FACTOR	INFILT L/s	Q PER CAPITA	ΔEATA Σ SEWAGE	TOTAL NO PEAK	SEWAGE L/s	TOTAL L/s	SIZE mm	SLOPE %	CAP L/s	n	VEL m/s	LENGTH m	FALL IN SEWER	HEADLOSS	DROP IN MH	UPPER INVERT	LOWER INVERT		
	BRANCH TRIBUTARY TO CONDO							12	2.4																						
1	ESTIMATED TOP END CONDO	SA1	SA2	1.07		1.07		5	3	44	44	3.81	0.11	350	0.18	0.18	0.68	0.78	200	0.31%	18.26	0.013	0.58	81.26							
2	STREET A AT ENTRANCE			0.75		0.75		14	3	42	42	3.81	0.08	350	0.17	0.17	0.65	0.72													
3	STREET B	SA2	SA3	0.49		2.31		5	3	15	101	3.73	0.23	350	0.06	0.24	0.89	1.12	200	0.31%	18.26	0.013	0.58	88.64							
4	STREET D NORTH BRANCH			0.53		0.53		8	3	24	24	3.85	0.05	350	0.10	0.10	0.37	0.43													
5	STREET B	SA3	SA4	0.58		3.42		10	3	30	155	3.68	0.34	350	0.12	0.46	1.68	2.03	200	0.31%	18.26	0.013	0.58	69.05							
6	STREET B	SA4	SA5	0.41		3.83		7	3	21	176	3.67	0.38	350	0.09	0.54	1.99	2.37	200	0.31%	18.26	0.013	0.58	56.00							
7	STREET D EAST BRANCH			1.00		1.00		15	3	45	45	3.80	0.10	350	0.18	0.18	0.69	0.79													
8	STREET D	SA5	SA6	0.38		5.21		6	3	18	239	3.62	0.52	350	0.07	0.80	2.89	3.41	200	0.31%	18.26	0.013	0.58	83.00							
9	STREET C UPPER BRANCH			2.80		2.80		40	3	120	120	3.71	0.28	350	0.49	0.49	1.81	2.09													
10	STREET C	SA6	SA7	0.08		8.09		1	3	3	362	3.56	0.81	350	0.01	1.30	4.61	5.42	200	0.31%	18.26	0.013	0.58	17.51							
11	STREET C	SA7	SA8	0.29		8.38		3	3	9																					
12	STREET C	SA8	SA9	0.07		8.45		1	2.4	2	373	3.55	0.84	350	0.05	1.34	4.77	5.60	200	0.31%	18.26	0.013	0.58	42.50							
								1	2.4	2	376	3.55	0.85	350	0.01	1.35	4.80	5.64	200	0.31%	18.26	0.013	0.58	14.50							
BRANCH TRIBUTARY TO TOP END VIA STREET B																															
13	ESTIMATED TOP END	SA10	SA11	1.81		1.81		30	2.4	72	72	3.77	0.18	350	0.29	0.29	1.10	1.28	200	0.31%	18.26	0.013	0.58	10.52							
		SA11	SA12			1.81				72	72	3.77	0.18	350	0.00	0.29	1.10	1.28	200	0.31%	18.26	0.013	0.58	10.52							
		SA12	SA13			1.81				72	72	3.77	0.18	350	0.00	0.29	1.10	1.28	200	0.31%	18.26	0.013	0.58	66.86							
		SA13	SA14			1.81				72	72	3.77	0.18	350	0.00	0.29	1.10	1.28	200	0.31%	18.26	0.013	0.58	58.25							
		SA14	SA15			1.81				72	72	3.77	0.18	350	0.00	0.29	1.10	1.28	200	0.31%	18.26	0.013	0.58	26.70							
14	STREET B	SA15	SA16	0.15		1.96		2	3	6	78	3.76	0.20	350	0.02	0.32	1.19	1.38	200	0.31%	18.26	0.013	0.58	26.30							
15	STREET B	SA16	SA17	0.50		2.46		8	3	24	102	3.73	0.25	350	0.10	0.41	1.54	1.79	200	0.31%	18.26	0.013	0.58	49.19							
16	STREET B	SA17	SA18	0.40		2.86		6	3	18	120	3.71	0.29	350	0.07	0.49	1.81	2.09	200	0.31%	18.26	0.013	0.58	59.65							
17	STREET B	SA18	SA19	0.95		3.81		12	3	36	156	3.68	0.38	350	0.15	0.63	2.33	2.71	200	0.31%	18.26	0.013	0.58	99.00							
18	STREET B	SA19	SA20	0.78		4.59		12	3	36	192	3.66	0.46	350	0.15	0.78	2.84	3.30	200	0.31%	18.26	0.013	0.58	89.74							
19	STREET B	SA20	SA21	0.80		5.39		12	3	36	228	3.63	0.54	350	0.15	0.92	3.35	3.89	200	0.31%	18.26	0.013	0.58	99.00							
EX	FUTURE SUBDIVISION					48.28					1215	3.29	4.83	350	4.92	4.92	16.22	21.04													
20	STREET E TOP END			0.18		48.46		3	3	9	1224	3.29	4.85	350	0.04	4.96	16.33	21.17	250	0.30%	32.57	0.013	0.66	43.90							
21	STREET E	SA21	SA9	0.42		54.27		5	3	15	1467	3.24	5.43	350	0.06	5.94	19.28	24.71	250	0.30%	32.57	0.013	0.66	91.85							
22	STREET C	SA9	SA22	0.85		63.57		14	2.4	33.6	1876	3.17	6.36	350	0.14	7.43	23.59	29.94	250	0.30%	32.57	0.013	0.66	67.70							
23	STREET C	SA22	SA23	0.83		64.40		13	2.4	31.2	1907	3.17	6.44	350	0.13	7.56	23.95	30.39	250	0.30%	32.57	0.013	0.66	74.00							
24	STREET C	SA23	XSA	1.51		65.91		26	2.4	62.4	1970																				
								40	1.6	64	2034	3.15	6.59	350	0.51	8.07	25.42	32.01	250	0.30%	32.57	0.013	0.66	63.80							

NOTE: NET AREA IS GROSS AREA FOR EACH CATCHMENT MINUS THE AREA OF THE ROAD ALLOWANCE

Internal and External Sanitary

**KOMOKA SUBDIVISION
BRANTAM DEVELOPMENTS
DOWNSTREAM CAPACITY ANALYSIS**



FLOW CRITERIA

$$PF = 0.8 \{ 1 + [14 / (4 + P^{0.5})] \}$$

PF x Uncertainty Factor

PROJECT No.: 1389-1
DESIGNED BY: LRG
DATE: APRIL 2019

CHECKED: DTW
APPROVED: SPB

LOCATION				AREA			POPULATION					SEWAGE FLOW							SEWER DESIGN					PROFILE					
AREA No.	STREET	FROM MH	TO MH	GROSS	DELTA ha	TOTAL ha	PER ha	PER LOT/UNIT	# of LOTS/UNIT	SUM POP	TOTAL POP	PEAKING FACTOR	INFILT L/s	Q PER CAPITA	ΔEATA Σ SEWAGE	TOTAL NO PEAK	SEWAGE L/s	TOTAL L/s	SIZE mm	SLOPE %	CAP L/s	n	VEL m/s	LENGTH m	FALL IN SEWER	HEADLOSS	DROP IN MH	UPPER INVERT	LOWER INVERT
	PROPOSED SUBDIVISION					17.63				819	3.39	1.76	350	0.51	3.15	10.68	12.44	250	0.30%	32.57	0.013	0.66	63.80						
	OXBOW DRIVE	XSA28	XSA29	3.43	1.36	21.06	100			136	955	3.36	2.11	300	0.47	3.62	12.15	14.26	250	0.31%	33.11	0.013	0.67	103.00					
	OXBOW DRIVE	XSA29	XSA30	1.34		22.40				0	955	3.36	2.24	300	0.00	3.62	12.15	14.39	250	0.30%	32.57	0.013	0.66	102.00					
	KOMOKA RD TRIB AREA		XSA30	32.98		32.98		151	3	453	453	3.52	3.30	300	1.57	1.57	5.53	8.83	250	0.70%	49.75	0.013	1.01	99.00					
	OXBOW DR. E. TRIB AREA		XSA30	21.55		21.55		127	3	381	180																		
						65	626	3.45	2.16	300	2.17	2.17	7.50	9.66	250	0.30%	32.57	0.013	0.66	99.00									
	KOMOKA RD	XSA30	XSA37	0.90		77.83		7	3	21	2055	3.15	7.78	300	0.07	7.44	23.42	31.20	250	0.30%	32.57	0.013	0.66	102.00					
	KOMOKA RD	XSA37	XSA38	2.01		79.84		3	3	9	2064	3.15	7.98	300	0.03	7.47	23.51	31.49	250	0.30%	32.57	0.013	0.66	102.00					
	KOMOKA RD	XSA38	XSA56	0.57		80.41		0	3	0	2064	3.15	8.04	300	0.00	7.47	23.51	31.55	250	0.30%	32.57	0.013	0.66	102.00					
	KOMOKA RD	XSA56	XSA59	1.36	0.08	81.77	100	5	3	23	2087	3.14	8.18	300	0.08	7.55	23.74	31.91	250	0.30%	32.57	0.013	0.66	102.00					
	ST. CLAIR TRIB AREA		XSA59	1.33		1.33		4	3	12	12	3.88	0.13	300	0.04	0.04	0.16	0.29	200	0.42%	21.26	0.013	0.68	99.00					
	KOMOKA RD	XSA59	XSA65	1.11	0.61	84.21	100	5	3	76	2175	3.13	8.42	300	0.26	7.86	24.59	33.02	250	0.35%	35.18	0.013	0.72	102.00					
	KOMOKA RD	XSA65	XSA74	0.83	0.18	85.04	100	2	3	24																			
							19	2218	3.12	8.50	300	0.15	8.01	25.02	33.52	250	0.36%	35.68	0.013	0.73	102.00								
	HAMILTON ST. TRIB AREA		XSA74	17.43		17.43		131	3	393	393	3.54	1.74	300	1.36	1.36	4.83	6.58	200	0.42%	21.26	0.013	0.68	99.00					
KOMOKA RD	XSA74	XSA75	0.41		102.88		40	2.4	96	2707	3.06	10.29	300	0.33	9.70	29.72	40.01	300	0.20%	43.25	0.013	0.61	102.00						
HURON AVE. TRIB AREA		XSA75	46.54	0.61	46.54	100	160	3	541	541	3.48	4.65	300	1.88	1.88	6.54	11.19	250	0.30%	32.57	0.013	0.66	99.00						
MAIN STREET	XSA75	XSA82	1.25		150.67				0	3248	3.00	15.07	300	0.00	11.58	34.79	49.85	300	0.35%	57.21	0.013	0.81	102.00						

NOTE: NET AREA IS GROSS AREA FOR EACH CATCHMENT MINUS THE AREA OF THE ROAD ALLOWANCE

APPENDIX B

Stormwater Management Pre Development Model

Internal and External Flows

2 Year Storm

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"      MIDUSS Output ----->"
"      MIDUSS version                      Version 2.07 rev. 387"
"      MIDUSS created                      Friday, September 23, 2005"
"      10 Units used:                      ie METRIC"
"      Job folder:                        G:\CLIENT\1389\1\SWM\MIDUSS\Pre"
"      Output filename:                    2 yr_pre-1.out"
"      Licensee name:                      lgrabowski"
"      Company"
"      Date & Time last used:              2/6/2019 at 9:55:54 AM"
" 31    TIME PARAMETERS"
"      5.000 Time Step"
"      180.000 Max. Storm length"
"      1500.000 Max. Hydrograph"
" 32    STORM Chicago storm"
"      1 Chicago storm"
"      724.690 Coefficient A"
"      5.500 Constant B"
"      0.800 Exponent C"
"      0.380 Fraction R"
"      180.000 Duration"
"      1.000 Time step multiplier"
"      Maximum intensity 101.773 mm/hr"
"      Total depth 33.312 mm"
"      4 2hyd Hydrograph extension used in this file"
" 33    CATCHMENT 1"
"      1 Triangular SCS"
"      1 Equal length"
"      1 SCS method"
"      1 external area 1"
"      1.040 % Impervious"
"      26.510 Total Area"
"      600.000 Flow length"
"      3.000 Overland Slope"
"      26.234 Pervious Area"
"      600.000 Pervious length"
"      3.000 Pervious slope"
"      0.276 Impervious Area"
"      600.000 Impervious length"
"      3.000 Impervious slope"
"      0.250 Pervious Manning 'n'"
"      84.000 Pervious SCS Curve No."
"      0.317 Pervious Runoff coefficient"
"      0.100 Pervious Ia/S coefficient"
"      4.838 Pervious Initial abstraction"
"      0.015 Impervious Manning 'n'"
"      98.000 Impervious SCS Curve No."
"      0.850 Impervious Runoff coefficient"
"      0.100 Impervious Ia/S coefficient"
"      0.518 Impervious Initial abstraction"
"      0.251 0.000 0.000 0.000 c.m/sec"
"      Catchment 1 Pervious Impervious Total Area "
"      Surface Area 26.234 0.276 26.510 hectare"
"      Time of concentration 113.007 12.292 110.248 minutes"
"      Time to Centroid 233.598 103.494 230.034 minutes"
"      Rainfall depth 33.312 33.312 33.312 mm"
"      Rainfall volume 8739.12 91.84 8830.96 c.m"
"      Rainfall losses 22.764 5.042 22.579 mm"
"      Runoff depth 10.548 28.270 10.733 mm"
"      Runoff volume 2767.26 77.94 2845.21 c.m"
"      Runoff coefficient 0.317 0.850 0.322 "
"      Maximum flow 0.247 0.039 0.251 c.m/sec"
" 40    HYDROGRAPH Add Runoff "
"      4 Add Runoff "
"      0.251 0.251 0.000 0.000"
" 58    CULVERT"
"      0.251 Culvert Q c.m/sec"
"      25.00 Length metre"
"      0.013 Manning 'n'"
"      244.300 Upstream IL metre"
"      244.290 Downstream IL metre"
"      247.050 Weir Elev. metre"
"      20.000 Weir Breadth. metre"
"      25.000 Weir Left slope to 1"
"      25.000 Weir Right slope to 1"
"      244.500 Tail water elevation"
"      2 Barrel Option (Pipe/Box/CSPA/HE/VE)"
"      1.000 Barrel Height/Diameter"
"      1.000 Barrel Width"
"      0.700 Cc 004 RC pipe socket inlet"
"      0.900 Ke 012 Project from fill"
"      1. Number of Barrels"

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"      39  Number of stages"
"          Level Discharge      Volume"
"      244.300      0.000      0.0"
"      244.800      0.013      23.9"
"      244.800      0.025      23.9"
"      244.800      0.038      23.9"
"      244.800      0.050      23.9"
"      244.800      0.063      23.9"
"      244.801      0.075      23.9"
"      244.801      0.088      24.0"
"      244.801      0.100      24.0"
"      244.801      0.113      24.0"
"      244.802      0.125      24.1"
"      244.802      0.138      24.1"
"      244.802      0.151      24.1"
"      244.803      0.163      24.2"
"      244.803      0.176      24.2"
"      244.804      0.188      24.3"
"      244.804      0.201      24.3"
"      244.805      0.213      24.4"
"      244.805      0.226      24.4"
"      244.806      0.238      24.5"
"      244.807      0.251      24.6"
"      244.807      0.263      24.6"
"      244.808      0.276      24.7"
"      244.809      0.288      24.8"
"      244.809      0.301      24.9"
"      244.810      0.314      24.9"
"      244.811      0.326      25.0"
"      244.812      0.339      25.1"
"      244.813      0.351      25.2"
"      244.814      0.364      25.3"
"      244.815      0.376      25.4"
"      244.816      0.389      25.5"
"      244.817      0.401      25.6"
"      244.818      0.414      25.7"
"      244.819      0.426      25.9"
"      244.820      0.439      26.0"
"      244.821      0.452      26.1"
"      244.830      0.464      27.0"
"      244.839      0.477      28.1"
"      1.500  Channel Basewidth"
"      1.000  Channel Depth"
"      3.500  Channel Topwidth"
"     10.000  Grade Left"
"     10.000  Grade Right"
"      1.000  Grade %"
"    300.000  Length"
"      Barrel Yo      0.432  metre"
"      Barrel Ycr      0.186  metre"
"      Exit Velocity      1.194  m/sec"
"      Barrel Peak Outflow      0.251  c.m/sec"
"      Weir Peak Flow      0.000  c.m/sec"
"      Total Peak Outflow      0.251  c.m/sec"
"      Maximum level      244.662  metre"
"      Maximum storage      24.560  c.m"
"      Centroidal lag      3.935  hours"
"      0.251  0.251  0.251  0.000 c.m/sec"
" 40  HYDROGRAPH Next link "
"      5  Next link "
"      0.251  0.251  0.251  0.000"
" 52  CHANNEL DESIGN"
"      0.251  Current peak flow  c.m/sec"
"      0.025  Manning 'n'"
"      0.  Cross-section type: 0=trapezoidal; 1=general"
"      0.000  Basewidth  metre"
"     25.000  Left bank slope"
"     25.000  Right bank slope"
"      1.000  Channel depth  metre"
"      1.000  Gradient  %"
"      Depth of flow      0.126  metre"
"      Velocity      0.633  m/sec"
"      Channel capacity      62.962  c.m/sec"
"      Critical depth      0.115  metre"
" 53  ROUTE  Channel Route 260"
"     260.00  Channel Route 260 Reach length  ( metre)"
"      0.482  X-factor <= 0.5"
"    154.069  K-lag  ( seconds)"
"      0.000  Default(0) or user spec.(1) values used"
"      0.500  X-factor <= 0.5"
"     30.000  K-lag  ( seconds)"

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"      0.500  Beta weighting factor"
" 300.000  Routing time step ( seconds)"
"      2    No. of sub-reaches"
"      Peak outflow      0.251      0.251      c.m/sec"
"      0.251      0.251      0.251      0.000 c.m/sec"
" 40      HYDROGRAPH Combine 999"
"      6    Combine "
"      999  Node #"
"      flows meeting from external areas"
"      Maximum flow      0.251      c.m/sec"
"      Hydrograph volume      2817.579      c.m"
"      0.251      0.251      0.251      0.251"
" 40      HYDROGRAPH Start - New Tributary"
"      2    Start - New Tributary"
"      0.251      0.000      0.251      0.251"
" 33      CATCHMENT 2"
"      1    Triangular SCS"
"      1    Equal length"
"      1    SCS method"
"      2    external area 2"
"      1.400  % Impervious"
"      120.880 Total Area"
"      900.000 Flow length"
"      3.000  Overland Slope"
"      119.188 Pervious Area"
"      900.000 Pervious length"
"      3.000  Pervious slope"
"      1.692  Impervious Area"
"      900.000 Impervious length"
"      3.000  Impervious slope"
"      0.250  Pervious Manning 'n'"
"      84.000 Pervious SCS Curve No."
"      0.317  Pervious Runoff coefficient"
"      0.100  Pervious Ia/S coefficient"
"      4.838  Pervious Initial abstraction"
"      0.015  Impervious Manning 'n'"
"      98.000 Impervious SCS Curve No."
"      0.850  Impervious Runoff coefficient"
"      0.100  Impervious Ia/S coefficient"
"      0.518  Impervious Initial abstraction"
"      0.925      0.000      0.251      0.251 c.m/sec"
"      Catchment 2      Pervious      Impervious      Total Area "
"      Surface Area      119.188      1.692      120.880      hectare"
"      Time of concentration      144.132      15.677      139.428      minutes"
"      Time to Centroid      271.255      108.434      265.292      minutes"
"      Rainfall depth      33.312      33.312      33.312      mm"
"      Rainfall volume      3.9704      0.0564      4.0267      ha-m"
"      Rainfall losses      22.764      5.072      22.517      mm"
"      Runoff depth      10.548      28.240      10.795      mm"
"      Runoff volume      1.2571      0.0478      1.3049      ha-m"
"      Runoff coefficient      0.317      0.850      0.324      "
"      Maximum flow      0.908      0.207      0.925      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"      4    Add Runoff "
"      0.925      0.925      0.251      0.251"
" 52      CHANNEL DESIGN"
"      0.925  Current peak flow      c.m/sec"
"      0.022  Manning 'n'"
"      0.    Cross-section type: 0=trapezoidal; 1=general"
"      5.000  Basewidth      metre"
"      3.000  Left bank slope"
"      3.000  Right bank slope"
"      0.500  Channel depth      metre"
"      0.600  Gradient      %"
"      Depth of flow      0.168      metre"
"      Velocity      1.003      m/sec"
"      Channel capacity      6.193      c.m/sec"
"      Critical depth      0.147      metre"
" 53      ROUTE      Channel Route 350"
"      350.00  Channel Route 350 Reach length ( metre)"
"      0.477  X-factor <= 0.5"
"      261.612 K-lag ( seconds)"
"      0.000  Default(0) or user spec.(1) values used"
"      0.500  X-factor <= 0.5"
"      30.000  K-lag ( seconds)"
"      0.500  Beta weighting factor"
"      150.000 Routing time step ( seconds)"
"      1    No. of sub-reaches"
"      Peak outflow      0.923      c.m/sec"
"      0.925      0.925      0.923      0.251 c.m/sec"
" 40      HYDROGRAPH Next link "

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"          5 Next link "
"          0.925      0.923      0.923      0.251"
" 58 CULVERT"
"      0.923 Culvert Q      c.m/sec"
"      19.30 Length      metre"
"      0.013 Manning 'n'"
"      242.130 Upstream IL      metre"
"      242.100 Downstream IL      metre"
"      243.610 Weir Elev.      metre"
"      20.000 Weir Breadth.      metre"
"      25.000 Weir Left slope to 1"
"      25.000 Weir Right slope to 1"
"      243.500 Tail water elevation"
"      1 Barrel Option (Pipe/Box/CSPA/HE/VE)"
"      0.900 Barrel Height/Diameter"
"      0.900 Barrel Width"
"      0.500 Cc 001 CSP thin walled projecting"
"      0.900 Ke 012 Project from fill"
"      1. Number of Barrels"
"      39 Number of stages"
"          Level Discharge      Volume"
"          242.130      0.000      0.0"
"          243.501      0.046      1493.3"
"          243.503      0.092      1498.9"
"          243.506      0.138      1508.3"
"          243.510      0.185      1521.5"
"          243.516      0.231      1538.6"
"          243.523      0.277      1559.7"
"          243.531      0.323      1585.0"
"          243.541      0.369      1614.5"
"          243.551      0.415      1648.4"
"          243.564      0.462      1686.9"
"          243.577      0.508      1730.2"
"          243.592      0.554      1778.5"
"          243.607      0.600      1832.2"
"          243.625      0.646      1891.4"
"          243.643      0.692      1956.6"
"          243.663      0.739      2028.0"
"          243.684      0.785      2106.1"
"          243.706      0.831      2191.3"
"          243.729      0.877      2283.9"
"          243.754      0.923      2384.5"
"          243.780      0.969      2493.7"
"          243.808      1.016      2611.9"
"          243.836      1.062      2739.9"
"          243.866      1.108      2878.3"
"          243.897      1.154      3027.6"
"          243.930      1.200      3188.9"
"          243.963      1.246      3362.8"
"          243.998      1.293      3550.1"
"          244.034      1.339      3751.8"
"          244.072      1.385      3969.0"
"          244.111      1.431      4202.6"
"          244.151      1.477      4453.8"
"          244.192      1.523      4723.6"
"          244.235      1.570      5018.9"
"          244.278      1.616      5336.0"
"          244.324      1.662      5674.7"
"          244.370      1.708      6035.9"
"          244.418      1.754      6420.9"
"      5.000 Channel Basewidth"
"      0.500 Channel Depth"
"      8.000 Channel Topwidth"
"      10.000 Grade Left"
"      10.000 Grade Right"
"      0.600 Grade %"
"      350.000 Length"
"          Barrel Yo      0.900      metre"
"          Barrel Ycr      0.544      metre"
"          Exit Velocity      0.976      m/sec"
"          Barrel Peak Outflow      0.621      c.m/sec"
"          Weir Peak Flow      0.231      c.m/sec"
"          Total Peak Outflow      0.851      c.m/sec"
"          Maximum level      243.645      metre"
"          Maximum storage      2232.089      c.m"
"          Centroidal lag      6.051      hours"
"          0.925      0.923      0.851      0.251 c.m/sec"
" 40 HYDROGRAPH Next link "
"      5 Next link "
"          0.925      0.851      0.851      0.251"
" 52 CHANNEL DESIGN"

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"      0.851 Current peak flow    c.m/sec"
"      0.022 Manning 'n'"
"      0.    Cross-section type: 0=trapezoidal; 1=general"
"      0.000 Basewidth    metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.200 Channel depth    metre"
"      0.290 Gradient    %"
"      Depth of flow            0.537    metre"
"      Velocity                0.984    m/sec"
"      Channel capacity        7.263    c.m/sec"
"      Critical depth          0.440    metre"
" 53    ROUTE    Channel Route 69"
"      69.00    Channel Route 69 Reach length    ( metre)"
"      0.000    X-factor <= 0.5"
"      52.611    K-lag    ( seconds)"
"      0.000    Default(0) or user spec.(1) values used"
"      0.500    X-factor <= 0.5"
"      30.000    K-lag    ( seconds)"
"      0.502    Beta weighting factor"
"      100.000    Routing time step    ( seconds)"
"      1    No. of sub-reaches"
"      Peak outflow            0.851    c.m/sec"
"      0.925    0.851    0.851    0.251 c.m/sec"
" 40    HYDROGRAPH Next link "
"      5    Next link "
"      0.925    0.851    0.851    0.251"
" 58    CULVERT"
"      0.851 Culvert Q    c.m/sec"
"      20.40 Length    metre"
"      0.013 Manning 'n'"
"      241.900 Upstream IL    metre"
"      241.870 Downstream IL    metre"
"      243.610 Weir Elev.    metre"
"      20.000 Weir Breadth.    metre"
"      116.900 Weir Left slope to 1"
"      116.900 Weir Right slope to 1"
"      242.800 Tail water elevation"
"      5 Barrel Option (Pipe/Box/CSPA/HE/VE)"
"      1.535 Barrel Height/Diameter"
"      0.975 Barrel Width"
"      0.500 Cc 001 CSP thin walled projecting"
"      0.900 Ke 012 Project from fill"
"      1. Number of Barrels"
"      39 Number of stages"
"      Level Discharge    Volume"
"      241.900    0.000    0.0"
"      242.800    0.043    36.3"
"      242.801    0.085    36.3"
"      242.803    0.128    36.5"
"      242.806    0.170    36.7"
"      242.809    0.213    37.0"
"      242.813    0.255    37.3"
"      242.818    0.298    37.7"
"      242.823    0.341    38.1"
"      242.829    0.383    38.6"
"      242.836    0.426    39.2"
"      242.844    0.468    39.8"
"      242.852    0.511    40.5"
"      242.861    0.553    41.3"
"      242.871    0.596    42.1"
"      242.881    0.638    43.0"
"      242.893    0.681    44.0"
"      242.904    0.724    45.0"
"      242.917    0.766    46.1"
"      242.930    0.809    47.3"
"      242.944    0.851    48.6"
"      242.958    0.894    49.9"
"      242.973    0.936    51.4"
"      242.989    0.979    52.9"
"      243.005    1.022    54.5"
"      243.022    1.064    56.1"
"      243.040    1.107    57.9"
"      243.058    1.149    59.7"
"      243.076    1.192    61.6"
"      243.095    1.234    63.6"
"      243.115    1.277    65.7"
"      243.135    1.319    67.9"
"      243.155    1.362    70.3"
"      243.176    1.405    72.9"
"      243.197    1.447    75.6"

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"          243.218      1.490      78.6"
"          243.240      1.532      81.8"
"          243.261      1.575      85.2"
"          243.283      1.617      88.8"
"      0.000 Channel Basewidth"
"      1.200 Channel Depth"
"      7.200 Channel Topwidth"
"     12.549 Grade Left"
"     12.549 Grade Right"
"      0.290 Grade %"
"     15.000 Length"
"          Barrel Yo          0.735 metre"
"          Barrel Ycr          0.586 metre"
"          Exit Velocity          1.142 m/sec"
"          Barrel Peak Outflow          0.851 c.m/sec"
"          Weir Peak Flow          0.000 c.m/sec"
"          Total Peak Outflow          0.851 c.m/sec"
"          Maximum level          242.944 metre"
"          Maximum storage          48.597 c.m"
"          Centroidal lag          6.060 hours"
"          0.925 0.851 0.851 0.251 c.m/sec"
" 40 HYDROGRAPH Next link "
"      5 Next link "
"          0.925 0.851 0.851 0.251"
" 52 CHANNEL DESIGN"
"      0.851 Current peak flow c.m/sec"
"      0.022 Manning 'n'"
"      0. Cross-section type: 0=trapezoidal; 1=general"
"      0.000 Basewidth metre"
"     25.000 Left bank slope"
"     25.000 Right bank slope"
"      1.000 Channel depth metre"
"      1.000 Gradient %"
"          Depth of flow          0.190 metre"
"          Velocity          0.945 m/sec"
"          Channel capacity          71.548 c.m/sec"
"          Critical depth          0.188 metre"
" 53 ROUTE Channel Route 30"
"     30.00 Channel Route 30 Reach length ( metre)"
"      0.381 X-factor <= 0.5"
"     23.806 K-lag ( seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"     30.000 K-lag ( seconds)"
"      0.500 Beta weighting factor"
"     27.273 Routing time step ( seconds)"
"      1 No. of sub-reaches"
"          Peak outflow          0.851 c.m/sec"
"          0.925 0.851 0.851 0.251 c.m/sec"
" 40 HYDROGRAPH Combine 999"
"      6 Combine "
"     999 Node #"
"          flows meeting from external areas"
"          Maximum flow          1.053 c.m/sec"
"          Hydrograph volume          15541.897 c.m"
"          0.925 0.851 0.851 1.053"
" 40 HYDROGRAPH Confluence 999"
"      7 Confluence "
"     999 Node #"
"          flows meeting from external areas"
"          Maximum flow          1.053 c.m/sec"
"          Hydrograph volume          15541.898 c.m"
"          0.925 1.053 0.851 0.000"
" 33 CATCHMENT 4"
"      1 Triangular SCS"
"      1 Equal length"
"      1 SCS method"
"      4 internal catchment"
"     1.800 % Impervious"
"     26.510 Total Area"
"    130.000 Flow length"
"     3.000 Overland Slope"
"     26.033 Pervious Area"
"    130.000 Pervious length"
"     3.000 Pervious slope"
"     0.477 Impervious Area"
"    130.000 Impervious length"
"     3.000 Impervious slope"
"     0.250 Pervious Manning 'n'"
"     78.000 Pervious SCS Curve No."
"     0.210 Pervious Runoff coefficient"

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"      0.100 Pervious Ia/S coefficient"
"      7.164 Pervious Initial abstraction"
"      0.015 Impervious Manning 'n'"
"     98.000 Impervious SCS Curve No."
"      0.850 Impervious Runoff coefficient"
"      0.100 Impervious Ia/S coefficient"
"      0.518 Impervious Initial abstraction"
"          0.290      1.053      0.851      0.000 c.m/sec"
"      Catchment 4 Pervious Impervious Total Area "
"      Surface Area      26.033      0.477      26.510 hectare"
"      Time of concentration      54.023      4.910      50.640 minutes"
"      Time to Centroid      164.618      92.758      159.668 minutes"
"      Rainfall depth      33.312      33.312      33.312 mm"
"      Rainfall volume      8672.01      158.96      8830.96 c.m"
"      Rainfall losses      26.322      5.101      25.940 mm"
"      Runoff depth      6.990      28.211      7.372 mm"
"      Runoff volume      1819.74      134.62      1954.35 c.m"
"      Runoff coefficient      0.210      0.850      0.221 "
"      Maximum flow      0.280      0.096      0.290 c.m/sec"
" 40 HYDROGRAPH Add Runoff "
"      4 Add Runoff "
"          0.290      1.160      0.851      0.000"
" 52 CHANNEL DESIGN"
"      1.160 Current peak flow c.m/sec"
"      0.022 Manning 'n'"
"      0. Cross-section type: 0=trapezoidal; 1=general"
"      0.000 Basewidth metre"
"     25.000 Left bank slope"
"     25.000 Right bank slope"
"      1.000 Channel depth metre"
"      1.000 Gradient %"
"      Depth of flow      0.213 metre"
"      Velocity      1.021 m/sec"
"      Channel capacity      71.548 c.m/sec"
"      Critical depth      0.213 metre"
" 53 ROUTE Channel Route 50"
"      50.00 Channel Route 50 Reach length ( metre)"
"      0.420 X-factor <= 0.5"
"     36.720 K-lag ( seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"     30.000 K-lag ( seconds)"
"      0.500 Beta weighting factor"
"     37.500 Routing time step ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow      1.160 c.m/sec"
"          0.290      1.160      1.160      0.000 c.m/sec"

```

Internal flow
contribution

25 Year Storm

```

"      MIDUSS Output ----->"
"      MIDUSS version                      Version 2.07 rev. 387"
"      MIDUSS created                      Friday, September 23, 2005"
"      10 Units used:                      ie METRIC"
"      Job folder:                        G:\CLIENT\1389\1\SWM\MIDUSS\Pre"
"      Output filename:                    25 yr pre.out"
"      Licensee name:                     lgrabowski"
"      Company"
"      Date & Time last used:              2/6/2019 at 9:23:41 AM"
" 31    TIME PARAMETERS"
"      5.000 Time Step"
"      180.000 Max. Storm length"
"      1500.000 Max. Hydrograph"
" 32    STORM Chicago storm"
"      1 Chicago storm"
"      1455.000 Coefficient A"
"      5.000 Constant B"
"      0.820 Exponent C"
"      0.380 Fraction R"
"      180.000 Duration"
"      1.000 Time step multiplier"
"      Maximum intensity                202.437 mm/hr"
"      Total depth                      60.381 mm"
"      5 25hyd Hydrograph extension used in this file"
" 33    CATCHMENT 1"
"      1 Triangular SCS"
"      1 Equal length"
"      1 SCS method"
"      1 external area 1"
"      1.040 % Impervious"
"      26.510 Total Area"
"      600.000 Flow length"
"      3.000 Overland Slope"
"      26.234 Pervious Area"
"      600.000 Pervious length"
"      3.000 Pervious slope"
"      0.276 Impervious Area"
"      600.000 Impervious length"
"      3.000 Impervious slope"
"      0.250 Pervious Manning 'n'"
"      84.000 Pervious SCS Curve No."
"      0.492 Pervious Runoff coefficient"
"      0.100 Pervious Ia/S coefficient"
"      4.838 Pervious Initial abstraction"
"      0.015 Impervious Manning 'n'"
"      98.000 Impervious SCS Curve No."
"      0.912 Impervious Runoff coefficient"
"      0.100 Impervious Ia/S coefficient"
"      0.518 Impervious Initial abstraction"
"      1.128 0.000 0.000 0.000 c.m/sec"
"      Catchment 1 Pervious Impervious Total Area "
"      Surface Area 26.234 0.276 26.510 hectare"
"      Time of concentration 66.913 9.096 65.810 minutes"
"      Time to Centroid 180.420 96.777 178.824 minutes"
"      Rainfall depth 60.381 60.381 60.381 mm"
"      Rainfall volume 1.5841 0.0166 1.6007 ha-m"
"      Rainfall losses 30.698 5.452 30.435 mm"
"      Runoff depth 29.683 54.929 29.946 mm"
"      Runoff volume 7787.25 151.44 7938.69 c.m"
"      Runoff coefficient 0.492 0.912 0.496 "
"      Maximum flow 1.120 0.090 1.128 c.m/sec"
" 40    HYDROGRAPH Add Runoff "
"      4 Add Runoff "
"      1.128 1.128 0.000 0.000"
" 58    CULVERT"
"      1.128 Culvert Q c.m/sec"
"      25.00 Length metre"
"      0.013 Manning 'n'"
"      244.300 Upstream IL metre"
"      244.290 Downstream IL metre"
"      247.050 Weir Elev. metre"
"      20.000 Weir Breadth. metre"
"      25.000 Weir Left slope to 1"
"      25.000 Weir Right slope to 1"
"      244.500 Tail water elevation"
"      2 Barrel Option (Pipe/Box/CSPA/HE/VE)"
"      1.000 Barrel Height/Diameter"
"      1.000 Barrel Width"
"      0.700 Cc 004 RC pipe socket inlet"
"      0.900 Ke 012 Project from fill"
"      1. Number of Barrels"

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"          39  Number of stages"
"              Level Discharge      Volume"
"              244.300      0.000      0.0"
"              244.800      0.056      23.9"
"              244.801      0.113      24.0"
"              244.803      0.169      24.2"
"              244.805      0.226      24.4"
"              244.808      0.282      24.7"
"              244.812      0.339      25.1"
"              244.816      0.395      25.6"
"              244.821      0.451      26.1"
"              244.862      0.508      30.7"
"              244.902      0.564      35.6"
"              244.940      0.621      40.8"
"              244.978      0.677      46.2"
"              245.015      0.733      51.9"
"              245.050      0.790      57.8"
"              245.085      0.846      64.0"
"              245.119      0.903      70.3"
"              245.152      0.959      76.9"
"              245.185      1.016      83.7"
"              245.217      1.072      90.8"
"              245.249      1.128      98.0"
"              245.280      1.185     105.4"
"              245.310      1.241     113.1"
"              245.340      1.298     121.2"
"              245.370      1.354     129.8"
"              245.399      1.410     138.9"
"              245.428      1.467     148.6"
"              245.456      1.523     158.7"
"              245.485      1.580     169.4"
"              245.512      1.636     180.6"
"              245.540      1.693     192.4"
"              245.567      1.749     204.7"
"              245.594      1.805     217.6"
"              245.621      1.862     231.1"
"              245.647      1.918     245.1"
"              245.673      1.975     259.7"
"              245.699      2.031     274.9"
"              245.746      2.087     304.4"
"              245.797      2.144     339.4"
"          1.500  Channel Basewidth"
"          1.000  Channel Depth"
"          3.500  Channel Topwidth"
"         10.000  Grade Left"
"         10.000  Grade Right"
"          1.000  Grade %"
"        300.000  Length"
"          Barrel Yo              1.000  metre"
"          Barrel Ycr              0.502  metre"
"          Exit Velocity            2.220  m/sec"
"          Barrel Peak Outflow      1.116  c.m/sec"
"          Weir Peak Flow           0.000  c.m/sec"
"          Total Peak Outflow       1.116  c.m/sec"
"          Maximum level            245.280  metre"
"          Maximum storage           96.348  c.m"
"          Centroidal lag           3.009  hours"
"          1.128      1.128      1.116      0.000 c.m/sec"
" 40      HYDROGRAPH Next link "
"          5      Next link "
"          1.128      1.116      1.116      0.000"
" 52      CHANNEL DESIGN"
"          1.116  Current peak flow  c.m/sec"
"          0.025  Manning 'n'"
"          0.      Cross-section type: 0=trapezoidal; 1=general"
"          0.000  Basewidth  metre"
"          25.000  Left bank slope"
"          25.000  Right bank slope"
"          1.000  Channel depth  metre"
"          1.000  Gradient  %"
"          Depth of flow              0.220  metre"
"          Velocity                    0.919  m/sec"
"          Channel capacity            62.962  c.m/sec"
"          Critical depth              0.210  metre"
" 53      ROUTE      Channel Route 260"
"          260.00  Channel Route 260 Reach length  ( metre)"
"          0.484  X-factor <= 0.5"
"          212.201  K-lag  ( seconds)"
"          0.000  Default(0) or user spec.(1) values used"
"          0.500  X-factor <= 0.5"
"          30.000  K-lag  ( seconds)"

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"      0.500 Beta weighting factor"
" 150.000 Routing time step ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow      1.111 c.m/sec"
"      1.128      1.116      1.111      0.000 c.m/sec"
" 40 HYDROGRAPH Combine 999"
"      6 Combine "
"      999 Node #"
"      flows meeting from external areas"
"      Maximum flow      1.111 c.m/sec"
"      Hydrograph volume      7938.838 c.m"
"      1.128      1.116      1.111      1.111"
" 40 HYDROGRAPH Start - New Tributary"
"      2 Start - New Tributary"
"      1.128      0.000      1.111      1.111"
" 33 CATCHMENT 2"
"      1 Triangular SCS"
"      1 Equal length"
"      1 SCS method"
"      2 external area 2"
"      1.400 % Impervious"
"      120.880 Total Area"
"      900.000 Flow length"
"      3.000 Overland Slope"
"      119.188 Pervious Area"
"      900.000 Pervious length"
"      3.000 Pervious slope"
"      1.692 Impervious Area"
"      900.000 Impervious length"
"      3.000 Impervious slope"
"      0.250 Pervious Manning 'n'"
"      84.000 Pervious SCS Curve No."
"      0.492 Pervious Runoff coefficient"
"      0.100 Pervious Ia/S coefficient"
"      4.838 Pervious Initial abstraction"
"      0.015 Impervious Manning 'n'"
"      98.000 Impervious SCS Curve No."
"      0.912 Impervious Runoff coefficient"
"      0.100 Impervious Ia/S coefficient"
"      0.518 Impervious Initial abstraction"
"      4.146      0.000      1.111      1.111 c.m/sec"
"      Catchment 2 Pervious Impervious Total Area "
"      Surface Area      119.188      1.692      120.880 hectare"
"      Time of concentration      85.343      11.601      83.450 minutes"
"      Time to Centroid      204.980      100.531      202.299 minutes"
"      Rainfall depth      60.381      60.381      60.381 mm"
"      Rainfall volume      7.1967      0.1022      7.2989 ha-m"
"      Rainfall losses      30.701      5.312      30.345 mm"
"      Runoff depth      29.681      55.070      30.036 mm"
"      Runoff volume      3.5376      0.0932      3.6308 ha-m"
"      Runoff coefficient      0.492      0.912      0.498 "
"      Maximum flow      4.099      0.503      4.146 c.m/sec"
" 40 HYDROGRAPH Add Runoff "
"      4 Add Runoff "
"      4.146      4.146      1.111      1.111"
" 52 CHANNEL DESIGN"
"      4.146 Current peak flow c.m/sec"
"      0.022 Manning 'n'"
"      0. Cross-section type: 0=trapezoidal; 1=general"
"      5.000 Basewidth metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      0.500 Channel depth metre"
"      0.600 Gradient %"
"      Depth of flow      0.399 metre"
"      Velocity      1.677 m/sec"
"      Channel capacity      6.193 c.m/sec"
"      Critical depth      0.381 metre"
" 53 ROUTE Channel Route 350"
"      350.00 Channel Route 350 Reach length ( metre)"
"      0.446 X-factor <= 0.5"
"      156.550 K-lag ( seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"      30.000 K-lag ( seconds)"
"      0.500 Beta weighting factor"
"      150.000 Routing time step ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow      4.128 c.m/sec"
"      4.146      4.146      4.128      1.111 c.m/sec"
" 40 HYDROGRAPH Next link "

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"          5 Next link "
"          4.146      4.128      4.128      1.111"
" 58 CULVERT"
"      4.128 Culvert Q      c.m/sec"
"      19.30 Length      metre"
"      0.013 Manning 'n'"
"      242.130 Upstream IL      metre"
"      242.100 Downstream IL      metre"
"      243.610 Weir Elev.      metre"
"      20.000 Weir Breadth.      metre"
"      25.000 Weir Left slope to 1"
"      25.000 Weir Right slope to 1"
"      243.500 Tail water elevation"
"      1 Barrel Option (Pipe/Box/CSPA/HE/VE)"
"      0.900 Barrel Height/Diameter"
"      0.900 Barrel Width"
"      0.500 Cc 001 CSP thin walled projecting"
"      0.900 Ke 012 Project from fill"
"      1. Number of Barrels"
"      39 Number of stages"
"          Level Discharge      Volume"
"          242.130      0.000      0.0"
"          243.513      0.206      1529.0"
"          243.551      0.413      1646.3"
"          243.614      0.619      1855.9"
"          243.703      0.826      2180.8"
"          243.818      1.032      2656.0"
"          243.957      1.238      3331.1"
"          244.122      1.445      4274.6"
"          244.313      1.651      5593.0"
"          244.529      1.857      7373.1"
"          244.770      2.064      9703.3"
"          245.176      2.270      14519.0"
"          245.670      2.477      21923.0"
"          246.206      2.683      31904.4"
"          246.786      2.889      44947.1"
"          247.408      3.096      61572.9"
"          248.073      3.302      82342.9"
"          248.781      3.509      107856.1"
"          249.532      3.715      138751.3"
"          250.326      3.921      175704.6"
"          251.163      4.128      219432.4"
"          252.043      4.334      270688.8"
"          252.966      4.541      330265.9"
"          253.931      4.747      398995.1"
"          254.940      4.953      477747.8"
"          255.991      5.160      567431.4"
"          257.085      5.366      668995.0"
"          258.223      5.572      783425.1"
"          259.403      5.779      911744.9"
"          260.626      5.985      1055017.9"
"          261.892      6.192      1214346.1"
"          263.201      6.398      1390874.6"
"          264.553      6.604      1585779.1"
"          265.947      6.811      1800277.6"
"          267.385      7.017      2035632.0"
"          268.866      7.224      2293128.0"
"          270.389      7.430      2574110.0"
"          271.956      7.636      2879951.8"
"          273.565      7.843      3212053.0"
"      5.000 Channel Basewidth"
"      0.500 Channel Depth"
"      8.000 Channel Topwidth"
"      10.000 Grade Left"
"      10.000 Grade Right"
"      0.600 Grade %"
"      350.000 Length"
"          Barrel Yo      0.900      metre"
"          Barrel Ycr      0.827      metre"
"          Exit Velocity      2.248      m/sec"
"          Barrel Peak Outflow      1.430      c.m/sec"
"          Weir Peak Flow      0.710      c.m/sec"
"          Total Peak Outflow      2.140      c.m/sec"
"          Maximum level      243.683      metre"
"          Maximum storage      11488.577      c.m"
"          Centroidal lag      4.631      hours"
"          4.146      4.128      2.140      1.111 c.m/sec"
" 40 HYDROGRAPH Next link "
"      5 Next link "
"          4.146      2.140      2.140      1.111"
" 52 CHANNEL DESIGN"

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"      2.140 Current peak flow c.m/sec"
"      0.022 Manning 'n'"
"      0. Cross-section type: 0=trapezoidal; 1=general"
"      0.000 Basewidth metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.200 Channel depth metre"
"      0.290 Gradient %"
"      Depth of flow 0.759 metre"
"      Velocity 1.239 m/sec"
"      Channel capacity 7.263 c.m/sec"
"      Critical depth 0.636 metre"
" 53 ROUTE Channel Route 69"
"      69.00 Channel Route 69 Reach length (metre)"
"      0.000 X-factor <= 0.5"
"      41.779 K-lag (seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"      30.000 K-lag (seconds)"
"      0.588 Beta weighting factor"
"      100.000 Routing time step (seconds)"
"      1 No. of sub-reaches"
"      Peak outflow 2.140 c.m/sec"
"      4.146 2.140 2.140 1.111 c.m/sec"
" 40 HYDROGRAPH Combine 1000"
"      6 Combine "
"      1000 Node #"
"      flows meeting east of Komoka road"
"      Maximum flow 2.140 c.m/sec"
"      Hydrograph volume 36293.438 c.m"
"      4.146 2.140 2.140 2.140"
" 40 HYDROGRAPH Start - New Tributary"
"      2 Start - New Tributary"
"      4.146 0.000 2.140 2.140"
" 33 CATCHMENT 3"
"      1 Triangular SCS"
"      1 Equal length"
"      1 SCS method"
"      3 external area 3 - east portion of komoka road"
"      45.000 % Impervious"
"      0.610 Total Area"
"      190.000 Flow length"
"      2.000 Overland Slope"
"      0.336 Pervious Area"
"      190.000 Pervious length"
"      2.000 Pervious slope"
"      0.275 Impervious Area"
"      190.000 Impervious length"
"      2.000 Impervious slope"
"      0.250 Pervious Manning 'n'"
"      75.000 Pervious SCS Curve No."
"      0.327 Pervious Runoff coefficient"
"      0.100 Pervious Ia/S coefficient"
"      8.467 Pervious Initial abstraction"
"      0.015 Impervious Manning 'n'"
"      98.000 Impervious SCS Curve No."
"      0.912 Impervious Runoff coefficient"
"      0.100 Impervious Ia/S coefficient"
"      0.518 Impervious Initial abstraction"
"      0.114 0.000 2.140 2.140 c.m/sec"
"      Catchment 3 Pervious Impervious Total Area "
"      Surface Area 0.336 0.275 0.610 hectare"
"      Time of concentration 47.747 5.153 18.170 minutes"
"      Time to Centroid 153.840 90.899 110.136 minutes"
"      Rainfall depth 60.381 60.381 60.381 mm"
"      Rainfall volume 202.58 165.75 368.33 c.m"
"      Rainfall losses 40.654 5.601 24.880 mm"
"      Runoff depth 19.728 54.780 35.501 mm"
"      Runoff volume 66.19 150.37 216.56 c.m"
"      Runoff coefficient 0.327 0.912 0.590 "
"      Maximum flow 0.013 0.113 0.114 c.m/sec"
" 40 HYDROGRAPH Add Runoff "
"      4 Add Runoff "
"      0.114 0.114 2.140 2.140"
" 56 DIVERSION"
"      3 Node number"
"      0.059 Overflow threshold"
"      1.000 Required diverted fraction"
"      0 Conduit type; 1=Pipe;2=Channel"
"      Peak of diverted flow 0.055 c.m/sec"
"      Volume of diverted flow 27.341 c.m"

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```

"      DIV00003.25hyd"
"      Major flow east of komoka road"
"      0.114      0.114      0.059      2.140 c.m/sec"
" 40      HYDROGRAPH Next link "
"      5      Next link "
"      0.114      0.059      0.059      2.140"
" 52      CHANNEL DESIGN"
"      0.059      Current peak flow      c.m/sec"
"      0.022      Manning 'n'"
"      0.      Cross-section type: 0=trapezoidal; 1=general"
"      0.000      Basewidth      metre"
"      3.000      Left bank slope"
"      3.000      Right bank slope"
"      1.200      Channel depth      metre"
"      0.290      Gradient      %"
"      Depth of flow      0.197      metre"
"      Velocity      0.505      m/sec"
"      Channel capacity      7.263      c.m/sec"
"      Critical depth      0.151      metre"
" 53      ROUTE      Channel Route 50"
"      50.00      Channel Route 50 Reach length      ( metre)"
"      0.245      X-factor <= 0.5"
"      74.297      K-lag      ( seconds)"
"      0.000      Default(0) or user spec.(1) values used"
"      0.500      X-factor <= 0.5"
"      30.000      K-lag      ( seconds)"
"      0.500      Beta weighting factor"
"      100.000      Routing time step      ( seconds)"
"      1      No. of sub-reaches"
"      Peak outflow      0.059      c.m/sec"
"      0.114      0.059      0.059      2.140 c.m/sec"
" 40      HYDROGRAPH Combine      1001"
"      6      Combine "
"      1001      Node #"
"      minor flows east of komoka leaving via pipe network"
"      Maximum flow      0.059      c.m/sec"
"      Hydrograph volume      189.217      c.m"
"      0.114      0.059      0.059      0.059"
" 47      FILEI_0 Read/Open DIV10000.25hyd"
"      1      1=read/open; 2=write/save"
"      2      1=rainfall; 2=hydrograph"
"      1      1=runoff; 2=inflow; 3=outflow; 4=junction"
"      DIV10000.25hyd"
"      Major flow east of komoka road"
"      Total volume      27.341      c.m"
"      Maximum flow      0.055      c.m/sec"
"      0.055      0.059      0.059      0.059 c.m/sec"
" 40      HYDROGRAPH Start - New Tributary"
"      2      Start - New Tributary"
"      0.055      0.000      0.059      0.059"
" 40      HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"      0.055      0.055      0.059      0.059"
" 52      CHANNEL DESIGN"
"      0.055      Current peak flow      c.m/sec"
"      0.022      Manning 'n'"
"      0.      Cross-section type: 0=trapezoidal; 1=general"
"      0.000      Basewidth      metre"
"      3.000      Left bank slope"
"      3.000      Right bank slope"
"      1.200      Channel depth      metre"
"      0.290      Gradient      %"
"      Depth of flow      0.192      metre"
"      Velocity      0.496      m/sec"
"      Channel capacity      7.263      c.m/sec"
"      Critical depth      0.147      metre"
" 53      ROUTE      Channel Route 15"
"      15.00      Channel Route 15 Reach length      ( metre)"
"      0.000      X-factor <= 0.5"
"      22.684      K-lag      ( seconds)"
"      0.000      Default(0) or user spec.(1) values used"
"      0.500      X-factor <= 0.5"
"      30.000      K-lag      ( seconds)"
"      0.624      Beta weighting factor"
"      60.000      Routing time step      ( seconds)"
"      1      No. of sub-reaches"
"      Peak outflow      0.052      c.m/sec"
"      0.055      0.055      0.052      0.059 c.m/sec"
" 40      HYDROGRAPH Combine      1000"
"      6      Combine "
"      1000      Node #"

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"          flows meeting east of Komoka road"
"          Maximum flow          2.140      c.m/sec"
"          Hydrograph volume      36320.773  c.m"
"          0.055      0.055      0.052      2.140"
" 40      HYDROGRAPH Confluence      1000"
"          7 Confluence "
"          1000 Node #"
"          flows meeting east of Komoka road"
"          Maximum flow          2.140      c.m/sec"
"          Hydrograph volume      36320.773  c.m"
"          0.055      2.140      0.052      0.000"
" 58      CULVERT"
"          2.140 Culvert Q      c.m/sec"
"          20.40 Length      metre"
"          0.013 Manning 'n'"
"          241.900 Upstream IL      metre"
"          241.870 Downstream IL      metre"
"          243.610 Weir Elev.      metre"
"          20.000 Weir Breadth.      metre"
"          116.900 Weir Left slope to 1"
"          116.900 Weir Right slope to 1"
"          243.200 Tail water elevation"
"          5 Barrel Option (Pipe/Box/CSPA/HE/VE)"
"          1.535 Barrel Height/Diameter"
"          0.975 Barrel Width"
"          0.500 Cc 001 CSP thin walled projecting"
"          0.900 Ke 012 Project from fill"
"          1. Number of Barrels"
"          39 Number of stages"
"          Level Discharge      Volume"
"          241.900      0.000      0.0"
"          243.201      0.107      53.9"
"          243.204      0.214      54.1"
"          243.210      0.321      54.5"
"          243.217      0.428      54.9"
"          243.226      0.535      55.5"
"          243.238      0.642      56.2"
"          243.252      0.749      57.1"
"          243.268      0.856      58.0"
"          243.285      0.963      59.2"
"          243.305      1.070      60.4"
"          243.327      1.177      61.8"
"          243.351      1.284      63.4"
"          243.378      1.391      65.1"
"          243.406      1.498      66.9"
"          243.436      1.605      68.9"
"          243.467      1.712      71.3"
"          243.501      1.819      74.8"
"          243.537      1.926      80.2"
"          243.575      2.033      87.7"
"          243.614      2.140      97.6"
"          243.655      2.247      110.0"
"          243.698      2.354      125.4"
"          243.742      2.461      144.0"
"          243.788      2.568      165.9"
"          243.836      2.675      191.5"
"          243.885      2.782      221.1"
"          243.935      2.889      254.9"
"          243.992      2.996      297.1"
"          244.089      3.103      378.1"
"          244.188      3.210      475.0"
"          244.291      3.318      589.1"
"          244.398      3.425      721.7"
"          244.508      3.532      874.2"
"          244.621      3.639      1048.1"
"          244.738      3.746      1245.1"
"          244.858      3.853      1466.5"
"          244.981      3.960      1714.1"
"          245.108      4.067      1989.4"
"          1.463 Channel Basewidth"
"          1.535 Channel Depth"
"          4.533 Channel Topwidth"
"          44.191 Grade Left"
"          44.191 Grade Right"
"          0.290 Grade %"
"          15.000 Length"
"          Barrel Yo      1.535      metre"
"          Barrel Ycr      0.948      metre"
"          Exit Velocity      1.977      m/sec"
"          Barrel Peak Outflow      2.140      c.m/sec"
"          Weir Peak Flow      0.000      c.m/sec"

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"      Total Peak Outflow          2.140    c.m/sec"
"      Maximum level              243.610    metre"
"      Maximum storage            97.532     c.m"
"      Centroidal lag              4.662     hours"
"      0.055    2.140    2.140    0.000 c.m/sec"
40    HYDROGRAPH Next link "
"      5      Next link "
"      0.055    2.140    2.140    0.000"
52    CHANNEL DESIGN"
"      2.140    Current peak flow    c.m/sec"
"      0.022    Manning 'n'"
"      0.      Cross-section type: 0=trapezoidal; 1=general"
"      0.000    Basewidth    metre"
"      25.000    Left bank slope"
"      25.000    Right bank slope"
"      1.000    Channel depth    metre"
"      1.000    Gradient    %"
"      Depth of flow              0.268     metre"
"      Velocity                  1.190     m/sec"
"      Channel capacity          71.548     c.m/sec"
"      Critical depth            0.272     metre"
53    ROUTE    Channel Route 30"
"      30.00    Channel Route 30 Reach length    ( metre)"
"      0.332    X-factor <= 0.5"
"      18.905    K-lag    ( seconds)"
"      0.000    Default(0) or user spec.(1) values used"
"      0.500    X-factor <= 0.5"
"      30.000    K-lag    ( seconds)"
"      0.500    Beta weighting factor"
"      25.000    Routing time step    ( seconds)"
"      1      No. of sub-reaches"
"      Peak outflow              2.140     c.m/sec"
"      0.055    2.140    2.140    0.000 c.m/sec"
40    HYDROGRAPH Combine 999"
"      6      Combine "
"      999    Node #"
"      flows meeting from external areas"
"      Maximum flow              2.852     c.m/sec"
"      Hydrograph volume          44234.820    c.m"
"      0.055    2.140    2.140    2.852"
40    HYDROGRAPH Confluence 999"
"      7      Confluence "
"      999    Node #"
"      flows meeting from external areas"
"      Maximum flow              2.852     c.m/sec"
"      Hydrograph volume          44234.816    c.m"
"      0.055    2.852    2.140    0.000"
33    CATCHMENT 4"
"      1      Triangular SCS"
"      1      Equal length"
"      1      SCS method"
"      4      internal catchment"
"      1.800    % Impervious"
"      26.510    Total Area"
"      130.000    Flow length"
"      3.000    Overland Slope"
"      26.033    Pervious Area"
"      130.000    Pervious length"
"      3.000    Pervious slope"
"      0.477    Impervious Area"
"      130.000    Impervious length"
"      3.000    Impervious slope"
"      0.250    Pervious Manning 'n'"
"      78.000    Pervious SCS Curve No."
"      0.376    Pervious Runoff coefficient"
"      0.100    Pervious Ia/S coefficient"
"      7.164    Pervious Initial abstraction"
"      0.015    Impervious Manning 'n'"
"      98.000    Impervious SCS Curve No."
"      0.912    Impervious Runoff coefficient"
"      0.100    Impervious Ia/S coefficient"
"      0.518    Impervious Initial abstraction"
"      1.598    2.852    2.140    0.000 c.m/sec"
"      Catchment 4      Pervious      Impervious      Total Area "
"      Surface Area      26.033      0.477      26.510    hectare"
"      Time of concentration 31.052      3.633      29.911    minutes"
"      Time to Centroid  132.982      88.757     131.141    minutes"
"      Rainfall depth     60.381      60.381     60.381    mm"
"      Rainfall volume    1.5719     0.0288     1.6007    ha-m"
"      Rainfall losses    37.710      6.663      37.151    mm"
"      Runoff depth       22.672     53.719     23.231    mm"

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"      Runoff volume      5902.12      256.33      6158.46      c.m"
"      Runoff coefficient  0.376      0.912      0.385      "
"      Maximum flow       1.570      0.201      1.598      c.m/sec"
" 40    HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"           1.598      3.336      2.140      0.000"
" 52    CHANNEL DESIGN"
"      3.336      Current peak flow      c.m/sec"
"      0.022      Manning 'n'"
"      0.      Cross-section type: 0=trapezoidal; 1=general"
"      0.000      Basewidth      metre"
"      25.000      Left bank slope"
"      25.000      Right bank slope"
"      1.000      Channel depth      metre"
"      1.000      Gradient      %"
"      Depth of flow      0.317      metre"
"      Velocity      1.330      m/sec"
"      Channel capacity      71.548      c.m/sec"
"      Critical depth      0.325      metre"
" 53    ROUTE      Channel Route 50"
"      50.00      Channel Route 50 Reach length      ( metre)"
"      0.381      X-factor <= 0.5"
"      28.198      K-lag      ( seconds)"
"      0.000      Default(0) or user spec.(1) values used"
"      0.500      X-factor <= 0.5"
"      30.000      K-lag      ( seconds)"
"      0.500      Beta weighting factor"
"      33.333      Routing time step      ( seconds)"
"      1      No. of sub-reaches"
"      Peak outflow      3.336      c.m/sec"
"           1.598      3.336      3.336      0.000 c.m/sec"

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internal flow
contribution

100 Year Storm


```

"      MIDUSS Output ----->"
"      MIDUSS version                      Version 2.07 rev. 387"
"      MIDUSS created                      Friday, September 23, 2005"
"      10 Units used:                      ie METRIC"
"      Job folder:                        G:\CLIENT\1389\1\SWM\MIDUSS\Pre"
"      Output filename:                    100 yr pre-2.out"
"      Licensee name:                      lgrabowski"
"      Company"
"      Date & Time last used:              2/6/2019 at 9:12:06 AM"
" 31    TIME PARAMETERS"
"      5.000 Time Step"
"      180.000 Max. Storm length"
"      1500.000 Max. Hydrograph"
" 32    STORM Chicago storm"
"      1 Chicago storm"
"      1499.530 Coefficient A"
"      3.297 Constant B"
"      0.794 Exponent C"
"      0.380 Fraction R"
"      180.000 Duration"
"      1.000 Time step multiplier"
"      Maximum intensity                257.108 mm/hr"
"      Total depth                      71.801 mm"
"      6 100hyd Hydrograph extension used in this file"
" 33    CATCHMENT 1"
"      1 Triangular SCS"
"      1 Equal length"
"      1 SCS method"
"      1 external area 1"
"      1.040 % Impervious"
"      26.510 Total Area"
"      600.000 Flow length"
"      3.000 Overland Slope"
"      26.234 Pervious Area"
"      600.000 Pervious length"
"      3.000 Pervious slope"
"      0.276 Impervious Area"
"      600.000 Impervious length"
"      3.000 Impervious slope"
"      0.250 Pervious Manning 'n'"
"      84.000 Pervious SCS Curve No."
"      0.541 Pervious Runoff coefficient"
"      0.100 Pervious Ia/S coefficient"
"      4.838 Pervious Initial abstraction"
"      0.015 Impervious Manning 'n'"
"      98.000 Impervious SCS Curve No."
"      0.925 Impervious Runoff coefficient"
"      0.100 Impervious Ia/S coefficient"
"      0.518 Impervious Initial abstraction"
"      1.608 0.000 0.000 0.000 c.m/sec"
"      Catchment 1 Pervious Impervious Total Area "
"      Surface Area 26.234 0.276 26.510 hectare"
"      Time of concentration 57.543 8.229 56.674 minutes"
"      Time to Centroid 171.362 95.869 170.032 minutes"
"      Rainfall depth 71.801 71.801 71.801 mm"
"      Rainfall volume 1.8837 0.0198 1.9034 ha-m"
"      Rainfall losses 32.930 5.440 32.644 mm"
"      Runoff depth 38.871 66.361 39.157 mm"
"      Runoff volume 1.0198 0.0183 1.0381 ha-m"
"      Runoff coefficient 0.541 0.925 0.545 "
"      Maximum flow 1.596 0.128 1.608 c.m/sec"
" 40    HYDROGRAPH Add Runoff "
"      4 Add Runoff "
"      1.608 1.608 0.000 0.000"
" 58    CULVERT"
"      1.608 Culvert Q c.m/sec"
"      25.00 Length metre"
"      0.013 Manning 'n'"
"      244.300 Upstream IL metre"
"      244.290 Downstream IL metre"
"      247.050 Weir Elev. metre"
"      20.000 Weir Breadth. metre"
"      25.000 Weir Left slope to 1"
"      25.000 Weir Right slope to 1"
"      244.500 Tail water elevation"
"      2 Barrel Option (Pipe/Box/CSPA/HE/VE)"
"      1.000 Barrel Height/Diameter"
"      1.000 Barrel Width"
"      0.700 Cc 004 RC pipe socket inlet"
"      0.900 Ke 012 Project from fill"
"      1. Number of Barrels"

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"      38  Number of stages"
"          Level Discharge      Volume"
"      244.300      0.000      0.0"
"      244.801      0.080      24.0"
"      244.803      0.161      24.2"
"      244.806      0.241      24.5"
"      244.811      0.322      25.0"
"      244.817      0.402      25.6"
"      244.843      0.482      28.5"
"      244.901      0.563      35.5"
"      244.956      0.643      43.0"
"      245.008      0.724      50.9"
"      245.059      0.804      59.3"
"      245.108      0.884      68.2"
"      245.156      0.965      77.6"
"      245.202      1.045      87.4"
"      245.247      1.126      97.6"
"      245.291      1.206     108.3"
"      245.334      1.286     119.5"
"      245.376      1.367     131.8"
"      245.418      1.447     145.1"
"      245.459      1.528     159.5"
"      245.499      1.608     174.9"
"      245.538      1.688     191.5"
"      245.577      1.769     209.2"
"      245.615      1.849     228.0"
"      245.652      1.929     248.0"
"      245.689      2.010     269.1"
"      245.748      2.090     305.7"
"      245.826      2.171     360.1"
"      245.907      2.251     425.3"
"      246.004      2.331     514.0"
"      246.094      2.412     608.8"
"      246.224      2.492     767.8"
"      246.369      2.573     978.1"
"      246.548      2.653    1310.5"
"      246.734      2.733    1750.7"
"      247.060      2.814    2798.2"
"      247.544      2.894    5190.5"
"      248.593      2.975   14531.8"
"      1.500  Channel Basewidth"
"      1.000  Channel Depth"
"      3.500  Channel Topwidth"
"      10.000 Grade Left"
"      10.000 Grade Right"
"      1.000  Grade %"
"      300.000 Length"
"          Barrel Yo      1.000  metre"
"          Barrel Ycr      0.637  metre"
"          Exit Velocity    2.499  m/sec"
"          Barrel Peak Outflow 1.591  c.m/sec"
"          Weir Peak Flow    0.000  c.m/sec"
"          Total Peak Outflow 1.591  c.m/sec"
"          Maximum level    245.542  metre"
"          Maximum storage   171.757  c.m"
"          Centroidal lag    2.861  hours"
"          1.608      1.608      1.591      0.000 c.m/sec"
" 40  HYDROGRAPH Next link "
"      5  Next link "
"          1.608      1.591      1.591      0.000"
" 52  CHANNEL DESIGN"
"      1.591  Current peak flow  c.m/sec"
"      0.025  Manning 'n'"
"      0.      Cross-section type: 0=trapezoidal; 1=general"
"      0.000  Basewidth  metre"
"      25.000 Left bank slope"
"      25.000 Right bank slope"
"      1.000  Channel depth  metre"
"      1.000  Gradient  %"
"          Depth of flow      0.252  metre"
"          Velocity          1.004  m/sec"
"          Channel capacity   62.962  c.m/sec"
"          Critical depth     0.242  metre"
" 53  ROUTE      Channel Route 260"
"      260.00  Channel Route 260 Reach length  ( metre)"
"      0.482  X-factor <= 0.5"
"      194.198 K-lag  ( seconds)"
"      0.000  Default(0) or user spec.(1) values used"
"      0.500  X-factor <= 0.5"
"      30.000 K-lag  ( seconds)"
"      0.500  Beta weighting factor"

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"      150.000 Routing time step ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow 1.586 c.m/sec"
"      1.608 1.591 1.586 0.000 c.m/sec"
" 40 HYDROGRAPH Combine 999"
"      6 Combine "
"      999 Node #"
"      flows meeting from external areas"
"      Maximum flow 1.586 c.m/sec"
"      Hydrograph volume 10377.486 c.m"
"      1.608 1.591 1.586 1.586"
" 40 HYDROGRAPH Start - New Tributary"
"      2 Start - New Tributary"
"      1.608 0.000 1.586 1.586"
" 33 CATCHMENT 2"
"      1 Triangular SCS"
"      1 Equal length"
"      1 SCS method"
"      2 external area 2"
"      1.400 % Impervious"
"      120.880 Total Area"
"      900.000 Flow length"
"      3.000 Overland Slope"
"      119.188 Pervious Area"
"      900.000 Pervious length"
"      3.000 Pervious slope"
"      1.692 Impervious Area"
"      900.000 Impervious length"
"      3.000 Impervious slope"
"      0.250 Pervious Manning 'n'"
"      84.000 Pervious SCS Curve No."
"      0.541 Pervious Runoff coefficient"
"      0.100 Pervious Ia/S coefficient"
"      4.838 Pervious Initial abstraction"
"      0.015 Impervious Manning 'n'"
"      98.000 Impervious SCS Curve No."
"      0.925 Impervious Runoff coefficient"
"      0.100 Impervious Ia/S coefficient"
"      0.518 Impervious Initial abstraction"
"      5.948 0.000 1.586 1.586 c.m/sec"
"      Catchment 2 Pervious Impervious Total Area "
"      Surface Area 119.188 1.692 120.880 hectare"
"      Time of concentration 73.392 10.496 71.907 minutes"
"      Time to Centroid 193.543 99.288 191.317 minutes"
"      Rainfall depth 71.801 71.801 71.801 mm"
"      Rainfall volume 8.5578 0.1215 8.6793 ha-m"
"      Rainfall losses 32.928 5.585 32.545 mm"
"      Runoff depth 38.874 66.216 39.256 mm"
"      Runoff volume 4.6332 0.1121 4.7453 ha-m"
"      Runoff coefficient 0.541 0.925 0.547 "
"      Maximum flow 5.887 0.629 5.948 c.m/sec"
" 40 HYDROGRAPH Add Runoff "
"      4 Add Runoff "
"      5.948 5.948 1.586 1.586"
" 52 CHANNEL DESIGN"
"      5.948 Current peak flow c.m/sec"
"      0.022 Manning 'n'"
"      0. Cross-section type: 0=trapezoidal; 1=general"
"      5.000 Basewidth metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      0.500 Channel depth metre"
"      0.600 Gradient %"
"      Depth of flow 0.489 metre"
"      Velocity 1.882 m/sec"
"      Channel capacity 6.193 c.m/sec"
"      Critical depth 0.474 metre"
" 53 ROUTE Channel Route 350"
"      350.00 Channel Route 350 Reach length ( metre)"
"      0.435 X-factor <= 0.5"
"      139.510 K-lag ( seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"      30.000 K-lag ( seconds)"
"      0.500 Beta weighting factor"
"      150.000 Routing time step ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow 5.915 c.m/sec"
"      5.948 5.948 5.915 1.586 c.m/sec"
" 40 HYDROGRAPH Next link "
"      5 Next link "

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"          5.948      5.915      5.915      1.586"
" 58      CULVERT"
"          5.915      Culvert Q      c.m/sec"
"          19.30      Length      metre"
"          0.013      Manning 'n'"
"          242.130      Upstream IL      metre"
"          242.100      Downstream IL      metre"
"          243.610      Weir Elev.      metre"
"          20.000      Weir Breadth.      metre"
"          25.000      Weir Left slope to 1"
"          25.000      Weir Right slope to 1"
"          243.500      Tail water elevation"
"          1      Barrel Option (Pipe/Box/CSPA/HE/VE)"
"          0.900      Barrel Height/Diameter"
"          0.900      Barrel Width"
"          0.500      Cc 001 CSP thin walled projecting"
"          0.900      Ke 012 Project from fill"
"          1.      Number of Barrels"
"          39      Number of stages"
"          Level Discharge      Volume"
"          242.130      0.000      0.0"
"          243.526      0.296      1569.5"
"          243.604      0.592      1821.8"
"          243.735      0.887      2305.3"
"          243.917      1.183      3127.2"
"          244.152      1.479      4462.3"
"          244.439      1.775      6597.9"
"          244.778      2.070      9786.6"
"          245.400      2.366      17665.6"
"          246.149      2.662      30748.1"
"          246.987      2.958      50018.0"
"          247.912      3.253      77025.4"
"          248.926      3.549      113482.9"
"          250.027      3.845      161266.4"
"          251.217      4.141      222414.0"
"          252.495      4.436      299129.3"
"          253.861      4.732      393775.7"
"          255.315      5.028      508882.5"
"          256.857      5.324      647140.9"
"          258.488      5.620      811404.1"
"          260.206      5.915      1004690.9"
"          262.013      6.211      1230182.0"
"          263.908      6.507      1491221.4"
"          265.891      6.803      1791316.1"
"          267.962      7.098      2134136.3"
"          270.121      7.394      2523515.0"
"          272.369      7.690      2963442.5"
"          274.704      7.986      3458090.5"
"          277.128      8.281      4011776.0"
"          279.639      8.577      4628976.5"
"          282.239      8.873      5314347.0"
"          284.927      9.169      6072701.5"
"          287.704      9.464      6909022.0"
"          290.568      9.760      7828430.0"
"          293.520      10.056      8836225.0"
"          296.561      10.352      9937891.0"
"          299.690      10.64811139047.0"
"          302.906      10.94312445483.0"
"          306.211      11.23913863139.0"
"          5.000      Channel Basewidth"
"          0.500      Channel Depth"
"          8.000      Channel Topwidth"
"          10.000      Grade Left"
"          10.000      Grade Right"
"          0.600      Grade %"
"          350.000      Length"
"          Barrel Yo      0.900      metre"
"          Barrel Ycr      0.848      metre"
"          Exit Velocity      2.248      m/sec"
"          Barrel Peak Outflow      1.430      c.m/sec"
"          Weir Peak Flow      0.940      c.m/sec"
"          Total Peak Outflow      2.370      c.m/sec"
"          Maximum level      243.697      metre"
"          Maximum storage      17837.146      c.m"
"          Centroidal lag      4.772      hours"
"          5.948      5.915      2.370      1.586 c.m/sec"
" 40      HYDROGRAPH Next link "
"          5      Next link "
"          5.948      2.370      2.370      1.586"
" 52      CHANNEL DESIGN"
"          2.370      Current peak flow      c.m/sec"

```

```

"      0.022 Manning 'n'"
"      0.      Cross-section type: 0=trapezoidal; 1=general"
"      0.000 Basewidth      metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.200 Channel depth      metre"
"      0.290 Gradient      %"
"      Depth of flow      0.788      metre"
"      Velocity      1.271      m/sec"
"      Channel capacity      7.263      c.m/sec"
"      Critical depth      0.662      metre"
" 53      ROUTE      Channel Route 69"
"      69.00      Channel Route 69 Reach length      ( metre)"
"      0.000 X-factor <= 0.5"
"      40.726 K-lag      ( seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"      30.000 K-lag      ( seconds)"
"      0.597 Beta weighting factor"
"      100.000 Routing time step      ( seconds)"
"      1      No. of sub-reaches"
"      Peak outflow      2.370      c.m/sec"
"      5.948      2.370      2.370      1.586 c.m/sec"
" 40      HYDROGRAPH      Combine      1000"
"      6      Combine "
"      1000      Node #"
"      flows meeting east of Komoka road"
"      Maximum flow      2.370      c.m/sec"
"      Hydrograph volume      47458.480      c.m"
"      5.948      2.370      2.370      2.370"
" 40      HYDROGRAPH Start - New Tributary"
"      2      Start - New Tributary"
"      5.948      0.000      2.370      2.370"
" 33      CATCHMENT 3"
"      1      Triangular SCS"
"      1      Equal length"
"      1      SCS method"
"      3      external area 3 - east portion of komoka road"
"      45.000 % Impervious"
"      0.610 Total Area"
"      190.000 Flow length"
"      2.000 Overland Slope"
"      0.336 Pervious Area"
"      190.000 Pervious length"
"      2.000 Pervious slope"
"      0.275 Impervious Area"
"      190.000 Impervious length"
"      2.000 Impervious slope"
"      0.250 Pervious Manning 'n'"
"      75.000 Pervious SCS Curve No."
"      0.377 Pervious Runoff coefficient"
"      0.100 Pervious Ia/S coefficient"
"      8.467 Pervious Initial abstraction"
"      0.015 Impervious Manning 'n'"
"      98.000 Impervious SCS Curve No."
"      0.925 Impervious Runoff coefficient"
"      0.100 Impervious Ia/S coefficient"
"      0.518 Impervious Initial abstraction"
"      0.143      0.000      2.370      2.370 c.m/sec"
"      Catchment 3      Pervious      Impervious      Total Area "
"      Surface Area      0.336      0.275      0.610      hectare"
"      Time of concentration      39.710      4.662      16.363      minutes"
"      Time to Centroid      146.330      90.276      108.990      minutes"
"      Rainfall depth      71.801      71.801      71.801      mm"
"      Rainfall volume      240.89      197.09      437.99      c.m"
"      Rainfall losses      44.706      5.724      27.164      mm"
"      Runoff depth      27.095      66.077      44.637      mm"
"      Runoff volume      90.90      181.38      272.29      c.m"
"      Runoff coefficient      0.377      0.925      0.624      "
"      Maximum flow      0.019      0.140      0.143      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"      0.143      0.143      2.370      2.370"
" 56      DIVERSION"
"      3      Node number"
"      0.059 Overflow threshold"
"      1.000 Required diverted fraction"
"      0      Conduit type; 1=Pipe;2=Channel"
"      Peak of diverted flow      0.084      c.m/sec"
"      Volume of diverted flow      45.827      c.m"
"      DIV00003.100hyd"

```

```

"          Major flow east of komoka road"
"          0.143      0.143      0.059      2.370 c.m/sec"
40  HYDROGRAPH Next link "
"      5 Next link "
"          0.143      0.059      0.059      2.370"
52  CHANNEL DESIGN"
"      0.059 Current peak flow c.m/sec"
"      0.022 Manning 'n'"
"      0. Cross-section type: 0=trapezoidal; 1=general"
"      0.000 Basewidth metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.200 Channel depth metre"
"      0.290 Gradient %"
"      Depth of flow 0.197 metre"
"      Velocity 0.505 m/sec"
"      Channel capacity 7.263 c.m/sec"
"      Critical depth 0.151 metre"
53  ROUTE Channel Route 50"
"      50.00 Channel Route 50 Reach length ( metre)"
"      0.245 X-factor <= 0.5"
"      74.297 K-lag ( seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"      30.000 K-lag ( seconds)"
"      0.500 Beta weighting factor"
"      100.000 Routing time step ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow 0.059 c.m/sec"
"          0.143      0.059      0.059      2.370 c.m/sec"
40  HYDROGRAPH Combine 1001"
"      6 Combine "
"      1001 Node #"
"      minor flows east of komoka leaving via pipe network"
"      Maximum flow 0.059 c.m/sec"
"      Hydrograph volume 226.458 c.m"
"          0.143      0.059      0.059      0.059"
47  FILEI_0 Read/Open DIV10000.100hyd"
"      1 1=read/open; 2=write/save"
"      2 1=rainfall; 2=hydrograph"
"      1 1=runoff; 2=inflow; 3=outflow; 4=junction"
"      DIV10000.100hyd"
"      Major flow east of komoka road"
"      Total volume 45.827 c.m"
"      Maximum flow 0.084 c.m/sec"
"          0.084      0.059      0.059      0.059 c.m/sec"
40  HYDROGRAPH Start - New Tributary"
"      2 Start - New Tributary"
"          0.084      0.000      0.059      0.059"
40  HYDROGRAPH Add Runoff "
"      4 Add Runoff "
"          0.084      0.084      0.059      0.059"
52  CHANNEL DESIGN"
"      0.084 Current peak flow c.m/sec"
"      0.022 Manning 'n'"
"      0. Cross-section type: 0=trapezoidal; 1=general"
"      0.000 Basewidth metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.200 Channel depth metre"
"      0.290 Gradient %"
"      Depth of flow 0.225 metre"
"      Velocity 0.551 m/sec"
"      Channel capacity 7.263 c.m/sec"
"      Critical depth 0.174 metre"
53  ROUTE Channel Route 15"
"      15.00 Channel Route 15 Reach length ( metre)"
"      0.000 X-factor <= 0.5"
"      20.405 K-lag ( seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"      30.000 K-lag ( seconds)"
"      0.660 Beta weighting factor"
"      60.000 Routing time step ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow 0.081 c.m/sec"
"          0.084      0.084      0.081      0.059 c.m/sec"
40  HYDROGRAPH Combine 1000"
"      6 Combine "
"      1000 Node #"
"      flows meeting east of Komoka road"

```

"		Maximum flow	2.370	c.m/sec"
"		Hydrograph volume	47504.313	c.m"
"		0.084 0.084 0.081	0.081	2.370"
" 40		HYDROGRAPH Confluence	1000"	
"		7 Confluence "		
"	1000	Node #"		
"		flows meeting east of Komoka road"		
"		Maximum flow	2.370	c.m/sec"
"		Hydrograph volume	47504.313	c.m"
"		0.084 2.370 0.081	0.000"	
" 58		CULVERT"		
"	2.370	Culvert Q	c.m/sec"	
"	20.40	Length	metre"	
"	0.013	Manning 'n'"		
"	241.900	Upstream IL	metre"	
"	241.870	Downstream IL	metre"	
"	243.610	Weir Elev.	metre"	
"	20.000	Weir Breadth.	metre"	
"	116.900	Weir Left slope to 1"		
"	116.900	Weir Right slope to 1"		
"	243.200	Tail water elevation"		
"	5	Barrel Option (Pipe/Box/CSPA/HE/VE)"		
"	1.535	Barrel Height/Diameter"		
"	0.975	Barrel Width"		
"	0.500	Cc 001 CSP thin walled projecting"		
"	0.900	Ke 012 Project from fill"		
"	1.	Number of Barrels"		
"	39	Number of stages"		
"		Level Discharge	Volume"	
"	241.900	0.000	0.0"	
"	243.201	0.118	54.0"	
"	243.205	0.237	54.2"	
"	243.212	0.355	54.6"	
"	243.221	0.474	55.1"	
"	243.232	0.592	55.9"	
"	243.247	0.711	56.7"	
"	243.263	0.829	57.8"	
"	243.283	0.948	59.0"	
"	243.305	1.066	60.4"	
"	243.329	1.185	61.9"	
"	243.356	1.303	63.7"	
"	243.385	1.422	65.6"	
"	243.417	1.540	67.7"	
"	243.451	1.659	70.0"	
"	243.488	1.777	73.2"	
"	243.527	1.896	78.5"	
"	243.568	2.014	86.2"	
"	243.611	2.133	96.8"	
"	243.657	2.251	110.6"	
"	243.704	2.370	127.9"	
"	243.754	2.488	149.2"	
"	243.805	2.607	174.7"	
"	243.859	2.725	204.8"	
"	243.914	2.844	240.0"	
"	243.971	2.962	280.4"	
"	244.068	3.081	359.7"	
"	244.178	3.199	464.2"	
"	244.292	3.318	589.5"	
"	244.410	3.436	737.5"	
"	244.532	3.555	910.2"	
"	244.659	3.673	1109.5"	
"	244.789	3.792	1337.7"	
"	244.924	3.910	1596.7"	
"	245.063	4.029	1888.9"	
"	245.205	4.147	2216.4"	
"	245.353	4.266	2581.8"	
"	245.504	4.384	2987.4"	
"	245.659	4.503	3435.7"	
"	1.463	Channel Basewidth"		
"	1.535	Channel Depth"		
"	4.533	Channel Topwidth"		
"	44.191	Grade Left"		
"	44.191	Grade Right"		
"	0.290	Grade %"		
"	15.000	Length"		
"		Barrel Yo	1.535	metre"
"		Barrel Ycr	0.999	metre"
"		Exit Velocity	2.190	m/sec"
"		Barrel Peak Outflow	2.370	c.m/sec"
"		Weir Peak Flow	0.000	c.m/sec"
"		Total Peak Outflow	2.370	c.m/sec"

"	Maximum level	243.610	metre"
"	Maximum storage	127.889	c.m"
"	Centroidal lag	4.796	hours"
"	0.084 2.370 2.370 0.000 c.m/sec"		
" 40	HYDROGRAPH Next link "		
"	5 Next link "		
"	0.084 2.370 2.370 0.000"		
" 52	CHANNEL DESIGN"		
"	2.370 Current peak flow c.m/sec"		
"	0.022 Manning 'n'"		
"	0. Cross-section type: 0=trapezoidal; 1=general"		
"	0.000 Basewidth metre"		
"	25.000 Left bank slope"		
"	25.000 Right bank slope"		
"	1.000 Channel depth metre"		
"	1.000 Gradient %"		
"	Depth of flow 0.279 metre"		
"	Velocity 1.221 m/sec"		
"	Channel capacity 71.548 c.m/sec"		
"	Critical depth 0.284 metre"		
" 53	ROUTE Channel Route 30"		
"	30.00 Channel Route 30 Reach length (metre)"		
"	0.326 X-factor <= 0.5"		
"	18.428 K-lag (seconds)"		
"	0.000 Default(0) or user spec.(1) values used"		
"	0.500 X-factor <= 0.5"		
"	30.000 K-lag (seconds)"		
"	0.500 Beta weighting factor"		
"	23.077 Routing time step (seconds)"		
"	1 No. of sub-reaches"		
"	Peak outflow 2.370 c.m/sec"		
"	0.084 2.370 2.370 0.000 c.m/sec"		
" 40	HYDROGRAPH Combine 999"		
"	6 Combine "		
"	999 Node #"		
"	flows meeting from external areas"		
"	Maximum flow 3.498 c.m/sec"		
"	Hydrograph volume 57900.734 c.m"		
"	0.084 2.370 2.370 3.498"		
" 40	HYDROGRAPH Confluence 999"		
"	7 Confluence "		
"	999 Node #"		
"	flows meeting from external areas"		
"	Maximum flow 3.498 c.m/sec"		
"	Hydrograph volume 57900.738 c.m"		
"	0.084 3.498 2.370 0.000"		
" 33	CATCHMENT 4"		
"	1 Triangular SCS"		
"	1 Equal length"		
"	1 SCS method"		
"	4 internal catchment"		
"	1.800 % Impervious"		
"	26.510 Total Area"		
"	130.000 Flow length"		
"	3.000 Overland Slope"		
"	26.033 Pervious Area"		
"	130.000 Pervious length"		
"	3.000 Pervious slope"		
"	0.477 Impervious Area"		
"	130.000 Impervious length"		
"	3.000 Impervious slope"		
"	0.250 Pervious Manning 'n'"		
"	78.000 Pervious SCS Curve No."		
"	0.427 Pervious Runoff coefficient"		
"	0.100 Pervious Ia/S coefficient"		
"	7.164 Pervious Initial abstraction"		
"	0.015 Impervious Manning 'n'"		
"	98.000 Impervious SCS Curve No."		
"	0.925 Impervious Runoff coefficient"		
"	0.100 Impervious Ia/S coefficient"		
"	0.518 Impervious Initial abstraction"		
"	2.316 3.498 2.370 0.000 c.m/sec"		
"	Catchment 4 Pervious Impervious Total Area "		
"	Surface Area 26.033 0.477 26.510 hectare"		
"	Time of concentration 26.145 3.287 25.287 minutes"		
"	Time to Centroid 128.136 88.229 126.639 minutes"		
"	Rainfall depth 71.801 71.801 71.801 mm"		
"	Rainfall volume 1.8692 0.0343 1.9034 ha-m"		
"	Rainfall losses 41.163 6.669 40.542 mm"		
"	Runoff depth 30.638 65.132 31.259 mm"		
"	Runoff volume 7975.88 310.80 8286.67 c.m"		

```

"      Runoff coefficient      0.427      0.925      0.436      "
"      Maximum flow           2.272      0.243      2.316      c.m/sec"
" 40  HYDROGRAPH Add Runoff "
"      4  Add Runoff "
"      2.316      4.432      2.370      0.000"
" 52  CHANNEL DESIGN"
"      4.432  Current peak flow   c.m/sec"
"      0.022  Manning 'n'"
"      0.      Cross-section type: 0=trapezoidal; 1=general"
"      0.000  Basewidth   metre"
"      25.000 Left bank slope"
"      25.000 Right bank slope"
"      1.000  Channel depth  metre"
"      1.000  Gradient   %"
"      Depth of flow           0.352      metre"
"      Velocity                1.428      m/sec"
"      Channel capacity        71.548      c.m/sec"
"      Critical depth          0.364      metre"
" 53  ROUTE   Channel Route 50"
"      50.00  Channel Route 50 Reach length  ( metre)"
"      0.368  X-factor <= 0.5"
"      26.265 K-lag  ( seconds)"
"      0.000  Default(0) or user spec.(1) values used"
"      0.500  X-factor <= 0.5"
"      30.000 K-lag  ( seconds)"
"      0.500  Beta weighting factor"
"      30.000 Routing time step  ( seconds)"
"      1      No. of sub-reaches"
"      Peak outflow           4.430      c.m/sec"
"      2.316      4.432      4.430      0.000 c.m/sec"

```

internal flow
contribution

250 Year Storm

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.07 rev. 387"
"          MIDUSS created                      Friday, September 23, 2005"
"          10 Units used:                      ie METRIC"
"          Job folder:                        G:\CLIENT\1389\1\SWM\MIDUSS\Pre"
"          Output filename:                    250 yr pre.out"
"          Licensee name:                     lgrabowski"
"          Company"
"          Date & Time last used:              2/14/2019 at 3:41:41 PM"
" 31      TIME PARAMETERS"
"          5.000 Time Step"
"          180.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1 Chicago storm"
"          3048.220 Coefficient A"
"          10.030 Constant B"
"          0.888 Exponent C"
"          0.380 Fraction R"
"          180.000 Duration"
"          1.000 Time step multiplier"
"          Maximum intensity                254.614 mm/hr"
"          Total depth                      86.611 mm"
"          6 250hyd Hydrograph extension used in this file"
" 33      CATCHMENT 1"
"          1 Triangular SCS"
"          1 Equal length"
"          1 SCS method"
"          1 external area 1"
"          1.040 % Impervious"
"          26.510 Total Area"
"          600.000 Flow length"
"          3.000 Overland Slope"
"          26.234 Pervious Area"
"          600.000 Pervious length"
"          3.000 Pervious slope"
"          0.276 Impervious Area"
"          600.000 Impervious length"
"          3.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          84.000 Pervious SCS Curve No."
"          0.593 Pervious Runoff coefficient"
"          0.100 Pervious Ia/S coefficient"
"          4.838 Pervious Initial abstraction"
"          0.015 Impervious Manning 'n'"
"          98.000 Impervious SCS Curve No."
"          0.938 Impervious Runoff coefficient"
"          0.100 Impervious Ia/S coefficient"
"          0.518 Impervious Initial abstraction"
"          2.410 0.000 0.000 0.000 c.m/sec"
"          Catchment 1 Pervious Impervious Total Area "
"          Surface Area 26.234 0.276 26.510 hectare"
"          Time of concentration 55.297 8.233 54.532 minutes"
"          Time to Centroid 159.879 93.599 158.801 minutes"
"          Rainfall depth 86.611 86.611 86.611 mm"
"          Rainfall volume 2.2722 0.0239 2.2961 ha-m"
"          Rainfall losses 35.242 5.784 34.935 mm"
"          Runoff depth 51.370 80.827 51.676 mm"
"          Runoff volume 1.3476 0.0223 1.3699 ha-m"
"          Runoff coefficient 0.593 0.938 0.597 "
"          Maximum flow 2.393 0.146 2.410 c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4 Add Runoff "
"          2.410 2.410 0.000 0.000"
" 58      CULVERT"
"          2.410 Culvert Q c.m/sec"
"          25.00 Length metre"
"          0.013 Manning 'n'"
"          244.300 Upstream IL metre"
"          244.290 Downstream IL metre"
"          247.050 Weir Elev. metre"
"          20.000 Weir Breadth. metre"
"          25.000 Weir Left slope to 1"
"          25.000 Weir Right slope to 1"
"          244.500 Tail water elevation"
"          2 Barrel Option (Pipe/Box/CSPA/HE/VE)"
"          1.000 Barrel Height/Diameter"
"          1.000 Barrel Width"
"          0.700 Cc 004 RC pipe socket inlet"
"          0.900 Ke 012 Project from fill"
"          1. Number of Barrels"

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"      25  Number of stages"
"          Level Discharge      Volume"
"          244.300      0.000      0.0"
"          244.802      0.121      24.0"
"          244.806      0.241      24.5"
"          244.814      0.362      25.3"
"          244.843      0.482      28.5"
"          244.928      0.603      39.1"
"          245.008      0.723      50.9"
"          245.083      0.844      63.7"
"          245.155      0.964      77.5"
"          245.224      1.085      92.3"
"          245.291      1.205     108.2"
"          245.355      1.326     125.4"
"          245.417      1.446     144.9"
"          245.478      1.567     166.9"
"          245.537      1.687     191.2"
"          245.595      1.808     218.1"
"          245.652      1.928     247.6"
"          245.711      2.049     281.9"
"          245.824      2.169     359.2"
"          245.944      2.290     457.2"
"          246.092      2.410     606.6"
"          246.296      2.531     867.4"
"          246.543      2.651    1300.1"
"          246.891      2.772    2207.8"
"          247.528      2.892    5095.7"
"      1.500  Channel Basewidth"
"      1.000  Channel Depth"
"      3.500  Channel Topwidth"
"     10.000  Grade Left"
"     10.000  Grade Right"
"      1.000  Grade %"
"    300.000  Length"
"          Barrel Yo      1.000  metre"
"          Barrel Ycr      0.840  metre"
"          Exit Velocity    2.870  m/sec"
"          Barrel Peak Outflow 2.410  c.m/sec"
"          Weir Peak Flow    0.000  c.m/sec"
"          Total Peak Outflow 2.410  c.m/sec"
"          Maximum level    246.092  metre"
"          Maximum storage   440.396  c.m"
"          Centroidal lag    2.682  hours"
"          2.410      2.410      2.410      0.000 c.m/sec"
"  40  HYDROGRAPH Next link "
"      5  Next link "
"          2.410      2.269      2.410      0.000"
"  52  CHANNEL DESIGN"
"      2.269  Current peak flow  c.m/sec"
"      0.025  Manning 'n'"
"      0.  Cross-section type: 0=trapezoidal; 1=general"
"      0.000  Basewidth  metre"
"     25.000  Left bank slope"
"     25.000  Right bank slope"
"      1.000  Channel depth  metre"
"      1.000  Gradient  %"
"          Depth of flow      0.288  metre"
"          Velocity            1.097  m/sec"
"          Channel capacity    62.962  c.m/sec"
"          Critical depth      0.279  metre"
"  53  ROUTE Channel Route 260"
"      260.00  Channel Route 260 Reach length  ( metre)"
"      0.479  X-factor <= 0.5"
"     177.707  K-lag  ( seconds)"
"      0.000  Default(0) or user spec.(1) values used"
"      0.500  X-factor <= 0.5"
"     30.000  K-lag  ( seconds)"
"      0.500  Beta weighting factor"
"     150.000  Routing time step  ( seconds)"
"      1  No. of sub-reaches"
"          Peak outflow      2.268  c.m/sec"
"          2.410      2.269      2.268      0.000 c.m/sec"
"  40  HYDROGRAPH Combine 999"
"      6  Combine "
"     999  Node #"
"          flows meeting from external areas"
"          Maximum flow      2.268  c.m/sec"
"          Hydrograph volume  13699.592  c.m"
"          2.410      2.269      2.268      2.268"
"  40  HYDROGRAPH Start - New Tributary"
"      2  Start - New Tributary"

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```

"          2.410      0.000      2.268      2.268"
" 33      CATCHMENT 2"
"          1      Triangular SCS"
"          1      Equal length"
"          1      SCS method"
"          2      external area 2"
"          1.400      % Impervious"
"          120.880      Total Area"
"          900.000      Flow length"
"          3.000      Overland Slope"
"          119.188      Pervious Area"
"          900.000      Pervious length"
"          3.000      Pervious slope"
"          1.692      Impervious Area"
"          900.000      Impervious length"
"          3.000      Impervious slope"
"          0.250      Pervious Manning 'n'"
"          84.000      Pervious SCS Curve No."
"          0.593      Pervious Runoff coefficient"
"          0.100      Pervious Ia/S coefficient"
"          4.838      Pervious Initial abstraction"
"          0.015      Impervious Manning 'n'"
"          98.000      Impervious SCS Curve No."
"          0.938      Impervious Runoff coefficient"
"          0.100      Impervious Ia/S coefficient"
"          0.518      Impervious Initial abstraction"
"          8.932      0.000      2.268      2.268 c.m/sec"
"          Catchment 2      Pervious      Impervious      Total Area      "
"          Surface Area      119.188      1.692      120.880      hectare"
"          Time of concentration      70.527      10.501      69.216      minutes"
"          Time to Centroid      179.556      96.727      177.745      minutes"
"          Rainfall depth      86.611      86.611      86.611      mm"
"          Rainfall volume      10.3230      0.1466      10.4695      ha-m"
"          Rainfall losses      35.241      5.768      34.828      mm"
"          Runoff depth      51.370      80.844      51.783      mm"
"          Runoff volume      6.1227      0.1368      6.2595      ha-m"
"          Runoff coefficient      0.593      0.938      0.598      "
"          Maximum flow      8.852      0.780      8.932      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4      Add Runoff "
"          8.932      8.932      2.268      2.268"
" 52      CHANNEL DESIGN"
"          8.932      Current peak flow      c.m/sec"
"          0.022      Manning 'n'"
"          0.      Cross-section type: 0=trapezoidal; 1=general"
"          5.000      Basewidth      metre"
"          3.000      Left bank slope"
"          3.000      Right bank slope"
"          0.700      Channel depth      metre"
"          0.600      Gradient      %"
"          Depth of flow      0.612      metre"
"          Velocity      2.134      m/sec"
"          Channel capacity      11.420      c.m/sec"
"          Critical depth      0.605      metre"
" 53      ROUTE      Channel Route 350"
"          350.00      Channel Route 350 Reach length      ( metre)"
"          0.420      X-factor <= 0.5"
"          123.019      K-lag ( seconds)"
"          0.000      Default(0) or user spec.(1) values used"
"          0.500      X-factor <= 0.5"
"          30.000      K-lag ( seconds)"
"          0.500      Beta weighting factor"
"          100.000      Routing time step ( seconds)"
"          1      No. of sub-reaches"
"          Peak outflow      8.859      c.m/sec"
"          8.932      8.932      8.859      2.268 c.m/sec"
" 40      HYDROGRAPH Next link "
"          5      Next link "
"          8.932      8.859      8.859      2.268"
" 58      CULVERT"
"          8.859      Culvert Q      c.m/sec"
"          19.30      Length      metre"
"          0.013      Manning 'n'"
"          242.130      Upstream IL      metre"
"          242.100      Downstream IL      metre"
"          243.610      Weir Elev.      metre"
"          20.000      Weir Breadth.      metre"
"          25.000      Weir Left slope to 1"
"          25.000      Weir Right slope to 1"
"          243.500      Tail water elevation"
"          1      Barrel Option (Pipe/Box/CSPA/HE/VE)"

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"      0.900 Barrel Height/Diameter"
"      0.900 Barrel Width"
"      0.500 Cc 001 CSP thin walled projecting"
"      0.900 Ke 012 Project from fill"
"      1. Number of Barrels"
"      39 Number of stages"
"      Level Discharge Volume"
"      242.130 0.000 0.0"
"      243.559 0.443 1535.3"
"      243.734 0.886 2083.7"
"      244.026 1.329 3317.7"
"      244.436 1.772 5871.1"
"      245.051 2.215 11668.1"
"      246.138 2.658 28215.1"
"      247.423 3.101 58437.3"
"      248.905 3.544 107667.7"
"      250.585 3.986 182060.0"
"      252.463 4.429 288589.2"
"      254.539 4.872 435048.2"
"      256.812 5.315 630053.0"
"      259.283 5.758 883042.4"
"      261.951 6.201 1204266.4"
"      264.817 6.644 1604804.1"
"      267.881 7.087 2096558.0"
"      271.142 7.530 2692235.8"
"      274.602 7.973 3405386.5"
"      278.258 8.416 4250363.5"
"      282.113 8.859 5242338.0"
"      286.165 9.302 6397324.5"
"      290.415 9.745 7732136.0"
"      294.862 10.188 9264413.0"
"      299.507 10.63111012616.0"
"      304.350 11.07312996026.0"
"      309.391 11.51615234761.0"
"      314.629 11.95917749712.0"
"      320.064 12.40220562626.0"
"      325.698 12.84523696110.0"
"      331.529 13.28827173516.0"
"      337.558 13.73131019014.0"
"      343.784 14.17435257704.0"
"      350.208 14.61739915388.0"
"      356.830 15.06045018740.0"
"      363.649 15.50350595220.0"
"      370.667 15.94656673208.0"
"      377.881 16.38963281728.0"
"      385.294 16.83270450808.0"
"      5.000 Channel Basewidth"
"      0.700 Channel Depth"
"      9.200 Channel Topwidth"
"      10.000 Grade Left"
"      10.000 Grade Right"
"      0.600 Grade %"
"      350.000 Length"
"      Barrel Yo 0.900 metre"
"      Barrel Ycr 0.867 metre"
"      Exit Velocity 2.248 m/sec"
"      Barrel Peak Outflow 1.430 c.m/sec"
"      Weir Peak Flow 1.251 c.m/sec"
"      Total Peak Outflow 2.680 c.m/sec"
"      Maximum level 243.714 metre"
"      Maximum storage 29770.400 c.m"
"      Centroidal lag 5.135 hours"
"      8.932 8.859 2.680 2.268 c.m/sec"
" 40 HYDROGRAPH Next link "
"      5 Next link "
"      8.932 2.680 2.680 2.268"
" 52 CHANNEL DESIGN"
"      2.680 Current peak flow c.m/sec"
"      0.022 Manning 'n'"
"      0. Cross-section type: 0=trapezoidal; 1=general"
"      0.000 Basewidth metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.200 Channel depth metre"
"      0.290 Gradient %"
"      Depth of flow 0.826 metre"
"      Velocity 1.310 m/sec"
"      Channel capacity 7.263 c.m/sec"
"      Critical depth 0.695 metre"
" 53 ROUTE Channel Route 69"
"      69.00 Channel Route 69 Reach length ( metre)"

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"      0.000 X-factor <= 0.5"
"      39.494 K-lag ( seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"      30.000 K-lag ( seconds)"
"      0.608 Beta weighting factor"
"      100.000 Routing time step ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow 2.680 c.m/sec"
"      8.932 2.680 2.680 2.268 c.m/sec"
" 40 HYDROGRAPH Combine 1000"
"      6 Combine "
"      1000 Node #"
"      flows meeting east of Komoka road"
"      Maximum flow 2.680 c.m/sec"
"      Hydrograph volume 62590.340 c.m"
"      8.932 2.680 2.680 2.680"
" 40 HYDROGRAPH Start - New Tributary"
"      2 Start - New Tributary"
"      8.932 0.000 2.680 2.680"
" 33 CATCHMENT 3"
"      1 Triangular SCS"
"      1 Equal length"
"      1 SCS method"
"      3 external area 3 - east portion of komoka road"
"      45.000 % Impervious"
"      0.610 Total Area"
"      190.000 Flow length"
"      2.000 Overland Slope"
"      0.336 Pervious Area"
"      190.000 Pervious length"
"      2.000 Pervious slope"
"      0.275 Impervious Area"
"      190.000 Impervious length"
"      2.000 Impervious slope"
"      0.250 Pervious Manning 'n'"
"      75.000 Pervious SCS Curve No."
"      0.433 Pervious Runoff coefficient"
"      0.100 Pervious Ia/S coefficient"
"      8.467 Pervious Initial abstraction"
"      0.015 Impervious Manning 'n'"
"      98.000 Impervious SCS Curve No."
"      0.938 Impervious Runoff coefficient"
"      0.100 Impervious Ia/S coefficient"
"      0.518 Impervious Initial abstraction"
"      0.164 0.000 2.680 2.680 c.m/sec"
"      Catchment 3 Pervious Impervious Total Area "
"      Surface Area 0.336 0.275 0.610 hectare"
"      Time of concentration 37.258 4.664 16.468 minutes"
"      Time to Centroid 136.710 88.525 105.974 minutes"
"      Rainfall depth 86.611 86.611 86.611 mm"
"      Rainfall volume 290.58 237.75 528.33 c.m"
"      Rainfall losses 49.126 5.911 29.679 mm"
"      Runoff depth 37.486 80.700 56.932 mm"
"      Runoff volume 125.76 221.52 347.29 c.m"
"      Runoff coefficient 0.433 0.938 0.660 "
"      Maximum flow 0.030 0.159 0.164 c.m/sec"
" 40 HYDROGRAPH Add Runoff "
"      4 Add Runoff "
"      0.164 0.164 2.680 2.680"
" 56 DIVERSION"
"      3 Node number"
"      0.059 Overflow threshold"
"      1.000 Required diverted fraction"
"      0 Conduit type; 1=Pipe;2=Channel"
"      Peak of diverted flow 0.105 c.m/sec"
"      Volume of diverted flow 73.065 c.m"
"      DIV00003.250hyd"
"      Major flow east of komoka road"
"      0.164 0.164 0.059 2.680 c.m/sec"
" 40 HYDROGRAPH Next link "
"      5 Next link "
"      0.164 0.059 0.059 2.680"
" 52 CHANNEL DESIGN"
"      0.059 Current peak flow c.m/sec"
"      0.022 Manning 'n'"
"      0 Cross-section type: 0=trapezoidal; 1=general"
"      0.000 Basewidth metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.200 Channel depth metre"

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"      0.290 Gradient %"
"      Depth of flow      0.197 metre"
"      Velocity           0.505 m/sec"
"      Channel capacity   7.263 c.m/sec"
"      Critical depth     0.151 metre"
" 53 ROUTE Channel Route 50"
"      50.00 Channel Route 50 Reach length ( metre)"
"      0.245 X-factor <= 0.5"
"      74.297 K-lag ( seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"      30.000 K-lag ( seconds)"
"      0.500 Beta weighting factor"
"      100.000 Routing time step ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow      0.059 c.m/sec"
"      0.164 0.059 0.059 2.680 c.m/sec"
" 40 HYDROGRAPH Combine 1001"
"      6 Combine "
"      1001 Node #"
"      minor flows east of komoka leaving via pipe network"
"      Maximum flow      0.059 c.m/sec"
"      Hydrograph volume  274.221 c.m"
"      0.164 0.059 0.059 0.059"
" 47 FILEI_0 Read/Open DIV10000.250hyd"
"      1 1=read/open; 2=write/save"
"      2 1=rainfall; 2=hydrograph"
"      1 1=runoff; 2=inflow; 3=outflow; 4=junction"
"      DIV10000.250hyd"
"      Major flow east of komoka road"
"      Total volume      73.065 c.m"
"      Maximum flow      0.105 c.m/sec"
"      0.105 0.059 0.059 0.059 c.m/sec"
" 40 HYDROGRAPH Start - New Tributary"
"      2 Start - New Tributary"
"      0.105 0.000 0.059 0.059"
" 40 HYDROGRAPH Add Runoff "
"      4 Add Runoff "
"      0.105 0.105 0.059 0.059"
" 52 CHANNEL DESIGN"
"      0.105 Current peak flow c.m/sec"
"      0.022 Manning 'n'"
"      0. Cross-section type: 0=trapezoidal; 1=general"
"      0.000 Basewidth metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.200 Channel depth metre"
"      0.290 Gradient %"
"      Depth of flow      0.245 metre"
"      Velocity           0.583 m/sec"
"      Channel capacity   7.263 c.m/sec"
"      Critical depth     0.190 metre"
" 53 ROUTE Channel Route 15"
"      15.00 Channel Route 15 Reach length ( metre)"
"      0.000 X-factor <= 0.5"
"      19.298 K-lag ( seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"      30.000 K-lag ( seconds)"
"      0.679 Beta weighting factor"
"      60.000 Routing time step ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow      0.102 c.m/sec"
"      0.105 0.105 0.102 0.059 c.m/sec"
" 40 HYDROGRAPH Combine 1000"
"      6 Combine "
"      1000 Node #"
"      flows meeting east of Komoka road"
"      Maximum flow      2.680 c.m/sec"
"      Hydrograph volume  62663.402 c.m"
"      0.105 0.105 0.102 2.680"
" 40 HYDROGRAPH Confluence 1000"
"      7 Confluence "
"      1000 Node #"
"      flows meeting east of Komoka road"
"      Maximum flow      2.680 c.m/sec"
"      Hydrograph volume  62663.402 c.m"
"      0.105 2.680 0.102 0.000"
" 58 CULVERT"
"      2.680 Culvert Q c.m/sec"
"      20.40 Length metre"

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"      0.013 Manning 'n'"
"      241.900 Upstream IL      metre"
"      241.870 Downstream IL    metre"
"      243.610 Weir Elev.      metre"
"      20.000 Weir Breadth.    metre"
"      116.900 Weir Left slope to 1"
"      116.900 Weir Right slope to 1"
"      243.200 Tail water elevation"
"      5 Barrel Option (Pipe/Box/CSPA/HE/VE)"
"      1.535 Barrel Height/Diameter"
"      0.975 Barrel Width"
"      0.500 Cc 001 CSP thin walled projecting"
"      0.900 Ke 012 Project from fill"
"      1. Number of Barrels"
"      39 Number of stages"
"      Level Discharge Volume"
"      241.900 0.000 0.0"
"      243.202 0.134 54.0"
"      243.207 0.268 54.3"
"      243.215 0.402 54.8"
"      243.227 0.536 55.5"
"      243.241 0.670 56.4"
"      243.260 0.804 57.5"
"      243.281 0.938 58.9"
"      243.306 1.072 60.4"
"      243.334 1.206 62.2"
"      243.365 1.340 64.2"
"      243.399 1.474 66.5"
"      243.436 1.608 69.0"
"      243.477 1.742 72.1"
"      243.520 1.876 77.4"
"      243.566 2.010 85.9"
"      243.616 2.144 98.0"
"      243.667 2.278 114.2"
"      243.722 2.412 135.1"
"      243.779 2.546 161.1"
"      243.838 2.680 192.8"
"      243.900 2.814 230.8"
"      243.964 2.948 275.4"
"      244.070 3.082 361.0"
"      244.194 3.217 481.0"
"      244.324 3.351 627.9"
"      244.459 3.485 804.6"
"      244.600 3.619 1013.9"
"      244.745 3.753 1258.8"
"      244.896 3.887 1542.3"
"      245.053 4.021 1867.6"
"      245.214 4.155 2238.0"
"      245.381 4.289 2656.9"
"      245.554 4.423 3127.8"
"      245.731 4.557 3654.5"
"      245.914 4.691 4240.5"
"      246.102 4.825 4889.9"
"      246.296 4.959 5606.4"
"      246.495 5.093 6394.2"
"      1.463 Channel Basewidth"
"      1.535 Channel Depth"
"      4.533 Channel Topwidth"
"      44.191 Grade Left"
"      44.191 Grade Right"
"      0.290 Grade %"
"      15.000 Length"
"      Barrel Yo      1.535 metre"
"      Barrel Ycr      1.064 metre"
"      Exit Velocity    2.335 m/sec"
"      Barrel Peak Outflow 2.527 c.m/sec"
"      Weir Peak Flow    0.153 c.m/sec"
"      Total Peak Outflow 2.680 c.m/sec"
"      Maximum level    243.635 metre"
"      Maximum storage    192.781 c.m"
"      Centroidal lag    5.158 hours"
"      0.105 2.680 2.680 0.000 c.m/sec"
40 HYDROGRAPH Next link "
"      5 Next link "
"      0.105 2.680 2.680 0.000"
52 CHANNEL DESIGN"
"      2.680 Current peak flow c.m/sec"
"      0.022 Manning 'n'"
"      0. Cross-section type: 0=trapezoidal; 1=general"
"      0.000 Basewidth metre"
"      25.000 Left bank slope"

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"      25.000 Right bank slope"
"      1.000 Channel depth      metre"
"      1.000 Gradient      %"
"      Depth of flow      0.292      metre"
"      Velocity      1.259      m/sec"
"      Channel capacity      71.548      c.m/sec"
"      Critical depth      0.298      metre"
" 53      ROUTE      Channel Route 30"
"      30.00      Channel Route 30 Reach length      ( metre)"
"      0.318      X-factor <= 0.5"
"      17.871      K-lag      ( seconds)"
"      0.000      Default(0) or user spec.(1) values used"
"      0.500      X-factor <= 0.5"
"      30.000      K-lag      ( seconds)"
"      0.500      Beta weighting factor"
"      23.077      Routing time step      ( seconds)"
"      1      No. of sub-reaches"
"      Peak outflow      2.680      c.m/sec"
"      0.105      2.680      2.680      0.000 c.m/sec"
" 40      HYDROGRAPH      Combine      999"
"      6      Combine "
"      999      Node #"
"      flows meeting from external areas"
"      Maximum flow      4.528      c.m/sec"
"      Hydrograph volume      76383.648      c.m"
"      0.105      2.680      4.528"
" 40      HYDROGRAPH      Confluence      999"
"      7      Confluence "
"      999      Node #"
"      flows meeting from external areas"
"      Maximum flow      4.528      c.m/sec"
"      Hydrograph volume      76383.648      c.m"
"      0.105      4.528      2.680      0.000"
" 33      CATCHMENT 4"
"      1      Triangular SCS"
"      1      Equal length"
"      1      SCS method"
"      4      internal catchment"
"      1.800      % Impervious"
"      26.510      Total Area"
"      130.000      Flow length"
"      3.000      Overland Slope"
"      26.033      Pervious Area"
"      130.000      Pervious length"
"      3.000      Pervious slope"
"      0.477      Impervious Area"
"      130.000      Impervious length"
"      3.000      Impervious slope"
"      0.250      Pervious Manning 'n'"
"      78.000      Pervious SCS Curve No."
"      0.482      Pervious Runoff coefficient"
"      0.100      Pervious Ia/S coefficient"
"      7.164      Pervious Initial abstraction"
"      0.015      Impervious Manning 'n'"
"      98.000      Impervious SCS Curve No."
"      0.938      Impervious Runoff coefficient"
"      0.100      Impervious Ia/S coefficient"
"      0.518      Impervious Initial abstraction"
"      3.612      4.528      2.680      0.000 c.m/sec"
"      Catchment 4      Pervious      Impervious      Total Area "
"      Surface Area      26.033      0.477      26.510      hectare"
"      Time of concentration      24.737      3.289      24.015      minutes"
"      Time to Centroid      121.109      86.589      119.945      minutes"
"      Rainfall depth      86.611      86.611      86.611      mm"
"      Rainfall volume      2.2547      0.0413      2.2961      ha-m"
"      Rainfall losses      44.899      7.237      44.222      mm"
"      Runoff depth      41.712      79.374      42.390      mm"
"      Runoff volume      1.0859      0.0379      1.1237      ha-m"
"      Runoff coefficient      0.482      0.938      0.491      "
"      Maximum flow      3.548      0.274      3.612      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"      3.612      6.267      2.680      0.000"
" 52      CHANNEL DESIGN"
"      6.267      Current peak flow      c.m/sec"
"      0.022      Manning 'n'"
"      0.      Cross-section type: 0=trapezoidal; 1=general"
"      0.000      Basewidth      metre"
"      25.000      Left bank slope"
"      25.000      Right bank slope"
"      1.000      Channel depth      metre"

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internal flow
contribution

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"      1.000 Gradient %"
"      Depth of flow      0.401 metre"
"      Velocity          1.557 m/sec"
"      Channel capacity   71.548 c.m/sec"
"      Critical depth     0.418 metre"
" 53    ROUTE Channel Route 50"
"      50.00 Channel Route 50 Reach length ( metre)"
"      0.350 X-factor <= 0.5"
"      24.086 K-lag ( seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"      30.000 K-lag ( seconds)"
"      0.500 Beta weighting factor"
"      30.000 Routing time step ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow      6.267 c.m/sec"
"      3.612 6.267 6.267 0.000 c.m/sec"

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APPENDIX C

Stormwater Management Post Development Model

SWM POND STORAGE DATA

Elevation (m)	Area (m ²)	Storage		Pipe Outlet Discharge			Description
		Storage Increment (m ³)	Total Storage (m ³)	150mm Ø (m ³ /s)	450mm Ø (m ³ /s)	Combined (m ³ /s)	
Forebay (Dead Storage)							
238.70	231	0	0				
240.00	1010	806	806				
Permanent Pool (Dead Storage)							
238.70	1047	0	0				
240.00	2054	2016	2016				
240.00	-	-	2822				Top of Permanent Pool
Extended Detention and Attenuation (Active Storage)							
240.00	3152	0	0	0.000	0.000	0.000	Bottom of Extended Detention
240.20	3608	675.5	675.5	0.015	0.000	0.015	
240.40	3874	749.7	1425.3	0.022	0.000	0.022	
240.60	4132	800.5	2225.8	0.028	0.000	0.028	
240.80	4399	853.0	3078.8	0.033	0.000	0.033	
241.00	4673	907.1	3985.9	0.037	0.076	0.113	
241.20	4956	962.8	4948.7	0.041	0.081	0.122	
241.40	5247	1020.2	5969.0	0.044	0.270	0.314	
241.60	5547	1079.3	7048.2	0.047	0.373	0.420	
241.80	5854	1140.0	8188.2	0.050	0.454	0.504	
242.00	6170	1202.3	9390.6	0.053	0.522	0.575	
242.20	6494	1266.3	10656.9	0.055	0.582	0.637	Overflow location
242.30	6675	657.7	11314.6	0.057	0.610	0.666	

SWM POND FOREBAY REQUIREMENTS

- 1) Settling Length: Length required to settle 150um size particles

$$\text{Distance} = \sqrt{\frac{rQ_p}{V_s}} \quad \text{where} \quad \begin{array}{ll} r = 4.9 : 1 & \text{Length to width ratio of forebay} \\ Q_p = 0.033 & \text{Peak outflow from extended detention zone} \\ V_s = 0.0003 \text{ m/s} & \text{Settling velocity} \end{array}$$

$$\text{Distance} = 23.2 \text{ m}$$

- 2) Dispersion Length: Length required for dispersion of incoming fluid jet

$$\text{Distance} = \frac{8Q}{dV_f} \quad \text{where} \quad \begin{array}{ll} Q = 1.64 \text{ m}^3/\text{s} & \text{for 2 year storm event} \\ d = 1.30 \text{ m} & \text{Depth of permanent pool in forebay} \\ V_f = 0.5 \text{ m/s} & \text{Desired velocity in forebay} \end{array}$$

$$\text{Distance} = 20.18 \text{ m}$$

FOREBAY LENGTH PROVIDED = 34 m at bottom elevation from inlet to forebay bottom

- 3) Bottom Width: Minimum forebay bottom width

$$\text{Width} = \frac{\text{Dist.}}{8}$$

$$\text{Width} = \frac{34}{8}$$

$$\text{Width} = 4.25 \text{ m}$$

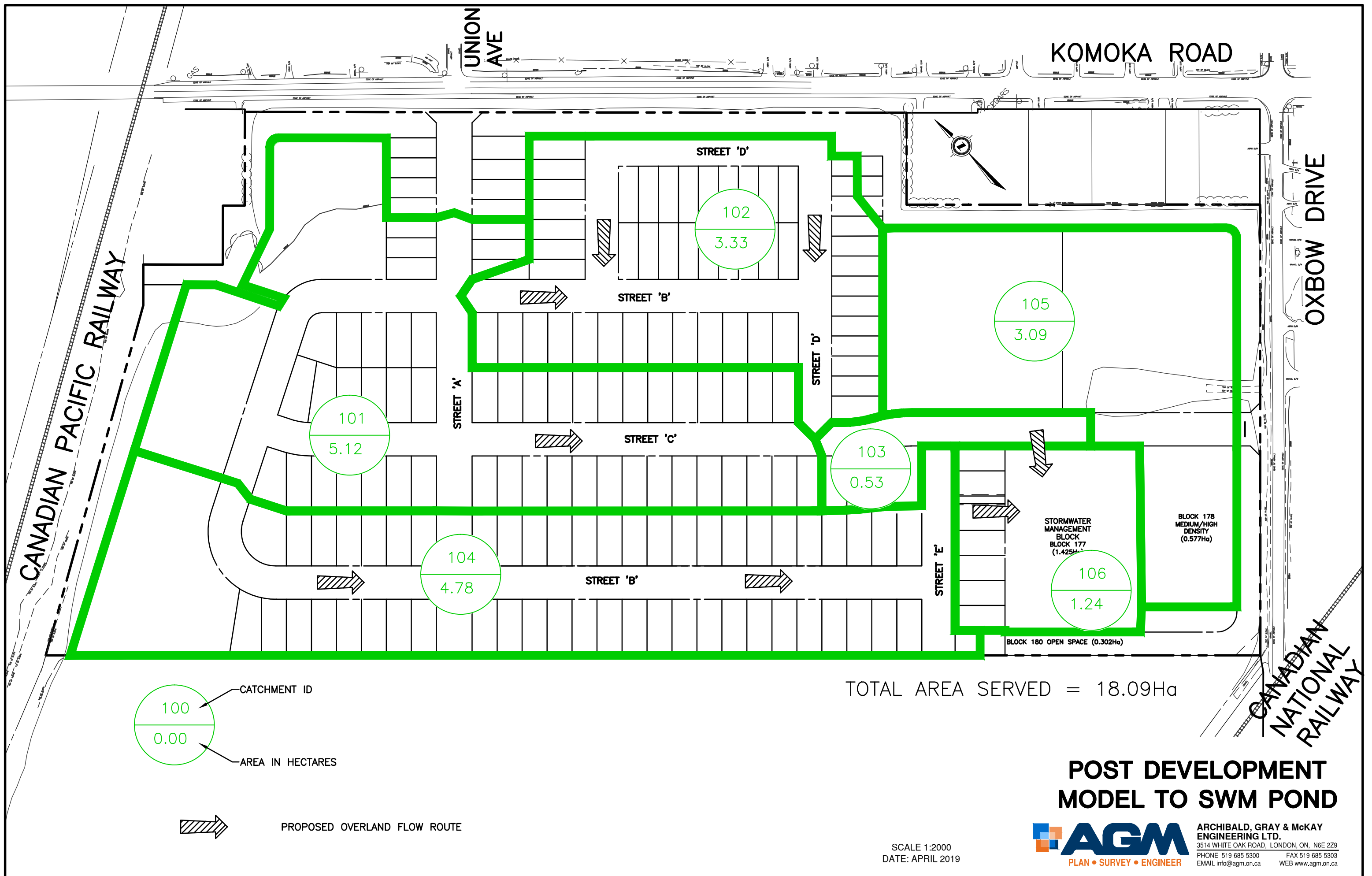
AVERAGE FOREBAY WIDTH PROVIDED = 7 m at bottom elevation

- 4) Maximum Area: Surface area of the forebay should not exceed 1/3 of the total permanent pool

$$A_{\text{forebay}} = 1010 \text{ m}^2 \quad \text{at top elevation}$$

$$A_{\text{perm.pool}} = 3063 \text{ m}^2 \quad \text{at top elevation}$$

$$A_{\text{forebay}} < \frac{1}{3} A_{\text{perm.pool}}$$



Internal Flows to Pond

2 Year Storm

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.07 rev. 387"
"          MIDUSS created                      Friday, September 23, 2005"
"          10 Units used:                      ie METRIC"
"          Job folder:                        G:\CLIENT\1389\1\SWM\MIDUSS\
"          november 2018-all external areas diverted through channel"
"          Output filename:                    2 year post phase 1 - final-1.out"
"          Licensee name:                      lgrabowski"
"          Company
"          Date & Time last used:              2/19/2019 at 10:53:25 AM"
" 31      TIME PARAMETERS"
"          5.000 Time Step"
"          180.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1 Chicago storm"
"          724.690 Coefficient A"
"          5.500 Constant B"
"          0.800 Exponent C"
"          0.380 Fraction R"
"          180.000 Duration"
"          1.000 Time step multiplier"
"          Maximum intensity                  101.773 mm/hr"
"          Total depth                        33.312 mm"
"          4 2hyd Hydrograph extension used in this file"
" 33      CATCHMENT 101"
"          1 Triangular SCS"
"          3 Specify values"
"          1 SCS method"
"          101 No description"
"          59.000 % Impervious"
"          5.120 Total Area"
"          45.500 Flow length"
"          2.000 Overland Slope"
"          2.099 Pervious Area"
"          45.500 Pervious length"
"          2.000 Pervious slope"
"          3.021 Impervious Area"
"          4.000 Impervious length"
"          2.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          78.000 Pervious SCS Curve No."
"          0.210 Pervious Runoff coefficient"
"          0.100 Pervious Ia/S coefficient"
"          7.164 Pervious Initial abstraction"
"          0.015 Impervious Manning 'n'"
"          98.000 Impervious SCS Curve No."
"          0.850 Impervious Runoff coefficient"
"          0.100 Impervious Ia/S coefficient"
"          0.518 Impervious Initial abstraction"
"          0.656 0.000 0.000 0.000 c.m/sec"
"          Catchment 101 Pervious Impervious Total Area "
"          Surface Area 2.099 3.021 5.120 hectare"
"          Time of concentration 32.497 0.687 5.612 minutes"
"          Time to Centroid 138.732 87.060 95.061 minutes"
"          Rainfall depth 33.312 33.312 33.312 mm"
"          Rainfall volume 699.28 1006.28 1705.57 c.m"
"          Rainfall losses 26.323 6.804 14.807 mm"
"          Runoff depth 6.988 26.508 18.505 mm"
"          Runoff volume 146.70 800.75 947.45 c.m"
"          Runoff coefficient 0.210 0.850 0.588 "
"          Maximum flow 0.033 0.655 0.656 c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4 Add Runoff "
"          0.656 0.656 0.000 0.000"
" 52      CHANNEL DESIGN"
"          0.656 Current peak flow c.m/sec"
"          0.015 Manning 'n'"
"          1. Cross-section type: 0=trapezoidal; 1=general"
"          7. Define an arbitrary cross-section"
"          0.000 5.500 6.000 10.000 14.000"
"          14.500 20.000"
"          0.270 0.050 0.000 0.080 0.000"
"          0.050 0.270"
"          0.270 Channel depth metre"
"          0.350 Gradient %"
"          0. Variable roughness: 0=False; 1=True"
"          0.0400 0.0400 0.0400 0.0400 0.0400"
"          0.0400 0.0400"
"          Depth of flow 0.127 metre"
"          Velocity 0.693 m/sec"

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"          Channel capacity          3.449    c.m/sec"
"          Critical depth            0.117    metre"
" 53 ROUTE      Channel Route 406"
"      406.00    Channel Route 406 Reach length  ( metre)"
"      0.465    X-factor <= 0.5"
"      219.764   K-lag  ( seconds)"
"      0.000    Default(0) or user spec.(1) values used"
"      0.500    X-factor <= 0.5"
"      30.000    K-lag  ( seconds)"
"      0.500    Beta weighting factor"
"      300.000   Routing time step  ( seconds)"
"      2        No. of sub-reaches"
"      Peak outflow          0.649    c.m/sec"
"      0.656    0.656    0.649    0.000 c.m/sec"
" 40 HYDROGRAPH Combine 8000"
"      6        Combine "
"      8000     Node #"
"      flows at intersection of street d & c"
"      Maximum flow          0.649    c.m/sec"
"      Hydrograph volume      947.449  c.m"
"      0.656    0.656    0.649    0.649"
" 40 HYDROGRAPH Start - New Tributary"
"      2        Start - New Tributary"
"      0.656    0.000    0.649    0.649"
" 33 CATCHMENT 102"
"      1        Triangular SCS"
"      3        Specify values"
"      1        SCS method"
"      102     No description"
"      55.000   % Impervious"
"      3.330    Total Area"
"      38.500   Flow length"
"      2.000    Overland Slope"
"      1.498    Pervious Area"
"      38.500   Pervious length"
"      2.000    Pervious slope"
"      1.831    Impervious Area"
"      4.000    Impervious length"
"      2.000    Impervious slope"
"      0.250    Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"      0.210    Pervious Runoff coefficient"
"      0.100    Pervious Ia/S coefficient"
"      7.164    Pervious Initial abstraction"
"      0.015    Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"      0.850    Impervious Runoff coefficient"
"      0.100    Impervious Ia/S coefficient"
"      0.518    Impervious Initial abstraction"
"      0.398    0.000    0.649    0.649 c.m/sec"
"      Catchment 102 Pervious Impervious Total Area "
"      Surface Area      1.498    1.831    3.330    hectare"
"      Time of concentration 29.398    0.687    5.780    minutes"
"      Time to Centroid    134.999    87.060    95.564    minutes"
"      Rainfall depth      33.312    33.312    33.312    mm"
"      Rainfall volume      499.18    610.11    1109.28    c.m"
"      Rainfall losses      26.325    6.804    15.588    mm"
"      Runoff depth         6.987    26.508    17.724    mm"
"      Runoff volume        104.70    485.49    590.19    c.m"
"      Runoff coefficient    0.210    0.850    0.562    "
"      Maximum flow        0.025    0.397    0.398    c.m/sec"
" 40 HYDROGRAPH Add Runoff "
"      4        Add Runoff "
"      0.398    0.398    0.649    0.649"
" 52 CHANNEL DESIGN"
"      0.398    Current peak flow    c.m/sec"
"      0.015    Manning 'n'"
"      1.        Cross-section type: 0=trapezoidal; 1=general"
"      7.        Define an arbitrary cross-section"
"      0.000    5.500    6.000    10.000    14.000"
"      14.500    20.000"
"      0.270    0.050    0.000    0.080    0.000"
"      0.050    0.270"
"      0.270    Channel depth    metre"
"      0.350    Gradient    %"
"      0.        Variable roughness: 0=False; 1=True"
"      0.0400    0.0400    0.0400    0.0400    0.0400"
"      0.0400    0.0400"
"      Depth of flow          0.105    metre"
"      Velocity              0.588    m/sec"
"      Channel capacity        3.449    c.m/sec"

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"          Critical depth          0.096   metre"
" 53      ROUTE      Channel Route 300"
"          300.00      Channel Route 300 Reach length   ( metre)"
"          0.464      X-factor <= 0.5"
"          191.366     K-lag   ( seconds)"
"          0.000      Default(0) or user spec.(1) values used"
"          0.500      X-factor <= 0.5"
"          30.000     K-lag   ( seconds)"
"          0.500      Beta weighting factor"
"          300.000     Routing time step   ( seconds)"
"          2          No. of sub-reaches"
"          Peak outflow          0.387   c.m/sec"
"          0.398      0.398      0.387   0.649 c.m/sec"
" 40      HYDROGRAPH   Combine      8000"
"          6          Combine "
"          8000      Node #"
"          flows at intersection of street d & c"
"          Maximum flow          1.037   c.m/sec"
"          Hydrograph volume      1537.641   c.m"
"          0.398      0.398      0.387   1.037"
" 40      HYDROGRAPH   Confluence      8000"
"          7          Confluence "
"          8000      Node #"
"          flows at intersection of street d & c"
"          Maximum flow          1.037   c.m/sec"
"          Hydrograph volume      1537.641   c.m"
"          0.398      1.037      0.387   0.000"
" 33      CATCHMENT 103"
"          1          Triangular SCS"
"          3          Specify values"
"          1          SCS method"
"          103       No description"
"          55.000     % Impervious"
"          0.530      Total Area"
"          41.000     Flow length"
"          2.000      Overland Slope"
"          0.238      Pervious Area"
"          41.000     Pervious length"
"          2.000      Pervious slope"
"          0.291      Impervious Area"
"          4.000      Impervious length"
"          2.000      Impervious slope"
"          0.250      Pervious Manning 'n'"
"          78.000     Pervious SCS Curve No."
"          0.210      Pervious Runoff coefficient"
"          0.100      Pervious Ia/S coefficient"
"          7.164      Pervious Initial abstraction"
"          0.015      Impervious Manning 'n'"
"          98.000     Impervious SCS Curve No."
"          0.850      Impervious Runoff coefficient"
"          0.100      Impervious Ia/S coefficient"
"          0.518      Impervious Initial abstraction"
"          0.063      1.037      0.387   0.000 c.m/sec"
"          Catchment 103      Pervious      Impervious Total Area "
"          Surface Area      0.238      0.291      0.530   hectare"
"          Time of concentration      30.529      0.687      5.982   minutes"
"          Time to Centroid      136.358      87.060      95.807   minutes"
"          Rainfall depth      33.312      33.312      33.312   mm"
"          Rainfall volume      79.45      97.10      176.55   c.m"
"          Rainfall losses      26.323      6.804      15.588   mm"
"          Runoff depth      6.989      26.508      17.724   mm"
"          Runoff volume      16.67      77.27      93.94   c.m"
"          Runoff coefficient      0.210      0.850      0.562   "
"          Maximum flow      0.004      0.063      0.063   c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4          Add Runoff "
"          0.063      1.060      0.387   0.000"
" 52      CHANNEL DESIGN"
"          1.060      Current peak flow   c.m/sec"
"          0.015      Manning 'n'"
"          1.       Cross-section type: 0=trapezoidal; 1=general"
"          7.       Define an arbitrary cross-section"
"          0.000      5.500      6.000      10.000      14.000"
"          14.500      20.000"
"          0.270      0.050      0.000      0.080      0.000"
"          0.050      0.270"
"          0.270      Channel depth   metre"
"          0.330      Gradient   %"
"          0.       Variable roughness: 0=False; 1=True"
"          0.0400     0.0400     0.0400     0.0400     0.0400"
"          0.0400     0.0400"

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"          Depth of flow          0.156   metre"
"          Velocity                0.790   m/sec"
"          Channel capacity        3.349   c.m/sec"
"          Critical depth          0.143   metre"
53 ROUTE      Channel Route 166"
"      166.00      Channel Route 166 Reach length   ( metre)"
"      0.441      X-factor <= 0.5"
"      157.574     K-lag   ( seconds)"
"      0.000      Default(0) or user spec.(1) values used"
"      0.500      X-factor <= 0.5"
"      30.000     K-lag   ( seconds)"
"      0.500      Beta weighting factor"
"      150.000    Routing time step   ( seconds)"
"      1          No. of sub-reaches"
"      Peak outflow          0.836   c.m/sec"
"      0.063      1.060      0.836   0.000 c.m/sec"
40 HYDROGRAPH  Combine      8001"
"      6          Combine "
"      8001       Node #"
"      flows entering pond"
"      Maximum flow          0.836   c.m/sec"
"      Hydrograph volume     1631.580 c.m"
"      0.063      1.060      0.836   0.836"
40 HYDROGRAPH Start - New Tributary"
"      2          Start - New Tributary"
"      0.063      0.000      0.836   0.836"
33 CATCHMENT 104"
"      1          Triangular SCS"
"      3          Specify values"
"      1          SCS method"
"      104        No description"
"      58.000     % Impervious"
"      4.780      Total Area"
"      41.500     Flow length"
"      2.000      Overland Slope"
"      2.008      Pervious Area"
"      41.500     Pervious length"
"      2.000      Pervious slope"
"      2.772      Impervious Area"
"      4.000      Impervious length"
"      2.000      Impervious slope"
"      0.250      Pervious Manning 'n'"
"      78.000     Pervious SCS Curve No."
"      0.210      Pervious Runoff coefficient"
"      0.100      Pervious Ia/S coefficient"
"      7.164      Pervious Initial abstraction"
"      0.015      Impervious Manning 'n'"
"      98.000     Impervious SCS Curve No."
"      0.850      Impervious Runoff coefficient"
"      0.100      Impervious Ia/S coefficient"
"      0.518      Impervious Initial abstraction"
"      0.602      0.000      0.836   0.836 c.m/sec"
"      Catchment 104      Pervious      Impervious Total Area "
"      Surface Area      2.008      2.772      4.780   hectare"
"      Time of concentration 30.752      0.687      5.506   minutes"
"      Time to Centroid    136.626      87.060      95.005   minutes"
"      Rainfall depth      33.312      33.312      33.312   mm"
"      Rainfall volume     668.77      923.54      1592.31 c.m"
"      Rainfall losses     26.323      6.804      15.002   mm"
"      Runoff depth        6.988      26.508      18.310   mm"
"      Runoff volume       140.30      734.90      875.20   c.m"
"      Runoff coefficient   0.210      0.850      0.581   "
"      Maximum flow        0.033      0.601      0.602   c.m/sec"
40 HYDROGRAPH Add Runoff "
"      4          Add Runoff "
"      0.602      0.602      0.836   0.836"
52 CHANNEL DESIGN"
"      0.602      Current peak flow   c.m/sec"
"      0.015      Manning 'n'"
"      1.          Cross-section type: 0=trapezoidal; 1=general"
"      7.          Define an arbitrary cross-section"
"      0.000      5.500      6.000      10.000      14.000"
"      14.500     20.000"
"      0.270      0.050      0.000      0.080      0.000"
"      0.050      0.270"
"      0.270      Channel depth   metre"
"      0.250      Gradient   %"
"      0.          Variable roughness: 0=False; 1=True"
"      0.0400     0.0400      0.0400      0.0400      0.0400"
"      0.0400     0.0400"
"      Depth of flow          0.131   metre"

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"          Velocity                0.601    m/sec"
"          Channel capacity        2.915    c.m/sec"
"          Critical depth          0.112    metre"
" 53      ROUTE      Channel Route 500"
"          500.00    Channel Route 500 Reach length    ( metre)"
"          0.458    X-factor <= 0.5"
"          311.874    K-lag    ( seconds)"
"          0.000    Default(0) or user spec.(1) values used"
"          0.500    X-factor <= 0.5"
"          30.000    K-lag    ( seconds)"
"          0.500    Beta weighting factor"
"          300.000    Routing time step    ( seconds)"
"          2        No. of sub-reaches"
"          Peak outflow                0.542    c.m/sec"
"          0.602    0.602    0.542    0.836 c.m/sec"
" 40      HYDROGRAPH    Combine    8001"
"          6        Combine "
"          8001    Node #"
"          flows entering pond"
"          Maximum flow                1.378    c.m/sec"
"          Hydrograph volume          2506.781    c.m"
"          0.602    0.602    0.542    1.378"
" 40      HYDROGRAPH Start - New Tributary"
"          2        Start - New Tributary"
"          0.602    0.000    0.542    1.378"
" 33      CATCHMENT 105"
"          1        Triangular SCS"
"          3        Specify values"
"          1        SCS method"
"          105     No description"
"          70.000    % Impervious"
"          3.090    Total Area"
"          110.000    Flow length"
"          2.000    Overland Slope"
"          0.927    Pervious Area"
"          110.000    Pervious length"
"          1.000    Pervious slope"
"          2.163    Impervious Area"
"          4.000    Impervious length"
"          2.000    Impervious slope"
"          0.250    Pervious Manning 'n'"
"          78.000    Pervious SCS Curve No."
"          0.210    Pervious Runoff coefficient"
"          0.100    Pervious Ia/S coefficient"
"          7.164    Pervious Initial abstraction"
"          0.015    Impervious Manning 'n'"
"          98.000    Impervious SCS Curve No."
"          0.850    Impervious Runoff coefficient"
"          0.100    Impervious Ia/S coefficient"
"          0.518    Impervious Initial abstraction"
"          0.469    0.000    0.542    1.378 c.m/sec"
"          Catchment 105    Pervious    Impervious    Total Area "
"          Surface Area    0.927    2.163    3.090    hectare"
"          Time of concentration    67.949    0.687    7.517    minutes"
"          Time to Centroid    181.365    87.060    96.636    minutes"
"          Rainfall depth    33.312    33.312    33.312    mm"
"          Rainfall volume    308.80    720.53    1029.34    c.m"
"          Rainfall losses    26.321    6.804    12.659    mm"
"          Runoff depth    6.991    26.508    20.653    mm"
"          Runoff volume    64.81    573.36    638.17    c.m"
"          Runoff coefficient    0.210    0.850    0.658    "
"          Maximum flow    0.008    0.469    0.469    c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4        Add Runoff "
"          0.469    0.469    0.542    1.378"
" 52      CHANNEL DESIGN"
"          0.469    Current peak flow    c.m/sec"
"          0.015    Manning 'n'"
"          1.        Cross-section type: 0=trapezoidal; 1=general"
"          7.        Define an arbitrary cross-section"
"          0.000    5.500    6.000    10.000    14.000"
"          14.500    20.000"
"          0.270    0.050    0.000    0.080    0.000"
"          0.050    0.270"
"          0.270    Channel depth    metre"
"          0.500    Gradient    %"
"          0.        Variable roughness: 0=False; 1=True"
"          0.0400    0.0400    0.0400    0.0400    0.0400"
"          0.0400    0.0400"
"          Depth of flow                0.105    metre"
"          Velocity                0.699    m/sec"

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"          Channel capacity          4.123    c.m/sec"
"          Critical depth            0.102    metre"
" 53      ROUTE      Channel Route 80"
"          80.00      Channel Route 80 Reach length  ( metre)"
"          0.452      X-factor <= 0.5"
"          85.798      K-lag  ( seconds)"
"          0.000      Default(0) or user spec.(1) values used"
"          0.500      X-factor <= 0.5"
"          30.000      K-lag  ( seconds)"
"          0.500      Beta weighting factor"
"          75.000      Routing time step  ( seconds)"
"          1          No. of sub-reaches"
"          Peak outflow          0.367    c.m/sec"
"          0.469          0.469          0.367    1.378 c.m/sec"
" 40      HYDROGRAPH      Combine      8001"
"          6      Combine "
"          8001      Node #"
"          flows entering pond"
"          Maximum flow          1.581    c.m/sec"
"          Hydrograph volume      3144.949    c.m"
"          0.469          0.469          0.367    1.581"
" 40      HYDROGRAPH      Confluence      8001"
"          7      Confluence "
"          8001      Node #"
"          flows entering pond"
"          Maximum flow          1.581    c.m/sec"
"          Hydrograph volume      3144.949    c.m"
"          0.469          1.581          0.367    0.000"
" 33      CATCHMENT 106"
"          1      Triangular SCS"
"          1      Equal length"
"          1      SCS method"
"          106     pond area direct"
"          50.000   % Impervious"
"          1.240   Total Area"
"          5.000   Flow length"
"          20.000   Overland Slope"
"          0.620   Pervious Area"
"          5.000   Pervious length"
"          20.000   Pervious slope"
"          0.620   Impervious Area"
"          5.000   Impervious length"
"          20.000   Impervious slope"
"          0.250   Pervious Manning 'n'"
"          78.000   Pervious SCS Curve No."
"          0.210   Pervious Runoff coefficient"
"          0.100   Pervious Ia/S coefficient"
"          7.164   Pervious Initial abstraction"
"          0.015   Impervious Manning 'n'"
"          98.000   Impervious SCS Curve No."
"          0.850   Impervious Runoff coefficient"
"          0.100   Impervious Ia/S coefficient"
"          0.518   Impervious Initial abstraction"
"          0.142          1.581          0.367    0.000 c.m/sec"
"          Catchment 106      Pervious      Impervious      Total Area "
"          Surface Area      0.620          0.620          1.240    hectare"
"          Time of concentration 4.329          0.393          1.245    minutes"
"          Time to Centroid      104.923      86.699          90.644    minutes"
"          Rainfall depth      33.312          33.312          33.312    mm"
"          Rainfall volume      206.53          206.53          413.07    c.m"
"          Rainfall losses      26.382          8.225          17.304    mm"
"          Runoff depth          6.929          25.087          16.008    mm"
"          Runoff volume          42.96          155.54          198.50    c.m"
"          Runoff coefficient    0.210          0.850          0.530    "
"          Maximum flow          0.021          0.135          0.142    c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4      Add Runoff "
"          0.142          1.640          0.367    0.000"
" 54      POND DESIGN"
"          1.640      Current peak flow    c.m/sec"
"          2.395      Target outflow      c.m/sec"
"          3344.0     Hydrograph volume    c.m"
"          13.        Number of stages"
"          240.000     Minimum water level  metre"
"          242.300     Maximum water level  metre"
"          240.000     Starting water level  metre"
"          0          Keep Design Data: 1 = True; 0 = False"
"          Level Discharge      Volume"
"          240.000     0.000          0.0"
"          240.200     0.015          675.5"
"          240.400     0.022          1425.3"

```


"	240.600	0.028	2225.8"			
"	240.800	0.033	3078.8"			
"	241.000	0.140	3985.9"			
"	241.200	0.193	4948.7"			
"	241.400	0.343	5969.0"			
"	241.600	0.442	7048.2"			
"	241.800	0.522	8188.2"			
"	242.000	0.590	9390.6"			
"	242.200	0.651	10656.9"			
"	242.300	0.680	11314.6"			
"	2. OUTFLOW PIPE"					
"	Upstream	Downstr'm	Pipe	Pipe	Manning	Entry"
"	invert	invert	Length	Diameter	'n'	loss Ke"
"	240.000	239.900	14.330	0.150	0.013	0.500"
"	240.790	240.680	16.300	0.450	0.013	0.500"
"	Peak outflow		0.033	c.m/sec"		
"	Maximum level		240.789	metre"		
"	Maximum storage		3031.383	c.m"		
"	Centroidal lag		16.281	hours"		
"	0.142	1.640	0.033	0.000 c.m/sec"		

25 Year Storm

```

"      MIDUSS Output ----->"
"      MIDUSS version                      Version 2.07 rev. 387"
"      MIDUSS created                      Friday, September 23, 2005"
"      10 Units used:                      ie METRIC"
"      Job folder:                        G:\CLIENT\1389\1\SWM\MIDUSS\"
"      november 2018-all external areas diverted through channel"
"      Output filename:                    25 year post phase 1 - final-1.out"
"      Licensee name:                      lgrabowski"
"      Company"
"      Date & Time last used:              2/19/2019 at 11:07:09 AM"
" 31    TIME PARAMETERS"
"      5.000 Time Step"
"      180.000 Max. Storm length"
"      1500.000 Max. Hydrograph"
" 32    STORM Chicago storm"
"      1 Chicago storm"
"      1455.000 Coefficient A"
"      5.000 Constant B"
"      0.820 Exponent C"
"      0.380 Fraction R"
"      180.000 Duration"
"      1.000 Time step multiplier"
"      Maximum intensity                202.437 mm/hr"
"      Total depth                      60.381 mm"
"      5 25hyd Hydrograph extension used in this file"
" 33    CATCHMENT 101"
"      1 Triangular SCS"
"      3 Specify values"
"      1 SCS method"
"      101 No description"
"      59.000 % Impervious"
"      5.120 Total Area"
"      45.500 Flow length"
"      2.000 Overland Slope"
"      2.099 Pervious Area"
"      45.500 Pervious length"
"      2.000 Pervious slope"
"      3.021 Impervious Area"
"      4.000 Impervious length"
"      2.000 Impervious slope"
"      0.250 Pervious Manning 'n'"
"      78.000 Pervious SCS Curve No."
"      0.376 Pervious Runoff coefficient"
"      0.100 Pervious Ia/S coefficient"
"      7.164 Pervious Initial abstraction"
"      0.015 Impervious Manning 'n'"
"      98.000 Impervious SCS Curve No."
"      0.912 Impervious Runoff coefficient"
"      0.100 Impervious Ia/S coefficient"
"      0.518 Impervious Initial abstraction"
"      1.416 0.000 0.000 0.000 c.m/sec"
"      Catchment 101 Pervious Impervious Total Area "
"      Surface Area 2.099 3.021 5.120 hectare"
"      Time of concentration 18.679 0.508 4.874 minutes"
"      Time to Centroid 117.231 84.526 92.384 minutes"
"      Rainfall depth 60.381 60.381 60.381 mm"
"      Rainfall volume 1267.53 1824.00 3091.53 c.m"
"      Rainfall losses 37.742 10.635 21.749 mm"
"      Runoff depth 22.639 49.747 38.633 mm"
"      Runoff volume 475.24 1502.75 1977.99 c.m"
"      Runoff coefficient 0.376 0.912 0.692 "
"      Maximum flow 0.173 1.398 1.416 c.m/sec"
" 40    HYDROGRAPH Add Runoff "
"      4 Add Runoff "
"      1.416 1.416 0.000 0.000"
" 52    CHANNEL DESIGN"
"      1.416 Current peak flow c.m/sec"
"      0.015 Manning 'n'"
"      1. Cross-section type: 0=trapezoidal; 1=general"
"      7. Define an arbitrary cross-section"
"      0.000 5.500 6.000 10.000 14.000"
"      14.500 20.000"
"      0.270 0.050 0.000 0.080 0.000"
"      0.050 0.270"
"      0.270 Channel depth metre"
"      0.350 Gradient %"
"      0. Variable roughness: 0=False; 1=True"
"      0.0400 0.0400 0.0400 0.0400 0.0400"
"      0.0400 0.0400"
"      Depth of flow 0.174 metre"
"      Velocity 0.881 m/sec"

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```

"          Channel capacity          3.449    c.m/sec"
"          Critical depth            0.163    metre"
" 53 ROUTE      Channel Route 406"
"      406.00    Channel Route 406 Reach length  ( metre)"
"      0.448    X-factor <= 0.5"
"      172.780   K-lag  ( seconds)"
"      0.000    Default(0) or user spec.(1) values used"
"      0.500    X-factor <= 0.5"
"      30.000    K-lag  ( seconds)"
"      0.500    Beta weighting factor"
"      300.000   Routing time step  ( seconds)"
"      2        No. of sub-reaches"
"      Peak outflow          1.266    c.m/sec"
"      1.416    1.416    1.266    0.000 c.m/sec"
" 40 HYDROGRAPH Combine 8000"
"      6        Combine "
"      8000     Node #"
"      flows at intersection of street d & c"
"      Maximum flow          1.266    c.m/sec"
"      Hydrograph volume      1977.985  c.m"
"      1.416    1.416    1.266    1.266"
" 40 HYDROGRAPH Start - New Tributary"
"      2        Start - New Tributary"
"      1.416    0.000    1.266    1.266"
" 33 CATCHMENT 102"
"      1        Triangular SCS"
"      3        Specify values"
"      1        SCS method"
"      102     No description"
"      55.000   % Impervious"
"      3.330    Total Area"
"      38.500   Flow length"
"      2.000    Overland Slope"
"      1.498    Pervious Area"
"      38.500   Pervious length"
"      2.000    Pervious slope"
"      1.831    Impervious Area"
"      4.000    Impervious length"
"      2.000    Impervious slope"
"      0.250    Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"      0.376    Pervious Runoff coefficient"
"      0.100    Pervious Ia/S coefficient"
"      7.164    Pervious Initial abstraction"
"      0.015    Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"      0.912    Impervious Runoff coefficient"
"      0.100    Impervious Ia/S coefficient"
"      0.518    Impervious Initial abstraction"
"      0.863    0.000    1.266    1.266 c.m/sec"
"      Catchment 102 Pervious Impervious Total Area "
"      Surface Area      1.498    1.831    3.330    hectare"
"      Time of concentration 16.898    0.508    4.958    minutes"
"      Time to Centroid    114.965    84.525    92.791    minutes"
"      Rainfall depth      60.381    60.381    60.381    mm"
"      Rainfall volume      904.82    1105.89    2010.70    c.m"
"      Rainfall losses      37.718    10.635    22.822    mm"
"      Runoff depth         22.663    49.747    37.559    mm"
"      Runoff volume        339.61    911.11    1250.72    c.m"
"      Runoff coefficient    0.376    0.912    0.671    "
"      Maximum flow        0.133    0.847    0.863    c.m/sec"
" 40 HYDROGRAPH Add Runoff "
"      4        Add Runoff "
"      0.863    0.863    1.266    1.266"
" 52 CHANNEL DESIGN"
"      0.863    Current peak flow    c.m/sec"
"      0.015    Manning 'n'"
"      1.        Cross-section type: 0=trapezoidal; 1=general"
"      7.        Define an arbitrary cross-section"
"      0.000    5.500    6.000    10.000    14.000"
"      14.500    20.000"
"      0.270    0.050    0.000    0.080    0.000"
"      0.050    0.270"
"      0.270    Channel depth    metre"
"      0.350    Gradient    %"
"      0.        Variable roughness: 0=False; 1=True"
"      0.0400    0.0400    0.0400    0.0400    0.0400"
"      0.0400    0.0400"
"      Depth of flow          0.142    metre"
"      Velocity              0.756    m/sec"
"      Channel capacity        3.449    c.m/sec"

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```

"      Critical depth      0.131  metre"
" 53  ROUTE      Channel Route 300"
"      300.00      Channel Route 300 Reach length  ( metre)"
"      0.473      X-factor <= 0.5"
"      297.583     K-lag  ( seconds)"
"      0.000      Default(0) or user spec.(1) values used"
"      0.500      X-factor <= 0.5"
"      30.000     K-lag  ( seconds)"
"      0.500      Beta weighting factor"
"      300.000    Routing time step  ( seconds)"
"      1          No. of sub-reaches"
"      Peak outflow      0.838  c.m/sec"
"      0.863      0.863      0.838  1.266 c.m/sec"
" 40  HYDROGRAPH  Combine      8000"
"      6          Combine "
"      8000      Node #"
"      flows at intersection of street d & c"
"      Maximum flow      1.796  c.m/sec"
"      Hydrograph volume  3228.702 c.m"
"      0.863      0.863      0.838  1.796"
" 40  HYDROGRAPH  Confluence  8000"
"      7          Confluence "
"      8000      Node #"
"      flows at intersection of street d & c"
"      Maximum flow      1.796  c.m/sec"
"      Hydrograph volume  3228.702 c.m"
"      0.863      1.796      0.838  0.000"
" 33  CATCHMENT 103"
"      1          Triangular SCS"
"      3          Specify values"
"      1          SCS method"
"      103       No description"
"      55.000    % Impervious"
"      0.530     Total Area"
"      41.000    Flow length"
"      2.000     Overland Slope"
"      0.238     Pervious Area"
"      41.000    Pervious length"
"      2.000     Pervious slope"
"      0.291     Impervious Area"
"      4.000     Impervious length"
"      2.000     Impervious slope"
"      0.250     Pervious Manning 'n'"
"      78.000    Pervious SCS Curve No."
"      0.376     Pervious Runoff coefficient"
"      0.100     Pervious Ia/S coefficient"
"      7.164     Pervious Initial abstraction"
"      0.015     Impervious Manning 'n'"
"      98.000    Impervious SCS Curve No."
"      0.912     Impervious Runoff coefficient"
"      0.100     Impervious Ia/S coefficient"
"      0.518     Impervious Initial abstraction"
"      0.137      1.796      0.838  0.000 c.m/sec"
"      Catchment 103      Pervious  Impervious Total Area "
"      Surface Area      0.238      0.291      0.530  hectare"
"      Time of concentration  17.548      0.508      5.134  minutes"
"      Time to Centroid    115.777      84.526      93.011  minutes"
"      Rainfall depth      60.381      60.381      60.381  mm"
"      Rainfall volume     144.01      176.01      320.02  c.m"
"      Rainfall losses     37.721      10.635      22.824  mm"
"      Runoff depth        22.660      49.747      37.558  mm"
"      Runoff volume       54.04      145.01      199.06  c.m"
"      Runoff coefficient   0.376      0.912      0.671  "
"      Maximum flow        0.021      0.135      0.137  c.m/sec"
" 40  HYDROGRAPH Add Runoff "
"      4          Add Runoff "
"      0.137      1.877      0.838  0.000"
" 52  CHANNEL DESIGN"
"      1.877      Current peak flow  c.m/sec"
"      0.015      Manning 'n'"
"      1.        Cross-section type: 0=trapezoidal; 1=general"
"      7.        Define an arbitrary cross-section"
"      0.000      5.500      6.000      10.000      14.000"
"      14.500     20.000"
"      0.270      0.050      0.000      0.080      0.000"
"      0.050      0.270"
"      0.270     Channel depth  metre"
"      0.330     Gradient  %"
"      0.        Variable roughness: 0=False; 1=True"
"      0.0400     0.0400      0.0400      0.0400      0.0400"
"      0.0400     0.0400"

```

```

"          Depth of flow          0.199    metre"
"          Velocity              0.939    m/sec"
"          Channel capacity      3.349    c.m/sec"
"          Critical depth        0.185    metre"
53 ROUTE    Channel Route 166"
"          166.00    Channel Route 166 Reach length    ( metre)"
"          0.422    X-factor <= 0.5"
"          132.556    K-lag    ( seconds)"
"          0.000    Default(0) or user spec.(1) values used"
"          0.500    X-factor <= 0.5"
"          30.000    K-lag    ( seconds)"
"          0.500    Beta weighting factor"
"          150.000    Routing time step    ( seconds)"
"          1    No. of sub-reaches"
"          Peak outflow          1.852    c.m/sec"
"          0.137    1.877    1.852    0.000 c.m/sec"
40 HYDROGRAPH    Combine    8001"
"          6    Combine "
"          8001    Node #"
"          flows entering pond"
"          Maximum flow          1.852    c.m/sec"
"          Hydrograph volume      3427.759    c.m"
"          0.137    1.877    1.852    1.852"
40 HYDROGRAPH Start - New Tributary"
"          2    Start - New Tributary"
"          0.137    0.000    1.852    1.852"
33 CATCHMENT 104"
"          1    Triangular SCS"
"          3    Specify values"
"          1    SCS method"
"          104    No description"
"          58.000    % Impervious"
"          4.780    Total Area"
"          41.500    Flow length"
"          2.000    Overland Slope"
"          2.008    Pervious Area"
"          41.500    Pervious length"
"          2.000    Pervious slope"
"          2.772    Impervious Area"
"          4.000    Impervious length"
"          2.000    Impervious slope"
"          0.250    Pervious Manning 'n'"
"          78.000    Pervious SCS Curve No."
"          0.376    Pervious Runoff coefficient"
"          0.100    Pervious Ia/S coefficient"
"          7.164    Pervious Initial abstraction"
"          0.015    Impervious Manning 'n'"
"          98.000    Impervious SCS Curve No."
"          0.912    Impervious Runoff coefficient"
"          0.100    Impervious Ia/S coefficient"
"          0.518    Impervious Initial abstraction"
"          1.302    0.000    1.852    1.852 c.m/sec"
"          Catchment 104    Pervious    Impervious    Total Area "
"          Surface Area      2.008    2.772    4.780    hectare"
"          Time of concentration 17.676    0.508    4.766    minutes"
"          Time to Centroid   115.944    84.526    92.318    minutes"
"          Rainfall depth     60.381    60.381    60.381    mm"
"          Rainfall volume     1212.22    1674.01    2886.23    c.m"
"          Rainfall losses     37.722    10.635    22.012    mm"
"          Runoff depth        22.659    49.747    38.370    mm"
"          Runoff volume       454.90    1379.18    1834.08    c.m"
"          Runoff coefficient   0.376    0.912    0.687    "
"          Maximum flow        0.173    1.283    1.302    c.m/sec"
40 HYDROGRAPH Add Runoff "
"          4    Add Runoff "
"          1.302    1.302    1.852    1.852"
52 CHANNEL DESIGN"
"          1.302    Current peak flow    c.m/sec"
"          0.015    Manning 'n'"
"          1.    Cross-section type: 0=trapezoidal; 1=general"
"          7.    Define an arbitrary cross-section"
"          0.000    5.500    6.000    10.000    14.000"
"          14.500    20.000"
"          0.270    0.050    0.000    0.080    0.000"
"          0.050    0.270"
"          0.270    Channel depth    metre"
"          0.250    Gradient    %"
"          0.    Variable roughness: 0=False; 1=True"
"          0.0400    0.0400    0.0400    0.0400    0.0400"
"          0.0400    0.0400"
"          Depth of flow          0.180    metre"

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```

"      Velocity                      0.764    m/sec"
"      Channel capacity              2.915    c.m/sec"
"      Critical depth                0.157    metre"
" 53      ROUTE      Channel Route 500"
"      500.00      Channel Route 500 Reach length    ( metre)"
"      0.439      X-factor <= 0.5"
"      245.437      K-lag    ( seconds)"
"      0.000      Default(0) or user spec.(1) values used"
"      0.500      X-factor <= 0.5"
"      30.000      K-lag    ( seconds)"
"      0.500      Beta weighting factor"
"      300.000      Routing time step    ( seconds)"
"      2          No. of sub-reaches"
"      Peak outflow                      1.205    c.m/sec"
"      1.302      1.302      1.205    1.852 c.m/sec"
" 40      HYDROGRAPH      Combine      8001"
"      6      Combine "
"      8001      Node #"
"      flows entering pond"
"      Maximum flow                      3.058    c.m/sec"
"      Hydrograph volume                5261.835    c.m"
"      1.302      1.302      1.205    3.058"
" 40      HYDROGRAPH Start - New Tributary"
"      2      Start - New Tributary"
"      1.302      0.000      1.205    3.058"
" 33      CATCHMENT 105"
"      1      Triangular SCS"
"      3      Specify values"
"      1      SCS method"
"      105     No description"
"      70.000    % Impervious"
"      3.090     Total Area"
"      110.000   Flow length"
"      2.000     Overland Slope"
"      0.927     Pervious Area"
"      110.000   Pervious length"
"      1.000     Pervious slope"
"      2.163     Impervious Area"
"      4.000     Impervious length"
"      2.000     Impervious slope"
"      0.250     Pervious Manning 'n'"
"      78.000    Pervious SCS Curve No."
"      0.376     Pervious Runoff coefficient"
"      0.100     Pervious Ia/S coefficient"
"      7.164     Pervious Initial abstraction"
"      0.015     Impervious Manning 'n'"
"      98.000    Impervious SCS Curve No."
"      0.912     Impervious Runoff coefficient"
"      0.100     Impervious Ia/S coefficient"
"      0.518     Impervious Initial abstraction"
"      1.003      0.000      1.205    3.058 c.m/sec"
"      Catchment 105      Pervious      Impervious      Total Area "
"      Surface Area      0.927      2.163      3.090      hectare"
"      Time of concentration 39.056      0.508      6.807      minutes"
"      Time to Centroid    143.166      84.526      94.107      minutes"
"      Rainfall depth      60.381      60.381      60.381      mm"
"      Rainfall volume     559.74      1306.05      1865.79      c.m"
"      Rainfall losses     37.712      10.635      18.758      mm"
"      Runoff depth        22.670      49.747      41.624      mm"
"      Runoff volume       210.15      1076.02      1286.17      c.m"
"      Runoff coefficient   0.376      0.912      0.751      "
"      Maximum flow        0.047      1.001      1.003      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"      1.003      1.003      1.205    3.058"
" 52      CHANNEL DESIGN"
"      1.003      Current peak flow    c.m/sec"
"      0.015      Manning 'n'"
"      1.      Cross-section type: 0=trapezoidal; 1=general"
"      7.      Define an arbitrary cross-section"
"      0.000      5.500      6.000      10.000      14.000"
"      14.500      20.000"
"      0.270      0.050      0.000      0.080      0.000"
"      0.050      0.270"
"      0.270      Channel depth    metre"
"      0.500      Gradient    %"
"      0.      Variable roughness: 0=False; 1=True"
"      0.0400      0.0400      0.0400      0.0400      0.0400"
"      0.0400      0.0400"
"      Depth of flow                      0.140    metre"
"      Velocity                      0.896    m/sec"

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```

"      Channel capacity          4.123    c.m/sec"
"      Critical depth            0.140    metre"
" 53  ROUTE      Channel Route 80"
"      80.00      Channel Route 80 Reach length  ( metre)"
"      0.429      X-factor <= 0.5"
" 66.983      K-lag  ( seconds)"
"      0.000      Default(0) or user spec.(1) values used"
"      0.500      X-factor <= 0.5"
"      30.000      K-lag  ( seconds)"
"      0.500      Beta weighting factor"
"      75.000      Routing time step  ( seconds)"
"      1          No. of sub-reaches"
"      Peak outflow          0.831    c.m/sec"
"      1.003      1.003      0.831    3.058 c.m/sec"
" 40  HYDROGRAPH  Combine      8001"
"      6          Combine "
"      8001      Node #"
"      flows entering pond"
"      Maximum flow          3.397    c.m/sec"
"      Hydrograph volume      6548.003 c.m"
"      1.003      1.003      0.831    3.397"
" 40  HYDROGRAPH  Confluence    8001"
"      7          Confluence "
"      8001      Node #"
"      flows entering pond"
"      Maximum flow          3.397    c.m/sec"
"      Hydrograph volume      6548.003 c.m"
"      1.003      3.397      0.831    0.000"
" 33  CATCHMENT 106"
"      1          Triangular SCS"
"      1          Equal length"
"      1          SCS method"
"      106        pond area direct"
" 50.000      % Impervious"
"      1.240      Total Area"
"      5.000      Flow length"
"      20.000      Overland Slope"
"      0.620      Pervious Area"
"      5.000      Pervious length"
"      20.000      Pervious slope"
"      0.620      Impervious Area"
"      5.000      Impervious length"
"      20.000      Impervious slope"
"      0.250      Pervious Manning 'n'"
"      78.000      Pervious SCS Curve No."
"      0.376      Pervious Runoff coefficient"
"      0.100      Pervious Ia/S coefficient"
"      7.164      Pervious Initial abstraction"
"      0.015      Impervious Manning 'n'"
"      98.000      Impervious SCS Curve No."
"      0.912      Impervious Runoff coefficient"
"      0.100      Impervious Ia/S coefficient"
"      0.518      Impervious Initial abstraction"
"      0.350      3.397      0.831    0.000 c.m/sec"
"      Catchment 106      Pervious      Impervious      Total Area "
"      Surface Area          0.620      0.620      1.240      hectare"
"      Time of concentration  2.488      0.291      0.989      minutes"
"      Time to Centroid      96.602      83.681      87.783      minutes"
"      Rainfall depth        60.381      60.381      60.381      mm"
"      Rainfall volume        374.36      374.36      748.73      c.m"
"      Rainfall losses        38.028      12.329      25.178      mm"
"      Runoff depth           22.354      48.052      35.203      mm"
"      Runoff volume          138.59      297.92      436.52      c.m"
"      Runoff coefficient      0.376      0.912      0.644      "
"      Maximum flow           0.100      0.286      0.350      c.m/sec"
" 40  HYDROGRAPH Add Runoff "
"      4          Add Runoff "
"      0.350      3.531      0.831    0.000"
" 54  POND DESIGN"
"      3.531      Current peak flow    c.m/sec"
"      2.395      Target outflow      c.m/sec"
"      6985.0     Hydrograph volume    c.m"
"      13.        Number of stages"
"      240.000     Minimum water level  metre"
"      242.300     Maximum water level  metre"
"      240.000     Starting water level metre"
"      0          Keep Design Data: 1 = True; 0 = False"
"      Level Discharge      Volume"
"      240.000     0.000      0.0"
"      240.200     0.015      675.5"
"      240.400     0.022      1425.3"

```


"	240.600	0.028	2225.8"			
"	240.800	0.033	3078.8"			
"	241.000	0.113	3985.9"			
"	241.200	0.122	4948.7"			
"	241.400	0.314	5969.0"			
"	241.600	0.420	7048.2"			
"	241.800	0.504	8188.2"			
"	242.000	0.575	9390.6"			
"	242.200	0.637	10656.9"			
"	242.300	0.666	11314.6"			
"	2. OUTFLOW PIPE"					
"	Upstream	Downstr'm	Pipe	Pipe	Manning	Entry"
"	invert	invert	Length	Diameter	'n'	loss Ke"
"	240.000	239.900	14.330	0.150	0.013	0.500"
"	240.790	240.730	16.300	0.450	0.013	0.500"
"	Peak outflow		0.242	c.m/sec"		
"	Maximum level		241.325	metre"		
"	Maximum storage		5585.151	c.m"		
"	Centroidal lag		12.095	hours"		
"	0.350	3.531	0.242	0.000 c.m/sec"		

100 Year Storm

```

"      MIDUSS Output ----->"
"      MIDUSS version                      Version 2.07 rev. 387"
"      MIDUSS created                      Friday, September 23, 2005"
"      10 Units used:                      ie METRIC"
"      Job folder:                        G:\CLIENT\1389\1\SWM\MIDUSS\"
"      november 2018-all external areas diverted through channel"
"      Output filename:                  100 year post phase 1 - final-1.out"
"      Licensee name:                    lgrabowski"
"      Company"
"      Date & Time last used:            2/19/2019 at 10:56:49 AM"
" 31    TIME PARAMETERS"
"      5.000 Time Step"
"      180.000 Max. Storm length"
"      1500.000 Max. Hydrograph"
" 32    STORM Chicago storm"
"      1 Chicago storm"
"      1499.530 Coefficient A"
"      3.297 Constant B"
"      0.794 Exponent C"
"      0.380 Fraction R"
"      180.000 Duration"
"      1.000 Time step multiplier"
"      Maximum intensity                257.108 mm/hr"
"      Total depth                      71.801 mm"
"      6 100hyd Hydrograph extension used in this file"
" 33    CATCHMENT 101"
"      1 Triangular SCS"
"      3 Specify values"
"      1 SCS method"
"      101 No description"
"      59.000 % Impervious"
"      5.120 Total Area"
"      45.500 Flow length"
"      2.000 Overland Slope"
"      2.099 Pervious Area"
"      45.500 Pervious length"
"      2.000 Pervious slope"
"      3.021 Impervious Area"
"      4.000 Impervious length"
"      2.000 Impervious slope"
"      0.250 Pervious Manning 'n'"
"      78.000 Pervious SCS Curve No."
"      0.427 Pervious Runoff coefficient"
"      0.100 Pervious Ia/S coefficient"
"      7.164 Pervious Initial abstraction"
"      0.015 Impervious Manning 'n'"
"      98.000 Impervious SCS Curve No."
"      0.925 Impervious Runoff coefficient"
"      0.100 Impervious Ia/S coefficient"
"      0.518 Impervious Initial abstraction"
"      1.834 0.000 0.000 0.000 c.m/sec"
"      Catchment 101 Pervious Impervious Total Area "
"      Surface Area 2.099 3.021 5.120 hectare"
"      Time of concentration 15.727 0.460 4.461 minutes"
"      Time to Centroid 114.150 84.329 92.145 minutes"
"      Rainfall depth 71.801 71.801 71.801 mm"
"      Rainfall volume 1507.25 2168.97 3676.22 c.m"
"      Rainfall losses 41.197 11.925 23.927 mm"
"      Runoff depth 30.604 59.876 47.874 mm"
"      Runoff volume 642.44 1808.73 2451.17 c.m"
"      Runoff coefficient 0.427 0.925 0.721 "
"      Maximum flow 0.258 1.795 1.834 c.m/sec"
" 40    HYDROGRAPH Add Runoff "
"      4 Add Runoff "
"      1.834 1.834 0.000 0.000"
" 52    CHANNEL DESIGN"
"      1.834 Current peak flow c.m/sec"
"      0.015 Manning 'n'"
"      1. Cross-section type: 0=trapezoidal; 1=general"
"      7. Define an arbitrary cross-section"
"      0.000 5.500 6.000 10.000 14.000"
"      14.500 20.000"
"      0.270 0.050 0.000 0.080 0.000"
"      0.050 0.270"
"      0.270 Channel depth metre"
"      0.350 Gradient %"
"      0. Variable roughness: 0=False; 1=True"
"      0.0400 0.0400 0.0400 0.0400 0.0400"
"      0.0400 0.0400"
"      Depth of flow 0.194 metre"
"      Velocity 0.952 m/sec"

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```

"          Channel capacity          3.449    c.m/sec"
"          Critical depth            0.183    metre"
" 53 ROUTE      Channel Route 406"
"      406.00    Channel Route 406 Reach length  ( metre)"
"      0.441    X-factor <= 0.5"
" 159.876    K-lag  ( seconds)"
"      0.000    Default(0) or user spec.(1) values used"
"      0.500    X-factor <= 0.5"
"      30.000    K-lag  ( seconds)"
"      0.500    Beta weighting factor"
" 300.000    Routing time step  ( seconds)"
"      2        No. of sub-reaches"
"      Peak outflow          1.543    c.m/sec"
"          1.834      1.834      1.543    0.000 c.m/sec"
" 40 HYDROGRAPH Combine 8000"
"      6 Combine "
"      8000 Node #"
"          flows at intersection of street d & c"
"          Maximum flow          1.543    c.m/sec"
"          Hydrograph volume      2451.168    c.m"
"          1.834      1.834      1.543    1.543"
" 40 HYDROGRAPH Start - New Tributary"
"      2 Start - New Tributary"
"          1.834      0.000      1.543    1.543"
" 33 CATCHMENT 102"
"      1 Triangular SCS"
"      3 Specify values"
"      1 SCS method"
"      102 No description"
" 55.000 % Impervious"
"      3.330 Total Area"
"      38.500 Flow length"
"      2.000 Overland Slope"
"      1.498 Pervious Area"
"      38.500 Pervious length"
"      2.000 Pervious slope"
"      1.831 Impervious Area"
"      4.000 Impervious length"
"      2.000 Impervious slope"
"      0.250 Pervious Manning 'n'"
"      78.000 Pervious SCS Curve No."
"      0.427 Pervious Runoff coefficient"
"      0.100 Pervious Ia/S coefficient"
"      7.164 Pervious Initial abstraction"
"      0.015 Impervious Manning 'n'"
"      98.000 Impervious SCS Curve No."
"      0.925 Impervious Runoff coefficient"
"      0.100 Impervious Ia/S coefficient"
"      0.518 Impervious Initial abstraction"
"          1.121      0.000      1.543    1.543 c.m/sec"
"      Catchment 102 Pervious Impervious Total Area "
"      Surface Area      1.498      1.831      3.330    hectare"
"      Time of concentration 14.227      0.460      4.517    minutes"
"      Time to Centroid 112.123      84.329      92.520    minutes"
"      Rainfall depth      71.801      71.801      71.801    mm"
"      Rainfall volume     1075.94     1315.04     2390.98    c.m"
"      Rainfall losses     41.226     11.925     25.111    mm"
"      Runoff depth        30.575     59.876     46.690    mm"
"      Runoff volume       458.16     1096.63     1554.79    c.m"
"      Runoff coefficient   0.427     0.925     0.701    "
"      Maximum flow        0.199     1.088     1.121    c.m/sec"
" 40 HYDROGRAPH Add Runoff "
"      4 Add Runoff "
"          1.121      1.121      1.543    1.543"
" 52 CHANNEL DESIGN"
"      1.121 Current peak flow    c.m/sec"
"      0.015 Manning 'n'"
"      1. Cross-section type: 0=trapezoidal; 1=general"
"      7. Define an arbitrary cross-section"
"          0.000      5.500      6.000      10.000      14.000"
"          14.500      20.000"
"          0.270      0.050      0.000      0.080      0.000"
"          0.050      0.270"
"      0.270 Channel depth      metre"
"      0.350 Gradient %"
"      0. Variable roughness: 0=False; 1=True"
"          0.0400      0.0400      0.0400      0.0400      0.0400"
"          0.0400      0.0400"
"      Depth of flow          0.158    metre"
"      Velocity              0.820    m/sec"
"      Channel capacity      3.449    c.m/sec"

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"          Critical depth          0.147   metre"
" 53      ROUTE      Channel Route 300"
"          300.00      Channel Route 300 Reach length   ( metre)"
"          0.469      X-factor <= 0.5"
"          274.258      K-lag   ( seconds)"
"          0.000      Default(0) or user spec.(1) values used"
"          0.500      X-factor <= 0.5"
"          30.000      K-lag   ( seconds)"
"          0.500      Beta weighting factor"
"          150.000      Routing time step   ( seconds)"
"          1          No. of sub-reaches"
"          Peak outflow          0.955   c.m/sec"
"          1.121      1.121      0.955   1.543 c.m/sec"
" 40      HYDROGRAPH   Combine      8000"
"          6          Combine "
"          8000      Node #"
"          flows at intersection of street d & c"
"          Maximum flow          2.239   c.m/sec"
"          Hydrograph volume      4005.960   c.m"
"          1.121      1.121      0.955   2.239"
" 40      HYDROGRAPH   Confluence      8000"
"          7          Confluence "
"          8000      Node #"
"          flows at intersection of street d & c"
"          Maximum flow          2.239   c.m/sec"
"          Hydrograph volume      4005.960   c.m"
"          1.121      2.239      0.955   0.000"
" 33      CATCHMENT 103"
"          1          Triangular SCS"
"          3          Specify values"
"          1          SCS method"
"          103       No description"
"          55.000     % Impervious"
"          0.530      Total Area"
"          41.000     Flow length"
"          2.000      Overland Slope"
"          0.238      Pervious Area"
"          41.000     Pervious length"
"          2.000      Pervious slope"
"          0.291      Impervious Area"
"          4.000      Impervious length"
"          2.000      Impervious slope"
"          0.250      Pervious Manning 'n'"
"          78.000     Pervious SCS Curve No."
"          0.427      Pervious Runoff coefficient"
"          0.100      Pervious Ia/S coefficient"
"          7.164      Pervious Initial abstraction"
"          0.015      Impervious Manning 'n'"
"          98.000     Impervious SCS Curve No."
"          0.925      Impervious Runoff coefficient"
"          0.100      Impervious Ia/S coefficient"
"          0.518      Impervious Initial abstraction"
"          0.178      2.239      0.955   0.000 c.m/sec"
"          Catchment 103      Pervious      Impervious Total Area "
"          Surface Area      0.238      0.291      0.530   hectare"
"          Time of concentration 14.775      0.460      4.682   minutes"
"          Time to Centroid    112.843      84.329      92.739   minutes"
"          Rainfall depth      71.801      71.801      71.801   mm"
"          Rainfall volume      171.25      209.30      380.55   c.m"
"          Rainfall losses      41.188      11.925      25.093   mm"
"          Runoff depth         30.613      59.876      46.708   mm"
"          Runoff volume         73.01      174.54      247.55   c.m"
"          Runoff coefficient    0.427      0.925      0.701   "
"          Maximum flow         0.030      0.173      0.178   c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4          Add Runoff "
"          0.178      2.337      0.955   0.000"
" 52      CHANNEL DESIGN"
"          2.337      Current peak flow   c.m/sec"
"          0.015      Manning 'n'"
"          1.          Cross-section type: 0=trapezoidal; 1=general"
"          7.          Define an arbitrary cross-section"
"          0.000      5.500      6.000      10.000      14.000"
"          14.500      20.000"
"          0.270      0.050      0.000      0.080      0.000"
"          0.050      0.270"
"          0.270      Channel depth   metre"
"          0.330      Gradient   %"
"          0.          Variable roughness: 0=False; 1=True"
"          0.0400      0.0400      0.0400      0.0400      0.0400"
"          0.0400      0.0400"

```

```

"          Depth of flow          0.219    metre"
"          Velocity                1.002    m/sec"
"          Channel capacity        3.349    c.m/sec"
"          Critical depth          0.205    metre"
" 53      ROUTE      Channel Route 166"
"          166.00      Channel Route 166 Reach length  ( metre)"
"          0.413      X-factor <= 0.5"
"          124.297     K-lag  ( seconds)"
"          0.000      Default(0) or user spec.(1) values used"
"          0.500      X-factor <= 0.5"
"          30.000     K-lag  ( seconds)"
"          0.500      Beta weighting factor"
"          100.000     Routing time step  ( seconds)"
"          1          No. of sub-reaches"
"          Peak outflow          2.272    c.m/sec"
"          0.178      2.337      2.272    0.000 c.m/sec"
" 40      HYDROGRAPH  Combine      8001"
"          6          Combine "
"          8001       Node #"
"          flows entering pond"
"          Maximum flow          2.272    c.m/sec"
"          Hydrograph volume     4253.510  c.m"
"          0.178      2.337      2.272    2.272"
" 40      HYDROGRAPH Start - New Tributary"
"          2          Start - New Tributary"
"          0.178      0.000      2.272    2.272"
" 33      CATCHMENT 104"
"          1          Triangular SCS"
"          3          Specify values"
"          1          SCS method"
"          104       No description"
"          58.000     % Impervious"
"          4.780     Total Area"
"          41.500     Flow length"
"          2.000     Overland Slope"
"          2.008     Pervious Area"
"          41.500     Pervious length"
"          2.000     Pervious slope"
"          2.772     Impervious Area"
"          4.000     Impervious length"
"          2.000     Impervious slope"
"          0.250     Pervious Manning 'n'"
"          78.000     Pervious SCS Curve No."
"          0.427     Pervious Runoff coefficient"
"          0.100     Pervious Ia/S coefficient"
"          7.164     Pervious Initial abstraction"
"          0.015     Impervious Manning 'n'"
"          98.000     Impervious SCS Curve No."
"          0.925     Impervious Runoff coefficient"
"          0.100     Impervious Ia/S coefficient"
"          0.518     Impervious Initial abstraction"
"          1.688      0.000      2.272    2.272 c.m/sec"
"          Catchment 104      Pervious      Impervious Total Area "
"          Surface Area      2.008      2.772      4.780    hectare"
"          Time of concentration 14.882      0.460      4.357    minutes"
"          Time to Centroid    112.990      84.329      92.075    minutes"
"          Rainfall depth      71.801      71.801      71.801    mm"
"          Rainfall volume     1441.48      1990.61      3432.09    c.m"
"          Rainfall losses     41.180      11.925      24.212    mm"
"          Runoff depth        30.621      59.876      47.589    mm"
"          Runoff volume       614.74      1660.00      2274.74    c.m"
"          Runoff coefficient   0.427      0.925      0.716    "
"          Maximum flow        0.254      1.648      1.688    c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4          Add Runoff "
"          1.688      1.688      2.272    2.272"
" 52      CHANNEL DESIGN"
"          1.688      Current peak flow    c.m/sec"
"          0.015      Manning 'n'"
"          1.          Cross-section type: 0=trapezoidal; 1=general"
"          7.          Define an arbitrary cross-section"
"          0.000      5.500      6.000      10.000      14.000"
"          14.500     20.000"
"          0.270      0.050      0.000      0.080      0.000"
"          0.050      0.270"
"          0.270      Channel depth    metre"
"          0.250      Gradient    %"
"          0.          Variable roughness: 0=False; 1=True"
"          0.0400     0.0400     0.0400     0.0400     0.0400"
"          0.0400     0.0400"
"          Depth of flow          0.202    metre"

```

```

"          Velocity                0.825    m/sec"
"          Channel capacity        2.915    c.m/sec"
"          Critical depth          0.177    metre"
" 53      ROUTE      Channel Route 500"
"          500.00    Channel Route 500 Reach length    ( metre)"
"          0.430    X-factor <= 0.5"
"          227.156    K-lag    ( seconds)"
"          0.000    Default(0) or user spec.(1) values used"
"          0.500    X-factor <= 0.5"
"          30.000    K-lag    ( seconds)"
"          0.500    Beta weighting factor"
"          300.000    Routing time step    ( seconds)"
"          2          No. of sub-reaches"
"          Peak outflow                1.531    c.m/sec"
"          1.688    1.688    1.531    2.272 c.m/sec"
" 40      HYDROGRAPH    Combine    8001"
"          6    Combine "
"          8001    Node #"
"          flows entering pond"
"          Maximum flow                3.803    c.m/sec"
"          Hydrograph volume            6528.250    c.m"
"          1.688    1.688    1.531    3.803"
" 40      HYDROGRAPH Start - New Tributary"
"          2    Start - New Tributary"
"          1.688    0.000    1.531    3.803"
" 33      CATCHMENT 105"
"          1    Triangular SCS"
"          3    Specify values"
"          1    SCS method"
"          105    No description"
"          70.000    % Impervious"
"          3.090    Total Area"
"          110.000    Flow length"
"          2.000    Overland Slope"
"          0.927    Pervious Area"
"          110.000    Pervious length"
"          1.000    Pervious slope"
"          2.163    Impervious Area"
"          4.000    Impervious length"
"          2.000    Impervious slope"
"          0.250    Pervious Manning 'n'"
"          78.000    Pervious SCS Curve No."
"          0.427    Pervious Runoff coefficient"
"          0.100    Pervious Ia/S coefficient"
"          7.164    Pervious Initial abstraction"
"          0.015    Impervious Manning 'n'"
"          98.000    Impervious SCS Curve No."
"          0.925    Impervious Runoff coefficient"
"          0.100    Impervious Ia/S coefficient"
"          0.518    Impervious Initial abstraction"
"          1.290    0.000    1.531    3.803 c.m/sec"
"          Catchment 105    Pervious    Impervious    Total Area "
"          Surface Area    0.927    2.163    3.090    hectare"
"          Time of concentration    32.884    0.460    6.293    minutes"
"          Time to Centroid    137.205    84.329    93.842    minutes"
"          Rainfall depth    71.801    71.801    71.801    mm"
"          Rainfall volume    665.60    1553.06    2218.65    c.m"
"          Rainfall losses    41.154    11.925    20.694    mm"
"          Runoff depth    30.647    59.876    51.107    mm"
"          Runoff volume    284.10    1295.12    1579.22    c.m"
"          Runoff coefficient    0.427    0.925    0.776    "
"          Maximum flow    0.069    1.285    1.290    c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4    Add Runoff "
"          1.290    1.290    1.531    3.803"
" 52      CHANNEL DESIGN"
"          1.290    Current peak flow    c.m/sec"
"          0.015    Manning 'n'"
"          1.    Cross-section type: 0=trapezoidal; 1=general"
"          7.    Define an arbitrary cross-section"
"          0.000    5.500    6.000    10.000    14.000"
"          14.500    20.000"
"          0.270    0.050    0.000    0.080    0.000"
"          0.050    0.270"
"          0.270    Channel depth    metre"
"          0.500    Gradient    %"
"          0.    Variable roughness: 0=False; 1=True"
"          0.0400    0.0400    0.0400    0.0400    0.0400"
"          0.0400    0.0400"
"          Depth of flow                0.155    metre"
"          Velocity                0.969    m/sec"

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```

"          Channel capacity          4.123    c.m/sec"
"          Critical depth            0.156    metre"
" 53      ROUTE      Channel Route 80"
"          80.00      Channel Route 80 Reach length  ( metre)"
"          0.420      X-factor <= 0.5"
"          61.911      K-lag  ( seconds)"
"          0.000      Default(0) or user spec.(1) values used"
"          0.500      X-factor <= 0.5"
"          30.000      K-lag  ( seconds)"
"          0.500      Beta weighting factor"
"          60.000      Routing time step  ( seconds)"
"          1          No. of sub-reaches"
"          Peak outflow          1.078    c.m/sec"
"          1.290      1.290      1.078    3.803 c.m/sec"
" 40      HYDROGRAPH      Combine      8001"
"          6          Combine "
"          8001      Node #"
"          flows entering pond"
"          Maximum flow          4.179    c.m/sec"
"          Hydrograph volume      8107.470    c.m"
"          1.290      1.290      1.078    4.179"
" 40      HYDROGRAPH      Confluence      8001"
"          7          Confluence "
"          8001      Node #"
"          flows entering pond"
"          Maximum flow          4.179    c.m/sec"
"          Hydrograph volume      8107.468    c.m"
"          1.290      4.179      1.078    0.000"
" 33      CATCHMENT 106"
"          1          Triangular SCS"
"          1          Equal length"
"          1          SCS method"
"          106      pond area direct"
"          50.000      % Impervious"
"          1.240      Total Area"
"          5.000      Flow length"
"          20.000      Overland Slope"
"          0.620      Pervious Area"
"          5.000      Pervious length"
"          20.000      Pervious slope"
"          0.620      Impervious Area"
"          5.000      Impervious length"
"          20.000      Impervious slope"
"          0.250      Pervious Manning 'n'"
"          78.000      Pervious SCS Curve No."
"          0.427      Pervious Runoff coefficient"
"          0.100      Pervious Ia/S coefficient"
"          7.164      Pervious Initial abstraction"
"          0.015      Impervious Manning 'n'"
"          98.000      Impervious SCS Curve No."
"          0.925      Impervious Runoff coefficient"
"          0.100      Impervious Ia/S coefficient"
"          0.518      Impervious Initial abstraction"
"          0.476      4.179      1.078    0.000 c.m/sec"
"          Catchment 106      Pervious      Impervious      Total Area "
"          Surface Area      0.620      0.620      1.240      hectare"
"          Time of concentration      2.095      0.263      0.893      minutes"
"          Time to Centroid      95.585      83.393      87.581      minutes"
"          Rainfall depth      71.801      71.801      71.801      mm"
"          Rainfall volume      445.17      445.17      890.33      c.m"
"          Rainfall losses      41.510      13.901      27.705      mm"
"          Runoff depth      30.291      57.900      44.096      mm"
"          Runoff volume      187.81      358.98      546.79      c.m"
"          Runoff coefficient      0.427      0.925      0.676      "
"          Maximum flow      0.137      0.369      0.476      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4          Add Runoff "
"          0.476      4.335      1.078    0.000"
" 54      POND DESIGN"
"          4.335      Current peak flow      c.m/sec"
"          2.395      Target outflow      c.m/sec"
"          8655.0      Hydrograph volume      c.m"
"          13.      Number of stages"
"          240.000      Minimum water level      metre"
"          242.300      Maximum water level      metre"
"          240.000      Starting water level      metre"
"          0          Keep Design Data: 1 = True; 0 = False"
"          Level Discharge      Volume"
"          240.000      0.000      0.0"
"          240.200      0.015      675.5"
"          240.400      0.022      1425.3"

```


"	240.600	0.028	2225.8"			
"	240.800	0.033	3078.8"			
"	241.000	0.113	3985.9"			
"	241.200	0.122	4948.7"			
"	241.400	0.314	5969.0"			
"	241.600	0.420	7048.2"			
"	241.800	0.504	8188.2"			
"	242.000	0.575	9390.6"			
"	242.200	0.637	10656.9"			
"	242.300	0.666	11314.6"			
"	2.	OUTFLOW PIPE"				
"	Upstream	Downstr'm	Pipe	Pipe	Manning	Entry"
"	invert	invert	Length	Diameter	'n'	loss Ke"
"	240.000	239.900	14.330	0.150	0.013	0.500"
"	240.790	240.730	16.300	0.450	0.013	0.500"
"	Peak outflow		0.366	c.m/sec"		
"	Maximum level		241.498	metre"		
"	Maximum storage		6495.484	c.m"		
"	Centroidal lag		10.649	hours"		
"	0.476	4.335	0.366	0.000 c.m/sec"		

250 Year Storm

```

"      MIDUSS Output ----->"
"      MIDUSS version                      Version 2.07 rev. 387"
"      MIDUSS created                      Friday, September 23, 2005"
"      10 Units used:                      ie METRIC"
"      Job folder:                        G:\CLIENT\1389\1\SWM\MIDUSS\
"      november 2018-all external areas diverted through channel"
"      Output filename:                    250 year post phase 1 - final-1.out"
"      Licensee name:                      lgrabowski"
"      Company
"      Date & Time last used:              2/19/2019 at 10:59:46 AM"
" 31    TIME PARAMETERS"
"      5.000 Time Step"
"      180.000 Max. Storm length"
"      1500.000 Max. Hydrograph"
" 32    STORM Chicago storm"
"      1 Chicago storm"
"      3048.220 Coefficient A"
"      10.030 Constant B"
"      0.888 Exponent C"
"      0.380 Fraction R"
"      180.000 Duration"
"      1.000 Time step multiplier"
"      Maximum intensity                254.614 mm/hr"
"      Total depth                      86.611 mm"
"      6 250hyd Hydrograph extension used in this file"
" 33    CATCHMENT 101"
"      1 Triangular SCS"
"      3 Specify values"
"      1 SCS method"
"      101 No description"
"      59.000 % Impervious"
"      5.120 Total Area"
"      45.500 Flow length"
"      2.000 Overland Slope"
"      2.099 Pervious Area"
"      45.500 Pervious length"
"      2.000 Pervious slope"
"      3.021 Impervious Area"
"      4.000 Impervious length"
"      2.000 Impervious slope"
"      0.250 Pervious Manning 'n'"
"      78.000 Pervious SCS Curve No."
"      0.482 Pervious Runoff coefficient"
"      0.100 Pervious Ia/S coefficient"
"      7.164 Pervious Initial abstraction"
"      0.015 Impervious Manning 'n'"
"      98.000 Impervious SCS Curve No."
"      0.938 Impervious Runoff coefficient"
"      0.100 Impervious Ia/S coefficient"
"      0.518 Impervious Initial abstraction"
"      1.846 0.000 0.000 0.000 c.m/sec"
"      Catchment 101 Pervious Impervious Total Area "
"      Surface Area 2.099 3.021 5.120 hectare"
"      Time of concentration 14.881 0.460 4.589 minutes"
"      Time to Centroid 108.828 82.938 90.351 minutes"
"      Rainfall depth 86.611 86.611 86.611 mm"
"      Rainfall volume 1818.14 2616.35 4434.49 c.m"
"      Rainfall losses 44.910 14.393 26.905 mm"
"      Runoff depth 41.701 72.218 59.706 mm"
"      Runoff volume 875.39 2181.57 3056.96 c.m"
"      Runoff coefficient 0.482 0.938 0.751 "
"      Maximum flow 0.400 1.792 1.846 c.m/sec"
" 40    HYDROGRAPH Add Runoff "
"      4 Add Runoff "
"      1.846 1.846 0.000 0.000"
" 52    CHANNEL DESIGN"
"      1.846 Current peak flow c.m/sec"
"      0.015 Manning 'n'"
"      1. Cross-section type: 0=trapezoidal; 1=general"
"      7. Define an arbitrary cross-section"
"      0.000 5.500 6.000 10.000 14.000"
"      14.500 20.000"
"      0.270 0.050 0.000 0.080 0.000"
"      0.050 0.270"
"      0.270 Channel depth metre"
"      0.350 Gradient %"
"      0. Variable roughness: 0=False; 1=True"
"      0.0400 0.0400 0.0400 0.0400 0.0400"
"      0.0400 0.0400"
"      Depth of flow 0.195 metre"
"      Velocity 0.954 m/sec"

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```

"          Channel capacity          3.449    c.m/sec"
"          Critical depth            0.184    metre"
53 ROUTE      Channel Route 406"
"      406.00    Channel Route 406 Reach length  ( metre)"
"      0.441    X-factor <= 0.5"
"      159.567    K-lag  ( seconds)"
"      0.000    Default(0) or user spec.(1) values used"
"      0.500    X-factor <= 0.5"
"      30.000    K-lag  ( seconds)"
"      0.500    Beta weighting factor"
"      300.000    Routing time step  ( seconds)"
"      2        No. of sub-reaches"
"      Peak outflow          1.728    c.m/sec"
"      1.846    1.846    1.728    0.000 c.m/sec"
40 HYDROGRAPH Combine 8000"
"      6        Combine "
"      8000    Node #"
"      flows at intersection of street d & c"
"      Maximum flow          1.728    c.m/sec"
"      Hydrograph volume      3056.960    c.m"
"      1.846    1.846    1.728    1.728"
40 HYDROGRAPH Start - New Tributary"
"      2        Start - New Tributary"
"      1.846    0.000    1.728    1.728"
33 CATCHMENT 102"
"      1        Triangular SCS"
"      3        Specify values"
"      1        SCS method"
"      102    No description"
"      55.000    % Impervious"
"      3.330    Total Area"
"      38.500    Flow length"
"      2.000    Overland Slope"
"      1.498    Pervious Area"
"      38.500    Pervious length"
"      2.000    Pervious slope"
"      1.831    Impervious Area"
"      4.000    Impervious length"
"      2.000    Impervious slope"
"      0.250    Pervious Manning 'n'"
"      78.000    Pervious SCS Curve No."
"      0.482    Pervious Runoff coefficient"
"      0.100    Pervious Ia/S coefficient"
"      7.164    Pervious Initial abstraction"
"      0.015    Impervious Manning 'n'"
"      98.000    Impervious SCS Curve No."
"      0.938    Impervious Runoff coefficient"
"      0.100    Impervious Ia/S coefficient"
"      0.518    Impervious Initial abstraction"
"      1.132    0.000    1.728    1.728 c.m/sec"
"      Catchment 102    Pervious    Impervious    Total Area "
"      Surface Area      1.498    1.831    3.330    hectare"
"      Time of concentration  13.462    0.460    4.630    minutes"
"      Time to Centroid    107.071    82.938    90.678    minutes"
"      Rainfall depth      86.611    86.611    86.611    mm"
"      Rainfall volume     1297.87    1586.28    2884.15    c.m"
"      Rainfall losses     44.932    14.393    28.136    mm"
"      Runoff depth        41.679    72.218    58.476    mm"
"      Runoff volume       624.55    1322.68    1947.24    c.m"
"      Runoff coefficient   0.482    0.938    0.733    "
"      Maximum flow       0.292    1.087    1.132    c.m/sec"
40 HYDROGRAPH Add Runoff "
"      4        Add Runoff "
"      1.132    1.132    1.728    1.728"
52 CHANNEL DESIGN"
"      1.132    Current peak flow    c.m/sec"
"      0.015    Manning 'n'"
"      1.      Cross-section type: 0=trapezoidal; 1=general"
"      7.      Define an arbitrary cross-section"
"      0.000    5.500    6.000    10.000    14.000"
"      14.500    20.000"
"      0.270    0.050    0.000    0.080    0.000"
"      0.050    0.270"
"      0.270    Channel depth    metre"
"      0.350    Gradient    %"
"      0.      Variable roughness: 0=False; 1=True"
"      0.0400    0.0400    0.0400    0.0400    0.0400"
"      0.0400    0.0400"
"      Depth of flow          0.158    metre"
"      Velocity              0.823    m/sec"
"      Channel capacity      3.449    c.m/sec"

```

```

"      Critical depth      0.147      metre"
" 53      ROUTE      Channel Route 300"
"      300.00      Channel Route 300 Reach length      ( metre)"
"      0.469      X-factor <= 0.5"
"      273.433      K-lag      ( seconds)"
"      0.000      Default(0) or user spec.(1) values used"
"      0.500      X-factor <= 0.5"
"      30.000      K-lag      ( seconds)"
"      0.500      Beta weighting factor"
"      150.000      Routing time step      ( seconds)"
"      1      No. of sub-reaches"
"      Peak outflow      1.016      c.m/sec"
"      1.132      1.132      1.016      1.728 c.m/sec"
" 40      HYDROGRAPH      Combine      8000"
"      6      Combine "
"      8000      Node #"
"      flows at intersection of street d & c"
"      Maximum flow      2.563      c.m/sec"
"      Hydrograph volume      5004.193      c.m"
"      1.132      1.132      1.016      2.563"
" 40      HYDROGRAPH      Confluence      8000"
"      7      Confluence "
"      8000      Node #"
"      flows at intersection of street d & c"
"      Maximum flow      2.563      c.m/sec"
"      Hydrograph volume      5004.193      c.m"
"      1.132      2.563      1.016      0.000"
" 33      CATCHMENT 103"
"      1      Triangular SCS"
"      3      Specify values"
"      1      SCS method"
"      103      No description"
"      55.000      % Impervious"
"      0.530      Total Area"
"      41.000      Flow length"
"      2.000      Overland Slope"
"      0.238      Pervious Area"
"      41.000      Pervious length"
"      2.000      Pervious slope"
"      0.291      Impervious Area"
"      4.000      Impervious length"
"      2.000      Impervious slope"
"      0.250      Pervious Manning 'n'"
"      78.000      Pervious SCS Curve No."
"      0.482      Pervious Runoff coefficient"
"      0.100      Pervious Ia/S coefficient"
"      7.164      Pervious Initial abstraction"
"      0.015      Impervious Manning 'n'"
"      98.000      Impervious SCS Curve No."
"      0.938      Impervious Runoff coefficient"
"      0.100      Impervious Ia/S coefficient"
"      0.518      Impervious Initial abstraction"
"      0.180      2.563      1.016      0.000 c.m/sec"
"      Catchment 103      Pervious      Impervious      Total Area "
"      Surface Area      0.238      0.291      0.530      hectare"
"      Time of concentration      13.979      0.460      4.800      minutes"
"      Time to Centroid      107.707      82.938      90.890      minutes"
"      Rainfall depth      86.611      86.611      86.611      mm"
"      Rainfall volume      206.57      252.47      459.04      c.m"
"      Rainfall losses      44.874      14.393      28.109      mm"
"      Runoff depth      41.737      72.218      58.502      mm"
"      Runoff volume      99.54      210.52      310.06      c.m"
"      Runoff coefficient      0.482      0.938      0.733      "
"      Maximum flow      0.046      0.173      0.180      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"      0.180      2.660      1.016      0.000"
" 52      CHANNEL DESIGN"
"      2.660      Current peak flow      c.m/sec"
"      0.015      Manning 'n'"
"      1.      Cross-section type: 0=trapezoidal; 1=general"
"      7.      Define an arbitrary cross-section"
"      0.000      5.500      6.000      10.000      14.000"
"      14.500      20.000"
"      0.270      0.050      0.000      0.080      0.000"
"      0.050      0.270"
"      0.270      Channel depth      metre"
"      0.330      Gradient      %"
"      0.      Variable roughness: 0=False; 1=True"
"      0.0400      0.0400      0.0400      0.0400      0.0400"
"      0.0400      0.0400"

```

```

"          Depth of flow          0.231    metre"
"          Velocity                1.040    m/sec"
"          Channel capacity        3.349    c.m/sec"
"          Critical depth          0.218    metre"
" 53      ROUTE      Channel Route 166"
"          166.00      Channel Route 166 Reach length  ( metre)"
"          0.408      X-factor <= 0.5"
"          119.721     K-lag  ( seconds)"
"          0.000      Default(0) or user spec.(1) values used"
"          0.500      X-factor <= 0.5"
"          30.000     K-lag  ( seconds)"
"          0.500      Beta weighting factor"
"          100.000     Routing time step  ( seconds)"
"          1          No. of sub-reaches"
"          Peak outflow          2.625      c.m/sec"
"          0.180      2.660      2.625      0.000 c.m/sec"
" 40      HYDROGRAPH  Combine      8001"
"          6          Combine "
"          8001      Node #"
"          flows entering pond"
"          Maximum flow          2.625      c.m/sec"
"          Hydrograph volume      5314.254    c.m"
"          0.180      2.660      2.625      2.625"
" 40      HYDROGRAPH Start - New Tributary"
"          2          Start - New Tributary"
"          0.180      0.000      2.625      2.625"
" 33      CATCHMENT 104"
"          1          Triangular SCS"
"          3          Specify values"
"          1          SCS method"
"          104       No description"
"          58.000     % Impervious"
"          4.780     Total Area"
"          41.500     Flow length"
"          2.000     Overland Slope"
"          2.008     Pervious Area"
"          41.500     Pervious length"
"          2.000     Pervious slope"
"          2.772     Impervious Area"
"          4.000     Impervious length"
"          2.000     Impervious slope"
"          0.250     Pervious Manning 'n'"
"          78.000     Pervious SCS Curve No."
"          0.482     Pervious Runoff coefficient"
"          0.100     Pervious Ia/S coefficient"
"          7.164     Pervious Initial abstraction"
"          0.015     Impervious Manning 'n'"
"          98.000     Impervious SCS Curve No."
"          0.938     Impervious Runoff coefficient"
"          0.100     Impervious Ia/S coefficient"
"          0.518     Impervious Initial abstraction"
"          1.701     0.000      2.625      2.625 c.m/sec"
"          Catchment 104      Pervious      Impervious      Total Area "
"          Surface Area      2.008      2.772      4.780      hectare"
"          Time of concentration 14.081      0.460      4.479      minutes"
"          Time to Centroid    107.834      82.938      90.283      minutes"
"          Rainfall depth      86.611      86.611      86.611      mm"
"          Rainfall volume      1738.80      2401.21      4140.01      c.m"
"          Rainfall losses      44.872      14.393      27.194      mm"
"          Runoff depth         41.739      72.218      59.417      mm"
"          Runoff volume         837.95      2002.18      2840.13      c.m"
"          Runoff coefficient    0.482      0.938      0.746      "
"          Maximum flow         0.388      1.645      1.701      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4          Add Runoff "
"          1.701      1.701      2.625      2.625"
" 52      CHANNEL DESIGN"
"          1.701      Current peak flow      c.m/sec"
"          0.015      Manning 'n'"
"          1.          Cross-section type: 0=trapezoidal; 1=general"
"          7.          Define an arbitrary cross-section"
"          0.000      5.500      6.000      10.000      14.000"
"          14.500      20.000"
"          0.270      0.050      0.000      0.080      0.000"
"          0.050      0.270"
"          0.270      Channel depth      metre"
"          0.250      Gradient      %"
"          0.          Variable roughness: 0=False; 1=True"
"          0.0400      0.0400      0.0400      0.0400      0.0400"
"          0.0400      0.0400"
"          Depth of flow          0.202      metre"

```

```

"      Velocity                0.827    m/sec"
"      Channel capacity        2.915    c.m/sec"
"      Critical depth          0.177    metre"
" 53      ROUTE      Channel Route 500"
"      500.00      Channel Route 500 Reach length  ( metre)"
"      0.430      X-factor <= 0.5"
" 226.642      K-lag  ( seconds)"
"      0.000      Default(0) or user spec.(1) values used"
"      0.500      X-factor <= 0.5"
"      30.000      K-lag  ( seconds)"
"      0.500      Beta weighting factor"
" 300.000      Routing time step  ( seconds)"
"      2          No. of sub-reaches"
"      Peak outflow                1.643    c.m/sec"
"      1.701      1.701      1.643    2.625 c.m/sec"
" 40      HYDROGRAPH      Combine      8001"
"      6      Combine "
"      8001      Node #"
"      flows entering pond"
"      Maximum flow                4.268    c.m/sec"
"      Hydrograph volume            8154.384    c.m"
"      1.701      1.701      1.643    4.268"
" 40      HYDROGRAPH Start - New Tributary"
"      2      Start - New Tributary"
"      1.701      0.000      1.643    4.268"
" 33      CATCHMENT 105"
"      1      Triangular SCS"
"      3      Specify values"
"      1      SCS method"
"      105     No description"
"      70.000   % Impervious"
"      3.090   Total Area"
"      110.000  Flow length"
"      2.000   Overland Slope"
"      0.927   Pervious Area"
"      110.000  Pervious length"
"      1.000   Pervious slope"
"      2.163   Impervious Area"
"      4.000   Impervious length"
"      2.000   Impervious slope"
"      0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"      0.482   Pervious Runoff coefficient"
"      0.100   Pervious Ia/S coefficient"
"      7.164   Pervious Initial abstraction"
"      0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"      0.938   Impervious Runoff coefficient"
"      0.100   Impervious Ia/S coefficient"
"      0.518   Impervious Initial abstraction"
"      1.290      0.000      1.643    4.268 c.m/sec"
"      Catchment 105      Pervious      Impervious      Total Area "
"      Surface Area      0.927      2.163      3.090      hectare"
"      Time of concentration 31.114      0.460      6.546      minutes"
"      Time to Centroid      129.054      82.938      92.093      minutes"
"      Rainfall depth      86.611      86.611      86.611      mm"
"      Rainfall volume      802.88      1873.40      2676.28      c.m"
"      Rainfall losses      44.872      14.393      23.537      mm"
"      Runoff depth      41.739      72.218      63.075      mm"
"      Runoff volume      386.92      1562.08      1949.00      c.m"
"      Runoff coefficient      0.482      0.938      0.801      "
"      Maximum flow      0.109      1.283      1.290      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"      1.290      1.290      1.643    4.268"
" 52      CHANNEL DESIGN"
"      1.290      Current peak flow      c.m/sec"
"      0.015      Manning 'n'"
"      1.      Cross-section type: 0=trapezoidal; 1=general"
"      7.      Define an arbitrary cross-section"
"      0.000      5.500      6.000      10.000      14.000"
"      14.500      20.000"
"      0.270      0.050      0.000      0.080      0.000"
"      0.050      0.270"
"      0.270      Channel depth      metre"
"      0.500      Gradient      %"
"      0.      Variable roughness: 0=False; 1=True"
"      0.0400      0.0400      0.0400      0.0400      0.0400"
"      0.0400      0.0400"
"      Depth of flow                0.155    metre"
"      Velocity                0.969    m/sec"

```

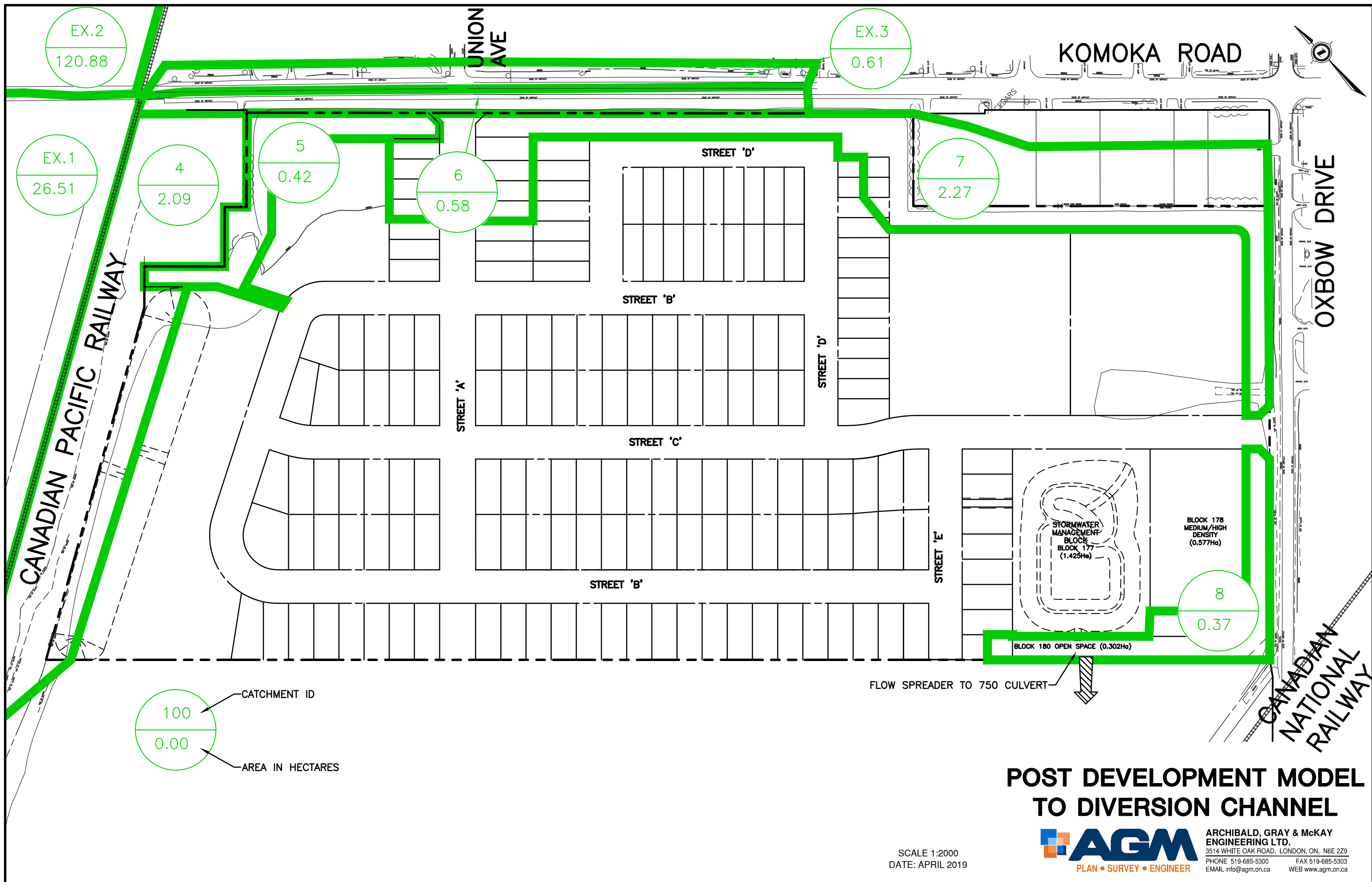
```

"          Channel capacity          4.123    c.m/sec"
"          Critical depth            0.156    metre"
" 53 ROUTE      Channel Route 80"
"      80.00      Channel Route 80 Reach length  ( metre)"
"      0.420      X-factor <= 0.5"
"      61.911      K-lag  ( seconds)"
"      0.000      Default(0) or user spec.(1) values used"
"      0.500      X-factor <= 0.5"
"      30.000      K-lag  ( seconds)"
"      0.500      Beta weighting factor"
"      60.000      Routing time step  ( seconds)"
"      1          No. of sub-reaches"
"      Peak outflow          1.109    c.m/sec"
"      1.290      1.290      1.109    4.268 c.m/sec"
" 40 HYDROGRAPH  Combine      8001"
"      6      Combine "
"      8001      Node #"
"      flows entering pond"
"      Maximum flow          4.810    c.m/sec"
"      Hydrograph volume      10103.373 c.m"
"      1.290      1.290      1.109    4.810"
" 40 HYDROGRAPH  Confluence    8001"
"      7      Confluence "
"      8001      Node #"
"      flows entering pond"
"      Maximum flow          4.810    c.m/sec"
"      Hydrograph volume      10103.373 c.m"
"      1.290      4.810      1.109    0.000"
" 33 CATCHMENT 106"
"      1      Triangular SCS"
"      1      Equal length"
"      1      SCS method"
"      106     pond area direct"
"      50.000   % Impervious"
"      1.240   Total Area"
"      5.000   Flow length"
"      20.000   Overland Slope"
"      0.620   Pervious Area"
"      5.000   Pervious length"
"      20.000   Pervious slope"
"      0.620   Impervious Area"
"      5.000   Impervious length"
"      20.000   Impervious slope"
"      0.250   Pervious Manning 'n'"
"      78.000   Pervious SCS Curve No."
"      0.482   Pervious Runoff coefficient"
"      0.100   Pervious Ia/S coefficient"
"      7.164   Pervious Initial abstraction"
"      0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"      0.938   Impervious Runoff coefficient"
"      0.100   Impervious Ia/S coefficient"
"      0.518   Impervious Initial abstraction"
"      0.503      4.810      1.109    0.000 c.m/sec"
"      Catchment 106      Pervious      Impervious      Total Area "
"      Surface Area      0.620      0.620      1.240      hectare"
"      Time of concentration 1.982      0.264      0.900      minutes"
"      Time to Centroid      92.556      82.063      85.946      minutes"
"      Rainfall depth      86.611      86.611      86.611      mm"
"      Rainfall volume      536.99      536.99      1073.98      c.m"
"      Rainfall losses      45.347      16.365      30.856      mm"
"      Runoff depth      41.265      70.246      55.755      mm"
"      Runoff volume      255.84      435.52      691.36      c.m"
"      Runoff coefficient    0.482      0.938      0.710      "
"      Maximum flow      0.181      0.369      0.503      c.m/sec"
" 40 HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"      0.503      5.054      1.109    0.000"
" 54 POND DESIGN"
"      5.054      Current peak flow    c.m/sec"
"      2.395      Target outflow      c.m/sec"
"      10800.0     Hydrograph volume    c.m"
"      13.         Number of stages"
"      240.000     Minimum water level  metre"
"      242.300     Maximum water level  metre"
"      240.000     Starting water level  metre"
"      0          Keep Design Data: 1 = True; 0 = False"
"      Level Discharge      Volume"
"      240.000     0.000      0.0"
"      240.200     0.015      675.5"
"      240.400     0.022      1425.3"

```


"	240.600	0.028	2225.8"			
"	240.800	0.033	3078.8"			
"	241.000	0.113	3985.9"			
"	241.200	0.122	4948.7"			
"	241.400	0.314	5969.0"			
"	241.600	0.420	7048.2"			
"	241.800	0.504	8188.2"			
"	242.000	0.575	9390.6"			
"	242.200	0.637	10656.9"			
"	242.300	0.666	11314.6"			
"	2. OUTFLOW PIPE"					
"	Upstream	Downstr'm	Pipe	Pipe	Manning	Entry"
"	invert	invert	Length	Diameter	'n'	loss Ke"
"	240.000	239.900	14.330	0.150	0.013	0.500"
"	240.790	240.730	16.300	0.450	0.013	0.500"
"	Peak outflow		0.497	c.m/sec"		
"	Maximum level		241.785	metre"		
"	Maximum storage		8103.375	c.m"		
"	Centroidal lag		9.486	hours"		
"	0.503	5.054	0.497	0.000 c.m/sec"		

Diversion Channel



POST DEVELOPMENT MODEL
TO DIVERSION CHANNEL



ARCHIBALD, GRAY & McKAY
ENGINEERING LTD.
3514 WHITE OAK ROAD, LONDON, ON, N6E 2Z9
PHONE 519-685-5300 FAX 519-685-5303
EMAIL info@agm.on.ca WEB www.agm.on.ca

SCALE 1:2000
DATE: APRIL 2019

2 Year Storm

```

"          MIDUSS Output ----->"
"          MIDUSS version          Version 2.07 rev. 387"
"          MIDUSS created          Friday, September 23, 2005"
"          10 Units used:          ie METRIC"
"          Job folder:             G:\CLIENT\1389\1\SWM\MIDUSS\
"                                   diversion channel"
"          Output filename:        2yr-external channel design.out"
"          Licensee name:          lgrabowski"
"          Company
"          Date & Time last used:   2/6/2019 at 3:37:52 PM"
" 31      TIME PARAMETERS"
"          5.000 Time Step"
"          180.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1 Chicago storm"
"          724.690 Coefficient A"
"          5.500 Constant B"
"          0.800 Exponent C"
"          0.380 Fraction R"
"          180.000 Duration"
"          1.000 Time step multiplier"
"          Maximum intensity      101.773 mm/hr"
"          Total depth            33.312 mm"
"          4 2hyd Hydrograph extension used in this file"
" 33      CATCHMENT 1"
"          1 Triangular SCS"
"          1 Equal length"
"          1 SCS method"
"          1 external area 1"
"          1.040 % Impervious"
"          26.510 Total Area"
"          600.000 Flow length"
"          3.000 Overland Slope"
"          26.234 Pervious Area"
"          600.000 Pervious length"
"          3.000 Pervious slope"
"          0.276 Impervious Area"
"          600.000 Impervious length"
"          3.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          84.000 Pervious SCS Curve No."
"          0.317 Pervious Runoff coefficient"
"          0.100 Pervious Ia/S coefficient"
"          4.838 Pervious Initial abstraction"
"          0.015 Impervious Manning 'n'"
"          98.000 Impervious SCS Curve No."
"          0.850 Impervious Runoff coefficient"
"          0.100 Impervious Ia/S coefficient"
"          0.518 Impervious Initial abstraction"
"          0.251 0.000 0.000 0.000 c.m/sec"
"          Catchment 1 Pervious Impervious Total Area "
"          Surface Area 26.234 0.276 26.510 hectare"
"          Time of concentration 113.007 12.292 110.248 minutes"
"          Time to Centroid 233.598 103.494 230.034 minutes"
"          Rainfall depth 33.312 33.312 33.312 mm"
"          Rainfall volume 8739.12 91.84 8830.96 c.m"
"          Rainfall losses 22.764 5.042 22.579 mm"
"          Runoff depth 10.548 28.270 10.733 mm"
"          Runoff volume 2767.26 77.94 2845.21 c.m"
"          Runoff coefficient 0.317 0.850 0.322 "
"          Maximum flow 0.247 0.039 0.251 c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4 Add Runoff "
"          0.251 0.251 0.000 0.000"
" 58      CULVERT"
"          0.251 Culvert Q c.m/sec"
"          25.00 Length metre"
"          0.015 Manning 'n'"
"          244.300 Upstream IL metre"
"          244.290 Downstream IL metre"
"          247.050 Weir Elev. metre"
"          20.000 Weir Breadth. metre"
"          25.000 Weir Left slope to 1"
"          25.000 Weir Right slope to 1"
"          244.600 Tail water elevation"
"          1 Barrel Option (Pipe/Box/CSPA/HE/VE)"
"          1.000 Barrel Height/Diameter"
"          1.000 Barrel Width"
"          0.700 Cc 004 RC pipe socket inlet"
"          0.900 Ke 012 Project from fill"

```

"	1.	Number of Barrels"		
"	39	Number of stages"		
"		Level Discharge	Volume"	
"		244.300	0.000	0.0"
"		244.800	0.013	23.9"
"		244.800	0.025	23.9"
"		244.800	0.038	23.9"
"		244.800	0.050	23.9"
"		244.801	0.063	24.0"
"		244.801	0.075	24.0"
"		244.801	0.088	24.0"
"		244.802	0.100	24.1"
"		244.802	0.113	24.1"
"		244.803	0.125	24.2"
"		244.803	0.138	24.2"
"		244.804	0.151	24.3"
"		244.804	0.163	24.3"
"		244.805	0.176	24.4"
"		244.806	0.188	24.5"
"		244.807	0.201	24.6"
"		244.808	0.213	24.7"
"		244.809	0.226	24.8"
"		244.810	0.238	24.9"
"		244.811	0.251	25.0"
"		244.812	0.263	25.1"
"		244.813	0.276	25.2"
"		244.814	0.288	25.3"
"		244.815	0.301	25.5"
"		244.819	0.314	25.8"
"		244.829	0.326	27.0"
"		244.840	0.339	28.2"
"		244.850	0.351	29.4"
"		244.861	0.364	30.6"
"		244.871	0.376	31.8"
"		244.881	0.389	33.0"
"		244.891	0.401	34.3"
"		244.901	0.414	35.5"
"		244.911	0.426	36.8"
"		244.920	0.439	38.1"
"		244.930	0.452	39.3"
"		244.939	0.464	40.7"
"		244.949	0.477	42.0"
"	1.500	Channel Basewidth"		
"	1.000	Channel Depth"		
"	3.500	Channel Topwidth"		
"	10.000	Grade Left"		
"	10.000	Grade Right"		
"	1.000	Grade %"		
"	300.000	Length"		
"		Barrel Yo	0.560	metre"
"		Barrel Ycr	0.279	metre"
"		Exit Velocity	1.209	m/sec"
"		Barrel Peak Outflow	0.251	c.m/sec"
"		Weir Peak Flow	0.000	c.m/sec"
"		Total Peak Outflow	0.251	c.m/sec"
"		Maximum level	244.769	metre"
"		Maximum storage	24.983	c.m"
"		Centroidal lag	3.928	hours"
"		0.251 0.251 0.251	0.251	0.000 c.m/sec"
" 40		HYDROGRAPH Combine	9999"	
"	6	Combine "		
"	9999	Node #"		
"		flows meeting south of ex culv"		
"		Maximum flow	0.251	c.m/sec"
"		Hydrograph volume	2826.912	c.m"
"		0.251 0.251 0.251	0.251	0.251"
" 40		HYDROGRAPH Start - New Tributary"		
"	2	Start - New Tributary"		
"		0.251 0.000 0.251	0.251	0.251"
" 33		CATCHMENT 4"		
"	1	Triangular SCS"		
"	1	Equal length"		
"	1	SCS method"		
"	4	flows between rail and berm + ex properties"		
"	5.000	% Impervious"		
"	2.090	Total Area"		
"	200.000	Flow length"		
"	10.000	Overland Slope"		
"	1.985	Pervious Area"		
"	200.000	Pervious length"		
"	10.000	Pervious slope"		

```

"      0.104 Impervious Area"
" 200.000 Impervious length"
" 10.000 Impervious slope"
"      0.250 Pervious Manning 'n'"
" 84.000 Pervious SCS Curve No."
"      0.317 Pervious Runoff coefficient"
"      0.100 Pervious Ia/S coefficient"
"      4.838 Pervious Initial abstraction"
"      0.015 Impervious Manning 'n'"
" 98.000 Impervious SCS Curve No."
"      0.850 Impervious Runoff coefficient"
"      0.100 Impervious Ia/S coefficient"
"      0.518 Impervious Initial abstraction"
"          0.046      0.000      0.251      0.251 c.m/sec"
"      Catchment 4      Pervious Impervious Total Area "
"      Surface Area      1.985      0.104      2.090 hectare"
"      Time of concentration      40.735      4.431      36.266 minutes"
"      Time to Centroid      145.854      92.092      139.235 minutes"
"      Rainfall depth      33.312      33.312      33.312 mm"
"      Rainfall volume      661.41      34.81      696.22 c.m"
"      Rainfall losses      22.769      5.189      21.890 mm"
"      Runoff depth      10.543      28.123      11.422 mm"
"      Runoff volume      209.32      29.39      238.71 c.m"
"      Runoff coefficient      0.317      0.850      0.343 "
"      Maximum flow      0.043      0.021      0.046 c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"          0.046      0.046      0.251      0.251"
" 52      CHANNEL DESIGN"
"      0.046 Current peak flow c.m/sec"
"      0.040 Manning 'n'"
"      0 Cross-section type: 0=trapezoidal; 1=general"
"      0.900 Basewidth metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.000 Channel depth metre"
"      0.500 Gradient %"
"      Depth of flow      0.110 metre"
"      Velocity      0.341 m/sec"
"      Channel capacity      4.571 c.m/sec"
"      Critical depth      0.060 metre"
" 53      ROUTE Zero Route"
"      0.00 Zero Route Reach length (metre)"
"          0.046      0.046      0.046      0.251 c.m/sec"
" 40      HYDROGRAPH Combine 9999"
"      6 Combine "
"      9999 Node #"
"          flows meeting south of ex culv"
"      Maximum flow      0.269 c.m/sec"
"      Hydrograph volume      3065.625 c.m"
"          0.046      0.046      0.046      0.269"
" 40      HYDROGRAPH Confluence 9999"
"      7 Confluence "
"      9999 Node #"
"          flows meeting south of ex culv"
"      Maximum flow      0.269 c.m/sec"
"      Hydrograph volume      3065.625 c.m"
"          0.046      0.269      0.046      0.000"
" 33      CATCHMENT 5"
"      1 Triangular SCS"
"      1 Equal length"
"      1 SCS method"
"      5 channel direct area"
"      0.000 % Impervious"
"      0.420 Total Area"
"      5.000 Flow length"
"      25.000 Overland Slope"
"      0.420 Pervious Area"
"      5.000 Pervious length"
"      25.000 Pervious slope"
"      0.000 Impervious Area"
"      5.000 Impervious length"
"      25.000 Impervious slope"
"      0.250 Pervious Manning 'n'"
"      84.000 Pervious SCS Curve No."
"      0.317 Pervious Runoff coefficient"
"      0.100 Pervious Ia/S coefficient"
"      4.838 Pervious Initial abstraction"
"      0.015 Impervious Manning 'n'"
"      98.000 Impervious SCS Curve No."
"      0.850 Impervious Runoff coefficient"

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"      0.100 Impervious Ia/S coefficient"
"      0.518 Impervious Initial abstraction"
"              0.027      0.269      0.046      0.000 c.m/sec"
"      Catchment 5      Pervious      Impervious      Total Area "
"      Surface Area      0.420      0.000      0.420      hectare"
"      Time of concentration      3.383      0.368      3.383      minutes"
"      Time to Centroid      100.725      86.569      100.725      minutes"
"      Rainfall depth      33.312      33.312      33.312      mm"
"      Rainfall volume      139.91      0.00      139.91      c.m"
"      Rainfall losses      23.022      8.326      23.022      mm"
"      Runoff depth      10.290      24.986      10.290      mm"
"      Runoff volume      43.22      0.00      43.22      c.m"
"      Runoff coefficient      0.317      0.850      0.317      "
"      Maximum flow      0.027      0.000      0.027      c.m/sec"
40  HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"              0.027      0.272      0.046      0.000"
52  CHANNEL DESIGN"
"      0.272 Current peak flow      c.m/sec"
"      0.025 Manning 'n'"
"      0. Cross-section type: 0=trapezoidal; 1=general"
"      0.900 Basewidth      metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.000 Channel depth      metre"
"      0.840 Gradient      %"
"      Depth of flow      0.192      metre"
"      Velocity      0.960      m/sec"
"      Channel capacity      9.479      c.m/sec"
"      Critical depth      0.172      metre"
53  ROUTE      Channel Route 79"
"      79.00      Channel Route 79 Reach length      ( metre)"
"      0.425 X-factor <= 0.5"
"      61.715 K-lag      ( seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"      30.000 K-lag      ( seconds)"
"      0.500 Beta weighting factor"
"      60.000 Routing time step      ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow      0.271      c.m/sec"
"              0.027      0.272      0.271      0.000 c.m/sec"
40  HYDROGRAPH Next link "
"      5      Next link "
"              0.027      0.271      0.271      0.000"
52  CHANNEL DESIGN"
"      0.271 Current peak flow      c.m/sec"
"      0.025 Manning 'n'"
"      0. Cross-section type: 0=trapezoidal; 1=general"
"      0.900 Basewidth      metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.000 Channel depth      metre"
"      0.400 Gradient      %"
"      Depth of flow      0.232      metre"
"      Velocity      0.734      m/sec"
"      Channel capacity      6.541      c.m/sec"
"      Critical depth      0.172      metre"
53  ROUTE      Channel Route 213"
"      213.00      Channel Route 213 Reach length      ( metre)"
"      0.431 X-factor <= 0.5"
"      217.728 K-lag      ( seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"      30.000 K-lag      ( seconds)"
"      0.500 Beta weighting factor"
"      150.000 Routing time step      ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow      0.271      c.m/sec"
"              0.027      0.271      0.271      0.000 c.m/sec"
40  HYDROGRAPH Next link "
"      5      Next link "
"              0.027      0.271      0.271      0.000"
52  CHANNEL DESIGN"
"      0.271 Current peak flow      c.m/sec"
"      0.040 Manning 'n'"
"      0. Cross-section type: 0=trapezoidal; 1=general"
"      1.800 Basewidth      metre"
"      0.100 Left bank slope"
"      0.100 Right bank slope"
"      1.000 Channel depth      metre"

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"      0.480 Gradient %"
"      Depth of flow      0.251 metre"
"      Velocity           0.591 m/sec"
"      Channel capacity   2.070 c.m/sec"
"      Critical depth     0.132 metre"
" 53 ROUTE Channel Route 10"
"      10.00 Channel Route 10 Reach length ( metre)"
"      0.000 X-factor <= 0.5"
"      12.701 K-lag ( seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"      30.000 K-lag ( seconds)"
"      0.804 Beta weighting factor"
"      50.000 Routing time step ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow      0.271 c.m/sec"
"      0.027 0.271 0.271 0.000 c.m/sec"
" 40 HYDROGRAPH Next link "
"      5 Next link "
"      0.027 0.271 0.271 0.000"
" 58 CULVERT"
"      0.271 Culvert Q c.m/sec"
"      20.00 Length metre"
"      0.015 Manning 'n'"
"      242.340 Upstream IL metre"
"      242.250 Downstream IL metre"
"      243.800 Weir Elev. metre"
"      10.000 Weir Breadth. metre"
"      25.000 Weir Left slope to 1"
"      25.000 Weir Right slope to 1"
"      242.800 Tail water elevation"
"      2 Barrel Option (Pipe/Box/CSPA/HE/VE)"
"      0.900 Barrel Height/Diameter"
"      1.800 Barrel Width"
"      0.700 Cc 004 RC pipe socket inlet"
"      0.900 Ke 012 Project from fill"
"      1. Number of Barrels"
"      39 Number of stages"
"      Level Discharge Volume"
"      242.340 0.000 0.0"
"      242.800 0.014 9.7"
"      242.800 0.027 9.7"
"      242.800 0.041 9.7"
"      242.800 0.054 9.7"
"      242.801 0.068 9.7"
"      242.801 0.081 9.7"
"      242.801 0.095 9.7"
"      242.802 0.108 9.8"
"      242.802 0.122 9.8"
"      242.803 0.135 9.8"
"      242.803 0.149 9.8"
"      242.804 0.162 9.8"
"      242.804 0.176 9.8"
"      242.805 0.189 9.8"
"      242.806 0.203 9.8"
"      242.807 0.216 9.9"
"      242.808 0.230 9.9"
"      242.809 0.244 9.9"
"      242.810 0.257 9.9"
"      242.811 0.271 9.9"
"      242.812 0.284 9.9"
"      242.813 0.298 10.0"
"      242.814 0.311 10.0"
"      242.815 0.325 10.0"
"      242.816 0.338 10.0"
"      242.818 0.352 10.1"
"      242.819 0.365 10.1"
"      242.821 0.379 10.1"
"      242.822 0.392 10.1"
"      242.824 0.406 10.2"
"      242.825 0.419 10.2"
"      242.827 0.433 10.2"
"      242.829 0.446 10.3"
"      242.830 0.460 10.3"
"      242.832 0.474 10.3"
"      242.834 0.487 10.4"
"      242.836 0.501 10.4"
"      242.838 0.514 10.4"
"      1.800 Channel Basewidth"
"      1.000 Channel Depth"
"      2.000 Channel Topwidth"

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"      10.000  Grade Left"
"      10.000  Grade Right"
"      0.480  Grade %"
"      10.000  Length"
"          Barrel Yo              0.138  metre"
"          Barrel Ycr              0.132  metre"
"          Exit Velocity            0.273  m/sec"
"          Barrel Peak Outflow      0.270  c.m/sec"
"          Weir Peak Flow           0.000  c.m/sec"
"          Total Peak Outflow       0.270  c.m/sec"
"          Maximum level            242.811  metre"
"          Maximum storage          9.922  c.m"
"          Centroidal lag           3.886  hours"
"          0.027  0.271  0.270  0.000 c.m/sec"
40  HYDROGRAPH Next link "
"      5  Next link "
"          0.027  0.270  0.270  0.000"
52  CHANNEL DESIGN"
"      0.270  Current peak flow  c.m/sec"
"      0.040  Manning 'n'"
"      0.  Cross-section type: 0=trapezoidal; 1=general"
"      0.900  Basewidth  metre"
"      3.000  Left bank slope"
"      3.000  Right bank slope"
"      1.000  Channel depth  metre"
"      0.480  Gradient  %"
"          Depth of flow            0.279  metre"
"          Velocity                  0.556  m/sec"
"          Channel capacity          4.478  c.m/sec"
"          Critical depth            0.172  metre"
53  ROUTE  Channel Route 67"
"      67.00  Channel Route 67 Reach length  ( metre)"
"      0.286  X-factor <= 0.5"
"      90.327  K-lag  ( seconds)"
"      0.000  Default(0) or user spec.(1) values used"
"      0.500  X-factor <= 0.5"
"      30.000  K-lag  ( seconds)"
"      0.500  Beta weighting factor"
"      100.000  Routing time step  ( seconds)"
"      1  No. of sub-reaches"
"          Peak outflow              0.270  c.m/sec"
"          0.027  0.270  0.270  0.000 c.m/sec"
40  HYDROGRAPH Combine 10000"
"      6  Combine "
"      10000  Node #"
"          flows entering main channel"
"          Maximum flow              0.270  c.m/sec"
"          Hydrograph volume          3106.157  c.m"
"          0.027  0.270  0.270  0.270"
40  HYDROGRAPH Start - New Tributary"
"      2  Start - New Tributary"
"          0.027  0.000  0.270  0.270"
33  CATCHMENT 2"
"      1  Triangular SCS"
"      1  Equal length"
"      1  SCS method"
"      2  external area 2"
"      1.400  % Impervious"
"      120.880  Total Area"
"      900.000  Flow length"
"      3.000  Overland Slope"
"      119.188  Pervious Area"
"      900.000  Pervious length"
"      3.000  Pervious slope"
"      1.692  Impervious Area"
"      900.000  Impervious length"
"      3.000  Impervious slope"
"      0.250  Pervious Manning 'n'"
"      84.000  Pervious SCS Curve No."
"      0.317  Pervious Runoff coefficient"
"      0.100  Pervious Ia/S coefficient"
"      4.838  Pervious Initial abstraction"
"      0.015  Impervious Manning 'n'"
"      98.000  Impervious SCS Curve No."
"      0.850  Impervious Runoff coefficient"
"      0.100  Impervious Ia/S coefficient"
"      0.518  Impervious Initial abstraction"
"          0.925  0.000  0.270  0.270 c.m/sec"
"          Catchment 2  Pervious  Impervious Total Area "
"          Surface Area  119.188  1.692  120.880  hectare"
"          Time of concentration  144.132  15.677  139.428  minutes"

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"      Time to Centroid      271.255      108.434      265.292      minutes"
"      Rainfall depth       33.312       33.312       33.312       mm"
"      Rainfall volume      3.9704      0.0564      4.0267      ha-m"
"      Rainfall losses      22.764      5.072       22.517      mm"
"      Runoff depth         10.548      28.240      10.795      mm"
"      Runoff volume        1.2571      0.0478      1.3049      ha-m"
"      Runoff coefficient    0.317       0.850       0.324       "
"      Maximum flow         0.908       0.207       0.925       c.m/sec"
40  HYDROGRAPH Add Runoff "
"      4  Add Runoff "
"          0.925      0.925      0.270      0.270"
52  CHANNEL DESIGN"
"      0.925  Current peak flow      c.m/sec"
"      0.022  Manning 'n'"
"      0.      Cross-section type: 0=trapezoidal; 1=general"
"      5.000  Basewidth      metre"
"      3.000  Left bank slope"
"      3.000  Right bank slope"
"      0.500  Channel depth      metre"
"      0.600  Gradient      %"
"      Depth of flow      0.168      metre"
"      Velocity      1.003      m/sec"
"      Channel capacity      6.193      c.m/sec"
"      Critical depth      0.147      metre"
53  ROUTE      Channel Route 350"
"      350.00  Channel Route 350 Reach length      ( metre)"
"      0.477  X-factor <= 0.5"
"      261.612  K-lag      ( seconds)"
"      0.000  Default(0) or user spec.(1) values used"
"      0.500  X-factor <= 0.5"
"      30.000  K-lag      ( seconds)"
"      0.500  Beta weighting factor"
"      150.000  Routing time step      ( seconds)"
"      1  No. of sub-reaches"
"      Peak outflow      0.923      c.m/sec"
"          0.925      0.925      0.923      0.270 c.m/sec"
40  HYDROGRAPH Next link "
"      5  Next link "
"          0.925      0.923      0.923      0.270"
58  CULVERT"
"      0.923  Culvert Q      c.m/sec"
"      19.30  Length      metre"
"      0.013  Manning 'n'"
"      242.130  Upstream IL      metre"
"      242.100  Downstream IL      metre"
"      243.610  Weir Elev.      metre"
"      20.000  Weir Breadth.      metre"
"      25.000  Weir Left slope to 1"
"      25.000  Weir Right slope to 1"
"      243.350  Tail water elevation"
"      1  Barrel Option (Pipe/Box/CSPA/HE/VE)"
"      0.900  Barrel Height/Diameter"
"      0.900  Barrel Width"
"      0.500  Cc 001 CSP thin walled projecting"
"      0.900  Ke 012 Project from fill"
"      1.  Number of Barrels"
"      39  Number of stages"
"      Level Discharge      Volume"
"      242.130      0.000      0.0"
"      243.351      0.046      1097.7"
"      243.353      0.092      1102.2"
"      243.356      0.138      1109.6"
"      243.360      0.185      1120.2"
"      243.366      0.231      1133.9"
"      243.373      0.277      1150.7"
"      243.381      0.323      1171.0"
"      243.391      0.369      1194.6"
"      243.401      0.415      1221.8"
"      243.414      0.462      1252.7"
"      243.427      0.508      1287.6"
"      243.442      0.554      1326.6"
"      243.457      0.600      1369.9"
"      243.475      0.646      1418.0"
"      243.493      0.692      1470.9"
"      243.513      0.739      1529.0"
"      243.534      0.785      1592.7"
"      243.556      0.831      1662.4"
"      243.579      0.877      1738.5"
"      243.604      0.923      1821.3"
"      243.630      0.969      1911.4"
"      243.658      1.016      2009.3"

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"      243.686      1.062      2115.6"
"      243.716      1.108      2230.9"
"      243.747      1.154      2355.7"
"      243.780      1.200      2490.9"
"      243.813      1.246      2637.1"
"      243.848      1.293      2795.2"
"      243.884      1.339      2965.9"
"      243.922      1.385      3150.3"
"      243.961      1.431      3349.3"
"      244.001      1.477      3563.9"
"      244.042      1.523      3795.2"
"      244.085      1.570      4044.5"
"      244.128      1.616      4312.9"
"      244.174      1.662      4601.8"
"      244.220      1.708      4915.7"
"      244.268      1.754      5256.6"
"      5.000      Channel Basewidth"
"      0.500      Channel Depth"
"      8.000      Channel Topwidth"
"      10.000      Grade Left"
"      10.000      Grade Right"
"      0.600      Grade %"
"      350.000      Length"
"      Barrel Yo      0.900      metre"
"      Barrel Ycr      0.550      metre"
"      Exit Velocity      1.367      m/sec"
"      Barrel Peak Outflow      0.869      c.m/sec"
"      Weir Peak Flow      0.000      c.m/sec"
"      Total Peak Outflow      0.869      c.m/sec"
"      Maximum level      243.575      metre"
"      Maximum storage      1725.638      c.m"
"      Centroidal lag      5.711      hours"
"      0.925      0.923      0.869      0.270 c.m/sec"
" 40      HYDROGRAPH Next link "
"      5      Next link "
"      0.925      0.869      0.869      0.270"
" 52      CHANNEL DESIGN"
"      0.869      Current peak flow      c.m/sec"
"      0.022      Manning 'n'"
"      0.      Cross-section type: 0=trapezoidal; 1=general"
"      0.000      Basewidth      metre"
"      3.000      Left bank slope"
"      3.000      Right bank slope"
"      1.000      Channel depth      metre"
"      0.290      Gradient      %"
"      Depth of flow      0.541      metre"
"      Velocity      0.989      m/sec"
"      Channel capacity      4.466      c.m/sec"
"      Critical depth      0.443      metre"
" 53      ROUTE      Channel Route 69"
"      69.00      Channel Route 69 Reach length      ( metre)"
"      0.000      X-factor <= 0.5"
"      52.337      K-lag      ( seconds)"
"      0.000      Default(0) or user spec.(1) values used"
"      0.500      X-factor <= 0.5"
"      30.000      K-lag      ( seconds)"
"      0.504      Beta weighting factor"
"      100.000      Routing time step      ( seconds)"
"      1      No. of sub-reaches"
"      Peak outflow      0.869      c.m/sec"
"      0.925      0.869      0.869      0.270 c.m/sec"
" 40      HYDROGRAPH Next link "
"      5      Next link "
"      0.925      0.869      0.869      0.270"
" 58      CULVERT"
"      0.869      Culvert Q      c.m/sec"
"      20.40      Length      metre"
"      0.013      Manning 'n'"
"      241.900      Upstream IL      metre"
"      241.870      Downstream IL      metre"
"      243.610      Weir Elev.      metre"
"      20.000      Weir Breadth.      metre"
"      116.900      Weir Left slope to 1"
"      116.900      Weir Right slope to 1"
"      242.600      Tail water elevation"
"      4      Barrel Option (Pipe/Box/CSPA/HE/VE)"
"      0.965      Barrel Height/Diameter"
"      1.524      Barrel Width"
"      0.500      Cc 001 CSP thin walled projecting"
"      0.900      Ke 012 Project from fill"
"      1.      Number of Barrels"

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"	39	Number of stages"		
"		Level Discharge	Volume"	
"		241.900	0.000	0.0"
"		242.600	0.043	80.5"
"		242.601	0.087	80.7"
"		242.602	0.130	81.0"
"		242.604	0.174	81.5"
"		242.606	0.217	82.1"
"		242.609	0.261	82.8"
"		242.613	0.304	83.7"
"		242.617	0.348	84.7"
"		242.621	0.391	85.8"
"		242.626	0.435	87.1"
"		242.631	0.478	88.5"
"		242.637	0.522	90.1"
"		242.643	0.565	91.8"
"		242.650	0.608	93.7"
"		242.658	0.652	95.7"
"		242.665	0.695	97.9"
"		242.674	0.739	100.2"
"		242.683	0.782	102.7"
"		242.692	0.826	105.4"
"		242.702	0.869	108.2"
"		242.712	0.913	111.2"
"		242.722	0.956	114.4"
"		242.733	1.000	117.7"
"		242.745	1.043	121.3"
"		242.757	1.087	125.0"
"		242.769	1.130	128.9"
"		242.781	1.173	133.0"
"		242.794	1.217	137.3"
"		242.808	1.260	141.7"
"		242.821	1.304	146.4"
"		242.836	1.347	151.2"
"		242.850	1.391	156.2"
"		242.864	1.434	161.5"
"		242.879	1.478	166.9"
"		242.895	1.521	172.5"
"		242.910	1.565	178.2"
"		242.926	1.608	184.3"
"		242.942	1.652	190.5"
"	0.000	Channel Basewidth"		
"	1.000	Channel Depth"		
"	6.000	Channel Topwidth"		
"	10.000	Grade Left"		
"	10.000	Grade Right"		
"	0.290	Grade %"		
"	69.000	Length"		
"		Barrel Yo	0.573	metre"
"		Barrel Ycr	0.425	metre"
"		Exit Velocity	0.930	m/sec"
"		Barrel Peak Outflow	0.869	c.m/sec"
"		Weir Peak Flow	0.000	c.m/sec"
"		Total Peak Outflow	0.869	c.m/sec"
"		Maximum level	242.702	metre"
"		Maximum storage	108.202	c.m"
"		Centroidal lag	5.854	hours"
"		0.925	0.869	0.869 0.270 c.m/sec"
" 40		HYDROGRAPH Combine	10003"	
"	6	Combine "		
"	10003	Node #"		
"		west of komoka road culvert"		
"		Maximum flow	0.869	c.m/sec"
"		Hydrograph volume	12876.001	c.m"
"		0.925	0.869	0.869
" 40		HYDROGRAPH Start - New Tributary"		
"	2	Start - New Tributary"		
"		0.925	0.000	0.869 0.869"
" 33		CATCHMENT 6"		
"	1	Triangular SCS"		
"	3	Specify values"		
"	1	SCS method"		
"	6	west side of komoka road major flows"		
"	45.000	% Impervious"		
"	0.580	Total Area"		
"	190.000	Flow length"		
"	2.000	Overland Slope"		
"	0.319	Pervious Area"		
"	190.000	Pervious length"		
"	2.000	Pervious slope"		
"	0.261	Impervious Area"		

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"      6.500 Impervious length"
"      2.000 Impervious slope"
"      0.250 Pervious Manning 'n'"
"      75.000 Pervious SCS Curve No."
"      0.169 Pervious Runoff coefficient"
"      0.100 Pervious Ia/S coefficient"
"      8.467 Pervious Initial abstraction"
"      0.015 Impervious Manning 'n'"
"      98.000 Impervious SCS Curve No."
"      0.850 Impervious Runoff coefficient"
"      0.100 Impervious Ia/S coefficient"
"      0.518 Impervious Initial abstraction"
"      0.056 0.000 0.869 0.869 c.m/sec"
"      Catchment 6 Pervious Impervious Total Area "
"      Surface Area 0.319 0.261 0.580 hectare"
"      Time of concentration 84.138 0.919 17.768 minutes"
"      Time to Centroid 202.588 86.812 110.253 minutes"
"      Rainfall depth 33.312 33.312 33.312 mm"
"      Rainfall volume 106.26 86.94 193.21 c.m"
"      Rainfall losses 27.676 6.176 18.001 mm"
"      Runoff depth 5.636 27.136 15.311 mm"
"      Runoff volume 17.98 70.82 88.80 c.m"
"      Runoff coefficient 0.169 0.850 0.476 "
"      Maximum flow 0.002 0.056 0.056 c.m/sec"
" 40 HYDROGRAPH Add Runoff "
"      4 Add Runoff "
"      0.056 0.056 0.869 0.869"
" 52 CHANNEL DESIGN"
"      0.056 Current peak flow c.m/sec"
"      0.022 Manning 'n'"
"      0. Cross-section type: 0=trapezoidal; 1=general"
"      0.900 Basewidth metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.100 Channel depth metre"
"      0.160 Gradient %"
"      Depth of flow 0.120 metre"
"      Velocity 0.369 m/sec"
"      Channel capacity 5.896 c.m/sec"
"      Critical depth 0.068 metre"
" 53 ROUTE Channel Route 5"
"      5.40 Channel Route 5 Reach length ( metre)"
"      0.000 X-factor <= 0.5"
"      10.979 K-lag ( seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"      30.000 K-lag ( seconds)"
"      0.982 Beta weighting factor"
"      75.000 Routing time step ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow 0.054 c.m/sec"
"      0.056 0.056 0.054 0.869 c.m/sec"
" 40 HYDROGRAPH Combine 10003"
"      6 Combine "
"      10003 Node #"
"      west of komoka road culvert"
"      Maximum flow 0.870 c.m/sec"
"      Hydrograph volume 12964.804 c.m"
"      0.056 0.056 0.054 0.870"
" 40 HYDROGRAPH Confluence 10003"
"      7 Confluence "
"      10003 Node #"
"      west of komoka road culvert"
"      Maximum flow 0.870 c.m/sec"
"      Hydrograph volume 12964.804 c.m"
"      0.056 0.870 0.054 0.000"
" 52 CHANNEL DESIGN"
"      0.870 Current peak flow c.m/sec"
"      0.022 Manning 'n'"
"      0. Cross-section type: 0=trapezoidal; 1=general"
"      0.900 Basewidth metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.100 Channel depth metre"
"      0.160 Gradient %"
"      Depth of flow 0.476 metre"
"      Velocity 0.785 m/sec"
"      Channel capacity 5.896 c.m/sec"
"      Critical depth 0.323 metre"
" 53 ROUTE Zero Route"
"      0.00 Zero Route Reach length ( metre)"

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"          0.056      0.870      0.870      0.000 c.m/sec"
" 40      HYDROGRAPH Combine 10000"
"          6 Combine "
"          10000 Node #"
"          flows entering main channel"
"          Maximum flow 1.094 c.m/sec"
"          Hydrograph volume 16070.967 c.m"
"          0.056      0.870      0.870      1.094"
" 40      HYDROGRAPH Confluence 10000"
"          7 Confluence "
"          10000 Node #"
"          flows entering main channel"
"          Maximum flow 1.094 c.m/sec"
"          Hydrograph volume 16070.968 c.m"
"          0.056      1.094      0.870      0.000"
" 33      CATCHMENT 7"
"          1 Triangular SCS"
"          3 Specify values"
"          1 SCS method"
"          7 channel direct area"
"          20.000 % Impervious"
"          2.270 Total Area"
"          5.000 Flow length"
"          25.000 Overland Slope"
"          1.816 Pervious Area"
"          190.000 Pervious length"
"          25.000 Pervious slope"
"          0.454 Impervious Area"
"          10.000 Impervious length"
"          25.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          78.000 Pervious SCS Curve No."
"          0.210 Pervious Runoff coefficient"
"          0.100 Pervious Ia/S coefficient"
"          7.164 Pervious Initial abstraction"
"          0.015 Impervious Manning 'n'"
"          98.000 Impervious SCS Curve No."
"          0.850 Impervious Runoff coefficient"
"          0.100 Impervious Ia/S coefficient"
"          0.518 Impervious Initial abstraction"
"          0.100      1.094      0.870      0.000 c.m/sec"
"          Catchment 7 Pervious Impervious Total Area "
"          Surface Area 1.816 0.454 2.270 hectare"
"          Time of concentration 35.910 0.558 18.925 minutes"
"          Time to Centroid 142.827 87.115 116.060 minutes"
"          Rainfall depth 33.312 33.312 33.312 mm"
"          Rainfall volume 604.94 151.24 756.18 c.m"
"          Rainfall losses 26.323 7.458 22.550 mm"
"          Runoff depth 6.989 25.854 10.762 mm"
"          Runoff volume 126.93 117.38 244.30 c.m"
"          Runoff coefficient 0.210 0.850 0.338 "
"          Maximum flow 0.026 0.099 0.100 c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4 Add Runoff "
"          0.100      1.101      0.870      0.000"
" 52      CHANNEL DESIGN"
"          1.101 Current peak flow c.m/sec"
"          0.022 Manning 'n'"
"          0. Cross-section type: 0=trapezoidal; 1=general"
"          0.900 Basewidth metre"
"          3.000 Left bank slope"
"          3.000 Right bank slope"
"          1.100 Channel depth metre"
"          0.160 Gradient %"
"          Depth of flow 0.530 metre"
"          Velocity 0.834 m/sec"
"          Channel capacity 5.896 c.m/sec"
"          Critical depth 0.364 metre"
" 53      ROUTE Channel Route 560"
"          560.00 Channel Route 560 Reach length (metre)"
"          0.232 X-factor <= 0.5"
"          251.895 K-lag (seconds)"
"          0.000 Default(0) or user spec.(1) values used"
"          0.500 X-factor <= 0.5"
"          30.000 K-lag (seconds)"
"          0.500 Beta weighting factor"
"          300.000 Routing time step (seconds)"
"          2 No. of sub-reaches"
"          Peak outflow 1.100 c.m/sec"
"          0.100      1.101      1.100      0.000 c.m/sec"
" 40      HYDROGRAPH Next link "

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"      5 Next link "
"      0.100      1.100      1.100      0.000"
" 52 CHANNEL DESIGN"
"      1.100 Current peak flow c.m/sec"
"      0.022 Manning 'n'"
"      0. Cross-section type: 0=trapezoidal; 1=general"
"      1.800 Basewidth metre"
"      0.100 Left bank slope"
"      0.100 Right bank slope"
"      3.500 Channel depth metre"
"      0.160 Gradient %"
"      Depth of flow 0.620 metre"
"      Velocity 0.952 m/sec"
"      Channel capacity 12.294 c.m/sec"
"      Critical depth 0.334 metre"
" 53 ROUTE Channel Route 10"
"      10.00 Channel Route 10 Reach length ( metre)"
"      0.000 X-factor <= 0.5"
"      7.875 K-lag ( seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"      30.000 K-lag ( seconds)"
"      1.176 Beta weighting factor"
"      150.000 Routing time step ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow 1.100 c.m/sec"
"      0.100 1.100 1.100 0.000 c.m/sec"
" 40 HYDROGRAPH Next link "
"      5 Next link "
"      0.100 1.100 1.100 0.000"
" 58 CULVERT"
"      1.100 Culvert Q c.m/sec"
"      20.00 Length metre"
"      0.013 Manning 'n'"
"      241.005 Upstream IL metre"
"      240.973 Downstream IL metre"
"      242.700 Weir Elev. metre"
"      20.000 Weir Breadth. metre"
"      116.900 Weir Left slope to 1"
"      116.900 Weir Right slope to 1"
"      241.600 Tail water elevation"
"      2 Barrel Option (Pipe/Box/CSPA/HE/VE)"
"      0.900 Barrel Height/Diameter"
"      1.800 Barrel width"
"      0.700 Cc 004 RC pipe socket inlet"
"      0.900 Ke 012 Project from fill"
"      2. Number of Barrels"
"      39 Number of stages"
"      Level Discharge Volume"
"      241.005 0.000 0.0"
"      241.600 0.055 11.5"
"      241.600 0.110 11.5"
"      241.601 0.165 11.5"
"      241.601 0.220 11.5"
"      241.602 0.275 11.6"
"      241.602 0.330 11.6"
"      241.603 0.385 11.6"
"      241.604 0.440 11.6"
"      241.606 0.495 11.6"
"      241.607 0.550 11.7"
"      241.608 0.605 11.7"
"      241.610 0.660 11.7"
"      241.612 0.715 11.7"
"      241.613 0.770 11.8"
"      241.615 0.825 11.8"
"      241.618 0.880 11.9"
"      241.620 0.935 11.9"
"      241.622 0.990 11.9"
"      241.625 1.045 12.0"
"      241.627 1.100 12.0"
"      241.630 1.155 12.1"
"      241.633 1.210 12.2"
"      241.636 1.264 12.2"
"      241.639 1.319 12.3"
"      241.643 1.374 12.3"
"      241.646 1.429 12.4"
"      241.650 1.484 12.5"
"      241.653 1.539 12.6"
"      241.657 1.594 12.6"
"      241.661 1.649 12.7"
"      241.665 1.704 12.8"

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"          241.670      1.759      12.9"
"          241.674      1.814      12.9"
"          241.678      1.869      13.0"
"          241.683      1.924      13.1"
"          241.688      1.979      13.2"
"          241.693      2.034      13.3"
"          241.698      2.089      13.4"
"      1.800  Channel Basewidth"
"      3.500  Channel Depth"
"      2.500  Channel Topwidth"
"     10.000  Grade Left"
"     10.000  Grade Right"
"       0.160  Grade %"
"     10.000  Length"
"          Barrel Yo          0.278  metre"
"          Barrel Ycr          0.212  metre"
"          Exit Velocity          0.487  m/sec"
"          Barrel Peak Outflow          1.099  c.m/sec"
"          Weir Peak Flow          0.000  c.m/sec"
"          Total Peak Outflow          1.099  c.m/sec"
"          Maximum level          241.627  metre"
"          Maximum storage          12.047  c.m"
"          Centroidal lag          5.604  hours"
"          0.100      1.100      1.099      0.000 c.m/sec"
40  HYDROGRAPH Next link "
"      5  Next link "
"          0.100      1.099      1.099      0.000"
33  CATCHMENT 8"
"      1  Triangular SCS"
"      3  Specify values"
"      1  SCS method"
"      8  direct channel area"
"      0.000  % Impervious"
"      0.370  Total Area"
"      5.000  Flow length"
"     25.000  Overland Slope"
"      0.370  Pervious Area"
"    190.000  Pervious length"
"     25.000  Pervious slope"
"       0.000  Impervious Area"
"     10.000  Impervious length"
"     25.000  Impervious slope"
"       0.250  Pervious Manning 'n'"
"     78.000  Pervious SCS Curve No."
"       0.210  Pervious Runoff coefficient"
"       0.100  Pervious Ia/S coefficient"
"       7.164  Pervious Initial abstraction"
"       0.015  Impervious Manning 'n'"
"    98.000  Impervious SCS Curve No."
"       0.850  Impervious Runoff coefficient"
"       0.100  Impervious Ia/S coefficient"
"       0.518  Impervious Initial abstraction"
"          0.005      1.099      1.099      0.000 c.m/sec"
"          Catchment 8      Pervious      Impervious Total Area "
"          Surface Area      0.370      0.000      0.370  hectare"
"          Time of concentration      35.910      0.558      35.910  minutes"
"          Time to Centroid      142.827      87.115      142.827  minutes"
"          Rainfall depth      33.312      33.312      33.312  mm"
"          Rainfall volume      123.25      0.00      123.25  c.m"
"          Rainfall losses      26.323      7.458      26.322  mm"
"          Runoff depth      6.989      25.854      6.989  mm"
"          Runoff volume      25.86      0.00      25.86  c.m"
"          Runoff coefficient      0.210      0.850      0.210  "
"          Maximum flow      0.005      0.000      0.005  c.m/sec"
40  HYDROGRAPH Add Runoff "
"      4  Add Runoff "
"          0.005      1.100      1.099      0.000"
52  CHANNEL DESIGN"
"     1.100  Current peak flow  c.m/sec"
"     0.022  Manning 'n'"
"       0.  Cross-section type: 0=trapezoidal; 1=general"
"     0.900  Basewidth  metre"
"     4.000  Left bank slope"
"     4.000  Right bank slope"
"     1.200  Channel depth  metre"
"     0.160  Gradient  %"
"          Depth of flow          0.490  metre"
"          Velocity          0.785  m/sec"
"          Channel capacity          9.174  c.m/sec"
"          Critical depth          0.339  metre"
53  ROUTE  Channel Route 254"

```

```

"      254.40      Channel Route 254 Reach length  ( metre)"
"      0.234      X-factor <= 0.5"
"      243.082     K-lag  ( seconds)"
"      0.000      Default(0) or user spec.(1) values used"
"      0.500      X-factor <= 0.5"
"      30.000     K-lag  ( seconds)"
"      0.500     Beta weighting factor"
"      300.000    Routing time step  ( seconds)"
"      1          No. of sub-reaches"
"      Peak outflow      1.099      c.m/sec"
"      0.005      1.100      1.099      0.000 c.m/sec"

```

25 Year Storm

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.07 rev. 387"
"          MIDUSS created                      Friday, September 23, 2005"
"          10 Units used:                      ie METRIC"
"          Job folder:                        G:\CLIENT\1389\1\SWM\MIDUSS\
"                                           diversion channel"
"          Output filename:                  25yr-external channel design.out"
"          Licensee name:                    lgrabowski"
"          Company
"          Date & Time last used:            2/6/2019 at 3:05:49 PM"
" 31      TIME PARAMETERS"
"          5.000 Time Step"
"          180.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1 Chicago storm"
"          1455.000 Coefficient A"
"          5.000 Constant B"
"          0.820 Exponent C"
"          0.380 Fraction R"
"          180.000 Duration"
"          1.000 Time step multiplier"
"          Maximum intensity                202.437 mm/hr"
"          Total depth                      60.381 mm"
"          5 25hyd Hydrograph extension used in this file"
" 33      CATCHMENT 1"
"          1 Triangular SCS"
"          1 Equal length"
"          1 SCS method"
"          1 external area 1"
"          1.040 % Impervious"
"          26.510 Total Area"
"          600.000 Flow length"
"          3.000 Overland Slope"
"          26.234 Pervious Area"
"          600.000 Pervious length"
"          3.000 Pervious slope"
"          0.276 Impervious Area"
"          600.000 Impervious length"
"          3.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          84.000 Pervious SCS Curve No."
"          0.492 Pervious Runoff coefficient"
"          0.100 Pervious Ia/S coefficient"
"          4.838 Pervious Initial abstraction"
"          0.015 Impervious Manning 'n'"
"          98.000 Impervious SCS Curve No."
"          0.912 Impervious Runoff coefficient"
"          0.100 Impervious Ia/S coefficient"
"          0.518 Impervious Initial abstraction"
"          1.128 0.000 0.000 0.000 c.m/sec"
"          Catchment 1 Pervious Impervious Total Area "
"          Surface Area 26.234 0.276 26.510 hectare"
"          Time of concentration 66.913 9.096 65.810 minutes"
"          Time to Centroid 180.420 96.777 178.824 minutes"
"          Rainfall depth 60.381 60.381 60.381 mm"
"          Rainfall volume 1.5841 0.0166 1.6007 ha-m"
"          Rainfall losses 30.698 5.452 30.435 mm"
"          Runoff depth 29.683 54.929 29.946 mm"
"          Runoff volume 7787.25 151.44 7938.69 c.m"
"          Runoff coefficient 0.492 0.912 0.496 "
"          Maximum flow 1.120 0.090 1.128 c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4 Add Runoff "
"          1.128 1.128 0.000 0.000"
" 58      CULVERT"
"          1.128 Culvert Q c.m/sec"
"          25.00 Length metre"
"          0.015 Manning 'n'"
"          244.300 Upstream IL metre"
"          244.290 Downstream IL metre"
"          247.050 Weir Elev. metre"
"          20.000 Weir Breadth. metre"
"          25.000 Weir Left slope to 1"
"          25.000 Weir Right slope to 1"
"          244.600 Tail water elevation"
"          1 Barrel Option (Pipe/Box/CSPA/HE/VE)"
"          1.000 Barrel Height/Diameter"
"          1.000 Barrel Width"
"          0.700 Cc 004 RC pipe socket inlet"
"          0.900 Ke 012 Project from fill"

```

"	1.	Number of Barrels"		
"	39	Number of stages"		
"		Level Discharge	Volume"	
"		244.300	0.000	0.0"
"		244.801	0.056	23.9"
"		244.802	0.113	24.1"
"		244.805	0.169	24.4"
"		244.809	0.226	24.8"
"		244.813	0.282	25.3"
"		244.840	0.339	28.2"
"		244.886	0.395	33.6"
"		244.930	0.451	39.3"
"		244.972	0.508	45.3"
"		245.012	0.564	51.5"
"		245.051	0.621	58.0"
"		245.089	0.677	64.7"
"		245.126	0.733	71.8"
"		245.163	0.790	79.1"
"		245.199	0.846	86.8"
"		245.235	0.903	94.8"
"		245.270	0.959	103.1"
"		245.305	1.016	111.9"
"		245.340	1.072	121.3"
"		245.376	1.128	131.6"
"		245.411	1.185	142.8"
"		245.447	1.241	155.1"
"		245.483	1.298	168.7"
"		245.519	1.354	183.5"
"		245.557	1.410	200.0"
"		245.595	1.467	218.3"
"		245.635	1.523	238.7"
"		245.677	1.580	262.0"
"		245.723	1.636	289.3"
"		245.772	1.693	321.6"
"		245.822	1.749	357.5"
"		245.869	1.805	393.6"
"		245.926	1.862	441.3"
"		245.979	1.918	489.7"
"		246.033	1.975	543.6"
"		246.091	2.031	604.9"
"		246.139	2.087	660.2"
"		246.202	2.144	738.2"
"	1.500	Channel Basewidth"		
"	1.000	Channel Depth"		
"	3.500	Channel Topwidth"		
"	10.000	Grade Left"		
"	10.000	Grade Right"		
"	1.000	Grade %"		
"	300.000	Length"		
"		Barrel Yo	1.000	metre"
"		Barrel Ycr	0.605	metre"
"		Exit Velocity	2.232	m/sec"
"		Barrel Peak Outflow	1.109	c.m/sec"
"		Weir Peak Flow	0.000	c.m/sec"
"		Total Peak Outflow	1.109	c.m/sec"
"		Maximum level	245.387	metre"
"		Maximum storage	128.025	c.m"
"		Centroidal lag	3.014	hours"
"		1.128 1.128	1.109	0.000 c.m/sec"
" 40		HYDROGRAPH Combine	9999"	
"	6	Combine "		
"	9999	Node #"		
"		flows meeting south of ex culv"		
"		Maximum flow	1.109	c.m/sec"
"		Hydrograph volume	7940.533	c.m"
"		1.128 1.128	1.109	1.109"
" 40		HYDROGRAPH Start - New Tributary"		
"	2	Start - New Tributary"		
"		1.128 0.000	1.109	1.109"
" 33		CATCHMENT 4"		
"	1	Triangular SCS"		
"	1	Equal length"		
"	1	SCS method"		
"	4	flows between rail and berm + ex properties"		
"	5.000	% Impervious"		
"	2.090	Total Area"		
"	200.000	Flow length"		
"	10.000	Overland Slope"		
"	1.985	Pervious Area"		
"	200.000	Pervious length"		
"	10.000	Pervious slope"		

```

"      0.104 Impervious Area"
" 200.000 Impervious length"
" 10.000 Impervious slope"
"      0.250 Pervious Manning 'n'"
" 84.000 Pervious SCS Curve No."
"      0.492 Pervious Runoff coefficient"
"      0.100 Pervious Ia/S coefficient"
"      4.838 Pervious Initial abstraction"
"      0.015 Impervious Manning 'n'"
" 98.000 Impervious SCS Curve No."
"      0.912 Impervious Runoff coefficient"
"      0.100 Impervious Ia/S coefficient"
"      0.518 Impervious Initial abstraction"
"          0.196      0.000      1.109      1.109 c.m/sec"
"      Catchment 4      Pervious Impervious Total Area "
"      Surface Area      1.985      0.104      2.090 hectare"
"      Time of concentration      24.120      3.279      22.300 minutes"
"      Time to Centroid      123.381      88.151      120.305 minutes"
"      Rainfall depth      60.381      60.381      60.381 mm"
"      Rainfall volume      1198.87      63.10      1261.97 c.m"
"      Rainfall losses      30.705      6.439      29.492 mm"
"      Runoff depth      29.676      53.943      30.890 mm"
"      Runoff volume      589.22      56.37      645.59 c.m"
"      Runoff coefficient      0.492      0.912      0.513 "
"      Maximum flow      0.187      0.044      0.196 c.m/sec"
" 40 HYDROGRAPH Add Runoff "
"      4 Add Runoff "
"          0.196      0.196      1.109      1.109"
" 52 CHANNEL DESIGN"
"      0.196 Current peak flow c.m/sec"
"      0.040 Manning 'n'"
"      0 Cross-section type: 0=trapezoidal; 1=general"
"      0.900 Basewidth metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.000 Channel depth metre"
"      0.500 Gradient %"
"      Depth of flow      0.236 metre"
"      Velocity      0.518 m/sec"
"      Channel capacity      4.571 c.m/sec"
"      Critical depth      0.143 metre"
" 53 ROUTE Zero Route"
"      0.00 Zero Route Reach length (metre)"
"          0.196      0.196      0.196      1.109 c.m/sec"
" 40 HYDROGRAPH Combine 9999"
"      6 Combine "
"      9999 Node #"
"          flows meeting south of ex culv"
"      Maximum flow      1.176 c.m/sec"
"      Hydrograph volume      8586.127 c.m"
"          0.196      0.196      0.196      1.176"
" 40 HYDROGRAPH Confluence 9999"
"      7 Confluence "
"      9999 Node #"
"          flows meeting south of ex culv"
"      Maximum flow      1.176 c.m/sec"
"      Hydrograph volume      8586.127 c.m"
"          0.196      1.176      0.196      0.000"
" 33 CATCHMENT 5"
"      1 Triangular SCS"
"      1 Equal length"
"      1 SCS method"
"      5 channel direct area"
"      0.000 % Impervious"
"      0.420 Total Area"
"      5.000 Flow length"
"      25.000 Overland Slope"
"      0.420 Pervious Area"
"      5.000 Pervious length"
"      25.000 Pervious slope"
"      0.000 Impervious Area"
"      5.000 Impervious length"
"      25.000 Impervious slope"
"      0.250 Pervious Manning 'n'"
"      84.000 Pervious SCS Curve No."
"      0.492 Pervious Runoff coefficient"
"      0.100 Pervious Ia/S coefficient"
"      4.838 Pervious Initial abstraction"
"      0.015 Impervious Manning 'n'"
"      98.000 Impervious SCS Curve No."
"      0.912 Impervious Runoff coefficient"

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"      0.100 Impervious Ia/S coefficient"
"      0.518 Impervious Initial abstraction"
"              0.090      1.176      0.196      0.000 c.m/sec"
"      Catchment 5      Pervious      Impervious      Total Area "
"      Surface Area      0.420      0.000      0.420      hectare"
"      Time of concentration      2.003      0.272      2.003      minutes"
"      Time to Centroid      93.702      83.541      93.702      minutes"
"      Rainfall depth      60.381      60.381      60.381      mm"
"      Rainfall volume      253.60      0.00      253.60      c.m"
"      Rainfall losses      31.035      12.446      31.035      mm"
"      Runoff depth      29.346      47.935      29.346      mm"
"      Runoff volume      123.25      0.00      123.25      c.m"
"      Runoff coefficient      0.492      0.912      0.492      "
"      Maximum flow      0.090      0.000      0.090      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"              0.090      1.184      0.196      0.000"
" 52      CHANNEL DESIGN"
"      1.184      Current peak flow      c.m/sec"
"      0.025      Manning 'n'"
"      0.      Cross-section type: 0=trapezoidal; 1=general"
"      0.900      Basewidth      metre"
"      3.000      Left bank slope"
"      3.000      Right bank slope"
"      1.000      Channel depth      metre"
"      0.840      Gradient      %"
"      Depth of flow      0.397      metre"
"      Velocity      1.428      m/sec"
"      Channel capacity      9.479      c.m/sec"
"      Critical depth      0.378      metre"
" 53      ROUTE      Channel Route 79"
"      79.00      Channel Route 79 Reach length      ( metre)"
"      0.359      X-factor <= 0.5"
"      41.482      K-lag      ( seconds)"
"      0.000      Default(0) or user spec.(1) values used"
"      0.500      X-factor <= 0.5"
"      30.000      K-lag      ( seconds)"
"      0.500      Beta weighting factor"
"      50.000      Routing time step      ( seconds)"
"      1      No. of sub-reaches"
"      Peak outflow      1.181      c.m/sec"
"              0.090      1.184      1.181      0.000 c.m/sec"
" 40      HYDROGRAPH Next link "
"      5      Next link "
"              0.090      1.181      1.181      0.000"
" 52      CHANNEL DESIGN"
"      1.181      Current peak flow      c.m/sec"
"      0.025      Manning 'n'"
"      0.      Cross-section type: 0=trapezoidal; 1=general"
"      0.900      Basewidth      metre"
"      3.000      Left bank slope"
"      3.000      Right bank slope"
"      1.000      Channel depth      metre"
"      0.400      Gradient      %"
"      Depth of flow      0.471      metre"
"      Velocity      1.085      m/sec"
"      Channel capacity      6.541      c.m/sec"
"      Critical depth      0.377      metre"
" 53      ROUTE      Channel Route 213"
"      213.00      Channel Route 213 Reach length      ( metre)"
"      0.373      X-factor <= 0.5"
"      147.271      K-lag      ( seconds)"
"      0.000      Default(0) or user spec.(1) values used"
"      0.500      X-factor <= 0.5"
"      30.000      K-lag      ( seconds)"
"      0.500      Beta weighting factor"
"      150.000      Routing time step      ( seconds)"
"      1      No. of sub-reaches"
"      Peak outflow      1.178      c.m/sec"
"              0.090      1.181      1.178      0.000 c.m/sec"
" 40      HYDROGRAPH Next link "
"      5      Next link "
"              0.090      1.178      1.178      0.000"
" 52      CHANNEL DESIGN"
"      1.178      Current peak flow      c.m/sec"
"      0.040      Manning 'n'"
"      0.      Cross-section type: 0=trapezoidal; 1=general"
"      1.800      Basewidth      metre"
"      0.100      Left bank slope"
"      0.100      Right bank slope"
"      1.000      Channel depth      metre"

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"      0.480 Gradient %"
"      Depth of flow      0.673 metre"
"      Velocity           0.938 m/sec"
"      Channel capacity   2.070 c.m/sec"
"      Critical depth     0.350 metre"
" 53 ROUTE Channel Route 10"
"      10.00 Channel Route 10 Reach length (metre)"
"      0.000 X-factor <= 0.5"
"      7.997 K-lag (seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"      30.000 K-lag (seconds)"
"      0.965 Beta weighting factor"
"      75.000 Routing time step (seconds)"
"      1 No. of sub-reaches"
"      Peak outflow      1.177 c.m/sec"
"      0.090 1.178 1.177 0.000 c.m/sec"
" 40 HYDROGRAPH Next link "
"      5 Next link "
"      0.090 1.177 1.177 0.000"
" 58 CULVERT"
"      1.177 Culvert Q c.m/sec"
"      20.00 Length metre"
"      0.015 Manning 'n'"
"      242.340 Upstream IL metre"
"      242.250 Downstream IL metre"
"      243.800 Weir Elev. metre"
"      10.000 Weir Breadth. metre"
"      25.000 Weir Left slope to 1"
"      25.000 Weir Right slope to 1"
"      242.800 Tail water elevation"
"      2 Barrel Option (Pipe/Box/CSPA/HE/VE)"
"      0.900 Barrel Height/Diameter"
"      1.800 Barrel Width"
"      0.700 Cc 004 RC pipe socket inlet"
"      0.900 Ke 012 Project from fill"
"      1. Number of Barrels"
"      39 Number of stages"
"      Level Discharge Volume"
"      242.340 0.000 0.0"
"      242.801 0.059 9.7"
"      242.802 0.118 9.8"
"      242.804 0.177 9.8"
"      242.808 0.235 9.9"
"      242.812 0.294 10.0"
"      242.818 0.353 10.1"
"      242.824 0.412 10.2"
"      242.832 0.471 10.3"
"      242.840 0.530 10.5"
"      242.850 0.589 10.7"
"      242.860 0.648 10.9"
"      242.872 0.706 11.1"
"      242.884 0.765 11.3"
"      242.897 0.824 11.6"
"      242.911 0.883 11.8"
"      242.927 0.942 12.1"
"      242.943 1.001 12.4"
"      242.960 1.060 12.8"
"      242.978 1.118 13.1"
"      242.997 1.177 13.5"
"      243.016 1.236 13.9"
"      243.037 1.295 14.3"
"      243.058 1.354 14.7"
"      243.080 1.413 15.1"
"      243.103 1.472 15.5"
"      243.126 1.531 16.0"
"      243.149 1.589 16.5"
"      243.173 1.648 16.9"
"      243.196 1.707 17.4"
"      243.219 1.766 17.8"
"      243.241 1.825 18.3"
"      243.262 1.884 18.7"
"      243.282 1.943 19.1"
"      243.301 2.001 19.5"
"      243.320 2.060 19.8"
"      243.339 2.119 20.2"
"      243.357 2.178 20.6"
"      243.375 2.237 21.0"
"      1.800 Channel Basewidth"
"      1.000 Channel Depth"
"      2.000 Channel Topwidth"

```



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"      10.000  Grade Left"
"      10.000  Grade Right"
"      0.480  Grade %"
"      10.000  Length"
"          Barrel Yo          0.361  metre"
"          Barrel Ycr          0.352  metre"
"          Exit Velocity        1.189  m/sec"
"          Barrel Peak Outflow  1.177  c.m/sec"
"          Weir Peak Flow       0.000  c.m/sec"
"          Total Peak Outflow   1.177  c.m/sec"
"          Maximum level        243.026  metre"
"          Maximum storage      13.485  c.m"
"          Centroidal lag       2.978  hours"
"              0.090  1.177  1.177  0.000 c.m/sec"
40  HYDROGRAPH Next link "
"      5  Next link "
"          0.090  1.177  1.177  0.000"
52  CHANNEL DESIGN"
"      1.177  Current peak flow  c.m/sec"
"      0.040  Manning 'n'"
"      0.  Cross-section type: 0=trapezoidal; 1=general"
"      0.900  Basewidth  metre"
"      3.000  Left bank slope"
"      3.000  Right bank slope"
"      1.000  Channel depth  metre"
"      0.480  Gradient  %"
"          Depth of flow          0.559  metre"
"          Velocity              0.818  m/sec"
"          Channel capacity       4.478  c.m/sec"
"          Critical depth         0.376  metre"
53  ROUTE Channel Route 67"
"      67.00  Channel Route 67 Reach length  ( metre)"
"      0.109  X-factor <= 0.5"
"      61.427  K-lag ( seconds)"
"      0.000  Default(0) or user spec.(1) values used"
"      0.500  X-factor <= 0.5"
"      30.000  K-lag ( seconds)"
"      0.500  Beta weighting factor"
"      100.000  Routing time step ( seconds)"
"      1  No. of sub-reaches"
"          Peak outflow          1.175  c.m/sec"
"              0.090  1.177  1.175  0.000 c.m/sec"
40  HYDROGRAPH Combine 10000"
"      6  Combine "
"      10000  Node #"
"          flows entering main channel"
"          Maximum flow          1.175  c.m/sec"
"          Hydrograph volume      8725.248  c.m"
"              0.090  1.177  1.175  1.175"
40  HYDROGRAPH Start - New Tributary"
"      2  Start - New Tributary"
"          0.090  0.000  1.175  1.175"
33  CATCHMENT 2"
"      1  Triangular SCS"
"      1  Equal length"
"      1  SCS method"
"      2  external area 2"
"      1.400  % Impervious"
"      120.880  Total Area"
"      900.000  Flow length"
"      3.000  Overland Slope"
"      119.188  Pervious Area"
"      900.000  Pervious length"
"      3.000  Pervious slope"
"      1.692  Impervious Area"
"      900.000  Impervious length"
"      3.000  Impervious slope"
"      0.250  Pervious Manning 'n'"
"      84.000  Pervious SCS Curve No."
"      0.492  Pervious Runoff coefficient"
"      0.100  Pervious Ia/S coefficient"
"      4.838  Pervious Initial abstraction"
"      0.015  Impervious Manning 'n'"
"      98.000  Impervious SCS Curve No."
"      0.912  Impervious Runoff coefficient"
"      0.100  Impervious Ia/S coefficient"
"      0.518  Impervious Initial abstraction"
"          4.146  0.000  1.175  1.175 c.m/sec"
"          Catchment 2  Pervious  Impervious Total Area "
"          Surface Area  119.188  1.692  120.880  hectare"
"          Time of concentration  85.343  11.601  83.450  minutes"

```

"	Time to Centroid	204.980	100.531	202.299	minutes"
"	Rainfall depth	60.381	60.381	60.381	mm"
"	Rainfall volume	7.1967	0.1022	7.2989	ha-m"
"	Rainfall losses	30.701	5.312	30.345	mm"
"	Runoff depth	29.681	55.070	30.036	mm"
"	Runoff volume	3.5376	0.0932	3.6308	ha-m"
"	Runoff coefficient	0.492	0.912	0.498	"
"	Maximum flow	4.099	0.503	4.146	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "	4.146	4.146	1.175	1.175"
" 52	CHANNEL DESIGN"				
"	4.146 Current peak flow	c.m/sec"			
"	0.022 Manning 'n'"				
"	0.	Cross-section type: 0=trapezoidal; 1=general"			
"	5.000 Basewidth	metre"			
"	3.000 Left bank slope"				
"	3.000 Right bank slope"				
"	0.500 Channel depth	metre"			
"	0.600 Gradient	%"			
"	Depth of flow	0.399	metre"		
"	Velocity	1.677	m/sec"		
"	Channel capacity	6.193	c.m/sec"		
"	Critical depth	0.381	metre"		
" 53	ROUTE Channel Route 350"				
"	350.00 Channel Route 350 Reach length	(metre)"			
"	0.446 X-factor <= 0.5"				
"	156.550 K-lag (seconds)"				
"	0.000 Default(0) or user spec.(1) values used"				
"	0.500 X-factor <= 0.5"				
"	30.000 K-lag (seconds)"				
"	0.500 Beta weighting factor"				
"	150.000 Routing time step (seconds)"				
"	1 No. of sub-reaches"				
"	Peak outflow	4.128	c.m/sec"		
"	4.146 4.146 4.128	1.175 c.m/sec"			
" 40	HYDROGRAPH Next link "				
"	5 Next link "	4.146	4.128	4.128	1.175"
" 58	CULVERT"				
"	4.128 Culvert Q	c.m/sec"			
"	19.30 Length	metre"			
"	0.013 Manning 'n'"				
"	242.130 Upstream IL	metre"			
"	242.100 Downstream IL	metre"			
"	243.610 Weir Elev.	metre"			
"	20.000 Weir Breadth.	metre"			
"	25.000 Weir Left slope to 1"				
"	25.000 Weir Right slope to 1"				
"	243.350 Tail water elevation"				
"	1 Barrel Option (Pipe/Box/CSPA/HE/VE)"				
"	0.900 Barrel Height/Diameter"				
"	0.900 Barrel Width"				
"	0.500 Cc 001 CSP thin walled projecting"				
"	0.900 Ke 012 Project from fill"				
"	1. Number of Barrels"				
"	39 Number of stages"				
"	Level Discharge	Volume"			
"	242.130 0.000	0.0"			
"	243.363 0.206	1126.2"			
"	243.401 0.413	1220.1"			
"	243.464 0.619	1389.1"			
"	243.553 0.826	1653.9"			
"	243.668 1.032	2045.9"			
"	243.807 1.238	2610.5"			
"	243.972 1.445	3410.8"			
"	244.163 1.651	4531.9"			
"	244.379 1.857	6106.0"			
"	244.726 2.064	9247.8"			
"	245.176 2.270	14519.0"			
"	245.670 2.477	21923.0"			
"	246.206 2.683	31904.4"			
"	246.786 2.889	44947.1"			
"	247.408 3.096	61572.9"			
"	248.073 3.302	82342.9"			
"	248.781 3.509	107856.1"			
"	249.532 3.715	138751.3"			
"	250.326 3.921	175704.6"			
"	251.163 4.128	219432.4"			
"	252.043 4.334	270688.8"			
"	252.966 4.541	330265.9"			

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"      253.931      4.747  398995.1"
"      254.940      4.953  477747.8"
"      255.991      5.160  567431.4"
"      257.085      5.366  668995.0"
"      258.223      5.572  783425.1"
"      259.403      5.779  911744.9"
"      260.626      5.985 1055017.9"
"      261.892      6.192 1214346.1"
"      263.201      6.398 1390874.6"
"      264.553      6.604 1585779.1"
"      265.947      6.811 1800277.6"
"      267.385      7.017 2035632.0"
"      268.866      7.224 2293128.0"
"      270.389      7.430 2574110.0"
"      271.956      7.636 2879951.8"
"      273.565      7.843 3212053.0"
"      5.000 Channel Basewidth"
"      0.500 Channel Depth"
"      8.000 Channel Topwidth"
"     10.000 Grade Left"
"     10.000 Grade Right"
"      0.600 Grade %"
"    350.000 Length"
"      Barrel Yo      0.900 metre"
"      Barrel Ycr      0.826 metre"
"      Exit Velocity    2.248 m/sec"
"      Barrel Peak Outflow 1.430 c.m/sec"
"      Weir Peak Flow    0.703 c.m/sec"
"      Total Peak Outflow 2.133 c.m/sec"
"      Maximum level      243.682 metre"
"      Maximum storage    11006.595 c.m"
"      Centroidal lag      4.488 hours"
"      4.146 4.128 2.133 1.175 c.m/sec"
" 40 HYDROGRAPH Next link "
"      5 Next link "
"      4.146 2.133 2.133 1.175"
" 52 CHANNEL DESIGN"
"      2.133 Current peak flow c.m/sec"
"      0.022 Manning 'n'"
"      0. Cross-section type: 0=trapezoidal; 1=general"
"      0.000 Basewidth metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.000 Channel depth metre"
"      0.290 Gradient %"
"      Depth of flow      0.758 metre"
"      Velocity            1.238 m/sec"
"      Channel capacity    4.466 c.m/sec"
"      Critical depth      0.635 metre"
" 53 ROUTE Channel Route 69"
"      69.00 Channel Route 69 Reach length ( metre)"
"      0.000 X-factor <= 0.5"
"     41.813 K-lag ( seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"     30.000 K-lag ( seconds)"
"      0.588 Beta weighting factor"
"    100.000 Routing time step ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow      2.133 c.m/sec"
"      4.146 2.133 2.133 1.175 c.m/sec"
" 40 HYDROGRAPH Combine 10001"
"      6 Combine "
"    10001 Node #"
"      flows entering from east of Komoka Road"
"      Maximum flow      2.133 c.m/sec"
"      Hydrograph volume  36295.590 c.m"
"      4.146 2.133 2.133 2.133"
" 40 HYDROGRAPH Start - New Tributary"
"      2 Start - New Tributary"
"      4.146 0.000 2.133 2.133"
" 33 CATCHMENT 3"
"      1 Triangular SCS"
"      1 Equal length"
"      1 SCS method"
"      3 externa larea 3 - east portion of komoka road"
"     45.000 % Impervious"
"      0.610 Total Area"
"    190.000 Flow length"
"      2.000 Overland Slope"
"      0.336 Pervious Area"

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"      190.000 Pervious length"
"      2.000 Pervious slope"
"      0.275 Impervious Area"
"      190.000 Impervious length"
"      2.000 Impervious slope"
"      0.250 Pervious Manning 'n'"
"      75.000 Pervious SCS Curve No."
"      0.327 Pervious Runoff coefficient"
"      0.100 Pervious Ia/S coefficient"
"      8.467 Pervious Initial abstraction"
"      0.015 Impervious Manning 'n'"
"      98.000 Impervious SCS Curve No."
"      0.912 Impervious Runoff coefficient"
"      0.100 Impervious Ia/S coefficient"
"      0.518 Impervious Initial abstraction"
"      0.114 0.000 2.133 2.133 c.m/sec"
"      Catchment 3 Pervious Impervious Total Area "
"      Surface Area 0.336 0.275 0.610 hectare"
"      Time of concentration 47.747 5.153 18.170 minutes"
"      Time to Centroid 153.840 90.899 110.136 minutes"
"      Rainfall depth 60.381 60.381 60.381 mm"
"      Rainfall volume 202.58 165.75 368.33 c.m"
"      Rainfall losses 40.654 5.601 24.880 mm"
"      Runoff depth 19.728 54.780 35.501 mm"
"      Runoff volume 66.19 150.37 216.56 c.m"
"      Runoff coefficient 0.327 0.912 0.590 "
"      Maximum flow 0.013 0.113 0.114 c.m/sec"
" 40 HYDROGRAPH Add Runoff "
"      4 Add Runoff "
"      0.114 0.114 2.133 2.133"
" 56 DIVERSION"
"      3 Node number"
"      0.059 Overflow threshold"
"      1.000 Required diverted fraction"
"      0 Conduit type; 1=Pipe;2=Channel"
"      Peak of diverted flow 0.055 c.m/sec"
"      Volume of diverted flow 27.341 c.m"
"      DIV00003.25hyd"
"      Major flow east of komoka road"
"      0.114 0.114 0.059 2.133 c.m/sec"
" 40 HYDROGRAPH Next link "
"      5 Next link "
"      0.114 0.059 0.059 2.133"
" 52 CHANNEL DESIGN"
"      0.059 Current peak flow c.m/sec"
"      0.022 Manning 'n'"
"      0 Cross-section type: 0=trapezoidal; 1=general"
"      0.000 Basewidth metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.000 Channel depth metre"
"      0.290 Gradient %"
"      Depth of flow 0.197 metre"
"      Velocity 0.505 m/sec"
"      Channel capacity 4.466 c.m/sec"
"      Critical depth 0.151 metre"
" 53 ROUTE Channel Route 50"
"      50.00 Channel Route 50 Reach length ( metre)"
"      0.245 X-factor <= 0.5"
"      74.297 K-lag ( seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"      30.000 K-lag ( seconds)"
"      0.500 Beta weighting factor"
"      100.000 Routing time step ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow 0.059 c.m/sec"
"      0.114 0.059 0.059 2.133 c.m/sec"
" 40 HYDROGRAPH Combine 10002"
"      6 Combine "
"      10002 Node #"
"      minor flows east of komoka leaving via pipe network"
"      Maximum flow 0.059 c.m/sec"
"      Hydrograph volume 189.217 c.m"
"      0.114 0.059 0.059 0.059"
" 47 FILEI_0 Read/Open DIV00003.25hyd"
"      1 1=read/open; 2=write/save"
"      2 1=rainfall; 2=hydrograph"
"      1 1=runoff; 2=inflow; 3=outflow; 4=junction"
"      DIV00003.25hyd"
"      Major flow east of komoka road"

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"      Total volume      27.341      c.m"
"      Maximum flow      0.055      c.m/sec"
"      0.055      0.059      0.059      0.059 c.m/sec"
" 40      HYDROGRAPH Start - New Tributary"
"      2      Start - New Tributary"
"      0.055      0.000      0.059      0.059"
" 40      HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"      0.055      0.055      0.059      0.059"
" 52      CHANNEL DESIGN"
"      0.055      Current peak flow      c.m/sec"
"      0.022      Manning 'n'"
"      0.      Cross-section type: 0=trapezoidal; 1=general"
"      0.000      Basewidth      metre"
"      3.000      Left bank slope"
"      3.000      Right bank slope"
"      1.000      Channel depth      metre"
"      0.290      Gradient      %"
"      Depth of flow      0.192      metre"
"      Velocity      0.496      m/sec"
"      Channel capacity      4.466      c.m/sec"
"      Critical depth      0.147      metre"
" 53      ROUTE      Channel Route 15"
"      15.00      Channel Route 15 Reach length      ( metre)"
"      0.000      X-factor <= 0.5"
"      22.684      K-lag      ( seconds)"
"      0.000      Default(0) or user spec.(1) values used"
"      0.500      X-factor <= 0.5"
"      30.000      K-lag      ( seconds)"
"      0.624      Beta weighting factor"
"      60.000      Routing time step      ( seconds)"
"      1      No. of sub-reaches"
"      Peak outflow      0.052      c.m/sec"
"      0.055      0.055      0.052      0.059 c.m/sec"
" 40      HYDROGRAPH Combine      10001"
"      6      Combine "
"      10001      Node #"
"      flows entering from east of Komoka Road"
"      Maximum flow      2.133      c.m/sec"
"      Hydrograph volume      36322.930      c.m"
"      0.055      0.055      0.052      2.133"
" 40      HYDROGRAPH Confluence      10001"
"      7      Confluence "
"      10001      Node #"
"      flows entering from east of Komoka Road"
"      Maximum flow      2.133      c.m/sec"
"      Hydrograph volume      36322.930      c.m"
"      0.055      2.133      0.052      0.000"
" 58      CULVERT"
"      2.133      Culvert Q      c.m/sec"
"      20.40      Length      metre"
"      0.013      Manning 'n'"
"      241.900      Upstream IL      metre"
"      241.870      Downstream IL      metre"
"      243.610      Weir Elev.      metre"
"      20.000      Weir Breadth.      metre"
"      116.900      Weir Left slope to 1"
"      116.900      Weir Right slope to 1"
"      242.600      Tail water elevation"
"      4      Barrel Option (Pipe/Box/CSPA/HE/VE)"
"      0.965      Barrel Height/Diameter"
"      1.524      Barrel Width"
"      0.500      Cc 001 CSP thin walled projecting"
"      0.900      Ke 012 Project from fill"
"      1.      Number of Barrels"
"      39      Number of stages"
"      Level Discharge      Volume"
"      241.900      0.000      0.0"
"      242.602      0.107      126.5"
"      242.606      0.213      127.7"
"      242.614      0.320      129.6"
"      242.625      0.427      132.2"
"      242.639      0.533      135.6"
"      242.656      0.640      139.8"
"      242.675      0.746      144.8"
"      242.698      0.853      150.5"
"      242.723      0.960      157.0"
"      242.751      1.066      164.2"
"      242.781      1.173      172.2"
"      242.814      1.280      181.0"
"      242.848      1.386      190.4"

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"	242.885	1.493	200.7"	
"	242.923	1.600	213.4"	
"	242.962	1.706	228.7"	
"	243.002	1.813	250.4"	
"	243.043	1.919	284.0"	
"	243.086	2.026	330.6"	
"	243.129	2.133	392.9"	
"	243.174	2.239	472.6"	
"	243.223	2.346	581.2"	
"	243.302	2.453	791.7"	
"	243.383	2.559	1064.1"	
"	243.468	2.666	1405.4"	
"	243.557	2.772	1822.8"	
"	243.649	2.879	2323.7"	
"	243.745	2.986	2915.7"	
"	243.844	3.092	3607.1"	
"	243.946	3.199	4406.0"	
"	244.052	3.306	5321.3"	
"	244.162	3.412	6361.6"	
"	244.275	3.519	7536.2"	
"	244.391	3.626	8854.8"	
"	244.511	3.732	10326.9"	
"	244.634	3.839	11962.7"	
"	244.761	3.945	13772.7"	
"	244.892	4.052	15767.6"	
"	2.286	Channel Basewidth"		
"	0.965	Channel Depth"		
"	4.216	Channel Topwidth"		
"	58.457	Grade Left"		
"	58.457	Grade Right"		
"	0.290	Grade %"		
"	69.000	Length"		
"	Barrel Yo	0.965	metre"	
"	Barrel Ycr	0.677	metre"	
"	Exit Velocity	2.278	m/sec"	
"	Barrel Peak Outflow	2.128	c.m/sec"	
"	Weir Peak Flow	0.000	c.m/sec"	
"	Total Peak Outflow	2.128	c.m/sec"	
"	Maximum level	243.166	metre"	
"	Maximum storage	390.215	c.m"	
"	Centroidal lag	4.554	hours"	
"	0.055	2.133	2.128	0.000 c.m/sec"
" 40	HYDROGRAPH Combine	10003"		
"	6 Combine "			
"	10003 Node #"			
"	west of komoka road culvert"			
"	Maximum flow	2.128	c.m/sec"	
"	Hydrograph volume	36352.168	c.m"	
"	0.055	2.133	2.128	2.128"
" 40	HYDROGRAPH Start - New Tributary"			
"	2 Start - New Tributary"			
"	0.055	0.000	2.128	2.128"
" 33	CATCHMENT 6"			
"	1 Triangular SCS"			
"	3 Specify values"			
"	1 SCS method"			
"	6 west side of komoka road major flows"			
"	45.000 % Impervious"			
"	0.580 Total Area"			
"	190.000 Flow length"			
"	2.000 Overland Slope"			
"	0.319 Pervious Area"			
"	190.000 Pervious length"			
"	2.000 Pervious slope"			
"	0.261 Impervious Area"			
"	6.500 Impervious length"			
"	2.000 Impervious slope"			
"	0.250 Pervious Manning 'n' "			
"	75.000 Pervious SCS Curve No."			
"	0.327 Pervious Runoff coefficient"			
"	0.100 Pervious Ia/S coefficient"			
"	8.467 Pervious Initial abstraction"			
"	0.015 Impervious Manning 'n' "			
"	98.000 Impervious SCS Curve No."			
"	0.912 Impervious Runoff coefficient"			
"	0.100 Impervious Ia/S coefficient"			
"	0.518 Impervious Initial abstraction"			
"	0.120	0.000	2.128	2.128 c.m/sec"
"	Catchment 6	Pervious	Impervious	Total Area "
"	Surface Area	0.319	0.261	0.580 hectare"
"	Time of concentration	47.747	0.680	15.702 minutes"

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"      Time to Centroid      153.841      84.491      106.625      minutes"
"      Rainfall depth        60.381      60.381      60.381      mm"
"      Rainfall volume       192.62      157.60      350.21      c.m"
"      Rainfall losses       40.654      8.948      26.386      mm"
"      Runoff depth          19.728      51.434      33.995      mm"
"      Runoff volume         62.93      134.24      197.17      c.m"
"      Runoff coefficient    0.327      0.912      0.590      "
"      Maximum flow          0.012      0.120      0.120      c.m/sec"
" 40  HYDROGRAPH Add Runoff "
"      4  Add Runoff "
"          0.120      0.120      2.128      2.128"
" 52  CHANNEL DESIGN"
"      0.120 Current peak flow c.m/sec"
"      0.022 Manning 'n'"
"          0. Cross-section type: 0=trapezoidal; 1=general"
"      0.900 Basewidth metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.100 Channel depth metre"
"      0.160 Gradient %"
"          Depth of flow      0.181 metre"
"          Velocity           0.461 m/sec"
"          Channel capacity   5.896 c.m/sec"
"          Critical depth     0.107 metre"
" 53  ROUTE Channel Route 5"
"      5.40 Channel Route 5 Reach length (metre)"
"      0.000 X-factor <= 0.5"
"      8.792 K-lag (seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"      30.000 K-lag (seconds)"
"      0.935 Beta weighting factor"
"      100.000 Routing time step (seconds)"
"          1 No. of sub-reaches"
"          Peak outflow      0.118 c.m/sec"
"          0.120      0.120      0.118      2.128 c.m/sec"
" 40  HYDROGRAPH Combine 10003"
"      6 Combine "
"      10003 Node #"
"          west of komoka road culvert"
"          Maximum flow      2.131 c.m/sec"
"          Hydrograph volume 36549.340 c.m"
"          0.120      0.120      0.118      2.131"
" 40  HYDROGRAPH Confluence 10003"
"      7 Confluence "
"      10003 Node #"
"          west of komoka road culvert"
"          Maximum flow      2.131 c.m/sec"
"          Hydrograph volume 36549.340 c.m"
"          0.120      2.131      0.118      0.000"
" 52  CHANNEL DESIGN"
"      2.131 Current peak flow c.m/sec"
"      0.022 Manning 'n'"
"          0. Cross-section type: 0=trapezoidal; 1=general"
"      0.900 Basewidth metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.100 Channel depth metre"
"      0.160 Gradient %"
"          Depth of flow      0.712 metre"
"          Velocity           0.987 m/sec"
"          Channel capacity   5.896 c.m/sec"
"          Critical depth     0.505 metre"
" 53  ROUTE Zero Route"
"      0.00 Zero Route Reach length (metre)"
"          0.120      2.131      2.131      0.000 c.m/sec"
" 40  HYDROGRAPH Combine 10000"
"      6 Combine "
"      10000 Node #"
"          flows entering main channel"
"          Maximum flow      2.932 c.m/sec"
"          Hydrograph volume 45274.566 c.m"
"          0.120      2.131      2.131      2.932"
" 40  HYDROGRAPH Confluence 10000"
"      7 Confluence "
"      10000 Node #"
"          flows entering main channel"
"          Maximum flow      2.932 c.m/sec"
"          Hydrograph volume 45274.566 c.m"
"          0.120      2.932      2.131      0.000"
" 33  CATCHMENT 7"

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"      1 Triangular SCS"
"      3 Specify values"
"      1 SCS method"
"      7 channel direct area"
" 20.000 % Impervious"
" 2.270 Total Area"
" 5.000 Flow length"
" 25.000 Overland Slope"
" 1.816 Pervious Area"
" 190.000 Pervious length"
" 25.000 Pervious slope"
" 0.454 Impervious Area"
" 10.000 Impervious length"
" 25.000 Impervious slope"
" 0.250 Pervious Manning 'n'"
" 78.000 Pervious SCS Curve No."
" 0.376 Pervious Runoff coefficient"
" 0.100 Pervious Ia/S coefficient"
" 7.164 Pervious Initial abstraction"
" 0.015 Impervious Manning 'n'"
" 98.000 Impervious SCS Curve No."
" 0.912 Impervious Runoff coefficient"
" 0.100 Impervious Ia/S coefficient"
" 0.518 Impervious Initial abstraction"
"      0.224      2.932      2.131      0.000 c.m/sec"
"      Catchment 7      Pervious      Impervious      Total Area "
"      Surface Area      1.816      0.454      2.270 hectare"
"      Time of concentration 20.641      0.413      13.543 minutes"
"      Time to Centroid 119.716      84.283      107.284 minutes"
"      Rainfall depth 60.381      60.381      60.381 mm"
"      Rainfall volume 1096.53      274.13      1370.66 c.m"
"      Rainfall losses 37.722      11.389      32.456 mm"
"      Runoff depth 22.659      48.993      27.926 mm"
"      Runoff volume 411.49      222.43      633.92 c.m"
"      Runoff coefficient 0.376      0.912      0.483 "
"      Maximum flow 0.141      0.210      0.224 c.m/sec"
" 40 HYDROGRAPH Add Runoff "
"      4 Add Runoff "
"      0.224      2.969      2.131      0.000"
" 52 CHANNEL DESIGN"
" 2.969 Current peak flow c.m/sec"
" 0.022 Manning 'n'"
" 0. Cross-section type: 0=trapezoidal; 1=general"
" 0.900 Basewidth metre"
" 3.000 Left bank slope"
" 3.000 Right bank slope"
" 1.100 Channel depth metre"
" 0.160 Gradient %"
"      Depth of flow 0.822 metre"
"      Velocity 1.073 m/sec"
"      Channel capacity 5.896 c.m/sec"
"      Critical depth 0.593 metre"
" 53 ROUTE Channel Route 560"
" 560.00 Channel Route 560 Reach length (metre)"
" 0.302 X-factor <= 0.5"
" 391.286 K-lag (seconds)"
" 0.000 Default(0) or user spec.(1) values used"
" 0.500 X-factor <= 0.5"
" 30.000 K-lag (seconds)"
" 0.500 Beta weighting factor"
" 300.000 Routing time step (seconds)"
" 1 No. of sub-reaches"
"      Peak outflow 2.963 c.m/sec"
"      0.224 2.969 2.963 0.000 c.m/sec"
" 40 HYDROGRAPH Next link "
"      5 Next link "
"      0.224 2.963 2.963 0.000"
" 52 CHANNEL DESIGN"
" 2.963 Current peak flow c.m/sec"
" 0.022 Manning 'n'"
" 0. Cross-section type: 0=trapezoidal; 1=general"
" 1.800 Basewidth metre"
" 0.100 Left bank slope"
" 0.100 Right bank slope"
" 3.500 Channel depth metre"
" 0.160 Gradient %"
"      Depth of flow 1.249 metre"
"      Velocity 1.232 m/sec"
"      Channel capacity 12.294 c.m/sec"
"      Critical depth 0.643 metre"
" 53 ROUTE Channel Route 10"

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"      10.00      Channel Route 10 Reach length  ( metre)"
"      0.000      X-factor <= 0.5"
"      6.087      K-lag  ( seconds)"
"      0.000      Default(0) or user spec.(1) values used"
"      0.500      X-factor <= 0.5"
"      30.000      K-lag  ( seconds)"
"      1.061      Beta weighting factor"
"      300.000     Routing time step  ( seconds)"
"      1          No. of sub-reaches"
"      Peak outflow      2.963      c.m/sec"
"      0.224      2.963      0.000 c.m/sec"
40      HYDROGRAPH Next link "
"      5          Next link "
"      0.224      2.963      2.963      0.000"
58      CULVERT"
"      2.963      Culvert Q      c.m/sec"
"      20.00      Length      metre"
"      0.013      Manning 'n'"
"      241.005     Upstream IL      metre"
"      240.973     Downstream IL      metre"
"      242.700     Weir Elev.      metre"
"      20.000     Weir Breadth.      metre"
"      116.900     Weir Left slope to 1"
"      116.900     Weir Right slope to 1"
"      241.600     Tail water elevation"
"      2          Barrel Option (Pipe/Box/CSPA/HE/VE)"
"      0.900      Barrel Height/Diameter"
"      1.800      Barrel Width"
"      0.700      Cc 004 RC pipe socket inlet"
"      0.900      Ke 012 Project from fill"
"      2          Number of Barrels"
"      39          Number of stages"
"      Level Discharge      Volume"
"      241.005      0.000      0.0"
"      241.601      0.148      11.5"
"      241.602      0.296      11.6"
"      241.604      0.444      11.6"
"      241.608      0.593      11.7"
"      241.612      0.741      11.8"
"      241.618      0.889      11.9"
"      241.624      1.037      12.0"
"      241.632      1.185      12.1"
"      241.640      1.333      12.3"
"      241.649      1.481      12.5"
"      241.660      1.630      12.7"
"      241.671      1.778      12.9"
"      241.683      1.926      13.1"
"      241.696      2.074      13.4"
"      241.710      2.222      13.7"
"      241.725      2.370      13.9"
"      241.741      2.518      14.2"
"      241.757      2.667      14.6"
"      241.775      2.815      14.9"
"      241.793      2.963      15.3"
"      241.812      3.111      15.6"
"      241.831      3.259      16.0"
"      241.851      3.407      16.4"
"      241.872      3.555      16.8"
"      241.893      3.704      17.2"
"      241.915      3.852      17.7"
"      241.937      4.000      18.1"
"      241.959      4.148      18.6"
"      241.981      4.296      19.0"
"      242.004      4.444      19.4"
"      242.026      4.592      19.9"
"      242.048      4.740      20.3"
"      242.070      4.889      20.8"
"      242.092      5.037      21.2"
"      242.114      5.185      21.7"
"      242.135      5.333      22.1"
"      242.156      5.481      22.5"
"      242.177      5.629      22.9"
"      1.800      Channel Basewidth"
"      3.500      Channel Depth"
"      2.500      Channel Topwidth"
"      10.000     Grade Left"
"      10.000     Grade Right"
"      0.160      Grade %"
"      10.000     Length"
"      Barrel Yo      0.548      metre"
"      Barrel Ycr      0.410      metre"

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"      Exit Velocity          1.312    m/sec"
"      Barrel Peak Outflow    2.962    c.m/sec"
"      Weir Peak Flow         0.000    c.m/sec"
"      Total Peak Outflow     2.962    c.m/sec"
"      Maximum level          241.805  metre"
"      Maximum storage         15.266  c.m"
"      Centroidal lag         4.326    hours"
"      0.224    2.963    2.962    0.000 c.m/sec"
40  HYDROGRAPH Next link "
"      5      Next link "
"      0.224    2.962    2.962    0.000"
33  CATCHMENT 8"
"      1      Triangular SCS"
"      3      Specify values"
"      1      SCS method"
"      8      direct channel area"
"      0.000  % Impervious"
"      0.370  Total Area"
"      5.000  Flow length"
"      25.000 Overland Slope"
"      0.370  Pervious Area"
"      190.000 Pervious length"
"      25.000 Pervious slope"
"      0.000  Impervious Area"
"      10.000 Impervious length"
"      25.000 Impervious slope"
"      0.250  Pervious Manning 'n'"
"      78.000 Pervious SCS Curve No."
"      0.376  Pervious Runoff coefficient"
"      0.100  Pervious Ia/S coefficient"
"      7.164  Pervious Initial abstraction"
"      0.015  Impervious Manning 'n'"
"      98.000 Impervious SCS Curve No."
"      0.912  Impervious Runoff coefficient"
"      0.100  Impervious Ia/S coefficient"
"      0.518  Impervious Initial abstraction"
"      0.029    2.962    2.962    0.000 c.m/sec"
"      Catchment 8      Pervious      Impervious      Total Area "
"      Surface Area      0.370      0.000      0.370  hectare"
"      Time of concentration 20.641      0.413      20.641  minutes"
"      Time to Centroid 119.717      84.283      119.717  minutes"
"      Rainfall depth      60.381      60.381      60.381  mm"
"      Rainfall volume      223.41      0.00      223.41  c.m"
"      Rainfall losses      37.722      11.389      37.722  mm"
"      Runoff depth      22.659      48.993      22.659  mm"
"      Runoff volume      83.84      0.00      83.84  c.m"
"      Runoff coefficient      0.376      0.912      0.376  "
"      Maximum flow      0.029      0.000      0.029  c.m/sec"
40  HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"      0.029    2.967    2.962    0.000"
52  CHANNEL DESIGN"
"      2.967  Current peak flow    c.m/sec"
"      0.022  Manning 'n'"
"      0.      Cross-section type: 0=trapezoidal; 1=general"
"      0.900  Basewidth    metre"
"      4.000  Left bank slope"
"      4.000  Right bank slope"
"      1.200  Channel depth    metre"
"      0.160  Gradient    %"
"      Depth of flow      0.752    metre"
"      Velocity      1.010    m/sec"
"      Channel capacity      9.174  c.m/sec"
"      Critical depth      0.545  metre"
53  ROUTE      Channel Route 254"
"      254.40  Channel Route 254 Reach length  ( metre)"
"      0.110  X-factor <= 0.5"
"      188.970 K-lag  ( seconds)"
"      0.000  Default(0) or user spec.(1) values used"
"      0.500  X-factor <= 0.5"
"      30.000 K-lag  ( seconds)"
"      0.500  Beta weighting factor"
"      300.000 Routing time step  ( seconds)"
"      1      No. of sub-reaches"
"      Peak outflow      2.964    c.m/sec"
"      0.029    2.967    2.964    0.000 c.m/sec"

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100 Year Storm

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"          MIDUSS Output ----->"
"          MIDUSS version          Version 2.07 rev. 387"
"          MIDUSS created          Friday, September 23, 2005"
"          10 Units used:          ie METRIC"
"          Job folder:             G:\CLIENT\1389\1\SWM\MIDUSS\
"                                   diversion channel"
"          Output filename:        100yr-external channel design-10.out"
"          Licensee name:          lgrabowski"
"          Company
"          Date & Time last used:   2/6/2019 at 2:42:56 PM"
" 31      TIME PARAMETERS"
"          5.000 Time Step"
"          180.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1 Chicago storm"
"          1499.530 Coefficient A"
"          3.297 Constant B"
"          0.794 Exponent C"
"          0.380 Fraction R"
"          180.000 Duration"
"          1.000 Time step multiplier"
"          Maximum intensity      257.108 mm/hr"
"          Total depth            71.801 mm"
"          6 100hyd Hydrograph extension used in this file"
" 33      CATCHMENT 1"
"          1 Triangular SCS"
"          1 Equal length"
"          1 SCS method"
"          1 external area 1"
"          1.040 % Impervious"
"          26.510 Total Area"
"          600.000 Flow length"
"          3.000 Overland Slope"
"          26.234 Pervious Area"
"          600.000 Pervious length"
"          3.000 Pervious slope"
"          0.276 Impervious Area"
"          600.000 Impervious length"
"          3.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          84.000 Pervious SCS Curve No."
"          0.541 Pervious Runoff coefficient"
"          0.100 Pervious Ia/S coefficient"
"          4.838 Pervious Initial abstraction"
"          0.015 Impervious Manning 'n'"
"          98.000 Impervious SCS Curve No."
"          0.925 Impervious Runoff coefficient"
"          0.100 Impervious Ia/S coefficient"
"          0.518 Impervious Initial abstraction"
"          1.608 0.000 0.000 0.000 c.m/sec"
"          Catchment 1 Pervious Impervious Total Area "
"          Surface Area 26.234 0.276 26.510 hectare"
"          Time of concentration 57.543 8.229 56.674 minutes"
"          Time to Centroid 171.362 95.869 170.032 minutes"
"          Rainfall depth 71.801 71.801 71.801 mm"
"          Rainfall volume 1.8837 0.0198 1.9034 ha-m"
"          Rainfall losses 32.930 5.440 32.644 mm"
"          Runoff depth 38.871 66.361 39.157 mm"
"          Runoff volume 1.0198 0.0183 1.0381 ha-m"
"          Runoff coefficient 0.541 0.925 0.545 "
"          Maximum flow 1.596 0.128 1.608 c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4 Add Runoff "
"          1.608 1.608 0.000 0.000"
" 58      CULVERT"
"          1.608 Culvert Q c.m/sec"
"          25.00 Length metre"
"          0.015 Manning 'n'"
"          244.300 Upstream IL metre"
"          244.290 Downstream IL metre"
"          247.050 Weir Elev. metre"
"          20.000 Weir Breadth. metre"
"          25.000 Weir Left slope to 1"
"          25.000 Weir Right slope to 1"
"          244.600 Tail water elevation"
"          1 Barrel Option (Pipe/Box/CSPA/HE/VE)"
"          1.000 Barrel Height/Diameter"
"          1.000 Barrel Width"
"          0.700 Cc 004 RC pipe socket inlet"
"          0.900 Ke 012 Project from fill"

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"	1.	Number of Barrels"		
"	39	Number of stages"		
"		Level Discharge	Volume"	
"		244.300	0.000	0.0"
"		244.801	0.080	24.0"
"		244.804	0.161	24.3"
"		244.810	0.241	24.9"
"		244.825	0.322	26.6"
"		244.892	0.402	34.3"
"		244.953	0.482	42.6"
"		245.011	0.563	51.3"
"		245.066	0.643	60.6"
"		245.120	0.724	70.5"
"		245.172	0.804	81.0"
"		245.223	0.884	92.1"
"		245.274	0.965	104.0"
"		245.324	1.045	116.7"
"		245.374	1.126	131.0"
"		245.424	1.206	147.3"
"		245.475	1.286	165.9"
"		245.528	1.367	187.1"
"		245.582	1.447	211.6"
"		245.638	1.528	240.3"
"		245.699	1.608	274.9"
"		245.768	1.688	319.1"
"		245.840	1.769	370.9"
"		245.914	1.849	431.0"
"		245.990	1.929	500.1"
"		246.069	2.010	580.7"
"		246.143	2.090	665.8"
"		246.228	2.171	772.6"
"		246.313	2.251	891.4"
"		246.419	2.331	1061.9"
"		246.487	2.412	1187.8"
"		246.577	2.492	1372.0"
"		246.670	2.573	1587.1"
"		246.765	2.653	1835.1"
"		246.860	2.733	2110.0"
"		246.961	2.814	2438.9"
"		247.063	2.894	2810.8"
"		247.165	2.975	3222.4"
"		247.268	3.055	3678.9"
"	1.500	Channel Basewidth"		
"	1.000	Channel Depth"		
"	3.500	Channel Topwidth"		
"	10.000	Grade Left"		
"	10.000	Grade Right"		
"	1.000	Grade %"		
"	300.000	Length"		
"		Barrel Yo	1.000	metre"
"		Barrel Ycr	0.722	metre"
"		Exit Velocity	2.529	m/sec"
"		Barrel Peak Outflow	1.566	c.m/sec"
"		Weir Peak Flow	0.000	c.m/sec"
"		Total Peak Outflow	1.566	c.m/sec"
"		Maximum level	245.667	metre"
"		Maximum storage	256.946	c.m"
"		Centroidal lag	2.870	hours"
"		1.608	1.608	1.566 0.000 c.m/sec"
" 40		HYDROGRAPH Combine	9999"	
"	6	Combine "		
"	9999	Node #"		
"		flows meeting south of ex culv"		
"		Maximum flow	1.566	c.m/sec"
"		Hydrograph volume	10378.294	c.m"
"		1.608 1.608	1.566	1.566"
" 40		HYDROGRAPH Start - New Tributary"		
"	2	Start - New Tributary"		
"		1.608 0.000	1.566	1.566"
" 33		CATCHMENT 4"		
"	1	Triangular SCS"		
"	1	Equal length"		
"	1	SCS method"		
"	4	flows between rail and berm + ex properties"		
"	5.000	% Impervious"		
"	2.090	Total Area"		
"	200.000	Flow length"		
"	10.000	Overland Slope"		
"	1.985	Pervious Area"		
"	200.000	Pervious length"		
"	10.000	Pervious slope"		

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"      0.104 Impervious Area"
" 200.000 Impervious length"
" 10.000 Impervious slope"
"      0.250 Pervious Manning 'n'"
" 84.000 Pervious SCS Curve No."
"      0.541 Pervious Runoff coefficient"
"      0.100 Pervious Ia/S coefficient"
"      4.838 Pervious Initial abstraction"
"      0.015 Impervious Manning 'n'"
" 98.000 Impervious SCS Curve No."
"      0.925 Impervious Runoff coefficient"
"      0.100 Impervious Ia/S coefficient"
"      0.518 Impervious Initial abstraction"
"          0.276      0.000      1.566      1.566 c.m/sec"
"      Catchment 4      Pervious Impervious Total Area "
"      Surface Area      1.985      0.104      2.090 hectare"
"      Time of concentration      20.742      2.966      19.299 minutes"
"      Time to Centroid      119.859      87.643      117.242 minutes"
"      Rainfall depth      71.801      71.801      71.801 mm"
"      Rainfall volume      1425.61      75.03      1500.64 c.m"
"      Rainfall losses      32.937      6.532      31.617 mm"
"      Runoff depth      38.864      65.269      40.184 mm"
"      Runoff volume      771.65      68.21      839.85 c.m"
"      Runoff coefficient      0.541      0.925      0.561 "
"      Maximum flow      0.267      0.053      0.276 c.m/sec"
" 40 HYDROGRAPH Add Runoff "
"      4 Add Runoff "
"          0.276      0.276      1.566      1.566"
" 52 CHANNEL DESIGN"
"      0.276 Current peak flow c.m/sec"
"      0.040 Manning 'n'"
"      0 Cross-section type: 0=trapezoidal; 1=general"
"      0.900 Basewidth metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.000 Channel depth metre"
"      0.500 Gradient %"
"      Depth of flow      0.279 metre"
"      Velocity      0.568 m/sec"
"      Channel capacity      4.571 c.m/sec"
"      Critical depth      0.174 metre"
" 53 ROUTE Zero Route"
"      0.00 Zero Route Reach length (metre)"
"          0.276      0.276      0.276      1.566 c.m/sec"
" 40 HYDROGRAPH Combine 9999"
"      6 Combine "
"      9999 Node #"
"          flows meeting south of ex culv"
"      Maximum flow      1.647 c.m/sec"
"      Hydrograph volume      11218.148 c.m"
"          0.276      0.276      0.276      1.647"
" 40 HYDROGRAPH Confluence 9999"
"      7 Confluence "
"      9999 Node #"
"          flows meeting south of ex culv"
"      Maximum flow      1.647 c.m/sec"
"      Hydrograph volume      11218.147 c.m"
"          0.276      1.647      0.276      0.000"
" 33 CATCHMENT 5"
"      1 Triangular SCS"
"      1 Equal length"
"      1 SCS method"
"      5 channel direct area"
"      0.000 % Impervious"
"      0.420 Total Area"
"      5.000 Flow length"
"      25.000 Overland Slope"
"      0.420 Pervious Area"
"      5.000 Pervious length"
"      25.000 Pervious slope"
"      0.000 Impervious Area"
"      5.000 Impervious length"
"      25.000 Impervious slope"
"      0.250 Pervious Manning 'n'"
"      84.000 Pervious SCS Curve No."
"      0.541 Pervious Runoff coefficient"
"      0.100 Pervious Ia/S coefficient"
"      4.838 Pervious Initial abstraction"
"      0.015 Impervious Manning 'n'"
"      98.000 Impervious SCS Curve No."
"      0.925 Impervious Runoff coefficient"

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"      0.100 Impervious Ia/S coefficient"
"      0.518 Impervious Initial abstraction"
"              0.115      1.647      0.276      0.000 c.m/sec"
"      Catchment 5      Pervious      Impervious      Total Area "
"      Surface Area      0.420      0.000      0.420      hectare"
"      Time of concentration      1.723      0.246      1.723      minutes"
"      Time to Centroid      93.074      83.249      93.074      minutes"
"      Rainfall depth      71.801      71.801      71.801      mm"
"      Rainfall volume      301.56      0.00      301.56      c.m"
"      Rainfall losses      33.426      14.053      33.426      mm"
"      Runoff depth      38.375      57.748      38.375      mm"
"      Runoff volume      161.17      0.00      161.17      c.m"
"      Runoff coefficient      0.541      0.925      0.541      "
"      Maximum flow      0.115      0.000      0.115      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"              0.115      1.659      0.276      0.000"
" 52      CHANNEL DESIGN"
"      1.659      Current peak flow      c.m/sec"
"      0.025      Manning 'n'"
"      0.      Cross-section type: 0=trapezoidal; 1=general"
"      0.900      Basewidth      metre"
"      3.000      Left bank slope"
"      3.000      Right bank slope"
"      1.000      Channel depth      metre"
"      0.840      Gradient      %"
"      Depth of flow      0.464      metre"
"      Velocity      1.559      m/sec"
"      Channel capacity      9.479      c.m/sec"
"      Critical depth      0.447      metre"
" 53      ROUTE      Channel Route 79"
"      79.00      Channel Route 79 Reach length      ( metre)"
"      0.339      X-factor <= 0.5"
"      37.997      K-lag      ( seconds)"
"      0.000      Default(0) or user spec.(1) values used"
"      0.500      X-factor <= 0.5"
"      30.000      K-lag      ( seconds)"
"      0.500      Beta weighting factor"
"      50.000      Routing time step      ( seconds)"
"      1      No. of sub-reaches"
"      Peak outflow      1.655      c.m/sec"
"              0.115      1.659      1.655      0.000 c.m/sec"
" 40      HYDROGRAPH Next link "
"      5      Next link "
"              0.115      1.655      1.655      0.000"
" 52      CHANNEL DESIGN"
"      1.655      Current peak flow      c.m/sec"
"      0.025      Manning 'n'"
"      0.      Cross-section type: 0=trapezoidal; 1=general"
"      0.900      Basewidth      metre"
"      3.000      Left bank slope"
"      3.000      Right bank slope"
"      1.000      Channel depth      metre"
"      0.400      Gradient      %"
"      Depth of flow      0.549      metre"
"      Velocity      1.183      m/sec"
"      Channel capacity      6.541      c.m/sec"
"      Critical depth      0.446      metre"
" 53      ROUTE      Channel Route 213"
"      213.00      Channel Route 213 Reach length      ( metre)"
"      0.355      X-factor <= 0.5"
"      135.012      K-lag      ( seconds)"
"      0.000      Default(0) or user spec.(1) values used"
"      0.500      X-factor <= 0.5"
"      30.000      K-lag      ( seconds)"
"      0.500      Beta weighting factor"
"      150.000      Routing time step      ( seconds)"
"      1      No. of sub-reaches"
"      Peak outflow      1.655      c.m/sec"
"              0.115      1.655      1.655      0.000 c.m/sec"
" 40      HYDROGRAPH Next link "
"      5      Next link "
"              0.115      1.655      1.655      0.000"
" 52      CHANNEL DESIGN"
"      1.655      Current peak flow      c.m/sec"
"      0.040      Manning 'n'"
"      0.      Cross-section type: 0=trapezoidal; 1=general"
"      1.800      Basewidth      metre"
"      0.100      Left bank slope"
"      0.100      Right bank slope"
"      1.000      Channel depth      metre"

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"      0.480 Gradient %"
"      Depth of flow      0.853 metre"
"      Velocity           1.029 m/sec"
"      Channel capacity   2.070 c.m/sec"
"      Critical depth     0.438 metre"
" 53 ROUTE Channel Route 10"
"      10.00 Channel Route 10 Reach length (metre)"
"      0.000 X-factor <= 0.5"
"      7.291 K-lag (seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"      30.000 K-lag (seconds)"
"      1.061 Beta weighting factor"
"      75.000 Routing time step (seconds)"
"      1 No. of sub-reaches"
"      Peak outflow      1.655 c.m/sec"
"      0.115 1.655 1.655 0.000 c.m/sec"
" 40 HYDROGRAPH Next link "
"      5 Next link "
"      0.115 1.655 1.655 0.000"
" 58 CULVERT"
"      1.655 Culvert Q c.m/sec"
"      20.00 Length metre"
"      0.015 Manning 'n'"
"      242.340 Upstream IL metre"
"      242.250 Downstream IL metre"
"      243.800 Weir Elev. metre"
"      10.000 Weir Breadth. metre"
"      25.000 Weir Left slope to 1"
"      25.000 Weir Right slope to 1"
"      242.800 Tail water elevation"
"      2 Barrel Option (Pipe/Box/CSPA/HE/VE)"
"      0.900 Barrel Height/Diameter"
"      1.800 Barrel Width"
"      0.700 Cc 004 RC pipe socket inlet"
"      0.900 Ke 012 Project from fill"
"      1. Number of Barrels"
"      39 Number of stages"
"      Level Discharge Volume"
"      242.340 0.000 0.0"
"      242.801 0.083 9.7"
"      242.804 0.165 9.8"
"      242.809 0.248 9.9"
"      242.816 0.331 10.0"
"      242.825 0.414 10.2"
"      242.835 0.496 10.4"
"      242.848 0.579 10.6"
"      242.863 0.662 10.9"
"      242.879 0.745 11.2"
"      242.898 0.827 11.6"
"      242.918 0.910 12.0"
"      242.941 0.993 12.4"
"      242.965 1.076 12.9"
"      242.990 1.158 13.4"
"      243.018 1.241 13.9"
"      243.047 1.324 14.5"
"      243.078 1.407 15.1"
"      243.109 1.489 15.7"
"      243.142 1.572 16.3"
"      243.175 1.655 17.0"
"      243.208 1.737 17.6"
"      243.239 1.820 18.2"
"      243.268 1.903 18.8"
"      243.296 1.986 19.4"
"      243.323 2.068 19.9"
"      243.349 2.151 20.4"
"      243.374 2.234 20.9"
"      243.399 2.317 21.5"
"      243.423 2.399 22.3"
"      243.447 2.482 23.1"
"      243.471 2.565 24.0"
"      243.495 2.648 25.1"
"      243.518 2.730 26.2"
"      243.541 2.813 27.4"
"      243.564 2.896 28.7"
"      243.587 2.979 30.1"
"      243.609 3.061 31.6"
"      243.631 3.144 33.2"
"      1.800 Channel Basewidth"
"      1.000 Channel Depth"
"      2.000 Channel Topwidth"

```



```

"      10.000  Grade Left"
"      10.000  Grade Right"
"      0.480  Grade %"
"      10.000  Length"
"          Barrel Yo          0.456  metre"
"          Barrel Ycr          0.442  metre"
"          Exit Velocity        1.671  m/sec"
"          Barrel Peak Outflow  1.654  c.m/sec"
"          Weir Peak Flow       0.000  c.m/sec"
"          Total Peak Outflow   1.654  c.m/sec"
"          Maximum level        243.201 metre"
"          Maximum storage      16.959  c.m"
"          Centroidal lag       2.841  hours"
"              0.115  1.655  1.654  0.000 c.m/sec"
" 40  HYDROGRAPH Next link "
"      5  Next link "
"          0.115  1.654  1.654  0.000"
" 52  CHANNEL DESIGN"
"      1.654  Current peak flow  c.m/sec"
"      0.040  Manning 'n'"
"          0.  Cross-section type: 0=trapezoidal; 1=general"
"      0.900  Basewidth  metre"
"      3.000  Left bank slope"
"      3.000  Right bank slope"
"      1.000  Channel depth  metre"
"      0.480  Gradient  %"
"          Depth of flow        0.650  metre"
"          Velocity             0.892  m/sec"
"          Channel capacity     4.478  c.m/sec"
"          Critical depth       0.446  metre"
" 53  ROUTE  Channel Route 67"
"      67.00  Channel Route 67 Reach length  ( metre)"
"      0.053  X-factor <= 0.5"
"      56.312 K-lag  ( seconds)"
"      0.000  Default(0) or user spec.(1) values used"
"      0.500  X-factor <= 0.5"
"      30.000 K-lag  ( seconds)"
"      0.500  Beta weighting factor"
"      100.000 Routing time step  ( seconds)"
"          1  No. of sub-reaches"
"          Peak outflow          1.651  c.m/sec"
"              0.115  1.654  1.651  0.000 c.m/sec"
" 40  HYDROGRAPH Combine 10000"
"      6  Combine "
"      10000 Node #"
"          flows entering main channel"
"          Maximum flow          1.651  c.m/sec"
"          Hydrograph volume     11368.258 c.m"
"              0.115  1.654  1.651  1.651"
" 40  HYDROGRAPH Start - New Tributary"
"      2  Start - New Tributary"
"          0.115  0.000  1.651  1.651"
" 33  CATCHMENT 2"
"      1  Triangular SCS"
"      1  Equal length"
"      1  SCS method"
"      2  external area 2"
"      1.400  % Impervious"
"      120.880 Total Area"
"      900.000 Flow length"
"      3.000  Overland Slope"
"      119.188 Pervious Area"
"      900.000 Pervious length"
"      3.000  Pervious slope"
"      1.692  Impervious Area"
"      900.000 Impervious length"
"      3.000  Impervious slope"
"      0.250  Pervious Manning 'n'"
"      84.000 Pervious SCS Curve No."
"      0.541  Pervious Runoff coefficient"
"      0.100  Pervious Ia/S coefficient"
"      4.838  Pervious Initial abstraction"
"      0.015  Impervious Manning 'n'"
"      98.000 Impervious SCS Curve No."
"      0.925  Impervious Runoff coefficient"
"      0.100  Impervious Ia/S coefficient"
"      0.518  Impervious Initial abstraction"
"          5.948  0.000  1.651  1.651 c.m/sec"
"          Catchment 2  Pervious  Impervious Total Area "
"          Surface Area  119.188  1.692  120.880  hectare"
"          Time of concentration  73.392  10.496  71.907  minutes"

```

"	Time to Centroid	193.543	99.288	191.317	minutes"
"	Rainfall depth	71.801	71.801	71.801	mm"
"	Rainfall volume	8.5578	0.1215	8.6793	ha-m"
"	Rainfall losses	32.928	5.585	32.545	mm"
"	Runoff depth	38.874	66.216	39.256	mm"
"	Runoff volume	4.6332	0.1121	4.7453	ha-m"
"	Runoff coefficient	0.541	0.925	0.547	"
"	Maximum flow	5.887	0.629	5.948	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	5.948	5.948	1.651	1.651"	
" 52	CHANNEL DESIGN"				
"	5.948 Current peak flow	c.m/sec"			
"	0.022 Manning 'n'"				
"	0.	Cross-section type: 0=trapezoidal; 1=general"			
"	5.000 Basewidth	metre"			
"	3.000 Left bank slope"				
"	3.000 Right bank slope"				
"	0.500 Channel depth	metre"			
"	0.600 Gradient	%"			
"	Depth of flow	0.489	metre"		
"	Velocity	1.882	m/sec"		
"	Channel capacity	6.193	c.m/sec"		
"	Critical depth	0.474	metre"		
" 53	ROUTE Channel Route 350"				
"	350.00 Channel Route 350 Reach length	(metre)"			
"	0.435 X-factor <= 0.5"				
"	139.510 K-lag (seconds)"				
"	0.000 Default(0) or user spec.(1) values used"				
"	0.500 X-factor <= 0.5"				
"	30.000 K-lag (seconds)"				
"	0.500 Beta weighting factor"				
"	150.000 Routing time step (seconds)"				
"	1 No. of sub-reaches"				
"	Peak outflow	5.915	c.m/sec"		
"	5.948	5.948	5.915	1.651 c.m/sec"	
" 40	HYDROGRAPH Next link "				
"	5 Next link "				
"	5.948	5.915	5.915	1.651"	
" 58	CULVERT"				
"	5.915 Culvert Q	c.m/sec"			
"	19.30 Length	metre"			
"	0.013 Manning 'n'"				
"	242.130 Upstream IL	metre"			
"	242.100 Downstream IL	metre"			
"	243.610 Weir Elev.	metre"			
"	20.000 Weir Breadth.	metre"			
"	25.000 Weir Left slope to 1"				
"	25.000 Weir Right slope to 1"				
"	243.350 Tail water elevation"				
"	1 Barrel Option (Pipe/Box/CSPA/HE/VE)"				
"	0.900 Barrel Height/Diameter"				
"	0.900 Barrel Width"				
"	0.500 Cc 001 CSP thin walled projecting"				
"	0.900 Ke 012 Project from fill"				
"	1. Number of Barrels"				
"	39 Number of stages"				
"	Level Discharge	Volume"			
"	242.130	0.000	0.0"		
"	243.376	0.296	1158.5"		
"	243.454	0.592	1361.5"		
"	243.585	0.887	1756.0"		
"	243.767	1.183	2439.1"		
"	244.002	1.479	3571.2"		
"	244.289	1.775	5413.8"		
"	244.739	2.070	9384.8"		
"	245.400	2.366	17665.6"		
"	246.149	2.662	30748.1"		
"	246.987	2.958	50018.0"		
"	247.912	3.253	77025.4"		
"	248.926	3.549	113482.9"		
"	250.027	3.845	161266.4"		
"	251.217	4.141	222414.0"		
"	252.495	4.436	299129.3"		
"	253.861	4.732	393775.7"		
"	255.315	5.028	508882.5"		
"	256.857	5.324	647140.9"		
"	258.488	5.620	811404.1"		
"	260.206	5.915	1004690.9"		
"	262.013	6.211	1230182.0"		
"	263.908	6.507	1491221.4"		

```

"      265.891      6.803 1791316.1"
"      267.962      7.098 2134136.3"
"      270.121      7.394 2523515.0"
"      272.369      7.690 2963442.5"
"      274.704      7.986 3458090.5"
"      277.128      8.281 4011776.0"
"      279.639      8.577 4628976.5"
"      282.239      8.873 5314347.0"
"      284.927      9.169 6072701.5"
"      287.704      9.464 6909022.0"
"      290.568      9.760 7828430.0"
"      293.520     10.056 8836225.0"
"      296.561     10.352 9937891.0"
"      299.690     10.6481139047.0"
"      302.906     10.94312445483.0"
"      306.211     11.23913863139.0"
"      5.000 Channel Basewidth"
"      0.500 Channel Depth"
"      8.000 Channel Topwidth"
"     10.000 Grade Left"
"     10.000 Grade Right"
"      0.600 Grade %"
"    350.000 Length"
"      Barrel Yo      0.900 metre"
"      Barrel Ycr      0.891 metre"
"      Exit Velocity    2.248 m/sec"
"      Barrel Peak Outflow 1.430 c.m/sec"
"      Weir Peak Flow    4.485 c.m/sec"
"      Total Peak Outflow 5.915 c.m/sec"
"      Maximum level     243.840 metre"
"      Maximum storage    17504.414 c.m"
"      Centroidal lag     4.694 hours"
"      5.948 5.915 5.915 1.651 c.m/sec"
" 40 HYDROGRAPH Next link "
"      5 Next link "
"      5.948 2.360 5.915 1.651"
" 52 CHANNEL DESIGN"
"      2.360 Current peak flow c.m/sec"
"      0.022 Manning 'n'"
"      0. Cross-section type: 0=trapezoidal; 1=general"
"      0.000 Basewidth metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.000 Channel depth metre"
"      0.290 Gradient %"
"      Depth of flow      0.787 metre"
"      Velocity            1.269 m/sec"
"      Channel capacity    4.466 c.m/sec"
"      Critical depth      0.661 metre"
" 53 ROUTE Channel Route 69"
"      69.00 Channel Route 69 Reach length ( metre)"
"      0.000 X-factor <= 0.5"
"     40.769 K-lag ( seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"     30.000 K-lag ( seconds)"
"      0.597 Beta weighting factor"
"    100.000 Routing time step ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow      2.360 c.m/sec"
"      5.948 2.360 2.360 1.651 c.m/sec"
" 40 HYDROGRAPH Combine 10001"
"      6 Combine "
"    10001 Node #"
"      flows entering from east of Komoka Road"
"      Maximum flow      2.360 c.m/sec"
"      Hydrograph volume 47443.727 c.m"
"      5.948 2.360 2.360 2.360"
" 40 HYDROGRAPH Start - New Tributary"
"      2 Start - New Tributary"
"      5.948 0.000 2.360 2.360"
" 33 CATCHMENT 3"
"      1 Triangular SCS"
"      1 Equal length"
"      1 SCS method"
"      3 externa larea 3 - east portion of komoka road"
"     45.000 % Impervious"
"      0.610 Total Area"
"    190.000 Flow length"
"      2.000 Overland Slope"
"      0.336 Pervious Area"

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" 190.000 Pervious length"
" 2.000 Pervious slope"
" 0.275 Impervious Area"
" 190.000 Impervious length"
" 2.000 Impervious slope"
" 0.250 Pervious Manning 'n'"
" 75.000 Pervious SCS Curve No."
" 0.377 Pervious Runoff coefficient"
" 0.100 Pervious Ia/S coefficient"
" 8.467 Pervious Initial abstraction"
" 0.015 Impervious Manning 'n'"
" 98.000 Impervious SCS Curve No."
" 0.925 Impervious Runoff coefficient"
" 0.100 Impervious Ia/S coefficient"
" 0.518 Impervious Initial abstraction"
" 0.143 0.000 2.360 2.360 c.m/sec"
" Catchment 3 Pervious Impervious Total Area "
" Surface Area 0.336 0.275 0.610 hectare"
" Time of concentration 39.710 4.662 16.363 minutes"
" Time to Centroid 146.330 90.276 108.990 minutes"
" Rainfall depth 71.801 71.801 71.801 mm"
" Rainfall volume 240.89 197.09 437.99 c.m"
" Rainfall losses 44.706 5.724 27.164 mm"
" Runoff depth 27.095 66.077 44.637 mm"
" Runoff volume 90.90 181.38 272.29 c.m"
" Runoff coefficient 0.377 0.925 0.624 "
" Maximum flow 0.019 0.140 0.143 c.m/sec"
40 HYDROGRAPH Add Runoff "
" 4 Add Runoff "
" 0.143 0.143 2.360 2.360"
56 DIVERSION"
" 3 Node number"
" 0.059 Overflow threshold"
" 1.000 Required diverted fraction"
" 0 Conduit type; 1=Pipe;2=Channel"
" Peak of diverted flow 0.084 c.m/sec"
" Volume of diverted flow 45.827 c.m"
" DIV00003.100hyd"
" Major flow east of komoka road"
" 0.143 0.143 0.059 2.360 c.m/sec"
40 HYDROGRAPH Next link "
" 5 Next link "
" 0.143 0.059 0.059 2.360"
52 CHANNEL DESIGN"
" 0.059 Current peak flow c.m/sec"
" 0.022 Manning 'n'"
" 0 Cross-section type: 0=trapezoidal; 1=general"
" 0.000 Basewidth metre"
" 3.000 Left bank slope"
" 3.000 Right bank slope"
" 1.000 Channel depth metre"
" 0.290 Gradient %"
" Depth of flow 0.197 metre"
" Velocity 0.505 m/sec"
" Channel capacity 4.466 c.m/sec"
" Critical depth 0.151 metre"
53 ROUTE Channel Route 50"
" 50.00 Channel Route 50 Reach length ( metre)"
" 0.245 X-factor <= 0.5"
" 74.297 K-lag ( seconds)"
" 0.000 Default(0) or user spec.(1) values used"
" 0.500 X-factor <= 0.5"
" 30.000 K-lag ( seconds)"
" 0.500 Beta weighting factor"
" 100.000 Routing time step ( seconds)"
" 1 No. of sub-reaches"
" Peak outflow 0.059 c.m/sec"
" 0.143 0.059 0.059 2.360 c.m/sec"
40 HYDROGRAPH Combine 10002"
" 6 Combine "
" 10002 Node #"
" minor flows east of komoka leaving via pipe network"
" Maximum flow 0.059 c.m/sec"
" Hydrograph volume 226.458 c.m"
" 0.143 0.059 0.059 0.059"
47 FILEI_0 Read/Open DIV00003.100hyd"
" 1 1=read/open; 2=write/save"
" 2 1=rainfall; 2=hydrograph"
" 1 1=runoff; 2=inflow; 3=outflow; 4=junction"
" DIV00003.100hyd"
" Major flow east of komoka road"

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"      Total volume          45.827    c.m"
"      Maximum flow          0.084    c.m/sec"
"      0.084    0.059    0.059    0.059 c.m/sec"
" 40    HYDROGRAPH Start - New Tributary"
"      2    Start - New Tributary"
"      0.084    0.000    0.059    0.059"
" 40    HYDROGRAPH Add Runoff "
"      4    Add Runoff "
"      0.084    0.084    0.059    0.059"
" 52    CHANNEL DESIGN"
"      0.084    Current peak flow    c.m/sec"
"      0.022    Manning 'n'"
"      0.    Cross-section type: 0=trapezoidal; 1=general"
"      0.000    Basewidth    metre"
"      3.000    Left bank slope"
"      3.000    Right bank slope"
"      1.000    Channel depth    metre"
"      0.290    Gradient    %"
"      Depth of flow          0.225    metre"
"      Velocity              0.551    m/sec"
"      Channel capacity      4.466    c.m/sec"
"      Critical depth        0.174    metre"
" 53    ROUTE    Channel Route 15"
"      15.00    Channel Route 15 Reach length    ( metre)"
"      0.000    X-factor <= 0.5"
"      20.405    K-lag    ( seconds)"
"      0.000    Default(0) or user spec.(1) values used"
"      0.500    X-factor <= 0.5"
"      30.000    K-lag    ( seconds)"
"      0.660    Beta weighting factor"
"      60.000    Routing time step    ( seconds)"
"      1    No. of sub-reaches"
"      Peak outflow          0.081    c.m/sec"
"      0.084    0.084    0.081    0.059 c.m/sec"
" 40    HYDROGRAPH Combine    10001"
"      6    Combine "
"      10001    Node #"
"      flows entering from east of Komoka Road"
"      Maximum flow          2.360    c.m/sec"
"      Hydrograph volume      47489.547    c.m"
"      0.084    0.084    0.081    2.360"
" 40    HYDROGRAPH Confluence    10001"
"      7    Confluence "
"      10001    Node #"
"      flows entering from east of Komoka Road"
"      Maximum flow          2.360    c.m/sec"
"      Hydrograph volume      47489.547    c.m"
"      0.084    2.360    0.081    0.000"
" 58    CULVERT"
"      2.360    Culvert Q    c.m/sec"
"      20.40    Length    metre"
"      0.013    Manning 'n'"
"      241.900    Upstream IL    metre"
"      241.870    Downstream IL    metre"
"      243.610    Weir Elev.    metre"
"      20.000    Weir Breadth.    metre"
"      116.900    Weir Left slope to 1"
"      116.900    Weir Right slope to 1"
"      242.600    Tail water elevation"
"      4    Barrel Option (Pipe/Box/CSPA/HE/VE)"
"      0.965    Barrel Height/Diameter"
"      1.524    Barrel Width"
"      0.500    Cc 001 CSP thin walled projecting"
"      0.900    Ke 012 Project from fill"
"      1.    Number of Barrels"
"      39    Number of stages"
"      Level Discharge    Volume"
"      241.900    0.000    0.0"
"      242.602    0.118    126.6"
"      242.608    0.236    128.0"
"      242.617    0.354    130.3"
"      242.630    0.472    133.6"
"      242.647    0.590    137.8"
"      242.668    0.708    142.9"
"      242.692    0.826    149.0"
"      242.719    0.944    156.0"
"      242.750    1.062    163.9"
"      242.783    1.180    172.8"
"      242.820    1.298    182.5"
"      242.858    1.416    193.1"
"      242.899    1.534    205.3"

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"		242.942	1.652	220.6"	
"		242.986	1.770	240.3"	
"		243.031	1.888	272.8"	
"		243.078	2.006	320.7"	
"		243.126	2.124	387.3"	
"		243.175	2.242	475.0"	
"		243.234	2.360	606.0"	
"		243.321	2.478	851.2"	
"		243.412	2.596	1174.4"	
"		243.508	2.714	1584.9"	
"		243.608	2.832	2092.6"	
"		243.713	2.950	2707.9"	
"		243.821	3.068	3441.4"	
"		243.934	3.186	4304.4"	
"		244.051	3.304	5308.6"	
"		244.172	3.422	6465.7"	
"		244.298	3.540	7788.6"	
"		244.428	3.658	9289.9"	
"		244.562	3.776	10983.3"	
"		244.700	3.894	12882.3"	
"		244.843	4.012	15001.3"	
"		244.989	4.130	17355.2"	
"		245.141	4.248	19958.7"	
"		245.296	4.366	22827.6"	
"		245.455	4.484	25977.8"	
"		2.286	Channel Basewidth"		
"		0.965	Channel Depth"		
"		4.216	Channel Topwidth"		
"		58.457	Grade Left"		
"		58.457	Grade Right"		
"		0.290	Grade %"		
"		69.000	Length"		
"		Barrel Yo	0.965	metre"	
"		Barrel Ycr	0.711	metre"	
"		Exit Velocity	2.485	m/sec"	
"		Barrel Peak Outflow	2.348	c.m/sec"	
"		Weir Peak Flow	0.000	c.m/sec"	
"		Total Peak Outflow	2.348	c.m/sec"	
"		Maximum level	243.257	metre"	
"		Maximum storage	592.086	c.m"	
"		Centroidal lag	4.764	hours"	
"		0.084	2.360	2.348	0.000 c.m/sec"
" 40		HYDROGRAPH	Combine	10003"	
"		6	Combine "		
"		10003	Node #"		
"			west of komoka road culvert"		
"		Maximum flow	2.348	c.m/sec"	
"		Hydrograph volume	47485.629	c.m"	
"		0.084	2.360	2.348	2.348"
" 40		HYDROGRAPH Start - New Tributary"			
"		2	Start - New Tributary"		
"		0.084	0.000	2.348	2.348"
" 33		CATCHMENT 6"			
"		1	Triangular SCS"		
"		3	Specify values"		
"		1	SCS method"		
"		6	west side of komoka road major flows"		
"		45.000	% Impervious"		
"		0.580	Total Area"		
"		190.000	Flow length"		
"		2.000	Overland Slope"		
"		0.319	Pervious Area"		
"		190.000	Pervious length"		
"		2.000	Pervious slope"		
"		0.261	Impervious Area"		
"		6.500	Impervious length"		
"		2.000	Impervious slope"		
"		0.250	Pervious Manning 'n'"		
"		75.000	Pervious SCS Curve No."		
"		0.377	Pervious Runoff coefficient"		
"		0.100	Pervious Ia/S coefficient"		
"		8.467	Pervious Initial abstraction"		
"		0.015	Impervious Manning 'n'"		
"		98.000	Impervious SCS Curve No."		
"		0.925	Impervious Runoff coefficient"		
"		0.100	Impervious Ia/S coefficient"		
"		0.518	Impervious Initial abstraction"		
"		0.155	0.000	2.348	2.348 c.m/sec"
"		Catchment 6	Pervious	Impervious	Total Area "
"		Surface Area	0.319	0.261	0.580 hectare"
"		Time of concentration	39.710	0.615	14.293 minutes"

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"      Time to Centroid      146.330      84.443      106.095      minutes"
"      Rainfall depth        71.801      71.801      71.801      mm"
"      Rainfall volume       229.05      187.40      416.45      c.m"
"      Rainfall losses       44.706      10.264      29.207      mm"
"      Runoff depth          27.095      61.537      42.594      mm"
"      Runoff volume         86.43      160.61      247.04      c.m"
"      Runoff coefficient     0.377      0.925      0.624      "
"      Maximum flow          0.018      0.154      0.155      c.m/sec"
40  HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"      0.155      0.155      2.348      2.348"
52  CHANNEL DESIGN"
"      0.155      Current peak flow      c.m/sec"
"      0.022      Manning 'n'"
"      0.      Cross-section type: 0=trapezoidal; 1=general"
"      0.900      Basewidth      metre"
"      3.000      Left bank slope"
"      3.000      Right bank slope"
"      1.100      Channel depth      metre"
"      0.160      Gradient      %"
"      Depth of flow      0.206      metre"
"      Velocity      0.495      m/sec"
"      Channel capacity      5.896      c.m/sec"
"      Critical depth      0.125      metre"
53  ROUTE      Channel Route 5"
"      5.40      Channel Route 5 Reach length      ( metre)"
"      0.000      X-factor <= 0.5"
"      8.181      K-lag      ( seconds)"
"      0.000      Default(0) or user spec.(1) values used"
"      0.500      X-factor <= 0.5"
"      30.000      K-lag      ( seconds)"
"      0.959      Beta weighting factor"
"      100.000      Routing time step      ( seconds)"
"      1      No. of sub-reaches"
"      Peak outflow      0.152      c.m/sec"
"      0.155      0.155      0.152      2.348 c.m/sec"
40  HYDROGRAPH Combine 10003"
"      6      Combine "
"      10003      Node #"
"      west of komoka road culvert"
"      Maximum flow      2.351      c.m/sec"
"      Hydrograph volume      47732.660      c.m"
"      0.155      0.155      0.152      2.351"
40  HYDROGRAPH Confluence 10003"
"      7      Confluence "
"      10003      Node #"
"      west of komoka road culvert"
"      Maximum flow      2.351      c.m/sec"
"      Hydrograph volume      47732.660      c.m"
"      0.155      2.351      0.152      0.000"
52  CHANNEL DESIGN"
"      2.351      Current peak flow      c.m/sec"
"      0.022      Manning 'n'"
"      0.      Cross-section type: 0=trapezoidal; 1=general"
"      0.900      Basewidth      metre"
"      3.000      Left bank slope"
"      3.000      Right bank slope"
"      1.100      Channel depth      metre"
"      0.160      Gradient      %"
"      Depth of flow      0.743      metre"
"      Velocity      1.012      m/sec"
"      Channel capacity      5.896      c.m/sec"
"      Critical depth      0.530      metre"
53  ROUTE Zero Route"
"      0.00      Zero Route Reach length      ( metre)"
"      0.155      2.351      2.351      0.000 c.m/sec"
40  HYDROGRAPH Combine 10000"
"      6      Combine "
"      10000      Node #"
"      flows entering main channel"
"      Maximum flow      3.568      c.m/sec"
"      Hydrograph volume      59100.949      c.m"
"      0.155      2.351      2.351      3.568"
40  HYDROGRAPH Confluence 10000"
"      7      Confluence "
"      10000      Node #"
"      flows entering main channel"
"      Maximum flow      3.568      c.m/sec"
"      Hydrograph volume      59100.949      c.m"
"      0.155      3.568      2.351      0.000"
33  CATCHMENT 7"

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"      1 Triangular SCS"
"      3 Specify values"
"      1 SCS method"
"      7 channel direct area"
" 20.000 % Impervious"
" 2.270 Total Area"
" 5.000 Flow length"
" 25.000 Overland Slope"
" 1.816 Pervious Area"
" 190.000 Pervious length"
" 25.000 Pervious slope"
" 0.454 Impervious Area"
" 10.000 Impervious length"
" 25.000 Impervious slope"
" 0.250 Pervious Manning 'n'"
" 78.000 Pervious SCS Curve No."
" 0.427 Pervious Runoff coefficient"
" 0.100 Pervious Ia/S coefficient"
" 7.164 Pervious Initial abstraction"
" 0.015 Impervious Manning 'n'"
" 98.000 Impervious SCS Curve No."
" 0.925 Impervious Runoff coefficient"
" 0.100 Impervious Ia/S coefficient"
" 0.518 Impervious Initial abstraction"
"      0.299      3.568      2.351      0.000 c.m/sec"
"      Catchment 7      Pervious      Impervious      Total Area "
"      Surface Area      1.816      0.454      2.270 hectare"
"      Time of concentration 17.379      0.373      11.847 minutes"
"      Time to Centroid 116.335      84.036      105.828 minutes"
"      Rainfall depth 71.801      71.801      71.801 mm"
"      Rainfall volume 1303.91      325.98      1629.88 c.m"
"      Rainfall losses 41.180      12.749      35.494 mm"
"      Runoff depth 30.621      59.052      36.307 mm"
"      Runoff volume 556.07      268.10      824.17 c.m"
"      Runoff coefficient 0.427      0.925      0.527 "
"      Maximum flow 0.210      0.270      0.299 c.m/sec"
" 40 HYDROGRAPH Add Runoff "
"      4 Add Runoff "
"      0.299      3.624      2.351      0.000"
" 52 CHANNEL DESIGN"
" 3.624 Current peak flow c.m/sec"
" 0.022 Manning 'n'"
" 0. Cross-section type: 0=trapezoidal; 1=general"
" 0.900 Basewidth metre"
" 3.000 Left bank slope"
" 3.000 Right bank slope"
" 1.100 Channel depth metre"
" 0.160 Gradient %"
"      Depth of flow 0.895 metre"
"      Velocity 1.129 m/sec"
"      Channel capacity 5.896 c.m/sec"
"      Critical depth 0.652 metre"
" 53 ROUTE Channel Route 560"
" 560.00 Channel Route 560 Reach length (metre)"
" 0.286 X-factor <= 0.5"
" 372.060 K-lag ( seconds)"
" 0.000 Default(0) or user spec.(1) values used"
" 0.500 X-factor <= 0.5"
" 30.000 K-lag ( seconds)"
" 0.500 Beta weighting factor"
" 300.000 Routing time step ( seconds)"
" 1 No. of sub-reaches"
"      Peak outflow 3.612 c.m/sec"
"      0.299      3.624      3.612      0.000 c.m/sec"
" 40 HYDROGRAPH Next link "
"      5 Next link "
"      0.299      3.612      3.612      0.000"
" 52 CHANNEL DESIGN"
" 3.612 Current peak flow c.m/sec"
" 0.022 Manning 'n'"
" 0. Cross-section type: 0=trapezoidal; 1=general"
" 1.800 Basewidth metre"
" 0.100 Left bank slope"
" 0.100 Right bank slope"
" 3.500 Channel depth metre"
" 0.160 Gradient %"
"      Depth of flow 1.442 metre"
"      Velocity 1.289 m/sec"
"      Channel capacity 12.294 c.m/sec"
"      Critical depth 0.733 metre"
" 53 ROUTE Channel Route 10"

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"      10.00      Channel Route 10 Reach length  ( metre)"
"      0.000      X-factor <= 0.5"
"      5.820      K-lag  ( seconds)"
"      0.000      Default(0) or user spec.(1) values used"
"      0.500      X-factor <= 0.5"
"      30.000      K-lag  ( seconds)"
"      1.124      Beta weighting factor"
"      300.000     Routing time step  ( seconds)"
"      1          No. of sub-reaches"
"      Peak outflow      3.612      3.612      c.m/sec"
"      0.299      3.612      0.000 c.m/sec"
" 40      HYDROGRAPH Next link "
"      5          Next link "
"      0.299      3.612      3.612      0.000"
" 58      CULVERT"
"      3.612      Culvert Q      c.m/sec"
"      20.00      Length      metre"
"      0.013      Manning 'n'"
"      241.005     Upstream IL      metre"
"      240.973     Downstream IL      metre"
"      242.700     Weir Elev.      metre"
"      20.000     Weir Breadth.      metre"
"      116.900     Weir Left slope to 1"
"      116.900     Weir Right slope to 1"
"      241.600     Tail water elevation"
"      2          Barrel Option (Pipe/Box/CSPA/HE/VE)"
"      0.900      Barrel Height/Diameter"
"      1.800      Barrel Width"
"      0.700      Cc 004 RC pipe socket inlet"
"      0.900      Ke 012 Project from fill"
"      2          Number of Barrels"
"      39          Number of stages"
"      Level Discharge      Volume"
"      241.005      0.000      0.0"
"      241.601      0.181      11.5"
"      241.603      0.361      11.6"
"      241.607      0.542      11.6"
"      241.612      0.722      11.7"
"      241.618      0.903      11.9"
"      241.627      1.084      12.0"
"      241.636      1.264      12.2"
"      241.647      1.445      12.4"
"      241.660      1.625      12.7"
"      241.673      1.806      12.9"
"      241.688      1.987      13.2"
"      241.705      2.167      13.6"
"      241.723      2.348      13.9"
"      241.742      2.529      14.3"
"      241.762      2.709      14.7"
"      241.784      2.890      15.1"
"      241.807      3.070      15.5"
"      241.830      3.251      16.0"
"      241.855      3.432      16.5"
"      241.880      3.612      17.0"
"      241.906      3.793      17.5"
"      241.933      3.973      18.0"
"      241.960      4.154      18.6"
"      241.987      4.335      19.1"
"      242.015      4.515      19.7"
"      242.042      4.696      20.2"
"      242.069      4.876      20.8"
"      242.095      5.057      21.3"
"      242.122      5.238      21.8"
"      242.147      5.418      22.3"
"      242.173      5.599      22.9"
"      242.198      5.780      23.4"
"      242.223      5.960      23.9"
"      242.247      6.141      24.4"
"      242.271      6.321      24.9"
"      242.295      6.502      25.4"
"      242.319      6.683      25.9"
"      242.343      6.863      26.4"
"      1.800      Channel Basewidth"
"      3.500      Channel Depth"
"      2.500      Channel Topwidth"
"      10.000     Grade Left"
"      10.000     Grade Right"
"      0.160      Grade %"
"      10.000     Length"
"      Barrel Yo      0.631      metre"
"      Barrel Ycr      0.468      metre"

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"      Exit Velocity                1.600    m/sec"
"      Barrel Peak Outflow          3.612    c.m/sec"
"      Weir Peak Flow                0.000    c.m/sec"
"      Total Peak Outflow            3.612    c.m/sec"
"      Maximum level                 241.918  metre"
"      Maximum storage               16.986    c.m"
"      Centroidal lag                4.455    hours"
"      0.299    3.612    3.612    0.000 c.m/sec"
40  HYDROGRAPH Next link "
"      5      Next link "
"      0.299    3.612    3.612    0.000"
33  CATCHMENT 8"
"      1      Triangular SCS"
"      3      Specify values"
"      1      SCS method"
"      8      direct channel area"
"      0.000  % Impervious"
"      0.370  Total Area"
"      5.000  Flow length"
"      25.000 Overland Slope"
"      0.370  Pervious Area"
"      190.000 Pervious length"
"      25.000 Pervious slope"
"      0.000  Impervious Area"
"      10.000 Impervious length"
"      25.000 Impervious slope"
"      0.250  Pervious Manning 'n'"
"      78.000 Pervious SCS Curve No."
"      0.427  Pervious Runoff coefficient"
"      0.100  Pervious Ia/S coefficient"
"      7.164  Pervious Initial abstraction"
"      0.015  Impervious Manning 'n'"
"      98.000 Impervious SCS Curve No."
"      0.925  Impervious Runoff coefficient"
"      0.100  Impervious Ia/S coefficient"
"      0.518  Impervious Initial abstraction"
"      0.043    3.612    3.612    0.000 c.m/sec"
"      Catchment 8      Pervious      Impervious Total Area "
"      Surface Area      0.370      0.000      0.370  hectare"
"      Time of concentration 17.379      0.373      17.379  minutes"
"      Time to Centroid    116.335      84.036      116.335  minutes"
"      Rainfall depth      71.801      71.801      71.801  mm"
"      Rainfall volume      265.66      0.00      265.66  c.m"
"      Rainfall losses      41.180      12.749      41.180  mm"
"      Runoff depth         30.621      59.052      30.621  mm"
"      Runoff volume         113.30      0.00      113.30  c.m"
"      Runoff coefficient    0.427      0.925      0.427  "
"      Maximum flow         0.043      0.000      0.043  c.m/sec"
40  HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"      0.043    3.619    3.612    0.000"
52  CHANNEL DESIGN"
"      3.619  Current peak flow    c.m/sec"
"      0.022  Manning 'n'"
"      0.      Cross-section type: 0=trapezoidal; 1=general"
"      0.900  Basewidth    metre"
"      4.000  Left bank slope"
"      4.000  Right bank slope"
"      1.200  Channel depth    metre"
"      0.160  Gradient    %"
"      Depth of flow          0.818    metre"
"      Velocity               1.062    m/sec"
"      Channel capacity        9.174    c.m/sec"
"      Critical depth          0.597    metre"
53  ROUTE    Channel Route 254"
"      254.40  Channel Route 254 Reach length  ( metre)"
"      0.079  X-factor <= 0.5"
"      179.734 K-lag  ( seconds)"
"      0.000  Default(0) or user spec.(1) values used"
"      0.500  X-factor <= 0.5"
"      30.000 K-lag  ( seconds)"
"      0.500  Beta weighting factor"
"      300.000 Routing time step  ( seconds)"
"      1      No. of sub-reaches"
"      Peak outflow          3.617    c.m/sec"
"      0.043    3.619    3.617    0.000 c.m/sec"

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250 Year Storm

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"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.07 rev. 387"
"          MIDUSS created                      Friday, September 23, 2005"
"          10 Units used:                      ie METRIC"
"          Job folder:                        G:\CLIENT\1389\1\SWM\MIDUSS\
"                                              diversion channel"
"          Output filename:                   250yr-external channel design.out"
"          Licensee name:                     lgrabowski"
"          Company                           "
"          Date & Time last used:             2/19/2019 at 11:46:26 AM"
31      TIME PARAMETERS"
"          5.000 Time Step"
"          180.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
32      STORM Chicago storm"
"          1 Chicago storm"
"          3048.220 Coefficient A"
"          10.030 Constant B"
"          0.888 Exponent C"
"          0.380 Fraction R"
"          180.000 Duration"
"          1.000 Time step multiplier"
"          Maximum intensity                   254.614 mm/hr"
"          Total depth                         86.611 mm"
"          6 250hyd Hydrograph extension used in this file"
33      CATCHMENT 1"
"          1 Triangular SCS"
"          1 Equal length"
"          1 SCS method"
"          1 external area 1"
"          1.040 % Impervious"
"          26.510 Total Area"
"          600.000 Flow length"
"          3.000 Overland Slope"
"          26.234 Pervious Area"
"          600.000 Pervious length"
"          3.000 Pervious slope"
"          0.276 Impervious Area"
"          600.000 Impervious length"
"          3.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          84.000 Pervious SCS Curve No."
"          0.593 Pervious Runoff coefficient"
"          0.100 Pervious Ia/S coefficient"
"          4.838 Pervious Initial abstraction"
"          0.015 Impervious Manning 'n'"
"          98.000 Impervious SCS Curve No."
"          0.938 Impervious Runoff coefficient"
"          0.100 Impervious Ia/S coefficient"
"          0.518 Impervious Initial abstraction"
"          2.410      0.000      0.000      0.000 c.m/sec"
"          Catchment 1      Pervious      Impervious      Total Area "
"          Surface Area      26.234      0.276      26.510 hectare"
"          Time of concentration      55.297      8.233      54.532 minutes"
"          Time to Centroid      159.879      93.599      158.801 minutes"
"          Rainfall depth      86.611      86.611      86.611 mm"
"          Rainfall volume      2.2722      0.0239      2.2961 ha-m"
"          Rainfall losses      35.242      5.784      34.935 mm"
"          Runoff depth      51.370      80.827      51.676 mm"
"          Runoff volume      1.3476      0.0223      1.3699 ha-m"
"          Runoff coefficient      0.593      0.938      0.597 "
"          Maximum flow      2.393      0.146      2.410 c.m/sec"
40      HYDROGRAPH Add Runoff "
"          4 Add Runoff "
"          2.410      2.410      0.000      0.000"
58      CULVERT"
"          2.410 Culvert Q c.m/sec"
"          25.00 Length metre"
"          0.015 Manning 'n'"

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"	244.300	Upstream IL	metre"
"	244.290	Downstream IL	metre"
"	247.050	Weir Elev.	metre"
"	20.000	Weir Breadth.	metre"
"	25.000	Weir Left slope to 1"	
"	25.000	Weir Right slope to 1"	
"	244.600	Tail water elevation"	
"	1	Barrel Option (Pipe/Box/CSPA/HE/VE)"	
"	1.000	Barrel Height/Diameter"	
"	1.000	Barrel Width"	
"	0.700	Cc 004 RC pipe socket inlet"	
"	0.900	Ke 012 Project from fill"	
"	1.	Number of Barrels"	
"	39	Number of stages"	
"		Level Discharge	Volume"
"	244.300	0.000	0.0"
"	244.802	0.121	24.1"
"	244.810	0.241	24.9"
"	244.859	0.362	30.4"
"	244.953	0.482	42.5"
"	245.039	0.603	55.9"
"	245.119	0.723	70.4"
"	245.197	0.844	86.4"
"	245.273	0.964	103.9"
"	245.348	1.085	123.5"
"	245.424	1.205	147.1"
"	245.501	1.326	175.9"
"	245.581	1.446	211.3"
"	245.667	1.567	256.3"
"	245.767	1.687	318.3"
"	245.876	1.808	399.0"
"	245.988	1.928	498.8"
"	246.108	2.049	624.9"
"	246.227	2.169	770.7"
"	246.354	2.290	954.5"
"	246.485	2.410	1184.1"
"	246.621	2.531	1469.7"
"	246.763	2.651	1828.8"
"	246.907	2.772	2261.2"
"	247.060	2.892	2800.6"
"	247.215	3.013	3437.7"
"	247.373	3.133	4207.7"
"	247.545	3.254	5196.2"
"	247.721	3.374	6368.8"
"	247.902	3.495	7735.6"
"	248.085	3.615	9288.1"
"	248.261	3.736	10940.7"
"	248.461	3.856	13022.9"
"	248.666	3.977	15414.9"
"	248.878	4.097	18139.8"
"	249.095	4.218	21221.0"
"	249.319	4.338	24682.3"
"	249.548	4.459	28548.2"
"	249.784	4.579	32844.4"
"	1.500	Channel Basewidth"	
"	1.000	Channel Depth"	
"	3.500	Channel Topwidth"	
"	10.000	Grade Left"	
"	10.000	Grade Right"	
"	1.000	Grade %"	
"	300.000	Length"	
"	Barrel Yo	1.000	metre"
"	Barrel Ycr	0.841	metre"
"	Exit Velocity	3.074	m/sec"
"	Barrel Peak Outflow	2.167	c.m/sec"
"	Weir Peak Flow	0.000	c.m/sec"
"	Total Peak Outflow	2.167	c.m/sec"
"	Maximum level	246.225	metre"
"	Maximum storage	767.496	c.m"

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"          Centroidal lag          2.705  hours"
"          2.410    2.410    2.167    0.000 c.m/sec"
40  HYDROGRAPH  Combine  9999"
"      6  Combine "
"  9999  Node #"
"          flows meeting south of ex culv"
"          Maximum flow          2.167    c.m/sec"
"          Hydrograph volume      13691.785  c.m"
"          2.410    2.410    2.167    2.167"
40  HYDROGRAPH Start - New Tributary"
"      2  Start - New Tributary"
"          2.410    0.000    2.167    2.167"
33  CATCHMENT 4"
"      1  Triangular SCS"
"      1  Equal length"
"      1  SCS method"
"      4  flows between rail and berm + ex properties"
"      5.000  % Impervious"
"      2.090  Total Area"
200.000  Flow length"
"      10.000  Overland Slope"
"      1.985  Pervious Area"
200.000  Pervious length"
"      10.000  Pervious slope"
"      0.104  Impervious Area"
200.000  Impervious length"
"      10.000  Impervious slope"
"      0.250  Pervious Manning 'n'"
"      84.000  Pervious SCS Curve No."
"      0.593  Pervious Runoff coefficient"
"      0.100  Pervious Ia/S coefficient"
"      4.838  Pervious Initial abstraction"
"      0.015  Impervious Manning 'n'"
"      98.000  Impervious SCS Curve No."
"      0.938  Impervious Runoff coefficient"
"      0.100  Impervious Ia/S coefficient"
"      0.518  Impervious Initial abstraction"
"          0.397    0.000    2.167    2.167 c.m/sec"
"      Catchment 4      Pervious  Impervious  Total Area  "
"      Surface Area      1.985    0.104    2.090    hectare"
"      Time of concentration  19.933    2.968    18.653    minutes"
"      Time to Centroid      114.199    86.086    112.078    minutes"
"      Rainfall depth      86.611    86.611    86.611    mm"
"      Rainfall volume      1719.66    90.51    1810.17    c.m"
"      Rainfall losses      35.280    7.013    33.867    mm"
"      Runoff depth      51.331    79.598    52.744    mm"
"      Runoff volume      1019.18    83.18    1102.36    c.m"
"      Runoff coefficient    0.593    0.938    0.610    "
"      Maximum flow      0.383    0.059    0.397    c.m/sec"
40  HYDROGRAPH Add Runoff "
"      4  Add Runoff "
"          0.397    0.397    2.167    2.167"
52  CHANNEL DESIGN"
"      0.397  Current peak flow  c.m/sec"
"      0.040  Manning 'n'"
"      0.  Cross-section type: 0=trapezoidal; 1=general"
"      0.900  Basewidth  metre"
"      3.000  Left bank slope"
"      3.000  Right bank slope"
"      1.000  Channel depth  metre"
"      0.500  Gradient  %"
"      Depth of flow          0.334  metre"
"      Velocity          0.626  m/sec"
"      Channel capacity      4.571  c.m/sec"
"      Critical depth      0.213  metre"
53  ROUTE Zero Route"
"      0.00  Zero Route Reach length  ( metre)"
"          0.397    0.397    0.397    2.167 c.m/sec"
40  HYDROGRAPH  Combine  9999"

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"      6  Combine "
"      9999 Node #"
"          flows meeting south of ex culv"
"          Maximum flow      2.262      c.m/sec"
"          Hydrograph volume  14794.144 c.m"
"              0.397      0.397      0.397      2.262"
" 40      HYDROGRAPH Confluence 9999"
"      7  Confluence "
"      9999 Node #"
"          flows meeting south of ex culv"
"          Maximum flow      2.262      c.m/sec"
"          Hydrograph volume  14794.144 c.m"
"              0.397      2.262      0.397      0.000"
" 33      CATCHMENT 5"
"      1  Triangular SCS"
"      1  Equal length"
"      1  SCS method"
"      5  channel direct area"
"      0.000 % Impervious"
"      0.420 Total Area"
"      5.000 Flow length"
"      25.000 Overland Slope"
"      0.420 Pervious Area"
"      5.000 Pervious length"
"      25.000 Pervious slope"
"      0.000 Impervious Area"
"      5.000 Impervious length"
"      25.000 Impervious slope"
"      0.250 Pervious Manning 'n'"
"      84.000 Pervious SCS Curve No."
"      0.593 Pervious Runoff coefficient"
"      0.100 Pervious Ia/S coefficient"
"      4.838 Pervious Initial abstraction"
"      0.015 Impervious Manning 'n'"
"      98.000 Impervious SCS Curve No."
"      0.938 Impervious Runoff coefficient"
"      0.100 Impervious Ia/S coefficient"
"      0.518 Impervious Initial abstraction"
"          0.149      2.262      0.397      0.000 c.m/sec"
"      Catchment 5      Pervious      Impervious Total Area "
"      Surface Area      0.420      0.000      0.420      hectare"
"      Time of concentration 1.656      0.247      1.656      minutes"
"      Time to Centroid      90.399      81.944      90.399      minutes"
"      Rainfall depth      86.611      86.611      86.611      mm"
"      Rainfall volume      363.77      0.00      363.77      c.m"
"      Rainfall losses      35.926      16.495      35.926      mm"
"      Runoff depth      50.685      70.116      50.685      mm"
"      Runoff volume      212.88      0.00      212.88      c.m"
"      Runoff coefficient      0.593      0.938      0.593      "
"      Maximum flow      0.149      0.000      0.149      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"      4  Add Runoff "
"          0.149      2.273      0.397      0.000"
" 52      CHANNEL DESIGN"
"      2.273 Current peak flow      c.m/sec"
"      0.025 Manning 'n'"
"      0. Cross-section type: 0=trapezoidal; 1=general"
"      0.900 Basewidth      metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.000 Channel depth      metre"
"      0.840 Gradient      %"
"      Depth of flow      0.536      metre"
"      Velocity      1.691      m/sec"
"      Channel capacity      9.479      c.m/sec"
"      Critical depth      0.521      metre"
" 53      ROUTE      Channel Route 79"
"      79.00      Channel Route 79 Reach length      ( metre)"
"      0.317 X-factor <= 0.5"

```

```

"      35.034 K-lag ( seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"      30.000 K-lag ( seconds)"
"      0.500 Beta weighting factor"
"      42.857 Routing time step ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow                2.272 c.m/sec"
"      0.149 2.273 2.272 0.000 c.m/sec"
" 40 HYDROGRAPH Next link "
"      5 Next link "
"      0.149 2.272 2.272 0.000"
" 52 CHANNEL DESIGN"
"      2.272 Current peak flow c.m/sec"
"      0.025 Manning 'n'"
"      0. Cross-section type: 0=trapezoidal; 1=general"
"      0.900 Basewidth metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.000 Channel depth metre"
"      0.400 Gradient %"
"      Depth of flow                0.633 metre"
"      Velocity                    1.283 m/sec"
"      Channel capacity             6.541 c.m/sec"
"      Critical depth               0.521 metre"
" 53 ROUTE Channel Route 213"
"      213.00 Channel Route 213 Reach length ( metre)"
"      0.335 X-factor <= 0.5"
"      124.501 K-lag ( seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"      30.000 K-lag ( seconds)"
"      0.500 Beta weighting factor"
"      150.000 Routing time step ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow                2.267 c.m/sec"
"      0.149 2.272 2.267 0.000 c.m/sec"
" 40 HYDROGRAPH Next link "
"      5 Next link "
"      0.149 2.267 2.267 0.000"
" 52 CHANNEL DESIGN"
"      2.267 Current peak flow c.m/sec"
"      0.040 Manning 'n'"
"      0. Cross-section type: 0=trapezoidal; 1=general"
"      1.800 Basewidth metre"
"      0.100 Left bank slope"
"      0.100 Right bank slope"
"      1.200 Channel depth metre"
"      0.480 Gradient %"
"      Depth of flow                1.067 metre"
"      Velocity                    1.114 m/sec"
"      Channel capacity             2.669 c.m/sec"
"      Critical depth               0.539 metre"
" 53 ROUTE Channel Route 10"
"      10.00 Channel Route 10 Reach length ( metre)"
"      0.000 X-factor <= 0.5"
"      6.732 K-lag ( seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"      30.000 K-lag ( seconds)"
"      1.002 Beta weighting factor"
"      100.000 Routing time step ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow                2.267 c.m/sec"
"      0.149 2.267 2.267 0.000 c.m/sec"
" 40 HYDROGRAPH Next link "
"      5 Next link "
"      0.149 2.267 2.267 0.000"
" 58 CULVERT"

```


"	2.267	Culvert Q	c.m/sec"
"	20.00	Length	metre"
"	0.015	Manning 'n'"	
"	242.340	Upstream IL	metre"
"	242.250	Downstream IL	metre"
"	243.800	Weir Elev.	metre"
"	10.000	Weir Breadth.	metre"
"	25.000	Weir Left slope to 1"	
"	25.000	Weir Right slope to 1"	
"	242.800	Tail water elevation"	
"	2	Barrel Option (Pipe/Box/CSPA/HE/VE)"	
"	0.900	Barrel Height/Diameter"	
"	1.800	Barrel Width"	
"	0.700	Cc 004 RC pipe socket inlet"	
"	0.900	Ke 012 Project from fill"	
"	1.	Number of Barrels"	
"	39	Number of stages"	
"		Level Discharge	Volume"
"	242.340	0.000	0.0"
"	242.802	0.113	9.8"
"	242.807	0.227	9.9"
"	242.817	0.340	10.0"
"	242.830	0.453	10.3"
"	242.846	0.567	10.6"
"	242.866	0.680	11.0"
"	242.890	0.793	11.4"
"	242.917	0.907	12.0"
"	242.948	1.020	12.6"
"	242.983	1.133	13.2"
"	243.020	1.247	13.9"
"	243.060	1.360	14.7"
"	243.103	1.473	15.6"
"	243.148	1.587	16.4"
"	243.193	1.700	17.3"
"	243.236	1.813	18.2"
"	243.277	1.927	19.0"
"	243.314	2.040	19.7"
"	243.349	2.153	20.4"
"	243.384	2.267	21.1"
"	243.417	2.380	21.8"
"	243.451	2.493	22.5"
"	243.483	2.607	23.1"
"	243.515	2.720	23.8"
"	243.547	2.833	24.4"
"	243.578	2.947	25.1"
"	243.609	3.060	26.0"
"	243.638	3.173	27.1"
"	243.669	3.287	28.6"
"	243.699	3.400	30.3"
"	243.727	3.513	32.2"
"	243.757	3.627	34.4"
"	243.785	3.740	36.8"
"	243.814	3.853	39.5"
"	243.841	3.967	42.2"
"	243.870	4.080	45.3"
"	243.897	4.194	48.6"
"	243.929	4.307	52.7"
"	1.800	Channel Basewidth"	
"	1.200	Channel Depth"	
"	2.040	Channel Topwidth"	
"	15.307	Grade Left"	
"	15.307	Grade Right"	
"	0.480	Grade %"	
"	10.000	Length"	
"		Barrel Yo	0.569 metre"
"		Barrel Ycr	0.545 metre"
"		Exit Velocity	2.289 m/sec"
"		Barrel Peak Outflow	2.266 c.m/sec"
"		Weir Peak Flow	0.000 c.m/sec"

```

"      Total Peak Outflow      2.266      c.m/sec"
"      Maximum level          243.402      metre"
"      Maximum storage         21.116      c.m"
"      Centroidal lag          2.676      hours"
"      0.149      2.267      2.266      0.000 c.m/sec"
40  HYDROGRAPH Next link "
"      5      Next link "
"      0.149      2.266      2.266      0.000"
52  CHANNEL DESIGN"
"      2.266      Current peak flow      c.m/sec"
"      0.040      Manning 'n'"
"      0.      Cross-section type: 0=trapezoidal; 1=general"
"      0.900      Basewidth      metre"
"      3.000      Left bank slope"
"      3.000      Right bank slope"
"      1.000      Channel depth      metre"
"      0.480      Gradient      %"
"      Depth of flow          0.747      metre"
"      Velocity              0.967      m/sec"
"      Channel capacity       4.478      c.m/sec"
"      Critical depth         0.521      metre"
53  ROUTE      Channel Route 67"
"      67.00      Channel Route 67 Reach length      ( metre)"
"      0.000      X-factor <= 0.5"
"      51.981      K-lag      ( seconds)"
"      0.000      Default(0) or user spec.(1) values used"
"      0.500      X-factor <= 0.5"
"      30.000      K-lag      ( seconds)"
"      0.503      Beta weighting factor"
"      100.000      Routing time step      ( seconds)"
"      1      No. of sub-reaches"
"      Peak outflow          2.264      c.m/sec"
"      0.149      2.266      2.264      0.000 c.m/sec"
40  HYDROGRAPH      Combine      10000"
"      6      Combine "
"      10000      Node #"
"      flows entering main channel"
"      Maximum flow          2.264      c.m/sec"
"      Hydrograph volume     15029.375      c.m"
"      0.149      2.266      2.264      2.264"
40  HYDROGRAPH Start - New Tributary"
"      2      Start - New Tributary"
"      0.149      0.000      2.264      2.264"
33  CATCHMENT 2"
"      1      Triangular SCS"
"      1      Equal length"
"      1      SCS method"
"      2      external area 2"
"      1.400      % Impervious"
"      120.880      Total Area"
"      900.000      Flow length"
"      3.000      Overland Slope"
"      119.188      Pervious Area"
"      900.000      Pervious length"
"      3.000      Pervious slope"
"      1.692      Impervious Area"
"      900.000      Impervious length"
"      3.000      Impervious slope"
"      0.250      Pervious Manning 'n'"
"      84.000      Pervious SCS Curve No."
"      0.593      Pervious Runoff coefficient"
"      0.100      Pervious Ia/S coefficient"
"      4.838      Pervious Initial abstraction"
"      0.015      Impervious Manning 'n'"
"      98.000      Impervious SCS Curve No."
"      0.938      Impervious Runoff coefficient"
"      0.100      Impervious Ia/S coefficient"
"      0.518      Impervious Initial abstraction"
"      8.932      0.000      2.264      2.264 c.m/sec"

```

	Catchment 2	Pervious	Impervious	Total Area	
"	Surface Area	119.188	1.692	120.880	hectare"
"	Time of concentration	70.527	10.501	69.216	minutes"
"	Time to Centroid	179.556	96.727	177.745	minutes"
"	Rainfall depth	86.611	86.611	86.611	mm"
"	Rainfall volume	10.3230	0.1466	10.4695	ha-m"
"	Rainfall losses	35.241	5.768	34.828	mm"
"	Runoff depth	51.370	80.844	51.783	mm"
"	Runoff volume	6.1227	0.1368	6.2595	ha-m"
"	Runoff coefficient	0.593	0.938	0.598	"
"	Maximum flow	8.852	0.780	8.932	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "	8.932	8.932	2.264	2.264"
" 52	CHANNEL DESIGN"				
"	8.932	Current peak flow	c.m/sec"		
"	0.022	Manning 'n'"			
"	0.	Cross-section type: 0=trapezoidal; 1=general"			
"	5.000	Basewidth	metre"		
"	3.000	Left bank slope"			
"	3.000	Right bank slope"			
"	0.650	Channel depth	metre"		
"	0.600	Gradient	%"		
"		Depth of flow	0.612	metre"	
"		Velocity	2.134	m/sec"	
"		Channel capacity	9.964	c.m/sec"	
"		Critical depth	0.605	metre"	
" 53	ROUTE Channel Route 350"				
"	350.00	Channel Route 350 Reach length	(metre)"		
"	0.420	X-factor <= 0.5"			
"	123.019	K-lag (seconds)"			
"	0.000	Default(0) or user spec.(1) values used"			
"	0.500	X-factor <= 0.5"			
"	30.000	K-lag (seconds)"			
"	0.500	Beta weighting factor"			
"	100.000	Routing time step (seconds)"			
"	1	No. of sub-reaches"			
"		Peak outflow	8.859	c.m/sec"	
"		8.932	8.932	8.859	2.264 c.m/sec"
" 40	HYDROGRAPH Next link "				
"	5 Next link "	8.932	8.859	8.859	2.264"
" 58	CULVERT"				
"	8.859	Culvert Q	c.m/sec"		
"	19.30	Length	metre"		
"	0.013	Manning 'n'"			
"	242.130	Upstream IL	metre"		
"	242.100	Downstream IL	metre"		
"	243.610	Weir Elev.	metre"		
"	20.000	Weir Breadth.	metre"		
"	25.000	Weir Left slope to 1"			
"	25.000	Weir Right slope to 1"			
"	243.350	Tail water elevation"			
"	1	Barrel Option (Pipe/Box/CSPA/HE/VE)"			
"	0.900	Barrel Height/Diameter"			
"	0.900	Barrel Width"			
"	0.500	Cc 001 CSP thin walled projecting"			
"	0.900	Ke 012 Project from fill"			
"	1.	Number of Barrels"			
"	39	Number of stages"			
"		Level Discharge	Volume"		
"	242.130	0.000	0.0"		
"	243.409	0.443	1172.7"		
"	243.584	0.886	1632.8"		
"	243.876	1.329	2692.4"		
"	244.286	1.772	4941.7"		
"	245.051	2.215	11959.5"		
"	246.138	2.658	28772.8"		
"	247.423	3.101	59309.8"		

"	248.905	3.544	108903.4"
"	250.585	3.986	183707.3"
"	252.463	4.429	290696.6"
"	254.539	4.872	437664.1"
"	256.812	5.315	633225.8"
"	259.283	5.758	886820.6"
"	261.951	6.201	1208698.4"
"	264.817	6.644	1609938.4"
"	267.881	7.087	2102442.8"
"	271.142	7.530	2698919.5"
"	274.602	7.973	3412918.0"
"	278.258	8.416	4258791.0"
"	282.113	8.859	5251709.5"
"	286.165	9.302	6407689.0"
"	290.415	9.745	7743542.0"
"	294.862	10.188	9276908.0"
"	299.507	10.631	11026249.0"
"	304.350	11.073	13010846.0"
"	309.391	11.516	15250815.0"
"	314.629	11.959	17767052.0"
"	320.064	12.402	20581296.0"
"	325.698	12.845	23716158.0"
"	331.529	13.288	27194996.0"
"	337.558	13.731	31041970.0"
"	343.784	14.174	35282184.0"
"	350.208	14.617	39941448.0"
"	356.830	15.060	45046420.0"
"	363.649	15.503	50624572.0"
"	370.667	15.946	56704280.0"
"	377.881	16.389	63314564.0"
"	385.294	16.832	70485456.0"
"	5.000	Channel Basewidth"	
"	0.650	Channel Depth"	
"	8.900	Channel Topwidth"	
"	10.000	Grade Left"	
"	10.000	Grade Right"	
"	0.600	Grade %"	
"	350.000	Length"	
"		0.900	metre"
"		0.866	metre"
"		2.248	m/sec"
"		1.430	c.m/sec"
"		1.240	c.m/sec"
"		2.670	c.m/sec"
"		243.714	metre"
"		29619.572	c.m"
"		5.110	hours"
"	8.932	8.859	2.670 2.264 c.m/sec"
" 40	HYDROGRAPH Next link "		
"	5	Next link "	
"	8.932	2.670	2.670 2.264"
" 52	CHANNEL DESIGN"		
"	2.670	Current peak flow	c.m/sec"
"	0.022	Manning 'n'"	
"	0.	Cross-section type: 0=trapezoidal; 1=general"	
"	0.000	Basewidth	metre"
"	3.000	Left bank slope"	
"	3.000	Right bank slope"	
"	1.000	Channel depth	metre"
"	0.290	Gradient	%"
"		Depth of flow	0.825 metre"
"		Velocity	1.309 m/sec"
"		Channel capacity	4.466 c.m/sec"
"		Critical depth	0.694 metre"
" 53	ROUTE Channel Route 69"		
"	69.00	Channel Route 69 Reach length	(metre)"
"	0.000	X-factor <= 0.5"	
"	39.531	K-lag	(seconds)"
"	0.000	Default(0) or user spec.(1) values used"	

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"      0.500  X-factor <= 0.5"
"      30.000 K-lag ( seconds)"
"      0.608  Beta weighting factor"
"      100.000 Routing time step ( seconds)"
"      1  No. of sub-reaches"
"      Peak outflow                2.670    c.m/sec"
"      8.932    2.670    2.670    2.264 c.m/sec"
" 40      HYDROGRAPH Combine 10001"
"      6  Combine "
"      10001 Node #"
"      flows entering from east of Komoka Road"
"      Maximum flow                2.670    c.m/sec"
"      Hydrograph volume          62593.477    c.m"
"      8.932    2.670    2.670    2.670"
" 40      HYDROGRAPH Start - New Tributary"
"      2  Start - New Tributary"
"      8.932    0.000    2.670    2.670"
" 33      CATCHMENT 3"
"      1  Triangular SCS"
"      1  Equal length"
"      1  SCS method"
"      3  externa larea 3 - east portion of komoka road"
"      45.000 % Impervious"
"      0.610  Total Area"
"      190.000 Flow length"
"      2.000  Overland Slope"
"      0.336  Pervious Area"
"      190.000 Pervious length"
"      2.000  Pervious slope"
"      0.275  Impervious Area"
"      190.000 Impervious length"
"      2.000  Impervious slope"
"      0.250  Pervious Manning 'n'"
"      75.000 Pervious SCS Curve No."
"      0.433  Pervious Runoff coefficient"
"      0.100  Pervious Ia/S coefficient"
"      8.467  Pervious Initial abstraction"
"      0.015  Impervious Manning 'n'"
"      98.000 Impervious SCS Curve No."
"      0.938  Impervious Runoff coefficient"
"      0.100  Impervious Ia/S coefficient"
"      0.518  Impervious Initial abstraction"
"      0.164    0.000    2.670    2.670 c.m/sec"
"      Catchment 3      Pervious Impervious Total Area "
"      Surface Area      0.336    0.275    0.610    hectare"
"      Time of concentration 37.258    4.664    16.468    minutes"
"      Time to Centroid 136.710    88.525    105.974    minutes"
"      Rainfall depth      86.611    86.611    86.611    mm"
"      Rainfall volume      290.58    237.75    528.33    c.m"
"      Rainfall losses      49.126    5.911    29.679    mm"
"      Runoff depth      37.486    80.700    56.932    mm"
"      Runoff volume      125.76    221.52    347.29    c.m"
"      Runoff coefficient    0.433    0.938    0.660    "
"      Maximum flow      0.030    0.159    0.164    c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"      4  Add Runoff "
"      0.164    0.164    2.670    2.670"
" 56      DIVERSION"
"      3  Node number"
"      0.059  Overflow threshold"
"      1.000  Required diverted fraction"
"      0  Conduit type; 1=Pipe;2=Channel"
"      Peak of diverted flow      0.105    c.m/sec"
"      Volume of diverted flow    73.065    c.m"
"      DIV00003.250hyd"
"      Major flow east of komoka road"
"      0.164    0.164    0.059    2.670 c.m/sec"
" 40      HYDROGRAPH Next link "
"      5  Next link "

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"          0.164    0.059    0.059    2.670"
" 52    CHANNEL DESIGN"
"    0.059    Current peak flow    c.m/sec"
"    0.022    Manning 'n'"
"    0.    Cross-section type: 0=trapezoidal; 1=general"
"    0.000    Basewidth    metre"
"    3.000    Left bank slope"
"    3.000    Right bank slope"
"    1.000    Channel depth    metre"
"    0.290    Gradient    %"
"    Depth of flow    0.197    metre"
"    Velocity    0.505    m/sec"
"    Channel capacity    4.466    c.m/sec"
"    Critical depth    0.151    metre"
" 53    ROUTE    Channel Route 50"
"    50.00    Channel Route 50 Reach length    ( metre)"
"    0.245    X-factor <= 0.5"
"    74.297    K-lag    ( seconds)"
"    0.000    Default(0) or user spec.(1) values used"
"    0.500    X-factor <= 0.5"
"    30.000    K-lag    ( seconds)"
"    0.500    Beta weighting factor"
"    100.000    Routing time step    ( seconds)"
"    1    No. of sub-reaches"
"    Peak outflow    0.059    c.m/sec"
"    0.164    0.059    0.059    2.670 c.m/sec"
" 40    HYDROGRAPH    Combine    10002"
"    6    Combine "
"    10002    Node #"
"    minor flows east of komoka leaving via pipe network"
"    Maximum flow    0.059    c.m/sec"
"    Hydrograph volume    274.221    c.m"
"    0.164    0.059    0.059    0.059"
" 47    FILEI_O Read/Open DIV0003.250hyd"
"    1    1=read/open; 2=write/save"
"    2    1=rainfall; 2=hydrograph"
"    1    1=runoff; 2=inflow; 3=outflow; 4=junction"
"    DIV0003.250hyd"
"    Major flow east of komoka road"
"    Total volume    73.065    c.m"
"    Maximum flow    0.105    c.m/sec"
"    0.105    0.059    0.059    0.059 c.m/sec"
" 40    HYDROGRAPH Start - New Tributary"
"    2    Start - New Tributary"
"    0.105    0.000    0.059    0.059"
" 40    HYDROGRAPH Add Runoff "
"    4    Add Runoff "
"    0.105    0.105    0.059    0.059"
" 52    CHANNEL DESIGN"
"    0.105    Current peak flow    c.m/sec"
"    0.022    Manning 'n'"
"    0.    Cross-section type: 0=trapezoidal; 1=general"
"    0.000    Basewidth    metre"
"    3.000    Left bank slope"
"    3.000    Right bank slope"
"    1.000    Channel depth    metre"
"    0.290    Gradient    %"
"    Depth of flow    0.245    metre"
"    Velocity    0.583    m/sec"
"    Channel capacity    4.466    c.m/sec"
"    Critical depth    0.190    metre"
" 53    ROUTE    Channel Route 15"
"    15.00    Channel Route 15 Reach length    ( metre)"
"    0.000    X-factor <= 0.5"
"    19.298    K-lag    ( seconds)"
"    0.000    Default(0) or user spec.(1) values used"
"    0.500    X-factor <= 0.5"
"    30.000    K-lag    ( seconds)"
"    0.679    Beta weighting factor"

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"      60.000 Routing time step ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow      0.102 c.m/sec"
"      0.105      0.105      0.102      0.059 c.m/sec"
" 40 HYDROGRAPH Combine 10001"
"      6 Combine "
"      10001 Node #"
"      flows entering from east of Komoka Road"
"      Maximum flow      2.670 c.m/sec"
"      Hydrograph volume 62666.543 c.m"
"      0.105      0.105      0.102      2.670"
" 40 HYDROGRAPH Confluence 10001"
"      7 Confluence "
"      10001 Node #"
"      flows entering from east of Komoka Road"
"      Maximum flow      2.670 c.m/sec"
"      Hydrograph volume 62666.543 c.m"
"      0.105      2.670      0.102      0.000"
" 58 CULVERT"
"      2.670 Culvert Q c.m/sec"
"      20.40 Length metre"
"      0.013 Manning 'n'"
"      241.900 Upstream IL metre"
"      241.870 Downstream IL metre"
"      243.610 Weir Elev. metre"
"      20.000 Weir Breadth. metre"
"      116.900 Weir Left slope to 1"
"      116.900 Weir Right slope to 1"
"      242.600 Tail water elevation"
"      4 Barrel Option (Pipe/Box/CSPA/HE/VE)"
"      0.965 Barrel Height/Diameter"
"      1.524 Barrel Width"
"      0.500 Cc 001 CSP thin walled projecting"
"      0.900 Ke 012 Project from fill"
"      1. Number of Barrels"
"      39 Number of stages"
"      Level Discharge Volume"
"      241.900 0.000 0.0"
"      242.602 0.133 126.7"
"      242.610 0.267 128.5"
"      242.622 0.400 131.5"
"      242.639 0.534 135.6"
"      242.660 0.667 141.0"
"      242.687 0.801 147.6"
"      242.717 0.934 155.4"
"      242.751 1.068 164.3"
"      242.790 1.201 174.5"
"      242.831 1.335 185.8"
"      242.876 1.468 198.2"
"      242.923 1.602 213.7"
"      242.973 1.735 233.5"
"      243.024 1.869 266.5"
"      243.076 2.002 319.0"
"      243.130 2.136 395.0"
"      243.186 2.269 498.5"
"      243.265 2.403 686.4"
"      243.366 2.536 1000.3"
"      243.472 2.670 1419.9"
"      243.583 2.803 1959.1"
"      243.701 2.937 2632.6"
"      243.823 3.070 3456.0"
"      243.951 3.204 4445.3"
"      244.085 3.337 5617.4"
"      244.223 3.471 6989.9"
"      244.368 3.604 8581.1"
"      244.518 3.738 10410.0"
"      244.673 3.871 12496.4"
"      244.833 4.005 14860.8"
"      245.000 4.138 17524.0"

```

"		245.171	4.272	20508.6"	
"		245.348	4.405	23836.7"	
"		245.531	4.539	27531.6"	
"		245.718	4.672	31617.8"	
"		245.912	4.806	36119.4"	
"		246.111	4.939	41062.7"	
"		246.315	5.073	46473.0"	
"	2.286	Channel Basewidth"			
"	0.965	Channel Depth"			
"	4.216	Channel Topwidth"			
"	58.457	Grade Left"			
"	58.457	Grade Right"			
"	0.290	Grade %"			
"	69.000	Length"			
"		Barrel Yo	0.965	metre"	
"		Barrel Ycr	0.751	metre"	
"		Exit Velocity	2.697	m/sec"	
"		Barrel Peak Outflow	2.625	c.m/sec"	
"		Weir Peak Flow	0.000	c.m/sec"	
"		Total Peak Outflow	2.625	c.m/sec"	
"		Maximum level	243.373	metre"	
"		Maximum storage	1278.403	c.m"	
"		Centroidal lag	5.209	hours"	
"		0.105	2.670	2.625	0.000 c.m/sec"
" 40		HYDROGRAPH	Combine	10003"	
"	6	Combine "			
"	10003	Node #"			
"		west of komoka road culvert"			
"		Maximum flow	2.625	c.m/sec"	
"		Hydrograph volume	62654.305	c.m"	
"		0.105	2.670	2.625	2.625"
" 40		HYDROGRAPH Start - New Tributary"			
"	2	Start - New Tributary"			
"		0.105	0.000	2.625	2.625"
" 33		CATCHMENT 6"			
"	1	Triangular SCS"			
"	3	Specify values"			
"	1	SCS method"			
"	6	west side of komoka road major flows"			
"	45.000	% Impervious"			
"	0.580	Total Area"			
"	190.000	Flow length"			
"	2.000	Overland Slope"			
"	0.319	Pervious Area"			
"	190.000	Pervious length"			
"	2.000	Pervious slope"			
"	0.261	Impervious Area"			
"	6.500	Impervious length"			
"	2.000	Impervious slope"			
"	0.250	Pervious Manning 'n' "			
"	75.000	Pervious SCS Curve No."			
"	0.433	Pervious Runoff coefficient"			
"	0.100	Pervious Ia/S coefficient"			
"	8.467	Pervious Initial abstraction"			
"	0.015	Impervious Manning 'n' "			
"	98.000	Impervious SCS Curve No."			
"	0.938	Impervious Runoff coefficient"			
"	0.100	Impervious Ia/S coefficient"			
"	0.518	Impervious Initial abstraction"			
"		0.157	0.000	2.625	2.625 c.m/sec"
"		Catchment 6	Pervious	Impervious	Total Area "
"		Surface Area	0.319	0.261	0.580 hectare"
"		Time of concentration	37.258	0.616	14.550 minutes"
"		Time to Centroid	136.710	83.075	103.472 minutes"
"		Rainfall depth	86.611	86.611	mm"
"		Rainfall volume	276.29	226.05	502.34 c.m"
"		Rainfall losses	49.126	11.952	32.397 mm"
"		Runoff depth	37.486	74.660	54.214 mm"
"		Runoff volume	119.58	194.86	314.44 c.m"


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"      Runoff coefficient      0.433      0.938      0.660      "
"      Maximum flow           0.029      0.155      0.157      c.m/sec"
40    HYDROGRAPH Add Runoff "
"      4 Add Runoff "
"      0.157      0.157      2.625      2.625"
52    CHANNEL DESIGN"
"      0.157 Current peak flow c.m/sec"
"      0.022 Manning 'n'"
"      0. Cross-section type: 0=trapezoidal; 1=general"
"      0.900 Basewidth metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.100 Channel depth metre"
"      0.160 Gradient %"
"      Depth of flow           0.208      metre"
"      Velocity                0.497      m/sec"
"      Channel capacity        5.896      c.m/sec"
"      Critical depth          0.126      metre"
53    ROUTE Channel Route 5"
"      5.40 Channel Route 5 Reach length ( metre)"
"      0.000 X-factor <= 0.5"
"      8.152 K-lag ( seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"      30.000 K-lag ( seconds)"
"      0.961 Beta weighting factor"
"      100.000 Routing time step ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow            0.154      c.m/sec"
"      0.157      0.157      0.154      2.625 c.m/sec"
40    HYDROGRAPH Combine 10003"
"      6 Combine "
"      10003 Node #"
"      west of komoka road culvert"
"      Maximum flow            2.626      c.m/sec"
"      Hydrograph volume       62968.738 c.m"
"      0.157      0.157      0.154      2.626"
40    HYDROGRAPH Confluence 10003"
"      7 Confluence "
"      10003 Node #"
"      west of komoka road culvert"
"      Maximum flow            2.626      c.m/sec"
"      Hydrograph volume       62968.734 c.m"
"      0.157      2.626      0.154      0.000"
52    CHANNEL DESIGN"
"      2.626 Current peak flow c.m/sec"
"      0.022 Manning 'n'"
"      0. Cross-section type: 0=trapezoidal; 1=general"
"      0.900 Basewidth metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.100 Channel depth metre"
"      0.160 Gradient %"
"      Depth of flow           0.779      metre"
"      Velocity                1.041      m/sec"
"      Channel capacity        5.896      c.m/sec"
"      Critical depth          0.559      metre"
53    ROUTE Zero Route"
"      0.00 Zero Route Reach length ( metre)"
"      0.157      2.626      2.626      0.000 c.m/sec"
40    HYDROGRAPH Combine 10000"
"      6 Combine "
"      10000 Node #"
"      flows entering main channel"
"      Maximum flow            4.462      c.m/sec"
"      Hydrograph volume       77998.117 c.m"
"      0.157      2.626      2.626      4.462"
40    HYDROGRAPH Confluence 10000"
"      7 Confluence "

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"      10000 Node #"
"      flows entering main channel"
"      Maximum flow      4.462 c.m/sec"
"      Hydrograph volume  77998.117 c.m"
"      0.157      4.462      2.626      0.000"
" 33 CATCHMENT 7"
"      1 Triangular SCS"
"      3 Specify values"
"      1 SCS method"
"      7 channel direct area"
"      20.000 % Impervious"
"      2.270 Total Area"
"      5.000 Flow length"
"      25.000 Overland Slope"
"      1.816 Pervious Area"
"      190.000 Pervious length"
"      25.000 Pervious slope"
"      0.454 Impervious Area"
"      10.000 Impervious length"
"      25.000 Impervious slope"
"      0.250 Pervious Manning 'n'"
"      78.000 Pervious SCS Curve No."
"      0.482 Pervious Runoff coefficient"
"      0.100 Pervious Ia/S coefficient"
"      7.164 Pervious Initial abstraction"
"      0.015 Impervious Manning 'n'"
"      98.000 Impervious SCS Curve No."
"      0.938 Impervious Runoff coefficient"
"      0.100 Impervious Ia/S coefficient"
"      0.518 Impervious Initial abstraction"
"      0.377      4.462      2.626      0.000 c.m/sec"
"      Catchment 7 Pervious Impervious Total Area "
"      Surface Area 1.816 0.454 2.270 hectare"
"      Time of concentration 16.444 0.374 11.629 minutes"
"      Time to Centroid 110.789 82.662 102.362 minutes"
"      Rainfall depth 86.611 86.611 86.611 mm"
"      Rainfall volume 1572.86 393.21 1966.07 c.m"
"      Rainfall losses 44.941 15.316 39.016 mm"
"      Runoff depth 41.670 71.295 47.595 mm"
"      Runoff volume 756.72 323.68 1080.40 c.m"
"      Runoff coefficient 0.482 0.938 0.573 "
"      Maximum flow 0.321 0.268 0.377 c.m/sec"
" 40 HYDROGRAPH Add Runoff "
"      4 Add Runoff "
"      0.377      4.520      2.626      0.000"
" 52 CHANNEL DESIGN"
"      4.520 Current peak flow c.m/sec"
"      0.022 Manning 'n'"
"      0. Cross-section type: 0=trapezoidal; 1=general"
"      0.900 Basewidth metre"
"      3.000 Left bank slope"
"      3.000 Right bank slope"
"      1.100 Channel depth metre"
"      0.160 Gradient %"
"      Depth of flow 0.984 metre"
"      Velocity 1.194 m/sec"
"      Channel capacity 5.896 c.m/sec"
"      Critical depth 0.723 metre"
" 53 ROUTE Channel Route 560"
"      560.00 Channel Route 560 Reach length ( metre)"
"      0.268 X-factor <= 0.5"
"      351.892 K-lag ( seconds)"
"      0.000 Default(0) or user spec.(1) values used"
"      0.500 X-factor <= 0.5"
"      30.000 K-lag ( seconds)"
"      0.500 Beta weighting factor"
"      300.000 Routing time step ( seconds)"
"      1 No. of sub-reaches"
"      Peak outflow 4.509 c.m/sec"

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"          0.377      4.520      4.509      0.000 c.m/sec"
" 40      HYDROGRAPH Next link "
"          5      Next link "
"          0.377      4.509      4.509      0.000"
" 52      CHANNEL DESIGN"
"          4.509      Current peak flow      c.m/sec"
"          0.022      Manning 'n'"
"          0.      Cross-section type: 0=trapezoidal; 1=general"
"          1.800      Basewidth      metre"
"          0.100      Left bank slope"
"          0.100      Right bank slope"
"          3.500      Channel depth      metre"
"          0.160      Gradient      %"
"          Depth of flow      1.694      metre"
"          Velocity      1.352      m/sec"
"          Channel capacity      12.294      c.m/sec"
"          Critical depth      0.848      metre"
" 53      ROUTE      Channel Route 10"
"          10.00      Channel Route 10 Reach length      ( metre)"
"          0.000      X-factor <= 0.5"
"          5.549      K-lag      ( seconds)"
"          0.000      Default(0) or user spec.(1) values used"
"          0.500      X-factor <= 0.5"
"          30.000      K-lag      ( seconds)"
"          1.203      Beta weighting factor"
"          300.000      Routing time step      ( seconds)"
"          1      No. of sub-reaches"
"          Peak outflow      4.509      c.m/sec"
"          0.377      4.509      4.509      0.000 c.m/sec"
" 40      HYDROGRAPH Next link "
"          5      Next link "
"          0.377      4.509      4.509      0.000"
" 58      CULVERT"
"          4.509      Culvert Q      c.m/sec"
"          20.00      Length      metre"
"          0.013      Manning 'n'"
"          241.005      Upstream IL      metre"
"          240.973      Downstream IL      metre"
"          242.700      Weir Elev.      metre"
"          20.000      Weir Breadth.      metre"
"          116.900      Weir Left slope to 1"
"          116.900      Weir Right slope to 1"
"          241.600      Tail water elevation"
"          2      Barrel Option (Pipe/Box/CSPA/HE/VE)"
"          0.900      Barrel Height/Diameter"
"          1.800      Barrel Width"
"          0.700      Cc 004 RC pipe socket inlet"
"          0.900      Ke 012 Project from fill"
"          2.      Number of Barrels"
"          39      Number of stages"
"          Level Discharge      Volume"
"          241.005      0.000      0.0"
"          241.601      0.225      11.5"
"          241.605      0.451      11.6"
"          241.610      0.676      11.7"
"          241.618      0.902      11.9"
"          241.629      1.127      12.1"
"          241.641      1.353      12.3"
"          241.656      1.578      12.6"
"          241.673      1.803      12.9"
"          241.692      2.029      13.3"
"          241.713      2.254      13.7"
"          241.737      2.480      14.2"
"          241.762      2.705      14.7"
"          241.789      2.931      15.2"
"          241.818      3.156      15.8"
"          241.848      3.382      16.3"
"          241.879      3.607      17.0"
"          241.912      3.832      17.6"

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"	241.946	4.058	18.3"
"	241.979	4.283	19.0"
"	242.014	4.509	19.6"
"	242.047	4.734	20.3"
"	242.081	4.960	21.0"
"	242.114	5.185	21.7"
"	242.146	5.410	22.3"
"	242.178	5.636	23.0"
"	242.209	5.861	23.6"
"	242.240	6.087	24.2"
"	242.270	6.312	24.9"
"	242.300	6.538	25.5"
"	242.330	6.763	26.1"
"	242.359	6.989	26.7"
"	242.388	7.214	27.3"
"	242.418	7.439	27.9"
"	242.469	7.665	29.0"
"	242.570	7.890	31.1"
"	242.647	8.116	32.7"
"	242.741	8.341	34.8"
"	242.917	8.567	38.6"
"	1.800	Channel Basewidth"	
"	3.500	Channel Depth"	
"	2.500	Channel Topwidth"	
"	10.000	Grade Left"	
"	10.000	Grade Right"	
"	0.160	Grade %"	
"	10.000	Length"	
"	Barrel Yo	0.742	metre"
"	Barrel Ycr	0.543	metre"
"	Exit Velocity	1.997	m/sec"
"	Barrel Peak Outflow	4.508	c.m/sec"
"	Weir Peak Flow	0.000	c.m/sec"
"	Total Peak Outflow	4.508	c.m/sec"
"	Maximum level	242.063	metre"
"	Maximum storage	19.641	c.m"
"	Centroidal lag	4.769	hours"
"	0.377	4.509	4.508 0.000 c.m/sec"
" 40	HYDROGRAPH Next link "		
"	5 Next link "		
"	0.377	4.508	4.508 0.000"
" 33	CATCHMENT 8"		
"	1 Triangular SCS"		
"	3 Specify values"		
"	1 SCS method"		
"	8 direct channel area"		
"	0.000 % Impervious"		
"	0.370 Total Area"		
"	5.000 Flow length"		
"	25.000 Overland Slope"		
"	0.370 Pervious Area"		
"	190.000 Pervious length"		
"	25.000 Pervious slope"		
"	0.000 Impervious Area"		
"	10.000 Impervious length"		
"	25.000 Impervious slope"		
"	0.250 Pervious Manning 'n' "		
"	78.000 Pervious SCS Curve No. "		
"	0.482 Pervious Runoff coefficient"		
"	0.100 Pervious Ia/S coefficient"		
"	7.164 Pervious Initial abstraction"		
"	0.015 Impervious Manning 'n' "		
"	98.000 Impervious SCS Curve No. "		
"	0.938 Impervious Runoff coefficient"		
"	0.100 Impervious Ia/S coefficient"		
"	0.518 Impervious Initial abstraction"		
"	0.066	4.508	4.508 0.000 c.m/sec"
"	Catchment 8	Pervious	Impervious Total Area "
"	Surface Area	0.370	0.000 0.370 hectare"

```

"      Time of concentration 16.444    0.374    16.444    minutes"
"      Time to Centroid    110.789    82.662    110.789    minutes"
"      Rainfall depth      86.611    86.611    86.611    mm"
"      Rainfall volume     320.46    0.00    320.46    c.m"
"      Rainfall losses     44.941    15.316    44.941    mm"
"      Runoff depth        41.670    71.295    41.670    mm"
"      Runoff volume       154.18    0.00    154.18    c.m"
"      Runoff coefficient   0.482    0.938    0.482    "
"      Maximum flow        0.066    0.000    0.066    c.m/sec"
" 40    HYDROGRAPH Add Runoff "
"      4    Add Runoff "
"          0.066    4.517    4.508    0.000"
" 52    CHANNEL DESIGN"
"      4.517    Current peak flow    c.m/sec"
"      0.022    Manning 'n'"
"      0.    Cross-section type: 0=trapezoidal; 1=general"
"      0.900    Basewidth    metre"
"      4.000    Left bank slope"
"      4.000    Right bank slope"
"      1.200    Channel depth    metre"
"      0.160    Gradient    %"
"      Depth of flow          0.897    metre"
"      Velocity              1.123    m/sec"
"      Channel capacity      9.174    c.m/sec"
"      Critical depth        0.661    metre"
" 53    ROUTE    Channel Route 254"
"      254.40    Channel Route 254 Reach length    ( metre)"
"      0.042    X-factor <= 0.5"
"      169.975    K-lag    ( seconds)"
"      0.000    Default(0) or user spec.(1) values used"
"      0.500    X-factor <= 0.5"
"      30.000    K-lag    ( seconds)"
"      0.500    Beta weighting factor"
"      300.000    Routing time step    ( seconds)"
"      1    No. of sub-reaches"
"      Peak outflow          4.515    c.m/sec"
"          0.066    4.517    4.515    0.000 c.m/sec"

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Missing stormwater modeling outputs available upon request

APPENDIX D

Watermain Demands and Elevations

WATERMAIN DEMANDS - KOMOKA SUBDIVISION

FULL SUBDIVISION

WATERCAD MODEL

14-Feb-19

DEMAND = 77 IGCPD
FIRE DEMAND = 1000 IGPM / 75.77 L/s

MAX DAY FACTOR = 2.75
MAX HOUR FACTOR = 4.13
MIN HOUR FACTOR = 0.40

LOW DENSITY 3 PEOPLE PER UNIT
MED DENSITY 2.4 PEOPLE PER UNIT
HIGH DENSITY 1.6 PEOPLE PER UNIT

JUNCTION	LOCATION	ELEVATION (m)	LOTS	POPULATION	AVG. DAY gallons/day	MAX DAY gallons/day	MAX HOUR gallons/day	AVG. DAILY L/s	MAX HOUR L/s	MAX DAY L/s	FIRE TEST L/s
1	OXBOW DRIVE AT ENTRANCE	240.52	0	133.5	10279.5	28269	42454	0.541	2.234	1.487	77.257
2	OXBOW DRIVE AT ENTRANCE	240.52	0	0	0	0	0	0.000	0.000	0.000	N/A
3	STREET 'C' - BLOCK 181	241.30	0	64	4928	13552	20353	0.259	1.071	0.713	76.483
4	STREET 'C' - BLOCK 180	241.85	0	62	4804.8	13213	19844	0.253	1.044	0.695	76.465
5	STREET 'C'-BLOCK 179 NORTH	241.74	0	36	2160	5940	8921	0.114	0.469	0.313	76.083
6	STREET 'E' LOW POINT	241.50	3	9	540	1485	2230	0.028	0.117	0.078	75.848
7	STREET 'E' @ STREET 'B'	241.82	4	12	720	1980	2974	0.038	0.156	0.104	N/A
8	STREET 'E' @ PHASE LIMITS	242.03	1	610	36600	100650	151158	1.926	7.953	5.296	81.066
9	STREET 'B' LOW POINT	241.64	8	24	1440	3960	5947	0.076	0.313	0.208	N/A
10	STREET 'B' HIGH POINT	242.19	8	24	1440	3960	5947	0.076	0.313	0.208	75.978
11	STREET 'B' LOW POINT	242.04	6	18	1080	2970	4460	0.057	0.235	0.156	N/A
12	STREET 'B' HIGH POINT	242.39	6	18	1080	2970	4460	0.057	0.235	0.156	N/A
13	STREET 'B' LOW POINT	242.28	6	18	1080	2970	4460	0.057	0.235	0.156	N/A
14	STREET 'B' @ STREET 'A'	242.58	2	6	360	990	1487	0.019	0.078	0.052	75.822
15	STREET 'B' @ STREET 'A'	242.58	2	6	360	990	1487	0.019	0.078	0.052	N/A
16	STREET 'B' LOW POINT	242.40	6	18	1080	2970	4460	0.057	0.235	0.156	N/A
17	STREET 'B' @ BEND	242.73	7	21	1260	3465	5204	0.066	0.274	0.182	N/A
18	STREET 'B' @ BEND	242.90	1	3	180	495	743	0.009	0.039	0.026	75.796
19	STREET 'B' - TOWNHOMES WEST	243.06	0	24	1440	3960	5947	0.076	0.313	0.208	75.978
20	STREET 'B' - TOWNHOMES CENTRAL	243.18	0	24	1440	3960	5947	0.076	0.313	0.208	75.978
21	STREET 'B' LOW PONT	243.15	0	0	0	0	0	0.000	0.000	0.000	N/A
22	STREET 'B' - TOWNHOMES EAST	243.46	0	24	1440	3960	5947	0.076	0.313	0.208	75.978
23	STREET 'B' @ BEND	243.53	0	0	0	0	0	0.000	0.000	0.000	N/A
24	STREET 'B' - BLOCK 178	243.60	0	29	1728	4752	7137	0.091	0.376	0.250	76.020
25	STREET 'B' @ STREET 'A'	243.03	6	18	1080	2970	4460	0.057	0.235	0.156	75.926
26	STREET 'B' @ STREET 'A'	243.03	2	6	360	990	1487	0.019	0.078	0.052	N/A
27	STREET 'B' LOW POINT	242.65	2	6	360	990	1487	0.019	0.078	0.052	N/A
28	STREET 'C'	241.78	1	3	180	495	743	0.009	0.039	0.026	N/A
29	STREET 'C' LOW POINT	241.66	2	6	360	990	1487	0.019	0.078	0.052	N/A
30	STREET 'C'	241.74	1	3	180	495	743	0.009	0.039	0.026	N/A
31	STREET 'C' @ STREET 'D'	241.79	7	21	1260	3465	5204	0.066	0.274	0.182	75.952
32	STREET 'C'	242.61	12	36	2160	5940	8921	0.114	0.469	0.313	N/A
33	STREET 'C' @ STREET 'A'	242.87	4	12	720	1980	2974	0.038	0.156	0.104	N/A
34	STREET 'C' @ STREET 'A'	242.87	5	15	900	2475	3717	0.047	0.196	0.130	N/A
35	STREET 'C'	243.28	6	18	1080	2970	4460	0.057	0.235	0.156	N/A
36	STREET 'C' TOP END	243.35	2	6	360	990	1487	0.019	0.078	0.052	N/A
37	STREET 'C' @ STREET 'B'	243.18	0	0	0	0	0	0.000	0.000	0.000	75.770
38	STREET 'D' LOW POINT	241.87	4	12	720	1980	2974	0.038	0.156	0.104	N/A
39	STREET 'D' @ STREET 'B'	241.97	8	24	1440	3960	5947	0.076	0.313	0.208	N/A
40	STREET 'B'	242.28	9	27	1620	4455	6691	0.085	0.352	0.234	76.004
42	STREET 'D' SOUTH BEND	242.49	3	9	540	1485	2230	0.028	0.117	0.078	75.848
43	STREET 'D' SOUTH BEND	242.67	1	3	180	495	743	0.009	0.039	0.026	N/A
44	STREET 'D' SOUTH BEND	242.85	3	9	540	1485	2230	0.028	0.117	0.078	N/A
45	STREET 'D' HIGH POINT	243.39	4	12	720	1980	2974	0.038	0.156	0.104	N/A
46	STREET 'D' NORTH BEND	243.31	2	6	360	990	1487	0.019	0.078	0.052	75.822
47	STREET 'D' NORTH BEND	243.13	1	3	180	495	743	0.009	0.039	0.026	N/A
48	STREET 'D' NORTH BEND	242.96	4	12	720	1980	2974	0.038	0.156	0.104	N/A
49	STREET 'B' @ STREET 'D'	242.65	7	21	1260	3465	5204	0.066	0.274	0.182	N/A
50	STREET 'A'	243.16	6	18	1080	2970	4460	0.057	0.235	0.156	N/A
51	KOMOKA ROAD	242.25	0	0	0	0	0	0.000	0.000	0.000	N/A
52	KOMOKA ROAD AT TOP END	245.69	5	15	900	2475	3717	0.047	0.196	0.130	75.900
53	KOMOKA ROAD TEE AT UNION	241.85	28	84	5040	13860	20815	0.265	1.095	0.729	N/A
54	KOMOKA ROAD @ OXBOW DRIVE	240.34	2	6	360	990	1487	0.019	0.078	0.052	N/A
55	KOMOKA ROAD	240.44	1	3	180	495	743	0.009	0.039	0.026	N/A
56	KOMOKA ROAD	240.44	5	15	900	2475	3717	0.047	0.196	0.130	N/A
57	STREET 'C'-BLOCK 179 SOUTH	241.35	0	34	2016	5544	8326	0.106	0.438	0.292	76.062
58	STREET 'A'	242.66	4	12	720	1980	2974	0.038	0.156	0.104	N/A
59	STREET 'C' FH	242.59	6	18	1080	2970	4460	0.057	0.235	0.156	75.926
60	KOMOKA ROAD HI POINT	242.27	2	6	360	990	1487	0.019	0.078	0.052	N/A
64	OXBOW DRIVE AT PRINCESS	241.33	6	18	1080	2970	4460	0.057	0.235	0.156	N/A
65	OXBOW DRIVE AT PRINCESS	241.33	3	9	540	1485	2230	0.028	0.117	0.078	N/A
68	OXBOW DRIVE HYDRANT	240.44	0	0	0	0	0	0.000	0.000	0.000	75.770
69	KOMOKA ROAD @ KO-2	242.59	0	0	0	0	0	0.000	0.000	0.000	75.770
70	KO-2	243.84	0	0	0	0	0	0.000	0.000	0.000	N/A
71	KO-73	243.20	0	0	0	0	0	0.000	0.000	0.000	N/A
72	RESERVE BLOCK 175	242.58	0	608	36480	100320	150662	1.919	7.927	5.279	81.049

WATERMAIN DEMANDS - KOMOKA SUBDIVISION

PHASE 1

WATERCAD MODEL

7-Feb-19

DEMAND = 77 IGCPD

FIRE DEMAND = 1000 IGPM / 75.77 L/s

MAX DAY FACTOR = 2.75

MAX HOUR FACTOR = 4.13

MIN HOUR FACTOR = 0.40

LOW DENSITY 3 PEOPLE PER UNIT

MED DENSITY 2.4 PEOPLE PER UNIT

HIGH DENSITY 1.6 PEOPLE PER UNIT

WATER QUALITY ANALYSIS

JUNCTION	LOCATION	ELEVATION (m)	LOTS	POPULATION	AVG. DAY gallons/day	MAX DAY gallons/day	MAX HOUR gallons/day	AVG. DAILY L/s	MAX HOUR L/s	MAX DAY L/s	FIRE TEST L/s
PHASE 1											
1	OXBOW DRIVE AT ENTRANCE	240.52		133.5	10279.5	28269	42454	0.541	2.234	1.487	77.257
2	OXBOW DRIVE AT ENTRANCE	240.52		0	0	0	0	0.000	0.000	0.000	N/A
3	STREET 'C' - BLOCK 181	241.30		64	4928	13552	20353	0.259	1.071	0.713	76.483
4	STREET 'C' - BLOCK 180	241.85		62	4804.8	13213	19844	0.253	1.044	0.695	76.465
5	STREET 'C'-BLOCK 179 NORTH	241.74		36	2160	5940	8921	0.114	0.469	0.313	76.083
6	STREET 'E' LOW POINT	241.50	3	9	540	1485	2230	0.028	0.117	0.078	75.848
7	STREET 'E' @ STREET 'B'	241.82	4	12	720	1980	2974	0.038	0.156	0.104	N/A
8	STREET 'E' @ PHASE LIMITS	242.03	1	3	180	495	743	0.009	0.039	0.026	N/A
24	STREET 'B' - phase 1 limits	243.30		3	180	495	743	0.009	0.039	0.026	N/A
25	STREET 'B' @ STREET 'A'	243.03	5	15	900	2475	3717	0.047	0.196	0.130	75.900
26	STREET 'B' @ STREET 'A'	243.03	2	6	360	990	1487	0.019	0.078	0.052	N/A
27	STREET 'B' LOW POINT	242.65	2	6	360	990	1487	0.019	0.078	0.052	N/A
28	STREET 'C'	241.78	1	3	180	495	743	0.009	0.039	0.026	N/A
29	STREET 'C' LOW POINT	241.66	2	6	360	990	1487	0.019	0.078	0.052	N/A
30	STREET 'C'	241.74	1	3	180	495	743	0.009	0.039	0.026	N/A
31	STREET 'C' @ STREET 'D'	241.79	2	6	360	990	1487	0.019	0.078	0.052	75.822
32	STREET 'C'	241.93	1	3	180	495	743	0.009	0.039	0.026	N/A
38	STREET 'D' LOW POINT	241.87	4	12	720	1980	2974	0.038	0.156	0.104	N/A
39	STREET 'D' @ STREET 'B'	241.97	7	21	1260	3465	5204	0.066	0.274	0.182	N/A
40	STREET 'B'	242.28	9	27	1620	4455	6691	0.085	0.352	0.234	76.004
42	STREET 'D' SOUTH BEND	242.49	3	9	540	1485	2230	0.028	0.117	0.078	75.848
43	STREET 'D' SOUTH BEND	242.67	1	3	180	495	743	0.009	0.039	0.026	N/A
44	STREET 'D' SOUTH BEND	242.85	3	9	540	1485	2230	0.028	0.117	0.078	N/A
45	STREET 'D' HIGH POINT	243.39	4	12	720	1980	2974	0.038	0.156	0.104	N/A
46	STREET 'D' NORTH BEND	243.31	2	6	360	990	1487	0.019	0.078	0.052	75.822
47	STREET 'D' NORTH BEND	243.13	1	3	180	495	743	0.009	0.039	0.026	N/A
48	STREET 'D' NORTH BEND	242.96	4	12	720	1980	2974	0.038	0.156	0.104	N/A
49	STREET 'B' @ STREET 'D'	242.65	7	21	1260	3465	5204	0.066	0.274	0.182	N/A
50	STREET 'A'	243.16	6	18	1080	2970	4460	0.057	0.235	0.156	N/A
51	KOMOKA ROAD	242.25	0	0	0	0	0	0.000	0.000	0.000	N/A
52	KOMOKA ROAD AT TOP END	245.69	5	15	900	2475	3717	0.047	0.196	0.130	75.900
53	KOMOKA ROAD TEE AT UNION	241.85	28	84	5040	13860	20815	0.265	1.095	0.729	N/A
54	KOMOKA ROAD @ OXBOW DRIVE	240.34	2	6	360	990	1487	0.019	0.078	0.052	N/A
55	KOMOKA ROAD	240.44	1	3	180	495	743	0.009	0.039	0.026	N/A
56	KOMOKA ROAD	240.44	5	15	900	2475	3717	0.047	0.196	0.130	N/A
57	STREET 'C'-BLOCK 179 SOUTH	241.35		34	2016	5544	8326	0.106	0.438	0.292	76.062
58	STREET 'A'	242.66	4	12	720	1980	2974	0.038	0.156	0.104	N/A
60	KOMOKA ROAD HI POINT	242.27	2	6	360	990	1487	0.019	0.078	0.052	N/A
64	OXBOW DRIVE AT PRINCESS	241.33	6	18	1080	2970	4460	0.057	0.235	0.156	N/A
65	OXBOW DRIVE AT PRINCESS	241.33	3	9	540	1485	2230	0.028	0.117	0.078	N/A
68	OXBOW DRIVE HYDRANT	240.44	0	0	0	0	0	0.000	0.000	0.000	75.770
69	KOMOKA ROAD @ KO-2	242.59	0	0	0	0	0	0.000	0.000	0.000	75.770
70	KO-2	243.84	0	0	0	0	0	0.000	0.000	0.000	N/A
71	KO-73	243.20	0	0	0	0	0	0.000	0.000	0.000	N/A

AVG. DAY 25% BUILD OUT	AVG. DAY 50% BUILD OUT	AVG. DAY 75% BUILD OUT
0.541	0.541	0.541
0.000	0.000	0.000
0.065	0.130	0.194
0.063	0.126	0.190
0.028	0.057	0.085
0.007	0.014	0.021
0.009	0.019	0.028
0.000	0.005	0.007
0.000	0.009	0.009
0.012	0.024	0.036
0.005	0.009	0.014
0.005	0.009	0.014
0.002	0.005	0.007
0.005	0.009	0.014
0.002	0.005	0.007
0.005	0.009	0.014
0.000	0.009	0.009
0.009	0.019	0.028
0.017	0.033	0.050
0.021	0.043	0.064
0.007	0.014	0.021
0.002	0.005	0.007
0.007	0.014	0.021
0.009	0.019	0.028
0.005	0.009	0.014
0.002	0.005	0.007
0.009	0.019	0.028
0.017	0.033	0.050
0.014	0.028	0.043
0.000	0.000	0.000
0.047	0.047	0.047
0.265	0.265	0.265
0.019	0.019	0.019
0.009	0.009	0.009
0.047	0.047	0.047
0.027	0.053	0.080
0.009	0.019	0.028
0.019	0.019	0.019
0.057	0.057	0.057
0.028	0.028	0.028
0.000	0.000	0.000
0.000	0.000	0.000
0.000	0.000	0.000
0.000	0.000	0.000

DENOTES JUNCTIONS THAT
WILL NOT BE EFFECTED BY
SUBDIVISION BUILD OUT
DEMANDS.

COMMERCIAL BLOCK EQUIVALENT POPULATION = 133.5

APPENDIX E

WaterCAD Results – Full Subdivision

Average Day Demand

Active Scenario: Average Day - 200mm PVC on Oxbow
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	3.541	0.1127	284.97	284.97
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	3.541	0.1127	284.97	284.96
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	3.282	0.1045	284.96	284.95
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	2.709	0.0862	284.94	284.94
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	2.681	0.0853	284.94	284.93
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	1.926	0.0613	284.93	284.93
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	0.717	0.0228	284.93	284.93
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	0.641	0.0204	284.93	284.93
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	0.565	0.0180	284.93	284.93
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	0.508	0.0162	284.93	284.93
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	0.451	0.0143	284.93	284.93
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	0.394	0.0125	284.93	284.93
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	0.375	0.0119	284.93	284.93
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	-1.563	0.0498	284.93	284.93
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	-1.620	0.0516	284.93	284.94
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	-1.686	0.0537	284.94	284.94
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	-1.695	0.0540	284.94	284.94
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	-1.771	0.0564	284.94	284.94
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	-1.433	0.0456	284.94	284.94
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	-1.433	0.0456	284.94	284.94
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	-1.509	0.0480	284.94	284.94
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	-1.509	0.0480	284.94	284.94
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	-1.600	0.0509	284.94	284.95
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	1.222	0.0389	284.95	284.95
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	1.203	0.0383	284.95	284.94
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	0.100	0.0032	284.94	284.94
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	0.091	0.0029	284.94	284.94
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	0.072	0.0023	284.94	284.94

Active Scenario: Average Day - 200mm PVC on Oxbow
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	0.063	0.0020	284.94	284.94
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	0.747	0.0238	284.94	284.94
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	0.538	0.0171	284.94	284.94
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	0.491	0.0156	284.94	284.94
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	0.434	0.0138	284.94	284.94
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	0.415	0.0132	284.94	284.94
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	0.415	0.0132	284.94	284.94
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-0.750	0.0239	284.94	284.94
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-0.788	0.0251	284.94	284.94
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-0.551	0.0175	284.94	284.94
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-0.636	0.0203	284.94	284.94
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-1.184	0.0377	284.94	284.94
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-0.312	0.0099	284.94	284.94
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-0.340	0.0108	284.94	284.94
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-0.349	0.0111	284.94	284.94
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-0.377	0.0120	284.94	284.94
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-0.415	0.0132	284.94	284.94
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-0.434	0.0138	284.94	284.94
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-0.443	0.0141	284.94	284.94
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-0.481	0.0153	284.94	284.94
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-2.878	0.0916	284.95	284.95
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-3.285	0.1046	284.96	284.98
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-2.072	0.0659	285.00	285.00
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-2.081	0.0662	285.00	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	1.392	0.0443	285.00	285.00
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	3.029	0.0964	284.95	284.95
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	2.923	0.0930	284.95	284.94
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-2.935	0.0934	284.95	284.95

Active Scenario: Average Day - 200mm PVC on Oxbow
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-2.973	0.0946	284.95	284.96
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	0.633	0.0201	284.94	284.94
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	0.576	0.0183	284.94	284.94
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-3.304	0.1052	284.98	285.00
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-1.345	0.0428	285.00	285.00
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-2.016	0.1141	285.00	285.00
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-2.044	0.1157	285.00	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-3.020	0.0615	284.96	284.96
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-3.421	0.1089	285.00	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-4.082	0.1299	284.97	284.99
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-4.082	0.1299	284.99	285.00
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.047	0.0015	284.96	284.96
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.047	0.0015	284.96	284.96
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	284.96	284.96
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	284.99	284.99
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	1.919	0.0611	284.93	284.93

Active Scenario: Average Day - 200mm PVC on Oxbow
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	0.541	Fixed	284.97	435.0
J-2	240.62	0.000	Fixed	284.97	434.0
J-3	241.30	0.259	Fixed	284.96	427.3
J-4	241.85	0.253	Fixed	284.95	421.9
J-5	241.74	0.114	Fixed	284.94	422.8
J-6	241.50	0.028	Fixed	284.94	425.1
J-7	241.82	0.038	Fixed	284.93	422.0
J-8	242.03	1.926	Fixed	284.93	419.9
J-9	241.64	0.076	Fixed	284.93	423.7
J-10	242.19	0.076	Fixed	284.93	418.3
J-11	242.04	0.057	Fixed	284.93	419.8
J-12	242.39	0.057	Fixed	284.93	416.4
J-13	242.28	0.057	Fixed	284.93	417.4
J-14	242.58	0.019	Fixed	284.93	414.5
J-15	242.58	0.019	Fixed	284.93	414.5
J-16	242.40	0.057	Fixed	284.93	416.3
J-17	242.73	0.066	Fixed	284.94	413.1
J-18	242.90	0.009	Fixed	284.94	411.4
J-19	243.06	0.076	Fixed	284.94	409.9
J-20	243.18	0.076	Fixed	284.94	408.7
J-21	243.15	0.000	Fixed	284.94	409.0
J-22	243.46	0.076	Fixed	284.94	406.0
J-23	243.53	0.000	Fixed	284.94	405.3
J-24	243.60	0.091	Fixed	284.94	404.6
J-25	243.03	0.057	Fixed	284.95	410.2
J-26	243.03	0.019	Fixed	284.95	410.2
J-27	242.65	0.019	Fixed	284.94	413.9
J-28	241.78	0.009	Fixed	284.94	422.4
J-29	241.66	0.019	Fixed	284.94	423.6
J-30	241.74	0.009	Fixed	284.94	422.8
J-31	241.79	0.066	Fixed	284.94	422.3
J-32	242.61	0.114	Fixed	284.94	414.3
J-33	242.87	0.038	Fixed	284.94	411.7
J-34	242.87	0.047	Fixed	284.94	411.7
J-35	243.28	0.057	Fixed	284.94	407.7
J-36	243.35	0.019	Fixed	284.94	407.0
J-37	243.18	0.000	Fixed	284.94	408.7
J-38	241.87	0.038	Fixed	284.94	421.6
J-39	241.97	0.076	Fixed	284.94	420.6
J-40	242.28	0.085	Fixed	284.94	417.5
J-42	242.49	0.028	Fixed	284.94	415.5
J-43	242.67	0.009	Fixed	284.94	413.7
J-44	242.85	0.028	Fixed	284.94	412.0
J-45	243.39	0.038	Fixed	284.94	406.7

Active Scenario: Average Day - 200mm PVC on Oxbow
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.019	Fixed	284.94	407.5
J-47	243.13	0.009	Fixed	284.94	409.2
J-48	242.96	0.038	Fixed	284.94	410.9
J-49	242.65	0.066	Fixed	284.94	413.9
J-50	243.16	0.057	Fixed	284.95	409.0
J-51	242.15	0.000	Fixed	284.96	418.9
J-52	245.69	0.047	Fixed	284.96	384.3
J-53	241.96	0.265	Fixed	284.96	420.8
J-54	240.34	0.019	Fixed	285.00	437.1
J-55	240.44	0.009	Fixed	285.00	436.1
J-56	240.44	0.047	Fixed	285.00	436.1
J-57	241.35	0.106	Fixed	284.95	426.7
J-58	242.66	0.038	Fixed	284.95	413.9
J-59	242.59	0.057	Fixed	284.94	414.5
J-60	242.27	0.019	Fixed	284.98	418.0
J-64	241.33	0.057	Fixed	285.00	427.3
J-65	241.33	0.028	Fixed	285.00	427.4
J-68	240.51	0.000	Fixed	284.99	435.3
J-69	242.59	0.000	Fixed	284.96	414.6
J-70	243.84	0.000	Fixed	284.96	402.4
J-71	243.20	0.000	Fixed	284.99	408.9
J-72	242.58	1.919	Fixed	284.93	414.5

Maximum Hour Demand

Active Scenario: Max Hour - 200mm PVC on Oxbow
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	14.624	0.4655	284.52	284.52
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	14.624	0.4655	284.52	284.41
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	13.553	0.4314	284.41	284.36
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	11.185	0.3560	284.21	284.17
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	11.068	0.3523	284.17	284.10
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	7.953	0.2532	284.10	284.07
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	2.959	0.0942	284.10	284.10
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	2.646	0.0842	284.10	284.09
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	2.333	0.0743	284.09	284.09
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	2.098	0.0668	284.09	284.08
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	1.863	0.0593	284.08	284.08
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	1.628	0.0518	284.08	284.08
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	1.550	0.0493	284.08	284.08
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	-6.455	0.2055	284.08	284.10
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	-6.690	0.2130	284.10	284.12
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	-6.964	0.2217	284.12	284.14
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	-7.003	0.2229	284.14	284.15
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	-7.316	0.2329	284.15	284.18
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	-5.917	0.1883	284.18	284.19
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	-5.917	0.1883	284.19	284.21
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	-6.230	0.1983	284.21	284.21
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	-6.230	0.1983	284.21	284.22
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	-6.606	0.2103	284.22	284.25
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	5.047	0.1607	284.25	284.25
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	4.969	0.1582	284.25	284.23
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	0.417	0.0133	284.21	284.21
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	0.378	0.0120	284.21	284.21
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	0.300	0.0096	284.21	284.21

Active Scenario: Max Hour - 200mm PVC on Oxbow
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	0.261	0.0083	284.21	284.21
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	3.081	0.0981	284.21	284.20
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	2.221	0.0707	284.19	284.19
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	2.025	0.0645	284.19	284.19
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	1.790	0.0570	284.19	284.19
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	1.712	0.0545	284.19	284.19
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	1.712	0.0545	284.19	284.18
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-3.094	0.0985	284.21	284.21
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-3.250	0.1035	284.21	284.22
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-2.276	0.0724	284.22	284.22
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-2.628	0.0836	284.22	284.23
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-4.891	0.1557	284.23	284.23
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-1.287	0.0410	284.22	284.22
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-1.404	0.0447	284.22	284.22
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-1.443	0.0459	284.22	284.22
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-1.560	0.0497	284.22	284.22
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-1.716	0.0546	284.22	284.22
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-1.794	0.0571	284.22	284.22
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-1.833	0.0584	284.22	284.22
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-1.989	0.0633	284.22	284.23
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-11.888	0.3784	284.25	284.30
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-13.570	0.4319	284.40	284.72
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-8.556	0.2723	284.98	284.99
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-8.595	0.2736	284.99	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	5.752	0.1831	284.98	284.97
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	12.509	0.3982	284.36	284.30
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	12.071	0.3842	284.30	284.21
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-12.123	0.3859	284.30	284.36

Active Scenario: Max Hour - 200mm PVC on Oxbow
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-12.279	0.3908	284.36	284.39
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	2.612	0.0832	284.20	284.19
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	2.377	0.0757	284.19	284.19
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-13.648	0.4344	284.72	284.93
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-5.556	0.1768	284.93	284.97
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-8.327	0.4712	284.93	284.97
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-8.444	0.4778	284.97	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-12.475	0.2541	284.39	284.40
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-14.132	0.4498	284.98	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-16.858	0.5366	284.52	284.80
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-16.858	0.5366	284.80	284.98
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.196	0.0062	284.39	284.39
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.196	0.0062	284.39	284.39
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	284.39	284.39
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	284.80	284.80
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	7.927	0.2523	284.08	284.06

Active Scenario: Max Hour - 200mm PVC on Oxbow
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	2.234	Fixed	284.52	430.6
J-2	240.62	0.000	Fixed	284.52	429.6
J-3	241.30	1.071	Fixed	284.41	421.9
J-4	241.85	1.044	Fixed	284.36	416.0
J-5	241.74	0.469	Fixed	284.21	415.6
J-6	241.50	0.117	Fixed	284.17	417.6
J-7	241.82	0.156	Fixed	284.10	413.8
J-8	242.03	7.953	Fixed	284.07	411.5
J-9	241.64	0.313	Fixed	284.10	415.5
J-10	242.19	0.313	Fixed	284.09	410.1
J-11	242.04	0.235	Fixed	284.09	411.5
J-12	242.39	0.235	Fixed	284.08	408.1
J-13	242.28	0.235	Fixed	284.08	409.1
J-14	242.58	0.078	Fixed	284.08	406.2
J-15	242.58	0.078	Fixed	284.08	406.2
J-16	242.40	0.235	Fixed	284.10	408.1
J-17	242.73	0.274	Fixed	284.12	405.1
J-18	242.90	0.039	Fixed	284.14	403.6
J-19	243.06	0.313	Fixed	284.15	402.2
J-20	243.18	0.313	Fixed	284.18	401.3
J-21	243.15	0.000	Fixed	284.19	401.6
J-22	243.46	0.313	Fixed	284.21	398.8
J-23	243.53	0.000	Fixed	284.21	398.1
J-24	243.60	0.376	Fixed	284.22	397.5
J-25	243.03	0.235	Fixed	284.25	403.4
J-26	243.03	0.078	Fixed	284.25	403.4
J-27	242.65	0.078	Fixed	284.23	406.9
J-28	241.78	0.039	Fixed	284.21	415.2
J-29	241.66	0.078	Fixed	284.21	416.4
J-30	241.74	0.039	Fixed	284.21	415.6
J-31	241.79	0.274	Fixed	284.21	415.1
J-32	242.61	0.469	Fixed	284.20	407.0
J-33	242.87	0.156	Fixed	284.19	404.4
J-34	242.87	0.196	Fixed	284.19	404.4
J-35	243.28	0.235	Fixed	284.19	400.3
J-36	243.35	0.078	Fixed	284.19	399.7
J-37	243.18	0.000	Fixed	284.19	401.3
J-38	241.87	0.156	Fixed	284.21	414.4
J-39	241.97	0.313	Fixed	284.22	413.5
J-40	242.28	0.352	Fixed	284.22	410.5
J-42	242.49	0.117	Fixed	284.22	408.4
J-43	242.67	0.039	Fixed	284.22	406.6
J-44	242.85	0.117	Fixed	284.22	404.9
J-45	243.39	0.156	Fixed	284.22	399.6

Active Scenario: Max Hour - 200mm PVC on Oxbow
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.078	Fixed	284.22	400.4
J-47	243.13	0.039	Fixed	284.22	402.2
J-48	242.96	0.156	Fixed	284.22	403.8
J-49	242.65	0.274	Fixed	284.23	406.9
J-50	243.16	0.235	Fixed	284.30	402.7
J-51	242.15	0.000	Fixed	284.39	413.4
J-52	245.69	0.196	Fixed	284.39	378.8
J-53	241.96	1.095	Fixed	284.40	415.4
J-54	240.34	0.078	Fixed	284.98	436.9
J-55	240.44	0.039	Fixed	284.99	436.0
J-56	240.44	0.196	Fixed	284.97	435.8
J-57	241.35	0.438	Fixed	284.30	420.3
J-58	242.66	0.156	Fixed	284.36	408.1
J-59	242.59	0.235	Fixed	284.19	407.2
J-60	242.27	0.078	Fixed	284.72	415.5
J-64	241.33	0.235	Fixed	284.93	426.7
J-65	241.33	0.117	Fixed	284.97	427.1
J-68	240.51	0.000	Fixed	284.80	433.4
J-69	242.59	0.000	Fixed	284.39	409.1
J-70	243.84	0.000	Fixed	284.39	396.9
J-71	243.20	0.000	Fixed	284.80	407.1
J-72	242.58	7.927	Fixed	284.06	406.0

Maximum Day Demand + Fire Flow

Active Scenario: Max Day + Fire J-1
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	-15.048	0.4790	279.67	279.68
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	-15.048	0.4790	279.68	279.79
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	-15.761	0.5017	279.79	279.86
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	1.754	0.0558	280.12	280.12
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	1.676	0.0534	280.12	280.12
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	5.296	0.1686	280.12	280.11
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	-3.723	0.1185	280.12	280.12
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	-3.932	0.1251	280.12	280.14
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	-4.139	0.1318	280.14	280.14
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	-4.295	0.1367	280.14	280.16
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	-4.452	0.1417	280.16	280.16
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	-4.607	0.1467	280.16	280.17
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	-4.660	0.1483	280.17	280.17
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	-9.991	0.3180	280.17	280.20
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	-10.146	0.3230	280.20	280.27
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	-10.332	0.3289	280.27	280.30
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	-10.358	0.3297	280.30	280.33
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	-10.565	0.3363	280.33	280.39
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	-16.084	0.5120	280.39	280.40
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	-16.084	0.5120	280.40	280.53
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	-16.292	0.5186	280.53	280.56
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	-16.292	0.5186	280.56	280.59
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	-16.542	0.5265	280.59	280.76
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	16.002	0.5093	280.76	280.73
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	15.950	0.5077	280.73	280.60
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	-18.815	0.5989	280.12	280.16
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	-18.841	0.5997	280.16	280.23
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	-18.893	0.6014	280.23	280.28

Active Scenario: Max Day + Fire J-1
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	-18.919	0.6022	280.28	280.31
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	-4.399	0.1400	280.31	280.33
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	-4.972	0.1583	280.35	280.36
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	-5.102	0.1624	280.36	280.38
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	-5.258	0.1674	280.38	280.38
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	-5.310	0.1690	280.38	280.39
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	-5.310	0.1690	280.39	280.39
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-14.702	0.4680	280.31	280.43
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-14.806	0.4713	280.43	280.46
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-9.070	0.2887	280.46	280.52
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-9.304	0.2961	280.52	280.57
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-15.898	0.5060	280.57	280.60
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-5.944	0.1892	280.46	280.49
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-6.022	0.1917	280.49	280.49
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-6.048	0.1925	280.49	280.50
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-6.126	0.1950	280.50	280.52
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-6.230	0.1983	280.52	280.53
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-6.282	0.2000	280.53	280.54
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-6.308	0.2008	280.54	280.54
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-6.412	0.2041	280.54	280.57
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-32.700	1.0409	280.76	281.11
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-33.819	1.0765	281.72	283.48
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-28.206	0.8978	284.80	284.92
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-28.232	0.8986	284.92	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	12.460	0.3966	284.80	284.76
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	-16.456	0.5238	279.86	279.96
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	-16.748	0.5331	279.96	280.12
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-32.856	1.0458	281.11	281.48

Active Scenario: Max Day + Fire J-1
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-32.960	1.0491	281.48	281.69
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	-4.712	0.1500	280.33	280.34
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	-4.868	0.1550	280.34	280.35
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-33.871	1.0781	283.48	284.60
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-12.330	0.3925	284.60	284.76
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-21.697	1.2278	284.60	284.84
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-21.775	1.2322	284.84	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-33.090	0.6741	281.69	281.72
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-46.516	1.4806	284.80	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-62.209	1.9802	279.67	282.76
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-62.209	1.9802	282.76	284.80
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.130	0.0041	281.69	281.69
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.130	0.0041	281.69	281.69
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	281.69	281.69
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	282.76	282.76
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	5.279	0.1680	280.17	280.16

Active Scenario: Max Day + Fire J-1
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	77.257	Fixed	279.67	383.2
J-2	240.62	0.000	Fixed	279.68	382.2
J-3	241.30	0.713	Fixed	279.79	376.7
J-4	241.85	0.695	Fixed	279.86	372.0
J-5	241.74	0.313	Fixed	280.12	375.7
J-6	241.50	0.078	Fixed	280.12	378.0
J-7	241.82	0.104	Fixed	280.12	374.8
J-8	242.03	5.296	Fixed	280.11	372.7
J-9	241.64	0.208	Fixed	280.12	376.6
J-10	242.19	0.208	Fixed	280.14	371.4
J-11	242.04	0.156	Fixed	280.14	372.9
J-12	242.39	0.156	Fixed	280.16	369.6
J-13	242.28	0.156	Fixed	280.16	370.7
J-14	242.58	0.052	Fixed	280.17	367.9
J-15	242.58	0.052	Fixed	280.17	367.9
J-16	242.40	0.156	Fixed	280.20	370.0
J-17	242.73	0.185	Fixed	280.27	367.4
J-18	242.90	0.026	Fixed	280.30	366.0
J-19	243.06	0.208	Fixed	280.33	364.7
J-20	243.18	0.208	Fixed	280.39	364.1
J-21	243.15	0.000	Fixed	280.40	364.6
J-22	243.46	0.208	Fixed	280.53	362.8
J-23	243.53	0.000	Fixed	280.56	362.4
J-24	243.60	0.250	Fixed	280.59	362.0
J-25	243.03	0.156	Fixed	280.76	369.2
J-26	243.03	0.052	Fixed	280.73	369.0
J-27	242.65	0.052	Fixed	280.60	371.4
J-28	241.78	0.026	Fixed	280.16	375.6
J-29	241.66	0.052	Fixed	280.23	377.4
J-30	241.74	0.026	Fixed	280.28	377.2
J-31	241.79	0.182	Fixed	280.31	377.0
J-32	242.61	0.313	Fixed	280.33	369.1
J-33	242.87	0.104	Fixed	280.35	366.9
J-34	242.87	0.130	Fixed	280.36	366.9
J-35	243.28	0.156	Fixed	280.38	363.1
J-36	243.35	0.052	Fixed	280.38	362.4
J-37	243.18	0.000	Fixed	280.39	364.1
J-38	241.87	0.104	Fixed	280.43	377.4
J-39	241.97	0.208	Fixed	280.46	376.7
J-40	242.28	0.234	Fixed	280.52	374.3
J-42	242.49	0.078	Fixed	280.49	371.9
J-43	242.67	0.026	Fixed	280.49	370.2
J-44	242.85	0.078	Fixed	280.50	368.5
J-45	243.39	0.104	Fixed	280.52	363.4

Active Scenario: Max Day + Fire J-1
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.052	Fixed	280.53	364.3
J-47	243.13	0.026	Fixed	280.54	366.1
J-48	242.96	0.104	Fixed	280.54	367.8
J-49	242.65	0.182	Fixed	280.57	371.1
J-50	243.16	0.156	Fixed	281.11	371.4
J-51	242.15	0.000	Fixed	281.69	387.0
J-52	245.69	0.130	Fixed	281.69	352.4
J-53	241.96	0.729	Fixed	281.72	389.1
J-54	240.34	0.052	Fixed	284.80	435.2
J-55	240.44	0.026	Fixed	284.92	435.3
J-56	240.44	0.130	Fixed	284.76	433.8
J-57	241.35	0.292	Fixed	279.96	377.8
J-58	242.66	0.104	Fixed	281.48	379.9
J-59	242.59	0.156	Fixed	280.34	369.5
J-60	242.27	0.052	Fixed	283.48	403.4
J-64	241.33	0.156	Fixed	284.60	423.5
J-65	241.33	0.078	Fixed	284.84	425.8
J-68	240.51	0.000	Fixed	282.76	413.5
J-69	242.59	0.000	Fixed	281.69	382.7
J-70	243.84	0.000	Fixed	281.69	370.5
J-71	243.20	0.000	Fixed	282.76	387.2
J-72	242.58	5.279	Fixed	280.16	367.8

Active Scenario: Max Day + Fire J-3
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	57.394	1.8269	280.18	280.14
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	57.394	1.8269	280.14	278.73
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	-19.089	0.6076	278.73	278.82
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	0.775	0.0247	279.20	279.20
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	0.697	0.0222	279.20	279.20
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	5.296	0.1686	279.20	279.19
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	-4.703	0.1497	279.20	279.20
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	-4.911	0.1563	279.20	279.22
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	-5.119	0.1629	279.22	279.23
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	-5.275	0.1679	279.23	279.25
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	-5.431	0.1729	279.25	279.25
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	-5.587	0.1778	279.25	279.27
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	-5.639	0.1795	279.27	279.27
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	-10.970	0.3492	279.27	279.31
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	-11.126	0.3542	279.31	279.38
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	-11.311	0.3600	279.38	279.42
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	-11.337	0.3609	279.42	279.46
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	-11.545	0.3675	279.46	279.53
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	-17.743	0.5648	279.53	279.54
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	-17.743	0.5648	279.54	279.70
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	-17.951	0.5714	279.70	279.73
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	-17.951	0.5714	279.73	279.77
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	-18.201	0.5794	279.77	279.97
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	17.671	0.5625	279.97	279.94
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	17.619	0.5608	279.94	279.78
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	-21.164	0.6737	279.20	279.24
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	-21.190	0.6745	279.24	279.32
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	-21.242	0.6761	279.32	279.39

Active Scenario: Max Day + Fire J-3
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	-21.268	0.6770	279.39	279.43
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	-5.079	0.1617	279.43	279.45
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	-5.652	0.1799	279.49	279.49
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	-5.782	0.1840	279.49	279.51
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	-5.938	0.1890	279.51	279.52
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	-5.990	0.1907	279.52	279.52
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	-5.990	0.1907	279.52	279.53
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-16.371	0.5211	279.43	279.57
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-16.475	0.5244	279.57	279.62
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-10.067	0.3205	279.62	279.68
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-10.301	0.3279	279.68	279.74
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-17.567	0.5592	279.74	279.78
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-6.615	0.2106	279.62	279.64
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-6.693	0.2131	279.64	279.65
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-6.719	0.2139	279.65	279.66
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-6.797	0.2164	279.66	279.68
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-6.901	0.2197	279.68	279.70
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-6.953	0.2213	279.70	279.71
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-6.979	0.2222	279.71	279.71
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-7.083	0.2255	279.71	279.74
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-36.028	1.1468	279.97	280.39
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-37.147	1.1824	281.12	283.22
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-27.644	0.8799	284.81	284.92
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-27.670	0.8808	284.92	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	14.301	0.4552	284.81	284.76
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	-19.784	0.6297	278.82	278.96
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	-20.076	0.6390	278.96	279.20
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-36.184	1.1518	280.39	280.83

Active Scenario: Max Day + Fire J-3
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-36.288	1.1551	280.83	281.09
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	-5.392	0.1716	279.45	279.47
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	-5.548	0.1766	279.47	279.49
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-37.199	1.1841	283.22	284.55
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-14.171	0.4511	284.55	284.76
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-23.183	1.3119	284.55	284.82
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-23.261	1.3163	284.82	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-36.418	0.7419	281.09	281.12
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-45.590	1.4512	284.81	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-58.881	1.8742	280.18	282.97
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-58.881	1.8742	282.97	284.81
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.130	0.0041	281.09	281.09
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.130	0.0041	281.09	281.09
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	281.09	281.09
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	282.97	282.97
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	5.279	0.1680	279.27	279.26

Active Scenario: Max Day + Fire J-3
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	280.18	388.1
J-2	240.62	0.000	Fixed	280.14	386.8
J-3	241.30	76.483	Fixed	278.73	366.4
J-4	241.85	0.695	Fixed	278.82	361.8
J-5	241.74	0.313	Fixed	279.20	366.6
J-6	241.50	0.078	Fixed	279.20	368.9
J-7	241.82	0.104	Fixed	279.20	365.8
J-8	242.03	5.296	Fixed	279.19	363.6
J-9	241.64	0.208	Fixed	279.20	367.6
J-10	242.19	0.208	Fixed	279.22	362.4
J-11	242.04	0.156	Fixed	279.23	364.0
J-12	242.39	0.156	Fixed	279.25	360.7
J-13	242.28	0.156	Fixed	279.25	361.9
J-14	242.58	0.052	Fixed	279.27	359.1
J-15	242.58	0.052	Fixed	279.27	359.1
J-16	242.40	0.156	Fixed	279.31	361.2
J-17	242.73	0.185	Fixed	279.38	358.7
J-18	242.90	0.026	Fixed	279.42	357.4
J-19	243.06	0.208	Fixed	279.46	356.2
J-20	243.18	0.208	Fixed	279.53	355.7
J-21	243.15	0.000	Fixed	279.54	356.2
J-22	243.46	0.208	Fixed	279.70	354.7
J-23	243.53	0.000	Fixed	279.73	354.3
J-24	243.60	0.250	Fixed	279.77	353.9
J-25	243.03	0.156	Fixed	279.97	361.5
J-26	243.03	0.052	Fixed	279.94	361.3
J-27	242.65	0.052	Fixed	279.78	363.4
J-28	241.78	0.026	Fixed	279.24	366.6
J-29	241.66	0.052	Fixed	279.32	368.6
J-30	241.74	0.026	Fixed	279.39	368.5
J-31	241.79	0.182	Fixed	279.43	368.3
J-32	242.61	0.313	Fixed	279.45	360.5
J-33	242.87	0.104	Fixed	279.49	358.4
J-34	242.87	0.130	Fixed	279.49	358.4
J-35	243.28	0.156	Fixed	279.51	354.6
J-36	243.35	0.052	Fixed	279.52	354.0
J-37	243.18	0.000	Fixed	279.52	355.7
J-38	241.87	0.104	Fixed	279.57	369.0
J-39	241.97	0.208	Fixed	279.62	368.4
J-40	242.28	0.234	Fixed	279.68	366.1
J-42	242.49	0.078	Fixed	279.64	363.6
J-43	242.67	0.026	Fixed	279.65	361.9
J-44	242.85	0.078	Fixed	279.66	360.2
J-45	243.39	0.104	Fixed	279.68	355.2

Active Scenario: Max Day + Fire J-3
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.052	Fixed	279.70	356.1
J-47	243.13	0.026	Fixed	279.71	358.0
J-48	242.96	0.104	Fixed	279.71	359.7
J-49	242.65	0.182	Fixed	279.74	363.0
J-50	243.16	0.156	Fixed	280.39	364.4
J-51	242.15	0.000	Fixed	281.09	381.1
J-52	245.69	0.130	Fixed	281.09	346.5
J-53	241.96	0.729	Fixed	281.12	383.3
J-54	240.34	0.052	Fixed	284.81	435.2
J-55	240.44	0.026	Fixed	284.92	435.3
J-56	240.44	0.130	Fixed	284.76	433.7
J-57	241.35	0.292	Fixed	278.96	368.1
J-58	242.66	0.104	Fixed	280.83	373.6
J-59	242.59	0.156	Fixed	279.47	360.9
J-60	242.27	0.052	Fixed	283.22	400.8
J-64	241.33	0.156	Fixed	284.55	423.0
J-65	241.33	0.078	Fixed	284.82	425.6
J-68	240.51	0.000	Fixed	282.97	415.5
J-69	242.59	0.000	Fixed	281.09	376.8
J-70	243.84	0.000	Fixed	281.09	364.6
J-71	243.20	0.000	Fixed	282.97	389.2
J-72	242.58	5.279	Fixed	279.26	359.0

Active Scenario: Max Day + Fire J-4
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	56.017	1.7831	280.38	280.34
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	56.017	1.7831	280.34	279.00
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	55.304	1.7604	279.00	278.37
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	0.366	0.0116	278.79	278.79
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	0.288	0.0092	278.79	278.79
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	5.296	0.1686	278.79	278.78
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	-5.112	0.1627	278.79	278.80
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	-5.320	0.1693	278.80	278.82
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	-5.528	0.1760	278.82	278.83
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	-5.684	0.1809	278.83	278.85
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	-5.840	0.1859	278.85	278.86
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	-5.996	0.1909	278.86	278.88
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	-6.048	0.1925	278.88	278.88
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	-11.379	0.3622	278.88	278.92
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	-11.535	0.3672	278.92	279.00
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	-11.720	0.3731	279.00	279.04
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	-11.746	0.3739	279.04	279.07
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	-11.954	0.3805	279.07	279.15
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	-18.430	0.5867	279.15	279.17
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	-18.430	0.5867	279.17	279.34
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	-18.638	0.5933	279.34	279.37
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	-18.638	0.5933	279.37	279.41
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	-18.888	0.6012	279.41	279.62
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	18.361	0.5844	279.62	279.60
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	18.309	0.5828	279.60	279.42
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	-22.132	0.7045	278.79	278.83
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	-22.158	0.7053	278.83	278.93
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	-22.210	0.7070	278.93	279.00

Active Scenario: Max Day + Fire J-4
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	-22.236	0.7078	279.00	279.04
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	-5.357	0.1705	279.04	279.07
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	-5.930	0.1888	279.11	279.11
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	-6.060	0.1929	279.11	279.14
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	-6.216	0.1979	279.14	279.14
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	-6.268	0.1995	279.14	279.15
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	-6.268	0.1995	279.15	279.15
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-17.061	0.5431	279.04	279.20
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-17.165	0.5464	279.20	279.25
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-10.480	0.3336	279.25	279.32
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-10.714	0.3410	279.32	279.38
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-18.257	0.5811	279.38	279.42
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-6.893	0.2194	279.25	279.27
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-6.971	0.2219	279.27	279.28
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-6.997	0.2227	279.28	279.29
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-7.075	0.2252	279.29	279.32
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-7.179	0.2285	279.32	279.33
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-7.231	0.2302	279.33	279.34
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-7.257	0.2310	279.34	279.35
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-7.361	0.2343	279.35	279.38
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-37.405	1.1906	279.62	280.08
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-38.524	1.2263	280.86	283.10
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-27.406	0.8724	284.81	284.92
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-27.432	0.8732	284.92	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	15.048	0.4790	284.81	284.76
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	-21.161	0.6736	278.37	278.53
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	-21.453	0.6829	278.53	278.79
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-37.561	1.1956	280.08	280.55

Active Scenario: Max Day + Fire J-4
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-37.665	1.1989	280.55	280.83
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	-5.670	0.1805	279.07	279.09
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	-5.826	0.1854	279.09	279.11
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-38.576	1.2279	283.10	284.53
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-14.918	0.4748	284.53	284.76
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-23.814	1.3476	284.53	284.81
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-23.892	1.3520	284.81	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-37.795	0.7700	280.83	280.86
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-45.198	1.4387	284.81	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-57.504	1.8304	280.38	283.05
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-57.504	1.8304	283.05	284.81
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.130	0.0041	280.83	280.83
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.130	0.0041	280.83	280.83
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	280.83	280.83
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.05	283.05
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	5.279	0.1680	278.88	278.87

Active Scenario: Max Day + Fire J-4

FlexTable: Junction Table

Label	Elevation (m)	Demand (L/s)	Pattern (Constituent)	Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	280.38	390.1
J-2	240.62	0.000	Fixed	280.34	388.7
J-3	241.30	0.713	Fixed	279.00	369.0
J-4	241.85	76.465	Fixed	278.37	357.4
J-5	241.74	0.313	Fixed	278.79	362.6
J-6	241.50	0.078	Fixed	278.79	365.0
J-7	241.82	0.104	Fixed	278.79	361.8
J-8	242.03	5.296	Fixed	278.78	359.7
J-9	241.64	0.208	Fixed	278.80	363.6
J-10	242.19	0.208	Fixed	278.82	358.5
J-11	242.04	0.156	Fixed	278.83	360.1
J-12	242.39	0.156	Fixed	278.85	356.8
J-13	242.28	0.156	Fixed	278.86	358.0
J-14	242.58	0.052	Fixed	278.88	355.2
J-15	242.58	0.052	Fixed	278.88	355.3
J-16	242.40	0.156	Fixed	278.92	357.4
J-17	242.73	0.185	Fixed	279.00	354.9
J-18	242.90	0.026	Fixed	279.04	353.7
J-19	243.06	0.208	Fixed	279.07	352.5
J-20	243.18	0.208	Fixed	279.15	352.0
J-21	243.15	0.000	Fixed	279.17	352.5
J-22	243.46	0.208	Fixed	279.34	351.1
J-23	243.53	0.000	Fixed	279.37	350.7
J-24	243.60	0.250	Fixed	279.41	350.4
J-25	243.03	0.156	Fixed	279.62	358.1
J-26	243.03	0.052	Fixed	279.60	357.9
J-27	242.65	0.052	Fixed	279.42	359.9
J-28	241.78	0.026	Fixed	278.83	362.6
J-29	241.66	0.052	Fixed	278.93	364.7
J-30	241.74	0.026	Fixed	279.00	364.6
J-31	241.79	0.182	Fixed	279.04	364.6
J-32	242.61	0.313	Fixed	279.07	356.8
J-33	242.87	0.104	Fixed	279.11	354.6
J-34	242.87	0.130	Fixed	279.11	354.7
J-35	243.28	0.156	Fixed	279.14	350.9
J-36	243.35	0.052	Fixed	279.14	350.3
J-37	243.18	0.000	Fixed	279.15	352.0
J-38	241.87	0.104	Fixed	279.20	365.3
J-39	241.97	0.208	Fixed	279.25	364.8
J-40	242.28	0.234	Fixed	279.32	362.5
J-42	242.49	0.078	Fixed	279.27	360.0
J-43	242.67	0.026	Fixed	279.28	358.3
J-44	242.85	0.078	Fixed	279.29	356.6
J-45	243.39	0.104	Fixed	279.32	351.6
J-46	243.31	0.052	Fixed	279.33	352.6
J-47	243.13	0.026	Fixed	279.34	354.4
J-48	242.96	0.104	Fixed	279.35	356.2

Active Scenario: Max Day + Fire J-4

FlexTable: Junction Table

Label	Elevation (m)	Demand (L/s)	Pattern (Constituent)	Hydraulic Grade (m)	Pressure (kPa)
J-49	242.65	0.182	Fixed	279.38	359.5
J-50	243.16	0.156	Fixed	280.08	361.3
J-51	242.15	0.000	Fixed	280.83	378.5
J-52	245.69	0.130	Fixed	280.83	343.9
J-53	241.96	0.729	Fixed	280.86	380.7
J-54	240.34	0.052	Fixed	284.81	435.3
J-55	240.44	0.026	Fixed	284.92	435.3
J-56	240.44	0.130	Fixed	284.76	433.7
J-57	241.35	0.292	Fixed	278.53	363.8
J-58	242.66	0.104	Fixed	280.55	370.8
J-59	242.59	0.156	Fixed	279.09	357.2
J-60	242.27	0.052	Fixed	283.10	399.6
J-64	241.33	0.156	Fixed	284.53	422.8
J-65	241.33	0.078	Fixed	284.81	425.6
J-68	240.51	0.000	Fixed	283.05	416.3
J-69	242.59	0.000	Fixed	280.83	374.2
J-70	243.84	0.000	Fixed	280.83	362.0
J-71	243.20	0.000	Fixed	283.05	390.0
J-72	242.58	5.279	Fixed	278.87	355.1

Active Scenario: Max Day + Fire J-5
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	51.296	1.6328	281.04	281.01
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	51.296	1.6328	281.01	279.87
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	50.583	1.6101	279.87	279.33
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	-1.032	0.0328	277.30	277.30
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	-1.110	0.0353	277.30	277.30
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	5.296	0.1686	277.30	277.29
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	-6.510	0.2072	277.30	277.31
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	-6.718	0.2138	277.31	277.35
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	-6.926	0.2204	277.35	277.36
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	-7.082	0.2254	277.36	277.40
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	-7.238	0.2304	277.40	277.41
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	-7.394	0.2353	277.41	277.43
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	-7.446	0.2370	277.43	277.44
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	-12.777	0.4067	277.44	277.49
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	-12.933	0.4117	277.49	277.58
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	-13.118	0.4175	277.58	277.63
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	-13.144	0.4184	277.63	277.68
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	-13.352	0.4250	277.68	277.77
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	-20.784	0.6616	277.77	277.79
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	-20.784	0.6616	277.79	278.00
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	-20.992	0.6682	278.00	278.04
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	-20.992	0.6682	278.04	278.09
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	-21.242	0.6761	278.09	278.36
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	20.728	0.6598	278.36	278.33
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	20.676	0.6581	278.33	278.11
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	-25.455	0.8103	277.30	277.36
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	-25.481	0.8111	277.36	277.48
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	-25.533	0.8128	277.48	277.57

Active Scenario: Max Day + Fire J-5
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	-25.559	0.8136	277.57	277.63
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	-6.313	0.2010	277.63	277.66
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	-6.886	0.2192	277.71	277.72
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	-7.016	0.2233	277.72	277.75
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	-7.172	0.2283	277.75	277.76
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	-7.224	0.2300	277.76	277.77
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	-7.224	0.2300	277.77	277.77
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-19.428	0.6184	277.63	277.83
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-19.532	0.6217	277.83	277.89
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-11.895	0.3786	277.89	277.98
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-12.129	0.3861	277.98	278.06
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-20.624	0.6565	278.06	278.11
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-7.845	0.2497	277.89	277.92
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-7.923	0.2522	277.92	277.93
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-7.949	0.2530	277.93	277.94
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-8.027	0.2555	277.94	277.98
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-8.131	0.2588	277.98	278.00
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-8.183	0.2605	278.00	278.01
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-8.209	0.2613	278.01	278.02
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-8.313	0.2646	278.02	278.06
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-42.126	1.3409	278.36	278.93
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-43.245	1.3765	279.89	282.68
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-26.568	0.8457	284.82	284.92
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-26.594	0.8465	284.92	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	17.550	0.5586	284.82	284.75
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	49.888	1.5880	279.33	278.55
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	49.596	1.5787	278.55	277.30
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-42.282	1.3459	278.93	279.51

Active Scenario: Max Day + Fire J-5
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-42.386	1.3492	279.51	279.86
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	-6.626	0.2109	277.66	277.69
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	-6.782	0.2159	277.69	277.71
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-43.297	1.3782	282.68	284.44
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-17.420	0.5545	284.44	284.75
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-26.033	1.4732	284.44	284.78
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-26.111	1.4776	284.78	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-42.516	0.8661	279.86	279.89
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-43.817	1.3947	284.82	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-52.783	1.6801	281.04	283.32
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-52.783	1.6801	283.32	284.82
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.130	0.0041	279.86	279.86
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.130	0.0041	279.86	279.86
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	279.86	279.86
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.32	283.32
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	5.279	0.1680	277.44	277.43

Active Scenario: Max Day + Fire J-5
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	281.04	396.6
J-2	240.62	0.000	Fixed	281.01	395.3
J-3	241.30	0.713	Fixed	279.87	377.5
J-4	241.85	0.695	Fixed	279.33	366.8
J-5	241.74	76.083	Fixed	277.30	348.0
J-6	241.50	0.078	Fixed	277.30	350.4
J-7	241.82	0.104	Fixed	277.30	347.3
J-8	242.03	5.296	Fixed	277.29	345.1
J-9	241.64	0.208	Fixed	277.31	349.1
J-10	242.19	0.208	Fixed	277.35	344.1
J-11	242.04	0.156	Fixed	277.36	345.7
J-12	242.39	0.156	Fixed	277.40	342.6
J-13	242.28	0.156	Fixed	277.41	343.8
J-14	242.58	0.052	Fixed	277.43	341.1
J-15	242.58	0.052	Fixed	277.44	341.1
J-16	242.40	0.156	Fixed	277.49	343.4
J-17	242.73	0.185	Fixed	277.58	341.1
J-18	242.90	0.026	Fixed	277.63	339.9
J-19	243.06	0.208	Fixed	277.68	338.8
J-20	243.18	0.208	Fixed	277.77	338.6
J-21	243.15	0.000	Fixed	277.79	339.1
J-22	243.46	0.208	Fixed	278.00	338.1
J-23	243.53	0.000	Fixed	278.04	337.8
J-24	243.60	0.250	Fixed	278.09	337.6
J-25	243.03	0.156	Fixed	278.36	345.8
J-26	243.03	0.052	Fixed	278.33	345.4
J-27	242.65	0.052	Fixed	278.11	347.0
J-28	241.78	0.026	Fixed	277.36	348.2
J-29	241.66	0.052	Fixed	277.48	350.6
J-30	241.74	0.026	Fixed	277.57	350.7
J-31	241.79	0.182	Fixed	277.63	350.7
J-32	242.61	0.313	Fixed	277.66	343.0
J-33	242.87	0.104	Fixed	277.71	341.0
J-34	242.87	0.130	Fixed	277.72	341.0
J-35	243.28	0.156	Fixed	277.75	337.4
J-36	243.35	0.052	Fixed	277.76	336.8
J-37	243.18	0.000	Fixed	277.77	338.5
J-38	241.87	0.104	Fixed	277.83	351.9
J-39	241.97	0.208	Fixed	277.89	351.5
J-40	242.28	0.234	Fixed	277.98	349.4
J-42	242.49	0.078	Fixed	277.92	346.8
J-43	242.67	0.026	Fixed	277.93	345.1
J-44	242.85	0.078	Fixed	277.94	343.4
J-45	243.39	0.104	Fixed	277.98	338.5

Active Scenario: Max Day + Fire J-5
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.052	Fixed	278.00	339.5
J-47	243.13	0.026	Fixed	278.01	341.3
J-48	242.96	0.104	Fixed	278.02	343.1
J-49	242.65	0.182	Fixed	278.06	346.5
J-50	243.16	0.156	Fixed	278.93	350.1
J-51	242.15	0.000	Fixed	279.86	369.0
J-52	245.69	0.130	Fixed	279.86	334.4
J-53	241.96	0.729	Fixed	279.89	371.3
J-54	240.34	0.052	Fixed	284.82	435.4
J-55	240.44	0.026	Fixed	284.92	435.4
J-56	240.44	0.130	Fixed	284.75	433.6
J-57	241.35	0.292	Fixed	278.55	364.1
J-58	242.66	0.104	Fixed	279.51	360.6
J-59	242.59	0.156	Fixed	277.69	343.5
J-60	242.27	0.052	Fixed	282.68	395.5
J-64	241.33	0.156	Fixed	284.44	421.9
J-65	241.33	0.078	Fixed	284.78	425.2
J-68	240.51	0.000	Fixed	283.32	418.9
J-69	242.59	0.000	Fixed	279.86	364.7
J-70	243.84	0.000	Fixed	279.86	352.5
J-71	243.20	0.000	Fixed	283.32	392.6
J-72	242.58	5.279	Fixed	277.43	341.0

Active Scenario: Max Day + Fire J-6
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	50.930	1.6211	281.09	281.06
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	50.930	1.6211	281.06	279.93
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	50.217	1.5985	279.93	279.40
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	67.875	2.1605	277.40	276.35
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	-7.973	0.2538	276.35	276.39
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	5.296	0.1686	276.39	276.38
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	-13.373	0.4257	276.39	276.42
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	-13.581	0.4323	276.42	276.56
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	-13.789	0.4389	276.56	276.61
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	-13.945	0.4439	276.61	276.72
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	-14.101	0.4488	276.72	276.76
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	-14.257	0.4538	276.76	276.85
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	-14.309	0.4555	276.85	276.86
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	-19.640	0.6251	276.86	276.98
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	-19.796	0.6301	276.98	277.19
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	-19.981	0.6360	277.19	277.29
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	-20.007	0.6368	277.29	277.39
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	-20.215	0.6435	277.39	277.60
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	-22.161	0.7054	277.60	277.62
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	-22.161	0.7054	277.62	277.86
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	-22.369	0.7120	277.86	277.90
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	-22.369	0.7120	277.90	277.95
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	-22.619	0.7200	277.95	278.26
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	19.717	0.6276	278.26	278.23
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	19.665	0.6260	278.23	278.03
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	-18.959	0.6035	277.40	277.43
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	-18.985	0.6043	277.43	277.50
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	-19.037	0.6060	277.50	277.56

Active Scenario: Max Day + Fire J-6
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	-19.063	0.6068	277.56	277.59
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	-0.828	0.0263	277.59	277.59
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	-1.401	0.0446	277.59	277.59
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	-1.531	0.0487	277.59	277.59
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	-1.687	0.0537	277.59	277.59
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	-1.739	0.0553	277.59	277.60
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	-1.739	0.0553	277.60	277.60
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-18.417	0.5862	277.59	277.77
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-18.521	0.5895	277.77	277.83
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-11.291	0.3594	277.83	277.91
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-11.525	0.3669	277.91	277.98
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-19.613	0.6243	277.98	278.03
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-7.438	0.2368	277.83	277.86
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-7.516	0.2392	277.86	277.87
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-7.542	0.2401	277.87	277.88
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-7.620	0.2426	277.88	277.91
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-7.724	0.2459	277.91	277.93
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-7.776	0.2475	277.93	277.94
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-7.802	0.2484	277.94	277.95
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-7.906	0.2517	277.95	277.98
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-42.492	1.3526	278.26	278.84
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-43.611	1.3882	279.82	282.65
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-26.502	0.8436	284.83	284.92
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-26.528	0.8444	284.92	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	17.741	0.5647	284.83	284.75
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	49.522	1.5763	279.40	278.63
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	49.230	1.5670	278.63	277.40
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-42.648	1.3575	278.84	279.42

Active Scenario: Max Day + Fire J-6
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-42.752	1.3608	279.42	279.78
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	-1.141	0.0363	277.59	277.59
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	-1.297	0.0413	277.59	277.59
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-43.663	1.3898	282.65	284.44
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-17.611	0.5606	284.44	284.75
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-26.208	1.4831	284.44	284.78
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-26.286	1.4875	284.78	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-42.882	0.8736	279.78	279.82
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-43.708	1.3913	284.83	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-52.417	1.6685	281.09	283.34
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-52.417	1.6685	283.34	284.83
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.130	0.0041	279.78	279.78
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.130	0.0041	279.78	279.78
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	279.78	279.78
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.34	283.34
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	5.279	0.1680	276.86	276.85

Active Scenario: Max Day + Fire J-6
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	281.09	397.0
J-2	240.62	0.000	Fixed	281.06	395.8
J-3	241.30	0.713	Fixed	279.93	378.1
J-4	241.85	0.695	Fixed	279.40	367.5
J-5	241.74	0.313	Fixed	277.40	349.0
J-6	241.50	75.848	Fixed	276.35	341.1
J-7	241.82	0.104	Fixed	276.39	338.3
J-8	242.03	5.296	Fixed	276.38	336.2
J-9	241.64	0.208	Fixed	276.42	340.4
J-10	242.19	0.208	Fixed	276.56	336.4
J-11	242.04	0.156	Fixed	276.61	338.3
J-12	242.39	0.156	Fixed	276.72	336.0
J-13	242.28	0.156	Fixed	276.76	337.4
J-14	242.58	0.052	Fixed	276.85	335.4
J-15	242.58	0.052	Fixed	276.86	335.5
J-16	242.40	0.156	Fixed	276.98	338.4
J-17	242.73	0.185	Fixed	277.19	337.2
J-18	242.90	0.026	Fixed	277.29	336.6
J-19	243.06	0.208	Fixed	277.39	336.0
J-20	243.18	0.208	Fixed	277.60	336.8
J-21	243.15	0.000	Fixed	277.62	337.4
J-22	243.46	0.208	Fixed	277.86	336.6
J-23	243.53	0.000	Fixed	277.90	336.4
J-24	243.60	0.250	Fixed	277.95	336.2
J-25	243.03	0.156	Fixed	278.26	344.8
J-26	243.03	0.052	Fixed	278.23	344.4
J-27	242.65	0.052	Fixed	278.03	346.2
J-28	241.78	0.026	Fixed	277.43	348.9
J-29	241.66	0.052	Fixed	277.50	350.8
J-30	241.74	0.026	Fixed	277.56	350.5
J-31	241.79	0.182	Fixed	277.59	350.4
J-32	242.61	0.313	Fixed	277.59	342.3
J-33	242.87	0.104	Fixed	277.59	339.8
J-34	242.87	0.130	Fixed	277.59	339.8
J-35	243.28	0.156	Fixed	277.59	335.8
J-36	243.35	0.052	Fixed	277.59	335.1
J-37	243.18	0.000	Fixed	277.60	336.8
J-38	241.87	0.104	Fixed	277.77	351.3
J-39	241.97	0.208	Fixed	277.83	350.9
J-40	242.28	0.234	Fixed	277.91	348.7
J-42	242.49	0.078	Fixed	277.86	346.1
J-43	242.67	0.026	Fixed	277.87	344.5
J-44	242.85	0.078	Fixed	277.88	342.8
J-45	243.39	0.104	Fixed	277.91	337.8

Active Scenario: Max Day + Fire J-6
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.052	Fixed	277.93	338.8
J-47	243.13	0.026	Fixed	277.94	340.6
J-48	242.96	0.104	Fixed	277.95	342.4
J-49	242.65	0.182	Fixed	277.98	345.8
J-50	243.16	0.156	Fixed	278.84	349.2
J-51	242.15	0.000	Fixed	279.78	368.3
J-52	245.69	0.130	Fixed	279.78	333.6
J-53	241.96	0.729	Fixed	279.82	370.5
J-54	240.34	0.052	Fixed	284.83	435.4
J-55	240.44	0.026	Fixed	284.92	435.4
J-56	240.44	0.130	Fixed	284.75	433.6
J-57	241.35	0.292	Fixed	278.63	364.9
J-58	242.66	0.104	Fixed	279.42	359.8
J-59	242.59	0.156	Fixed	277.59	342.5
J-60	242.27	0.052	Fixed	282.65	395.2
J-64	241.33	0.156	Fixed	284.44	421.9
J-65	241.33	0.078	Fixed	284.78	425.2
J-68	240.51	0.000	Fixed	283.34	419.1
J-69	242.59	0.000	Fixed	279.78	363.9
J-70	243.84	0.000	Fixed	279.78	351.7
J-71	243.20	0.000	Fixed	283.34	392.8
J-72	242.58	5.279	Fixed	276.85	335.4

Active Scenario: Max Day + Fire J-8
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	50.629	1.6116	281.13	281.10
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	50.629	1.6116	281.10	279.99
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	49.916	1.5889	279.99	279.46
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	59.908	1.9069	277.48	276.65
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	59.830	1.9044	276.65	274.99
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	81.066	2.5804	274.99	273.25
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	-21.340	0.6793	274.99	275.06
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	-21.548	0.6859	275.06	275.39
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	-21.756	0.6925	275.39	275.50
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	-21.912	0.6975	275.50	275.77
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	-22.068	0.7025	275.77	275.85
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	-22.224	0.7074	275.85	276.05
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	-22.276	0.7091	276.05	276.08
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	-27.607	0.8788	276.08	276.30
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	-27.763	0.8837	276.30	276.69
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	-27.948	0.8896	276.69	276.88
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	-27.974	0.8904	276.88	277.07
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	-28.182	0.8971	277.07	277.45
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	-23.261	0.7404	277.45	277.48
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	-23.261	0.7404	277.48	277.73
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	-23.469	0.7471	277.73	277.78
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	-23.469	0.7471	277.78	277.84
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	-23.719	0.7550	277.84	278.17
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	18.917	0.6022	278.17	278.14
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	18.865	0.6005	278.14	277.96
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	-11.291	0.3594	277.48	277.50
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	-11.317	0.3602	277.50	277.52
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	-11.369	0.3619	277.52	277.54

Active Scenario: Max Day + Fire J-8
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	-11.395	0.3627	277.54	277.55
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	6.040	0.1923	277.55	277.52
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	5.467	0.1740	277.48	277.48
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	5.337	0.1699	277.48	277.46
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	5.181	0.1649	277.46	277.46
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	5.129	0.1633	277.46	277.45
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	5.129	0.1633	277.45	277.45
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-17.617	0.5608	277.55	277.72
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-17.721	0.5641	277.72	277.77
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-10.813	0.3442	277.77	277.85
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-11.047	0.3516	277.85	277.92
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-18.813	0.5988	277.92	277.96
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-7.116	0.2265	277.77	277.80
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-7.194	0.2290	277.80	277.81
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-7.220	0.2298	277.81	277.82
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-7.298	0.2323	277.82	277.85
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-7.402	0.2356	277.85	277.87
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-7.454	0.2373	277.87	277.87
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-7.480	0.2381	277.87	277.88
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-7.584	0.2414	277.88	277.92
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-42.793	1.3621	278.17	278.76
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-43.912	1.3977	279.75	282.62
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-26.448	0.8419	284.83	284.92
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-26.474	0.8427	284.92	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	17.897	0.5697	284.83	284.75
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	49.221	1.5668	279.46	278.70
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	48.929	1.5575	278.70	277.48
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-42.949	1.3671	278.76	279.35

Active Scenario: Max Day + Fire J-8
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-43.053	1.3704	279.35	279.71
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	5.727	0.1823	277.52	277.50
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	5.571	0.1773	277.50	277.48
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-43.964	1.3994	282.62	284.43
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-17.767	0.5655	284.43	284.75
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-26.353	1.4912	284.43	284.77
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-26.431	1.4957	284.77	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-43.183	0.8797	279.71	279.75
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-43.618	1.3884	284.83	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-52.116	1.6589	281.13	283.35
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-52.116	1.6589	283.35	284.83
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.130	0.0041	279.71	279.71
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.130	0.0041	279.71	279.71
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	279.71	279.71
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.35	283.35
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	5.279	0.1680	276.08	276.07

Active Scenario: Max Day + Fire J-8
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	281.13	397.4
J-2	240.62	0.000	Fixed	281.10	396.2
J-3	241.30	0.713	Fixed	279.99	378.6
J-4	241.85	0.695	Fixed	279.46	368.1
J-5	241.74	0.313	Fixed	277.48	349.8
J-6	241.50	0.078	Fixed	276.65	344.0
J-7	241.82	0.104	Fixed	274.99	324.6
J-8	242.03	81.066	Fixed	273.25	305.5
J-9	241.64	0.208	Fixed	275.06	327.1
J-10	242.19	0.208	Fixed	275.39	324.9
J-11	242.04	0.156	Fixed	275.50	327.5
J-12	242.39	0.156	Fixed	275.77	326.7
J-13	242.28	0.156	Fixed	275.85	328.5
J-14	242.58	0.052	Fixed	276.05	327.5
J-15	242.58	0.052	Fixed	276.08	327.9
J-16	242.40	0.156	Fixed	276.30	331.7
J-17	242.73	0.185	Fixed	276.69	332.3
J-18	242.90	0.026	Fixed	276.88	332.5
J-19	243.06	0.208	Fixed	277.07	332.9
J-20	243.18	0.208	Fixed	277.45	335.4
J-21	243.15	0.000	Fixed	277.48	335.9
J-22	243.46	0.208	Fixed	277.73	335.4
J-23	243.53	0.000	Fixed	277.78	335.2
J-24	243.60	0.250	Fixed	277.84	335.1
J-25	243.03	0.156	Fixed	278.17	343.9
J-26	243.03	0.052	Fixed	278.14	343.6
J-27	242.65	0.052	Fixed	277.96	345.6
J-28	241.78	0.026	Fixed	277.50	349.5
J-29	241.66	0.052	Fixed	277.52	351.0
J-30	241.74	0.026	Fixed	277.54	350.4
J-31	241.79	0.182	Fixed	277.55	350.0
J-32	242.61	0.313	Fixed	277.52	341.7
J-33	242.87	0.104	Fixed	277.48	338.8
J-34	242.87	0.130	Fixed	277.48	338.7
J-35	243.28	0.156	Fixed	277.46	334.5
J-36	243.35	0.052	Fixed	277.46	333.8
J-37	243.18	0.000	Fixed	277.45	335.4
J-38	241.87	0.104	Fixed	277.72	350.9
J-39	241.97	0.208	Fixed	277.77	350.4
J-40	242.28	0.234	Fixed	277.85	348.1
J-42	242.49	0.078	Fixed	277.80	345.6
J-43	242.67	0.026	Fixed	277.81	343.9
J-44	242.85	0.078	Fixed	277.82	342.2
J-45	243.39	0.104	Fixed	277.85	337.3

Active Scenario: Max Day + Fire J-8
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.052	Fixed	277.87	338.2
J-47	243.13	0.026	Fixed	277.87	340.0
J-48	242.96	0.104	Fixed	277.88	341.8
J-49	242.65	0.182	Fixed	277.92	345.2
J-50	243.16	0.156	Fixed	278.76	348.4
J-51	242.15	0.000	Fixed	279.71	367.6
J-52	245.69	0.130	Fixed	279.71	333.0
J-53	241.96	0.729	Fixed	279.75	369.9
J-54	240.34	0.052	Fixed	284.83	435.4
J-55	240.44	0.026	Fixed	284.92	435.4
J-56	240.44	0.130	Fixed	284.75	433.6
J-57	241.35	0.292	Fixed	278.70	365.6
J-58	242.66	0.104	Fixed	279.35	359.1
J-59	242.59	0.156	Fixed	277.50	341.7
J-60	242.27	0.052	Fixed	282.62	394.9
J-64	241.33	0.156	Fixed	284.43	421.8
J-65	241.33	0.078	Fixed	284.77	425.2
J-68	240.51	0.000	Fixed	283.35	419.3
J-69	242.59	0.000	Fixed	279.71	363.3
J-70	243.84	0.000	Fixed	279.71	351.1
J-71	243.20	0.000	Fixed	283.35	393.0
J-72	242.58	5.279	Fixed	276.07	327.8

Active Scenario: Max Day + Fire J-10
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	50.314	1.6015	281.17	281.14
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	50.314	1.6015	281.14	280.04
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	49.601	1.5788	280.04	279.52
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	52.506	1.6713	277.57	276.91
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	52.428	1.6688	276.91	275.62
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	5.296	0.1686	275.62	275.60
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	47.028	1.4969	275.62	275.32
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	46.820	1.4903	275.32	273.93
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	-29.158	0.9281	273.93	274.12
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	-29.314	0.9331	274.12	274.58
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	-29.470	0.9381	274.58	274.71
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	-29.626	0.9430	274.71	275.06
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	-29.678	0.9447	275.06	275.11
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	-35.009	1.1144	275.11	275.44
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	-35.165	1.1193	275.44	276.05
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	-35.350	1.1252	276.05	276.35
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	-35.376	1.1261	276.35	276.65
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	-35.584	1.1327	276.65	277.23
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	-25.496	0.8115	277.23	277.26
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	-25.496	0.8115	277.26	277.56
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	-25.704	0.8182	277.56	277.62
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	-25.704	0.8182	277.62	277.69
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	-25.954	0.8261	277.69	278.08
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	16.999	0.5411	278.08	278.06
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	16.947	0.5394	278.06	277.91
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	-4.205	0.1338	277.57	277.57
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	-4.231	0.1347	277.57	277.57
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	-4.283	0.1363	277.57	277.58

Active Scenario: Max Day + Fire J-10
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	-4.309	0.1372	277.58	277.58
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	11.208	0.3568	277.58	277.48
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	10.635	0.3385	277.35	277.34
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	10.505	0.3344	277.34	277.26
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	10.349	0.3294	277.26	277.25
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	10.297	0.3278	277.25	277.23
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	10.297	0.3278	277.23	277.23
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-15.699	0.4997	277.58	277.71
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-15.803	0.5030	277.71	277.76
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-9.666	0.3077	277.76	277.82
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-9.900	0.3151	277.82	277.87
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-16.895	0.5378	277.87	277.91
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-6.345	0.2020	277.76	277.78
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-6.423	0.2044	277.78	277.79
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-6.449	0.2053	277.79	277.79
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-6.527	0.2078	277.79	277.82
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-6.631	0.2111	277.82	277.83
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-6.683	0.2127	277.83	277.84
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-6.709	0.2136	277.84	277.85
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-6.813	0.2169	277.85	277.87
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-43.108	1.3722	278.08	278.68
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-44.227	1.4078	279.68	282.59
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-26.390	0.8400	284.83	284.93
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-26.416	0.8409	284.93	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	18.061	0.5749	284.83	284.75
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	48.906	1.5567	279.52	278.77
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	48.614	1.5474	278.77	277.57
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-43.264	1.3771	278.68	279.28

Active Scenario: Max Day + Fire J-10
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-43.368	1.3805	279.28	279.64
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	10.895	0.3468	277.48	277.40
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	10.739	0.3418	277.40	277.35
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-44.279	1.4094	282.59	284.42
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-17.931	0.5708	284.42	284.75
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-26.504	1.4998	284.42	284.77
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-26.582	1.5042	284.77	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-43.498	0.8861	279.64	279.68
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-43.524	1.3854	284.83	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-51.801	1.6489	281.17	283.37
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-51.801	1.6489	283.37	284.83
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.130	0.0041	279.64	279.64
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.130	0.0041	279.64	279.64
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	279.64	279.64
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.37	283.37
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	5.279	0.1680	275.11	275.10

Active Scenario: Max Day + Fire J-10
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	281.17	397.9
J-2	240.62	0.000	Fixed	281.14	396.6
J-3	241.30	0.713	Fixed	280.04	379.1
J-4	241.85	0.695	Fixed	279.52	368.7
J-5	241.74	0.313	Fixed	277.57	350.6
J-6	241.50	0.078	Fixed	276.91	346.6
J-7	241.82	0.104	Fixed	275.62	330.7
J-8	242.03	5.296	Fixed	275.60	328.6
J-9	241.64	0.208	Fixed	275.32	329.6
J-10	242.19	75.978	Fixed	273.93	310.6
J-11	242.04	0.156	Fixed	274.12	314.0
J-12	242.39	0.156	Fixed	274.58	315.0
J-13	242.28	0.156	Fixed	274.71	317.4
J-14	242.58	0.052	Fixed	275.06	317.8
J-15	242.58	0.052	Fixed	275.11	318.4
J-16	242.40	0.156	Fixed	275.44	323.4
J-17	242.73	0.185	Fixed	276.05	326.1
J-18	242.90	0.026	Fixed	276.35	327.3
J-19	243.06	0.208	Fixed	276.65	328.7
J-20	243.18	0.208	Fixed	277.23	333.2
J-21	243.15	0.000	Fixed	277.26	333.8
J-22	243.46	0.208	Fixed	277.56	333.8
J-23	243.53	0.000	Fixed	277.62	333.6
J-24	243.60	0.250	Fixed	277.69	333.6
J-25	243.03	0.156	Fixed	278.08	343.0
J-26	243.03	0.052	Fixed	278.06	342.8
J-27	242.65	0.052	Fixed	277.91	345.1
J-28	241.78	0.026	Fixed	277.57	350.3
J-29	241.66	0.052	Fixed	277.57	351.5
J-30	241.74	0.026	Fixed	277.58	350.7
J-31	241.79	0.182	Fixed	277.58	350.3
J-32	242.61	0.313	Fixed	277.48	341.3
J-33	242.87	0.104	Fixed	277.35	337.5
J-34	242.87	0.130	Fixed	277.34	337.4
J-35	243.28	0.156	Fixed	277.26	332.6
J-36	243.35	0.052	Fixed	277.25	331.8
J-37	243.18	0.000	Fixed	277.23	333.3
J-38	241.87	0.104	Fixed	277.71	350.8
J-39	241.97	0.208	Fixed	277.76	350.2
J-40	242.28	0.234	Fixed	277.82	347.8
J-42	242.49	0.078	Fixed	277.78	345.4
J-43	242.67	0.026	Fixed	277.79	343.7
J-44	242.85	0.078	Fixed	277.79	342.0
J-45	243.39	0.104	Fixed	277.82	336.9

Active Scenario: Max Day + Fire J-10
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.052	Fixed	277.83	337.9
J-47	243.13	0.026	Fixed	277.84	339.7
J-48	242.96	0.104	Fixed	277.85	341.4
J-49	242.65	0.182	Fixed	277.87	344.7
J-50	243.16	0.156	Fixed	278.68	347.6
J-51	242.15	0.000	Fixed	279.64	367.0
J-52	245.69	0.130	Fixed	279.64	332.3
J-53	241.96	0.729	Fixed	279.68	369.2
J-54	240.34	0.052	Fixed	284.83	435.4
J-55	240.44	0.026	Fixed	284.93	435.4
J-56	240.44	0.130	Fixed	284.75	433.6
J-57	241.35	0.292	Fixed	278.77	366.2
J-58	242.66	0.104	Fixed	279.28	358.4
J-59	242.59	0.156	Fixed	277.40	340.7
J-60	242.27	0.052	Fixed	282.59	394.6
J-64	241.33	0.156	Fixed	284.42	421.8
J-65	241.33	0.078	Fixed	284.77	425.2
J-68	240.51	0.000	Fixed	283.37	419.5
J-69	242.59	0.000	Fixed	279.64	362.6
J-70	243.84	0.000	Fixed	279.64	350.4
J-71	243.20	0.000	Fixed	283.37	393.2
J-72	242.58	5.279	Fixed	275.10	318.3

Active Scenario: Max Day + Fire J-14
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	49.947	1.5899	281.22	281.19
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	49.947	1.5899	281.19	280.10
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	49.234	1.5672	280.10	279.59
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	43.002	1.3688	277.67	277.21
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	42.924	1.3663	277.21	276.32
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	5.296	0.1686	276.32	276.31
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	37.524	1.1944	276.32	276.12
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	37.316	1.1878	276.12	275.21
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	37.108	1.1812	275.21	274.91
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	36.952	1.1762	274.91	274.21
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	36.796	1.1712	274.21	274.00
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	36.640	1.1663	274.00	273.49
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	-39.182	1.2472	273.49	273.59
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	-44.513	1.4169	273.59	274.10
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	-44.669	1.4219	274.10	275.05
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	-44.854	1.4278	275.05	275.51
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	-44.880	1.4286	275.51	275.98
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	-45.088	1.4352	275.98	276.87
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	-29.269	0.9317	276.87	276.92
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	-29.269	0.9317	276.92	277.31
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	-29.477	0.9383	277.31	277.38
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	-29.477	0.9383	277.38	277.47
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	-29.727	0.9462	277.47	277.98
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	13.591	0.4326	277.98	277.96
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	13.539	0.4310	277.96	277.86
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	4.933	0.1570	277.67	277.66
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	4.907	0.1562	277.66	277.66
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	4.855	0.1545	277.66	277.65

Active Scenario: Max Day + Fire J-14
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	4.829	0.1537	277.65	277.65
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	16.938	0.5392	277.65	277.44
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	16.365	0.5209	277.15	277.13
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	16.235	0.5168	277.13	276.95
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	16.079	0.5118	276.95	276.93
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	16.027	0.5102	276.93	276.89
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	16.027	0.5102	276.89	276.87
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-12.291	0.3913	277.65	277.74
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-12.395	0.3946	277.74	277.76
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-7.629	0.2428	277.76	277.80
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-7.863	0.2503	277.80	277.84
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-13.487	0.4293	277.84	277.86
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-4.975	0.1584	277.76	277.78
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-5.053	0.1608	277.78	277.78
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-5.079	0.1617	277.78	277.79
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-5.157	0.1641	277.79	277.80
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-5.261	0.1675	277.80	277.81
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-5.313	0.1691	277.81	277.82
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-5.339	0.1699	277.82	277.82
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-5.443	0.1732	277.82	277.84
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-43.475	1.3838	277.98	278.58
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-44.594	1.4195	279.60	282.55
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-26.324	0.8379	284.83	284.93
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-26.350	0.8387	284.93	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	18.251	0.5810	284.83	284.75
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	48.539	1.5451	279.59	278.85
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	48.247	1.5358	278.85	277.67
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-43.631	1.3888	278.58	279.19

Active Scenario: Max Day + Fire J-14
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-43.735	1.3921	279.19	279.56
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	16.625	0.5292	277.44	277.27
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	16.469	0.5242	277.27	277.15
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-44.646	1.4211	282.55	284.42
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-18.121	0.5768	284.42	284.75
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-26.681	1.5098	284.42	284.77
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-26.759	1.5142	284.77	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-43.865	0.8936	279.56	279.60
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-43.414	1.3819	284.83	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-51.434	1.6372	281.22	283.39
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-51.434	1.6372	283.39	284.83
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.130	0.0041	279.56	279.56
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.130	0.0041	279.56	279.56
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	279.56	279.56
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.39	283.39
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	5.279	0.1680	273.59	273.58

Active Scenario: Max Day + Fire J-14
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	281.22	398.3
J-2	240.62	0.000	Fixed	281.19	397.0
J-3	241.30	0.713	Fixed	280.10	379.8
J-4	241.85	0.695	Fixed	279.59	369.4
J-5	241.74	0.313	Fixed	277.67	351.6
J-6	241.50	0.078	Fixed	277.21	349.5
J-7	241.82	0.104	Fixed	276.32	337.6
J-8	242.03	5.296	Fixed	276.31	335.5
J-9	241.64	0.208	Fixed	276.12	337.5
J-10	242.19	0.208	Fixed	275.21	323.1
J-11	242.04	0.156	Fixed	274.91	321.7
J-12	242.39	0.156	Fixed	274.21	311.4
J-13	242.28	0.156	Fixed	274.00	310.4
J-14	242.58	75.822	Fixed	273.49	302.5
J-15	242.58	0.052	Fixed	273.59	303.4
J-16	242.40	0.156	Fixed	274.10	310.3
J-17	242.73	0.185	Fixed	275.05	316.3
J-18	242.90	0.026	Fixed	275.51	319.2
J-19	243.06	0.208	Fixed	275.98	322.2
J-20	243.18	0.208	Fixed	276.87	329.8
J-21	243.15	0.000	Fixed	276.92	330.5
J-22	243.46	0.208	Fixed	277.31	331.3
J-23	243.53	0.000	Fixed	277.38	331.3
J-24	243.60	0.250	Fixed	277.47	331.5
J-25	243.03	0.156	Fixed	277.98	342.0
J-26	243.03	0.052	Fixed	277.96	341.9
J-27	242.65	0.052	Fixed	277.86	344.6
J-28	241.78	0.026	Fixed	277.66	351.2
J-29	241.66	0.052	Fixed	277.66	352.3
J-30	241.74	0.026	Fixed	277.65	351.5
J-31	241.79	0.182	Fixed	277.65	351.0
J-32	242.61	0.313	Fixed	277.44	340.8
J-33	242.87	0.104	Fixed	277.15	335.5
J-34	242.87	0.130	Fixed	277.13	335.3
J-35	243.28	0.156	Fixed	276.95	329.6
J-36	243.35	0.052	Fixed	276.93	328.6
J-37	243.18	0.000	Fixed	276.89	329.9
J-38	241.87	0.104	Fixed	277.74	351.0
J-39	241.97	0.208	Fixed	277.76	350.3
J-40	242.28	0.234	Fixed	277.80	347.7
J-42	242.49	0.078	Fixed	277.78	345.4
J-43	242.67	0.026	Fixed	277.78	343.6
J-44	242.85	0.078	Fixed	277.79	341.9
J-45	243.39	0.104	Fixed	277.80	336.8

Active Scenario: Max Day + Fire J-14
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.052	Fixed	277.81	337.7
J-47	243.13	0.026	Fixed	277.82	339.5
J-48	242.96	0.104	Fixed	277.82	341.2
J-49	242.65	0.182	Fixed	277.84	344.4
J-50	243.16	0.156	Fixed	278.58	346.7
J-51	242.15	0.000	Fixed	279.56	366.2
J-52	245.69	0.130	Fixed	279.56	331.5
J-53	241.96	0.729	Fixed	279.60	368.4
J-54	240.34	0.052	Fixed	284.83	435.4
J-55	240.44	0.026	Fixed	284.93	435.4
J-56	240.44	0.130	Fixed	284.75	433.6
J-57	241.35	0.292	Fixed	278.85	367.0
J-58	242.66	0.104	Fixed	279.19	357.6
J-59	242.59	0.156	Fixed	277.27	339.4
J-60	242.27	0.052	Fixed	282.55	394.2
J-64	241.33	0.156	Fixed	284.42	421.7
J-65	241.33	0.078	Fixed	284.77	425.1
J-68	240.51	0.000	Fixed	283.39	419.7
J-69	242.59	0.000	Fixed	279.56	361.8
J-70	243.84	0.000	Fixed	279.56	349.6
J-71	243.20	0.000	Fixed	283.39	393.3
J-72	242.58	5.279	Fixed	273.58	303.3

Active Scenario: Max Day + Fire J-18
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	49.536	1.5768	281.27	281.24
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	49.536	1.5768	281.24	280.18
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	48.823	1.5541	280.18	279.67
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	34.356	1.0936	277.77	277.48
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	34.279	1.0911	277.48	276.89
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	5.296	0.1686	276.89	276.87
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	28.878	0.9192	276.89	276.77
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	28.670	0.9126	276.77	276.20
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	28.462	0.9060	276.20	276.02
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	28.307	0.9010	276.02	275.59
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	28.150	0.8961	275.59	275.47
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	27.994	0.8911	275.47	275.16
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	27.942	0.8894	275.16	275.11
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	22.611	0.7197	275.11	274.96
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	22.455	0.7148	274.96	274.70
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	22.270	0.7089	274.70	274.57
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	-53.525	1.7038	274.57	275.22
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	-53.733	1.7104	275.22	276.46
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	-33.323	1.0607	276.46	276.51
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	-33.323	1.0607	276.51	277.01
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	-33.531	1.0673	277.01	277.11
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	-33.531	1.0673	277.11	277.22
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	-33.781	1.0753	277.22	277.86
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	9.949	0.3167	277.86	277.85
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	9.897	0.3150	277.85	277.79
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	13.166	0.4191	277.77	277.76
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	13.140	0.4183	277.76	277.72
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	13.088	0.4166	277.72	277.70

Active Scenario: Max Day + Fire J-18
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	13.062	0.4158	277.70	277.68
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	21.529	0.6853	277.68	277.35
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	20.956	0.6671	276.90	276.86
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	20.826	0.6629	276.86	276.59
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	20.670	0.6580	276.59	276.54
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	20.618	0.6563	276.54	276.49
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	20.618	0.6563	276.49	276.46
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-8.649	0.2753	277.68	277.73
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-8.753	0.2786	277.73	277.74
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-5.451	0.1735	277.74	277.76
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-5.685	0.1810	277.76	277.78
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-9.845	0.3134	277.78	277.79
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-3.510	0.1117	277.74	277.75
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-3.588	0.1142	277.75	277.75
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-3.614	0.1150	277.75	277.75
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-3.692	0.1175	277.75	277.76
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-3.796	0.1208	277.76	277.76
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-3.848	0.1225	277.76	277.77
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-3.874	0.1233	277.77	277.77
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-3.978	0.1266	277.77	277.78
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-43.886	1.3969	277.86	278.47
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-45.005	1.4326	279.51	282.51
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-26.249	0.8355	284.83	284.93
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-26.275	0.8364	284.93	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	18.464	0.5877	284.83	284.75
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	48.128	1.5320	279.67	278.94
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	47.836	1.5227	278.94	277.77
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-44.042	1.4019	278.47	279.10

Active Scenario: Max Day + Fire J-18
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-44.146	1.4052	279.10	279.47
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	21.216	0.6753	277.35	277.08
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	21.060	0.6704	277.08	276.90
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-45.057	1.4342	282.51	284.41
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-18.334	0.5836	284.41	284.75
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-26.879	1.5210	284.41	284.77
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-26.957	1.5255	284.77	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-44.276	0.9020	279.47	279.51
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-43.290	1.3780	284.83	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-51.023	1.6241	281.27	283.41
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-51.023	1.6241	283.41	284.83
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.130	0.0041	279.47	279.47
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.130	0.0041	279.47	279.47
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	279.47	279.47
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.41	283.41
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	5.279	0.1680	275.11	275.10

Active Scenario: Max Day + Fire J-18
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	281.27	398.9
J-2	240.62	0.000	Fixed	281.24	397.6
J-3	241.30	0.713	Fixed	280.18	380.5
J-4	241.85	0.695	Fixed	279.67	370.2
J-5	241.74	0.313	Fixed	277.77	352.7
J-6	241.50	0.078	Fixed	277.48	352.1
J-7	241.82	0.104	Fixed	276.89	343.2
J-8	242.03	5.296	Fixed	276.87	341.0
J-9	241.64	0.208	Fixed	276.77	343.8
J-10	242.19	0.208	Fixed	276.20	332.9
J-11	242.04	0.156	Fixed	276.02	332.6
J-12	242.39	0.156	Fixed	275.59	325.0
J-13	242.28	0.156	Fixed	275.47	324.8
J-14	242.58	0.052	Fixed	275.16	318.8
J-15	242.58	0.052	Fixed	275.11	318.4
J-16	242.40	0.156	Fixed	274.96	318.7
J-17	242.73	0.185	Fixed	274.70	312.8
J-18	242.90	75.796	Fixed	274.57	310.0
J-19	243.06	0.208	Fixed	275.22	314.7
J-20	243.18	0.208	Fixed	276.46	325.7
J-21	243.15	0.000	Fixed	276.51	326.5
J-22	243.46	0.208	Fixed	277.01	328.4
J-23	243.53	0.000	Fixed	277.11	328.6
J-24	243.60	0.250	Fixed	277.22	329.0
J-25	243.03	0.156	Fixed	277.86	340.9
J-26	243.03	0.052	Fixed	277.85	340.8
J-27	242.65	0.052	Fixed	277.79	343.9
J-28	241.78	0.026	Fixed	277.76	352.1
J-29	241.66	0.052	Fixed	277.72	352.9
J-30	241.74	0.026	Fixed	277.70	351.9
J-31	241.79	0.182	Fixed	277.68	351.3
J-32	242.61	0.313	Fixed	277.35	340.0
J-33	242.87	0.104	Fixed	276.90	333.1
J-34	242.87	0.130	Fixed	276.86	332.7
J-35	243.28	0.156	Fixed	276.59	326.0
J-36	243.35	0.052	Fixed	276.54	324.9
J-37	243.18	0.000	Fixed	276.49	326.0
J-38	241.87	0.104	Fixed	277.73	350.9
J-39	241.97	0.208	Fixed	277.74	350.1
J-40	242.28	0.234	Fixed	277.76	347.2
J-42	242.49	0.078	Fixed	277.75	345.1
J-43	242.67	0.026	Fixed	277.75	343.3
J-44	242.85	0.078	Fixed	277.75	341.6
J-45	243.39	0.104	Fixed	277.76	336.4

Active Scenario: Max Day + Fire J-18
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.052	Fixed	277.76	337.2
J-47	243.13	0.026	Fixed	277.77	339.0
J-48	242.96	0.104	Fixed	277.77	340.7
J-49	242.65	0.182	Fixed	277.78	343.8
J-50	243.16	0.156	Fixed	278.47	345.6
J-51	242.15	0.000	Fixed	279.47	365.3
J-52	245.69	0.130	Fixed	279.47	330.6
J-53	241.96	0.729	Fixed	279.51	367.6
J-54	240.34	0.052	Fixed	284.83	435.4
J-55	240.44	0.026	Fixed	284.93	435.4
J-56	240.44	0.130	Fixed	284.75	433.6
J-57	241.35	0.292	Fixed	278.94	367.9
J-58	242.66	0.104	Fixed	279.10	356.6
J-59	242.59	0.156	Fixed	277.08	337.5
J-60	242.27	0.052	Fixed	282.51	393.8
J-64	241.33	0.156	Fixed	284.41	421.6
J-65	241.33	0.078	Fixed	284.77	425.1
J-68	240.51	0.000	Fixed	283.41	419.9
J-69	242.59	0.000	Fixed	279.47	360.9
J-70	243.84	0.000	Fixed	279.47	348.7
J-71	243.20	0.000	Fixed	283.41	393.6
J-72	242.58	5.279	Fixed	275.10	318.2

Active Scenario: Max Day + Fire J-19
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	49.412	1.5728	281.29	281.26
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	49.412	1.5728	281.26	280.20
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	48.699	1.5501	280.20	279.70
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	31.953	1.0171	277.81	277.55
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	31.875	1.0146	277.55	277.03
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	5.296	0.1686	277.03	277.02
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	26.475	0.8427	277.03	276.93
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	26.267	0.8361	276.93	276.45
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	26.059	0.8295	276.45	276.29
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	25.903	0.8245	276.29	275.93
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	25.747	0.8196	275.93	275.82
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	25.591	0.8146	275.82	275.56
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	25.539	0.8129	275.56	275.52
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	20.208	0.6433	275.52	275.40
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	20.052	0.6383	275.40	275.19
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	19.867	0.6324	275.19	275.09
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	19.841	0.6316	275.09	274.98
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	-56.137	1.7869	274.98	276.33
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	-34.532	1.0992	276.33	276.38
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	-34.532	1.0992	276.38	276.92
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	-34.740	1.1058	276.92	277.02
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	-34.740	1.1058	277.02	277.14
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	-34.990	1.1138	277.14	277.82
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	8.864	0.2822	277.82	277.81
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	8.812	0.2805	277.81	277.77
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	15.445	0.4916	277.81	277.79
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	15.419	0.4908	277.79	277.74
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	15.367	0.4892	277.74	277.70

Active Scenario: Max Day + Fire J-19
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	15.341	0.4883	277.70	277.68
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	22.724	0.7233	277.68	277.31
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	22.151	0.7051	276.82	276.78
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	22.021	0.7009	276.78	276.47
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	21.865	0.6960	276.47	276.42
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	21.813	0.6943	276.42	276.36
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	21.813	0.6943	276.36	276.33
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-7.564	0.2408	277.68	277.72
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-7.668	0.2441	277.72	277.73
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-4.803	0.1529	277.73	277.74
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-5.037	0.1603	277.74	277.76
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-8.760	0.2788	277.76	277.77
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-3.073	0.0978	277.73	277.73
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-3.151	0.1003	277.73	277.73
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-3.177	0.1011	277.73	277.74
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-3.255	0.1036	277.74	277.74
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-3.359	0.1069	277.74	277.75
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-3.411	0.1086	277.75	277.75
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-3.437	0.1094	277.75	277.75
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-3.541	0.1127	277.75	277.76
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-44.010	1.4009	277.82	278.44
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-45.129	1.4365	279.48	282.50
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-26.226	0.8348	284.83	284.93
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-26.252	0.8356	284.93	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	18.528	0.5898	284.83	284.75
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	48.004	1.5280	279.70	278.97
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	47.712	1.5187	278.97	277.81
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-44.166	1.4058	278.44	279.07

Active Scenario: Max Day + Fire J-19
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-44.270	1.4092	279.07	279.45
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	22.411	0.7133	277.31	277.02
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	22.255	0.7084	277.02	276.82
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-45.181	1.4382	282.50	284.41
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-18.398	0.5856	284.41	284.75
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-26.939	1.5244	284.41	284.76
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-27.017	1.5288	284.76	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-44.400	0.9045	279.45	279.48
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-43.253	1.3768	284.83	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-50.899	1.6202	281.29	283.42
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-50.899	1.6202	283.42	284.83
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.130	0.0041	279.45	279.45
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.130	0.0041	279.45	279.45
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	279.45	279.45
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.42	283.42
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	5.279	0.1680	275.52	275.51

Active Scenario: Max Day + Fire J-19
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	281.29	399.0
J-2	240.62	0.000	Fixed	281.26	397.7
J-3	241.30	0.713	Fixed	280.20	380.7
J-4	241.85	0.695	Fixed	279.70	370.4
J-5	241.74	0.313	Fixed	277.81	353.0
J-6	241.50	0.078	Fixed	277.55	352.8
J-7	241.82	0.104	Fixed	277.03	344.6
J-8	242.03	5.296	Fixed	277.02	342.4
J-9	241.64	0.208	Fixed	276.93	345.4
J-10	242.19	0.208	Fixed	276.45	335.3
J-11	242.04	0.156	Fixed	276.29	335.2
J-12	242.39	0.156	Fixed	275.93	328.3
J-13	242.28	0.156	Fixed	275.82	328.3
J-14	242.58	0.052	Fixed	275.56	322.8
J-15	242.58	0.052	Fixed	275.52	322.4
J-16	242.40	0.156	Fixed	275.40	323.0
J-17	242.73	0.185	Fixed	275.19	317.6
J-18	242.90	0.026	Fixed	275.09	315.0
J-19	243.06	75.978	Fixed	274.98	312.4
J-20	243.18	0.208	Fixed	276.33	324.4
J-21	243.15	0.000	Fixed	276.38	325.3
J-22	243.46	0.208	Fixed	276.92	327.5
J-23	243.53	0.000	Fixed	277.02	327.7
J-24	243.60	0.250	Fixed	277.14	328.3
J-25	243.03	0.156	Fixed	277.82	340.5
J-26	243.03	0.052	Fixed	277.81	340.4
J-27	242.65	0.052	Fixed	277.77	343.7
J-28	241.78	0.026	Fixed	277.79	352.4
J-29	241.66	0.052	Fixed	277.74	353.1
J-30	241.74	0.026	Fixed	277.70	352.0
J-31	241.79	0.182	Fixed	277.68	351.3
J-32	242.61	0.313	Fixed	277.31	339.6
J-33	242.87	0.104	Fixed	276.82	332.2
J-34	242.87	0.130	Fixed	276.78	331.8
J-35	243.28	0.156	Fixed	276.47	324.8
J-36	243.35	0.052	Fixed	276.42	323.7
J-37	243.18	0.000	Fixed	276.36	324.7
J-38	241.87	0.104	Fixed	277.72	350.8
J-39	241.97	0.208	Fixed	277.73	349.9
J-40	242.28	0.234	Fixed	277.74	347.1
J-42	242.49	0.078	Fixed	277.73	344.9
J-43	242.67	0.026	Fixed	277.73	343.2
J-44	242.85	0.078	Fixed	277.74	341.4
J-45	243.39	0.104	Fixed	277.74	336.2

Active Scenario: Max Day + Fire J-19
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.052	Fixed	277.75	337.0
J-47	243.13	0.026	Fixed	277.75	338.8
J-48	242.96	0.104	Fixed	277.75	340.5
J-49	242.65	0.182	Fixed	277.76	343.6
J-50	243.16	0.156	Fixed	278.44	345.3
J-51	242.15	0.000	Fixed	279.45	365.0
J-52	245.69	0.130	Fixed	279.45	330.4
J-53	241.96	0.729	Fixed	279.48	367.3
J-54	240.34	0.052	Fixed	284.83	435.4
J-55	240.44	0.026	Fixed	284.93	435.4
J-56	240.44	0.130	Fixed	284.75	433.6
J-57	241.35	0.292	Fixed	278.97	368.2
J-58	242.66	0.104	Fixed	279.07	356.3
J-59	242.59	0.156	Fixed	277.02	336.9
J-60	242.27	0.052	Fixed	282.50	393.7
J-64	241.33	0.156	Fixed	284.41	421.6
J-65	241.33	0.078	Fixed	284.76	425.1
J-68	240.51	0.000	Fixed	283.42	419.9
J-69	242.59	0.000	Fixed	279.45	360.7
J-70	243.84	0.000	Fixed	279.45	348.5
J-71	243.20	0.000	Fixed	283.42	393.6
J-72	242.58	5.279	Fixed	275.51	322.3

Active Scenario: Max Day + Fire J-20
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	49.112	1.5633	281.33	281.30
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	49.112	1.5633	281.30	280.25
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	48.399	1.5406	280.25	279.75
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	26.287	0.8368	277.89	277.71
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	26.209	0.8343	277.71	277.35
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	5.296	0.1686	277.35	277.33
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	20.809	0.6624	277.35	277.28
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	20.601	0.6558	277.28	276.98
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	20.393	0.6491	276.98	276.88
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	20.237	0.6442	276.88	276.65
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	20.081	0.6392	276.65	276.58
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	19.925	0.6342	276.58	276.42
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	19.873	0.6326	276.42	276.39
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	14.542	0.4629	276.39	276.32
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	14.386	0.4579	276.32	276.21
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	14.201	0.4520	276.21	276.15
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	14.175	0.4512	276.15	276.10
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	13.967	0.4446	276.10	275.99
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	-37.506	1.1938	275.99	276.06
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	-37.506	1.1938	276.06	276.68
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	-37.714	1.2005	276.68	276.80
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	-37.714	1.2005	276.80	276.94
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	-37.964	1.2084	276.94	277.73
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	6.190	0.1970	277.73	277.73
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	6.138	0.1954	277.73	277.71
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	20.812	0.6625	277.89	277.85
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	20.786	0.6616	277.85	277.76
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	20.734	0.6600	277.76	277.70

Active Scenario: Max Day + Fire J-20
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	20.708	0.6591	277.70	277.67
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	25.416	0.8090	277.67	277.21
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	24.843	0.7908	276.60	276.55
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	24.713	0.7866	276.55	276.17
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	24.557	0.7817	276.17	276.11
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	24.505	0.7800	276.11	276.04
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	24.505	0.7800	276.04	275.99
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-4.890	0.1557	277.67	277.68
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-4.994	0.1590	277.68	277.69
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-3.205	0.1020	277.69	277.69
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-3.439	0.1095	277.69	277.70
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-6.086	0.1937	277.70	277.71
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-1.997	0.0636	277.69	277.69
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-2.075	0.0661	277.69	277.69
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-2.101	0.0669	277.69	277.69
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-2.179	0.0694	277.69	277.69
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-2.283	0.0727	277.69	277.70
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-2.335	0.0743	277.70	277.70
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-2.361	0.0752	277.70	277.70
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-2.465	0.0785	277.70	277.70
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-44.310	1.4104	277.73	278.36
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-45.429	1.4460	279.42	282.47
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-26.171	0.8331	284.83	284.93
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-26.197	0.8339	284.93	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	18.683	0.5947	284.83	284.74
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	47.704	1.5185	279.75	279.04
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	47.412	1.5092	279.04	277.89
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-44.466	1.4154	278.36	279.00

Active Scenario: Max Day + Fire J-20
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-44.570	1.4187	279.00	279.38
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	25.103	0.7991	277.21	276.85
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	24.947	0.7941	276.85	276.60
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-45.481	1.4477	282.47	284.40
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-18.553	0.5906	284.40	284.74
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-27.084	1.5326	284.40	284.76
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-27.162	1.5370	284.76	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-44.700	0.9106	279.38	279.42
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-43.163	1.3739	284.83	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-50.599	1.6106	281.33	283.44
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-50.599	1.6106	283.44	284.83
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.130	0.0041	279.38	279.38
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.130	0.0041	279.38	279.38
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	279.38	279.38
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.44	283.44
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	5.279	0.1680	276.39	276.38

Active Scenario: Max Day + Fire J-20
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	281.33	399.4
J-2	240.62	0.000	Fixed	281.30	398.1
J-3	241.30	0.713	Fixed	280.25	381.2
J-4	241.85	0.695	Fixed	279.75	371.0
J-5	241.74	0.313	Fixed	277.89	353.8
J-6	241.50	0.078	Fixed	277.71	354.3
J-7	241.82	0.104	Fixed	277.35	347.7
J-8	242.03	5.296	Fixed	277.33	345.5
J-9	241.64	0.208	Fixed	277.28	348.8
J-10	242.19	0.208	Fixed	276.98	340.4
J-11	242.04	0.156	Fixed	276.88	340.9
J-12	242.39	0.156	Fixed	276.65	335.3
J-13	242.28	0.156	Fixed	276.58	335.7
J-14	242.58	0.052	Fixed	276.42	331.1
J-15	242.58	0.052	Fixed	276.39	330.9
J-16	242.40	0.156	Fixed	276.32	332.0
J-17	242.73	0.185	Fixed	276.21	327.6
J-18	242.90	0.026	Fixed	276.15	325.4
J-19	243.06	0.208	Fixed	276.10	323.3
J-20	243.18	75.978	Fixed	275.99	321.2
J-21	243.15	0.000	Fixed	276.06	322.1
J-22	243.46	0.208	Fixed	276.68	325.2
J-23	243.53	0.000	Fixed	276.80	325.6
J-24	243.60	0.250	Fixed	276.94	326.3
J-25	243.03	0.156	Fixed	277.73	339.6
J-26	243.03	0.052	Fixed	277.73	339.6
J-27	242.65	0.052	Fixed	277.71	343.1
J-28	241.78	0.026	Fixed	277.85	353.0
J-29	241.66	0.052	Fixed	277.76	353.3
J-30	241.74	0.026	Fixed	277.70	352.0
J-31	241.79	0.182	Fixed	277.67	351.1
J-32	242.61	0.313	Fixed	277.21	338.6
J-33	242.87	0.104	Fixed	276.60	330.1
J-34	242.87	0.130	Fixed	276.55	329.6
J-35	243.28	0.156	Fixed	276.17	321.9
J-36	243.35	0.052	Fixed	276.11	320.6
J-37	243.18	0.000	Fixed	276.04	321.6
J-38	241.87	0.104	Fixed	277.68	350.5
J-39	241.97	0.208	Fixed	277.69	349.6
J-40	242.28	0.234	Fixed	277.69	346.6
J-42	242.49	0.078	Fixed	277.69	344.5
J-43	242.67	0.026	Fixed	277.69	342.7
J-44	242.85	0.078	Fixed	277.69	341.0
J-45	243.39	0.104	Fixed	277.69	335.7

Active Scenario: Max Day + Fire J-20

FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.052	Fixed	277.70	336.5
J-47	243.13	0.026	Fixed	277.70	338.3
J-48	242.96	0.104	Fixed	277.70	340.0
J-49	242.65	0.182	Fixed	277.70	343.1
J-50	243.16	0.156	Fixed	278.36	344.5
J-51	242.15	0.000	Fixed	279.38	364.3
J-52	245.69	0.130	Fixed	279.38	329.7
J-53	241.96	0.729	Fixed	279.42	366.6
J-54	240.34	0.052	Fixed	284.83	435.4
J-55	240.44	0.026	Fixed	284.93	435.4
J-56	240.44	0.130	Fixed	284.74	433.6
J-57	241.35	0.292	Fixed	279.04	368.8
J-58	242.66	0.104	Fixed	279.00	355.6
J-59	242.59	0.156	Fixed	276.85	335.3
J-60	242.27	0.052	Fixed	282.47	393.4
J-64	241.33	0.156	Fixed	284.40	421.5
J-65	241.33	0.078	Fixed	284.76	425.1
J-68	240.51	0.000	Fixed	283.44	420.1
J-69	242.59	0.000	Fixed	279.38	360.0
J-70	243.84	0.000	Fixed	279.38	347.8
J-71	243.20	0.000	Fixed	283.44	393.8
J-72	242.58	5.279	Fixed	276.38	330.8

Active Scenario: Max Day + Fire J-22
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	48.848	1.5549	281.36	281.33
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	48.848	1.5549	281.33	280.29
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	48.135	1.5322	280.29	279.80
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	23.086	0.7348	277.96	277.81
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	23.008	0.7324	277.81	277.53
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	5.296	0.1686	277.53	277.52
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	17.608	0.5605	277.53	277.48
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	17.400	0.5539	277.48	277.26
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	17.192	0.5472	277.26	277.19
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	17.036	0.5423	277.19	277.02
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	16.880	0.5373	277.02	276.97
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	16.724	0.5323	276.97	276.85
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	16.672	0.5307	276.85	276.83
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	11.341	0.3610	276.83	276.79
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	11.185	0.3560	276.79	276.72
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	11.000	0.3501	276.72	276.69
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	10.974	0.3493	276.69	276.65
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	10.766	0.3427	276.65	276.59
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	29.868	0.9507	276.59	276.54
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	29.868	0.9507	276.54	276.14
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	-46.110	1.4677	276.14	276.30
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	-46.110	1.4677	276.30	276.51
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	-46.360	1.4757	276.51	277.66
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	-1.942	0.0618	277.66	277.66
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	-1.994	0.0635	277.66	277.66
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	23.749	0.7560	277.96	277.91
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	23.723	0.7551	277.91	277.80
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	23.671	0.7535	277.80	277.72

Active Scenario: Max Day + Fire J-22
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	23.645	0.7527	277.72	277.67
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	20.221	0.6437	277.67	277.38
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	19.648	0.6254	276.98	276.95
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	19.518	0.6213	276.95	276.70
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	19.362	0.6163	276.70	276.66
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	19.310	0.6147	276.66	276.62
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	19.310	0.6147	276.62	276.59
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	3.242	0.1032	277.67	277.67
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	3.138	0.0999	277.67	277.66
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	1.665	0.0530	277.66	277.66
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	1.431	0.0456	277.66	277.66
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	2.046	0.0651	277.66	277.66
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	1.265	0.0403	277.66	277.66
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	1.187	0.0378	277.66	277.66
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	1.161	0.0369	277.66	277.66
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	1.083	0.0345	277.66	277.66
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	0.979	0.0312	277.66	277.66
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	0.927	0.0295	277.66	277.66
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	0.901	0.0287	277.66	277.66
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	0.797	0.0254	277.66	277.66
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-44.574	1.4188	277.66	278.29
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-45.693	1.4544	279.36	282.44
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-26.123	0.8315	284.83	284.93
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-26.149	0.8324	284.93	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	18.819	0.5990	284.83	284.74
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	47.440	1.5101	279.80	279.09
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	47.148	1.5008	279.09	277.96
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-44.730	1.4238	278.29	278.93

Active Scenario: Max Day + Fire J-22
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-44.834	1.4271	278.93	279.32
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	19.908	0.6337	277.38	277.14
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	19.752	0.6287	277.14	276.98
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-45.745	1.4561	282.44	284.40
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-18.689	0.5949	284.40	284.74
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-27.212	1.5399	284.40	284.76
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-27.290	1.5443	284.76	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-44.964	0.9160	279.32	279.36
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-43.083	1.3714	284.83	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-50.335	1.6022	281.36	283.45
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-50.335	1.6022	283.45	284.83
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.130	0.0041	279.32	279.32
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.130	0.0041	279.32	279.32
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	279.32	279.32
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.45	283.45
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	5.279	0.1680	276.83	276.82

Active Scenario: Max Day + Fire J-22
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	281.36	399.7
J-2	240.62	0.000	Fixed	281.33	398.5
J-3	241.30	0.713	Fixed	280.29	381.6
J-4	241.85	0.695	Fixed	279.80	371.5
J-5	241.74	0.313	Fixed	277.96	354.4
J-6	241.50	0.078	Fixed	277.81	355.4
J-7	241.82	0.104	Fixed	277.53	349.5
J-8	242.03	5.296	Fixed	277.52	347.3
J-9	241.64	0.208	Fixed	277.48	350.8
J-10	242.19	0.208	Fixed	277.26	343.2
J-11	242.04	0.156	Fixed	277.19	344.0
J-12	242.39	0.156	Fixed	277.02	338.9
J-13	242.28	0.156	Fixed	276.97	339.5
J-14	242.58	0.052	Fixed	276.85	335.4
J-15	242.58	0.052	Fixed	276.83	335.2
J-16	242.40	0.156	Fixed	276.79	336.6
J-17	242.73	0.185	Fixed	276.72	332.7
J-18	242.90	0.026	Fixed	276.69	330.7
J-19	243.06	0.208	Fixed	276.65	328.8
J-20	243.18	0.208	Fixed	276.59	327.0
J-21	243.15	0.000	Fixed	276.54	326.8
J-22	243.46	75.978	Fixed	276.14	319.8
J-23	243.53	0.000	Fixed	276.30	320.7
J-24	243.60	0.250	Fixed	276.51	322.1
J-25	243.03	0.156	Fixed	277.66	338.9
J-26	243.03	0.052	Fixed	277.66	338.9
J-27	242.65	0.052	Fixed	277.66	342.6
J-28	241.78	0.026	Fixed	277.91	353.6
J-29	241.66	0.052	Fixed	277.80	353.7
J-30	241.74	0.026	Fixed	277.72	352.1
J-31	241.79	0.182	Fixed	277.67	351.2
J-32	242.61	0.313	Fixed	277.38	340.2
J-33	242.87	0.104	Fixed	276.98	333.8
J-34	242.87	0.130	Fixed	276.95	333.5
J-35	243.28	0.156	Fixed	276.70	327.1
J-36	243.35	0.052	Fixed	276.66	326.0
J-37	243.18	0.000	Fixed	276.62	327.2
J-38	241.87	0.104	Fixed	277.67	350.3
J-39	241.97	0.208	Fixed	277.66	349.3
J-40	242.28	0.234	Fixed	277.66	346.3
J-42	242.49	0.078	Fixed	277.66	344.2
J-43	242.67	0.026	Fixed	277.66	342.5
J-44	242.85	0.078	Fixed	277.66	340.7
J-45	243.39	0.104	Fixed	277.66	335.4

Active Scenario: Max Day + Fire J-22
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.052	Fixed	277.66	336.2
J-47	243.13	0.026	Fixed	277.66	338.0
J-48	242.96	0.104	Fixed	277.66	339.6
J-49	242.65	0.182	Fixed	277.66	342.6
J-50	243.16	0.156	Fixed	278.29	343.8
J-51	242.15	0.000	Fixed	279.32	363.8
J-52	245.69	0.130	Fixed	279.32	329.1
J-53	241.96	0.729	Fixed	279.36	366.1
J-54	240.34	0.052	Fixed	284.83	435.4
J-55	240.44	0.026	Fixed	284.93	435.4
J-56	240.44	0.130	Fixed	284.74	433.6
J-57	241.35	0.292	Fixed	279.09	369.4
J-58	242.66	0.104	Fixed	278.93	355.0
J-59	242.59	0.156	Fixed	277.14	338.1
J-60	242.27	0.052	Fixed	282.44	393.2
J-64	241.33	0.156	Fixed	284.40	421.5
J-65	241.33	0.078	Fixed	284.76	425.0
J-68	240.51	0.000	Fixed	283.45	420.2
J-69	242.59	0.000	Fixed	279.32	359.4
J-70	243.84	0.000	Fixed	279.32	347.2
J-71	243.20	0.000	Fixed	283.45	393.9
J-72	242.58	5.279	Fixed	276.82	335.1

Active Scenario: Max Day + Fire J-24
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	48.701	1.5502	281.38	281.35
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	48.701	1.5502	281.35	280.32
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	47.988	1.5275	280.32	279.83
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	21.846	0.6954	277.99	277.87
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	21.768	0.6929	277.87	277.61
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	5.296	0.1686	277.61	277.60
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	16.368	0.5210	277.61	277.57
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	16.160	0.5144	277.57	277.37
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	15.952	0.5078	277.37	277.31
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	15.796	0.5028	277.31	277.17
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	15.640	0.4978	277.17	277.12
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	15.484	0.4929	277.12	277.02
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	15.432	0.4912	277.02	277.00
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	10.101	0.3215	277.00	276.97
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	9.945	0.3165	276.97	276.91
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	9.760	0.3107	276.91	276.89
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	9.734	0.3098	276.89	276.86
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	9.526	0.3032	276.86	276.81
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	26.509	0.8438	276.81	276.77
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	26.509	0.8438	276.77	276.44
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	26.301	0.8372	276.44	276.39
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	26.301	0.8372	276.39	276.31
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	-49.719	1.5826	276.31	277.61
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	-5.154	0.1640	277.61	277.62
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	-5.206	0.1657	277.62	277.63
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	24.843	0.7908	277.99	277.94
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	24.817	0.7899	277.94	277.82
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	24.765	0.7883	277.82	277.74

Active Scenario: Max Day + Fire J-24
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	24.739	0.7875	277.74	277.69
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	18.103	0.5762	277.69	277.44
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	17.530	0.5580	277.12	277.10
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	17.400	0.5539	277.10	276.90
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	17.244	0.5489	276.90	276.87
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	17.192	0.5472	276.87	276.83
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	17.192	0.5472	276.83	276.81
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	6.454	0.2054	277.69	277.66
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	6.350	0.2021	277.66	277.65
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	3.583	0.1140	277.65	277.64
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	3.349	0.1066	277.64	277.64
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	5.258	0.1674	277.64	277.63
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	2.559	0.0814	277.65	277.65
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	2.481	0.0790	277.65	277.65
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	2.455	0.0781	277.65	277.65
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	2.377	0.0757	277.65	277.64
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	2.273	0.0723	277.64	277.64
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	2.221	0.0707	277.64	277.64
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	2.195	0.0699	277.64	277.64
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	2.091	0.0666	277.64	277.64
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-44.721	1.4235	277.61	278.25
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-45.840	1.4591	279.33	282.43
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-26.096	0.8307	284.83	284.93
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-26.122	0.8315	284.93	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	18.895	0.6014	284.83	284.74
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	47.293	1.5054	279.83	279.13
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	47.001	1.4961	279.13	277.99
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-44.877	1.4285	278.25	278.90

Active Scenario: Max Day + Fire J-24
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-44.981	1.4318	278.90	279.29
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	17.790	0.5663	277.44	277.25
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	17.634	0.5613	277.25	277.12
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-45.892	1.4608	282.43	284.39
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-18.765	0.5973	284.39	284.74
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-27.283	1.5439	284.39	284.76
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-27.361	1.5483	284.76	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-45.111	0.9190	279.29	279.33
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-43.039	1.3700	284.83	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-50.188	1.5975	281.38	283.46
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-50.188	1.5975	283.46	284.83
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.130	0.0041	279.29	279.29
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.130	0.0041	279.29	279.29
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	279.29	279.29
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.46	283.46
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	5.279	0.1680	277.00	276.99

Active Scenario: Max Day + Fire J-24
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	281.38	399.9
J-2	240.62	0.000	Fixed	281.35	398.7
J-3	241.30	0.713	Fixed	280.32	381.9
J-4	241.85	0.695	Fixed	279.83	371.7
J-5	241.74	0.313	Fixed	277.99	354.8
J-6	241.50	0.078	Fixed	277.87	355.9
J-7	241.82	0.104	Fixed	277.61	350.3
J-8	242.03	5.296	Fixed	277.60	348.1
J-9	241.64	0.208	Fixed	277.57	351.6
J-10	242.19	0.208	Fixed	277.37	344.3
J-11	242.04	0.156	Fixed	277.31	345.2
J-12	242.39	0.156	Fixed	277.17	340.4
J-13	242.28	0.156	Fixed	277.12	341.0
J-14	242.58	0.052	Fixed	277.02	337.1
J-15	242.58	0.052	Fixed	277.00	336.9
J-16	242.40	0.156	Fixed	276.97	338.3
J-17	242.73	0.185	Fixed	276.91	334.5
J-18	242.90	0.026	Fixed	276.89	332.6
J-19	243.06	0.208	Fixed	276.86	330.8
J-20	243.18	0.208	Fixed	276.81	329.1
J-21	243.15	0.000	Fixed	276.77	329.1
J-22	243.46	0.208	Fixed	276.44	322.8
J-23	243.53	0.000	Fixed	276.39	321.6
J-24	243.60	76.020	Fixed	276.31	320.1
J-25	243.03	0.156	Fixed	277.61	338.5
J-26	243.03	0.052	Fixed	277.62	338.5
J-27	242.65	0.052	Fixed	277.63	342.4
J-28	241.78	0.026	Fixed	277.94	353.9
J-29	241.66	0.052	Fixed	277.82	353.9
J-30	241.74	0.026	Fixed	277.74	352.3
J-31	241.79	0.182	Fixed	277.69	351.3
J-32	242.61	0.313	Fixed	277.44	340.9
J-33	242.87	0.104	Fixed	277.12	335.2
J-34	242.87	0.130	Fixed	277.10	335.0
J-35	243.28	0.156	Fixed	276.90	329.0
J-36	243.35	0.052	Fixed	276.87	328.0
J-37	243.18	0.000	Fixed	276.83	329.3
J-38	241.87	0.104	Fixed	277.66	350.3
J-39	241.97	0.208	Fixed	277.65	349.2
J-40	242.28	0.234	Fixed	277.64	346.1
J-42	242.49	0.078	Fixed	277.65	344.1
J-43	242.67	0.026	Fixed	277.65	342.3
J-44	242.85	0.078	Fixed	277.65	340.6
J-45	243.39	0.104	Fixed	277.64	335.2

Active Scenario: Max Day + Fire J-24
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.052	Fixed	277.64	336.0
J-47	243.13	0.026	Fixed	277.64	337.7
J-48	242.96	0.104	Fixed	277.64	339.4
J-49	242.65	0.182	Fixed	277.64	342.4
J-50	243.16	0.156	Fixed	278.25	343.4
J-51	242.15	0.000	Fixed	279.29	363.4
J-52	245.69	0.130	Fixed	279.29	328.8
J-53	241.96	0.729	Fixed	279.33	365.7
J-54	240.34	0.052	Fixed	284.83	435.4
J-55	240.44	0.026	Fixed	284.93	435.4
J-56	240.44	0.130	Fixed	284.74	433.6
J-57	241.35	0.292	Fixed	279.13	369.7
J-58	242.66	0.104	Fixed	278.90	354.6
J-59	242.59	0.156	Fixed	277.25	339.2
J-60	242.27	0.052	Fixed	282.43	393.0
J-64	241.33	0.156	Fixed	284.39	421.4
J-65	241.33	0.078	Fixed	284.76	425.0
J-68	240.51	0.000	Fixed	283.46	420.3
J-69	242.59	0.000	Fixed	279.29	359.1
J-70	243.84	0.000	Fixed	279.29	346.9
J-71	243.20	0.000	Fixed	283.46	394.0
J-72	242.58	5.279	Fixed	276.99	336.8

Active Scenario: Max Day + Fire J-25
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	47.700	1.5183	281.51	281.48
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	47.700	1.5183	281.48	280.49
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	46.987	1.4956	280.49	280.02
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	17.593	0.5600	278.25	278.17
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	17.515	0.5575	278.17	278.00
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	5.296	0.1686	278.00	277.99
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	12.115	0.3856	278.00	277.97
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	11.907	0.3790	277.97	277.86
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	11.699	0.3724	277.86	277.83
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	11.543	0.3674	277.83	277.75
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	11.387	0.3625	277.75	277.72
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	11.231	0.3575	277.72	277.67
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	11.179	0.3558	277.67	277.66
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	5.848	0.1862	277.66	277.64
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	5.692	0.1812	277.64	277.62
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	5.507	0.1753	277.62	277.61
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	5.481	0.1745	277.61	277.60
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	5.273	0.1678	277.60	277.59
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	14.109	0.4491	277.59	277.58
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	14.109	0.4491	277.58	277.47
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	13.901	0.4425	277.47	277.46
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	13.901	0.4425	277.46	277.43
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	13.651	0.4345	277.43	277.31
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	-16.553	0.5269	277.31	277.34
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	-16.605	0.5286	277.34	277.48
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	28.094	0.8943	278.25	278.19
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	28.068	0.8934	278.19	278.04
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	28.016	0.8918	278.04	277.93

Active Scenario: Max Day + Fire J-25
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	27.990	0.8909	277.93	277.87
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	9.955	0.3169	277.87	277.79
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	9.382	0.2986	277.68	277.68
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	9.252	0.2945	277.68	277.62
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	9.096	0.2895	277.62	277.61
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	9.044	0.2879	277.61	277.59
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	9.044	0.2879	277.59	277.59
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	17.853	0.5683	277.87	277.70
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	17.749	0.5650	277.70	277.65
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	10.397	0.3310	277.65	277.57
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	10.163	0.3235	277.57	277.52
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	16.657	0.5302	277.52	277.48
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	7.144	0.2274	277.65	277.62
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	7.066	0.2249	277.62	277.61
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	7.040	0.2241	277.61	277.60
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	6.962	0.2216	277.60	277.57
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	6.858	0.2183	277.57	277.56
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	6.806	0.2166	277.56	277.55
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	6.780	0.2158	277.55	277.54
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	6.676	0.2125	277.54	277.52
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-45.722	1.4554	277.31	277.98
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-46.841	1.4910	279.10	282.33
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-25.912	0.8248	284.83	284.93
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-25.938	0.8256	284.93	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	19.409	0.6178	284.83	284.74
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	46.292	1.4735	280.02	279.34
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	46.000	1.4642	279.34	278.25
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-45.878	1.4603	277.98	278.65

Active Scenario: Max Day + Fire J-25
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-45.982	1.4636	278.65	279.06
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	9.642	0.3069	277.79	277.73
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	9.486	0.3019	277.73	277.68
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-46.893	1.4926	282.33	284.37
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-19.279	0.6137	284.37	284.74
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-27.770	1.5715	284.37	284.75
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-27.848	1.5759	284.75	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-46.112	0.9394	279.06	279.10
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-42.736	1.3603	284.83	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-49.187	1.5657	281.51	283.51
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-49.187	1.5657	283.51	284.83
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.130	0.0041	279.06	279.06
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.130	0.0041	279.06	279.06
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	279.06	279.06
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.51	283.51
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	5.279	0.1680	277.66	277.65

Active Scenario: Max Day + Fire J-25
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	281.51	401.2
J-2	240.62	0.000	Fixed	281.48	399.9
J-3	241.30	0.713	Fixed	280.49	383.5
J-4	241.85	0.695	Fixed	280.02	373.6
J-5	241.74	0.313	Fixed	278.25	357.3
J-6	241.50	0.078	Fixed	278.17	358.9
J-7	241.82	0.104	Fixed	278.00	354.1
J-8	242.03	5.296	Fixed	277.99	351.9
J-9	241.64	0.208	Fixed	277.97	355.6
J-10	242.19	0.208	Fixed	277.86	349.1
J-11	242.04	0.156	Fixed	277.83	350.2
J-12	242.39	0.156	Fixed	277.75	346.0
J-13	242.28	0.156	Fixed	277.72	346.9
J-14	242.58	0.052	Fixed	277.67	343.4
J-15	242.58	0.052	Fixed	277.66	343.3
J-16	242.40	0.156	Fixed	277.64	344.9
J-17	242.73	0.185	Fixed	277.62	341.5
J-18	242.90	0.026	Fixed	277.61	339.7
J-19	243.06	0.208	Fixed	277.60	338.1
J-20	243.18	0.208	Fixed	277.59	336.7
J-21	243.15	0.000	Fixed	277.58	336.9
J-22	243.46	0.208	Fixed	277.47	332.9
J-23	243.53	0.000	Fixed	277.46	332.0
J-24	243.60	0.250	Fixed	277.43	331.1
J-25	243.03	75.926	Fixed	277.31	335.5
J-26	243.03	0.052	Fixed	277.34	335.8
J-27	242.65	0.052	Fixed	277.48	340.9
J-28	241.78	0.026	Fixed	278.19	356.3
J-29	241.66	0.052	Fixed	278.04	356.0
J-30	241.74	0.026	Fixed	277.93	354.2
J-31	241.79	0.182	Fixed	277.87	353.1
J-32	242.61	0.313	Fixed	277.79	344.3
J-33	242.87	0.104	Fixed	277.68	340.7
J-34	242.87	0.130	Fixed	277.68	340.6
J-35	243.28	0.156	Fixed	277.62	336.0
J-36	243.35	0.052	Fixed	277.61	335.3
J-37	243.18	0.000	Fixed	277.59	336.8
J-38	241.87	0.104	Fixed	277.70	350.6
J-39	241.97	0.208	Fixed	277.65	349.1
J-40	242.28	0.234	Fixed	277.57	345.4
J-42	242.49	0.078	Fixed	277.62	343.8
J-43	242.67	0.026	Fixed	277.61	341.9
J-44	242.85	0.078	Fixed	277.60	340.1
J-45	243.39	0.104	Fixed	277.57	334.5

Active Scenario: Max Day + Fire J-25
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.052	Fixed	277.56	335.2
J-47	243.13	0.026	Fixed	277.55	336.9
J-48	242.96	0.104	Fixed	277.54	338.5
J-49	242.65	0.182	Fixed	277.52	341.2
J-50	243.16	0.156	Fixed	277.98	340.8
J-51	242.15	0.000	Fixed	279.06	361.2
J-52	245.69	0.130	Fixed	279.06	326.6
J-53	241.96	0.729	Fixed	279.10	363.5
J-54	240.34	0.052	Fixed	284.83	435.4
J-55	240.44	0.026	Fixed	284.93	435.4
J-56	240.44	0.130	Fixed	284.74	433.6
J-57	241.35	0.292	Fixed	279.34	371.8
J-58	242.66	0.104	Fixed	278.65	352.2
J-59	242.59	0.156	Fixed	277.73	343.9
J-60	242.27	0.052	Fixed	282.33	392.1
J-64	241.33	0.156	Fixed	284.37	421.3
J-65	241.33	0.078	Fixed	284.75	425.0
J-68	240.51	0.000	Fixed	283.51	420.8
J-69	242.59	0.000	Fixed	279.06	356.9
J-70	243.84	0.000	Fixed	279.06	344.7
J-71	243.20	0.000	Fixed	283.51	394.5
J-72	242.58	5.279	Fixed	277.65	343.2

Active Scenario: Max Day + Fire J-31
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	50.015	1.5920	281.21	281.18
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	50.015	1.5920	281.18	280.09
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	49.302	1.5693	280.09	279.58
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	9.422	0.2999	277.65	277.62
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	9.344	0.2974	277.62	277.57
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	5.296	0.1686	277.57	277.56
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	3.944	0.1255	277.57	277.56
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	3.736	0.1189	277.56	277.55
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	3.528	0.1123	277.55	277.55
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	3.372	0.1073	277.55	277.54
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	3.216	0.1024	277.54	277.54
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	3.060	0.0974	277.54	277.53
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	3.008	0.0958	277.53	277.53
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	-2.323	0.0739	277.53	277.53
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	-2.479	0.0789	277.53	277.54
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	-2.664	0.0848	277.54	277.54
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	-2.690	0.0856	277.54	277.54
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	-2.898	0.0922	277.54	277.55
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	-17.906	0.5700	277.55	277.56
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	-17.906	0.5700	277.56	277.72
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	-18.114	0.5766	277.72	277.75
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	-18.114	0.5766	277.75	277.79
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	-18.364	0.5845	277.79	278.00
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	24.887	0.7922	278.00	277.95
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	24.835	0.7905	277.95	277.64
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	38.579	1.2280	277.65	277.53
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	38.553	1.2272	277.53	277.26
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	38.501	1.2255	277.26	277.07

Active Scenario: Max Day + Fire J-31
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	38.475	1.2247	277.07	276.95
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	-13.889	0.4421	276.95	277.10
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	-14.462	0.4604	277.32	277.34
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	-14.592	0.4645	277.34	277.48
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	-14.748	0.4695	277.48	277.50
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	-14.800	0.4711	277.50	277.53
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	-14.800	0.4711	277.53	277.55
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-23.587	0.7508	276.95	277.24
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-23.691	0.7541	277.24	277.33
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-14.382	0.4578	277.33	277.46
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-14.616	0.4652	277.46	277.57
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-24.783	0.7889	277.57	277.64
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-9.517	0.3029	277.33	277.38
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-9.595	0.3054	277.38	277.39
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-9.621	0.3063	277.39	277.41
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-9.699	0.3087	277.41	277.46
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-9.803	0.3120	277.46	277.49
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-9.855	0.3137	277.49	277.50
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-9.881	0.3145	277.50	277.52
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-9.985	0.3178	277.52	277.57
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-43.407	1.3817	278.00	278.60
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-44.526	1.4173	279.62	282.56
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-26.336	0.8383	284.83	284.93
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-26.362	0.8391	284.93	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	18.216	0.5798	284.83	284.75
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	48.607	1.5472	279.58	278.84
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	48.315	1.5379	278.84	277.65
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-43.563	1.3867	278.60	279.21

Active Scenario: Max Day + Fire J-31
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-43.667	1.3900	279.21	279.58
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	-14.202	0.4521	277.10	277.23
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	-14.358	0.4570	277.23	277.32
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-44.578	1.4190	282.56	284.42
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-18.086	0.5757	284.42	284.75
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-26.648	1.5080	284.42	284.77
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-26.726	1.5124	284.77	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-43.797	0.8922	279.58	279.62
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-43.434	1.3825	284.83	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-51.502	1.6393	281.21	283.39
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-51.502	1.6393	283.39	284.83
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.130	0.0041	279.58	279.58
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.130	0.0041	279.58	279.58
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	279.58	279.58
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.39	283.39
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	5.279	0.1680	277.53	277.52

Active Scenario: Max Day + Fire J-31
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	281.21	398.2
J-2	240.62	0.000	Fixed	281.18	397.0
J-3	241.30	0.713	Fixed	280.09	379.7
J-4	241.85	0.695	Fixed	279.58	369.3
J-5	241.74	0.313	Fixed	277.65	351.4
J-6	241.50	0.078	Fixed	277.62	353.5
J-7	241.82	0.104	Fixed	277.57	349.9
J-8	242.03	5.296	Fixed	277.56	347.7
J-9	241.64	0.208	Fixed	277.56	351.6
J-10	242.19	0.208	Fixed	277.55	346.1
J-11	242.04	0.156	Fixed	277.55	347.5
J-12	242.39	0.156	Fixed	277.54	344.0
J-13	242.28	0.156	Fixed	277.54	345.1
J-14	242.58	0.052	Fixed	277.53	342.1
J-15	242.58	0.052	Fixed	277.53	342.1
J-16	242.40	0.156	Fixed	277.53	343.8
J-17	242.73	0.185	Fixed	277.54	340.7
J-18	242.90	0.026	Fixed	277.54	339.0
J-19	243.06	0.208	Fixed	277.54	337.5
J-20	243.18	0.208	Fixed	277.55	336.4
J-21	243.15	0.000	Fixed	277.56	336.8
J-22	243.46	0.208	Fixed	277.72	335.3
J-23	243.53	0.000	Fixed	277.75	334.9
J-24	243.60	0.250	Fixed	277.79	334.6
J-25	243.03	0.156	Fixed	278.00	342.2
J-26	243.03	0.052	Fixed	277.95	341.7
J-27	242.65	0.052	Fixed	277.64	342.5
J-28	241.78	0.026	Fixed	277.53	349.8
J-29	241.66	0.052	Fixed	277.26	348.4
J-30	241.74	0.026	Fixed	277.07	345.8
J-31	241.79	75.952	Fixed	276.95	344.1
J-32	242.61	0.313	Fixed	277.10	337.6
J-33	242.87	0.104	Fixed	277.32	337.1
J-34	242.87	0.130	Fixed	277.34	337.3
J-35	243.28	0.156	Fixed	277.48	334.7
J-36	243.35	0.052	Fixed	277.50	334.2
J-37	243.18	0.000	Fixed	277.53	336.2
J-38	241.87	0.104	Fixed	277.24	346.2
J-39	241.97	0.208	Fixed	277.33	346.0
J-40	242.28	0.234	Fixed	277.46	344.3
J-42	242.49	0.078	Fixed	277.38	341.5
J-43	242.67	0.026	Fixed	277.39	339.8
J-44	242.85	0.078	Fixed	277.41	338.2
J-45	243.39	0.104	Fixed	277.46	333.4

Active Scenario: Max Day + Fire J-31
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.052	Fixed	277.49	334.5
J-47	243.13	0.026	Fixed	277.50	336.4
J-48	242.96	0.104	Fixed	277.52	338.2
J-49	242.65	0.182	Fixed	277.57	341.8
J-50	243.16	0.156	Fixed	278.60	346.8
J-51	242.15	0.000	Fixed	279.58	366.3
J-52	245.69	0.130	Fixed	279.58	331.7
J-53	241.96	0.729	Fixed	279.62	368.6
J-54	240.34	0.052	Fixed	284.83	435.4
J-55	240.44	0.026	Fixed	284.93	435.4
J-56	240.44	0.130	Fixed	284.75	433.6
J-57	241.35	0.292	Fixed	278.84	366.9
J-58	242.66	0.104	Fixed	279.21	357.7
J-59	242.59	0.156	Fixed	277.23	339.0
J-60	242.27	0.052	Fixed	282.56	394.3
J-64	241.33	0.156	Fixed	284.42	421.7
J-65	241.33	0.078	Fixed	284.77	425.1
J-68	240.51	0.000	Fixed	283.39	419.6
J-69	242.59	0.000	Fixed	279.58	362.0
J-70	243.84	0.000	Fixed	279.58	349.8
J-71	243.20	0.000	Fixed	283.39	393.3
J-72	242.58	5.279	Fixed	277.52	342.0

Active Scenario: Max Day + Fire J-37
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	49.127	1.5637	281.33	281.30
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	49.127	1.5637	281.30	280.25
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	48.414	1.5411	280.25	279.75
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	25.917	0.8250	277.88	277.71
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	25.839	0.8225	277.71	277.36
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	5.296	0.1686	277.36	277.34
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	20.439	0.6506	277.36	277.29
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	20.231	0.6440	277.29	277.00
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	20.023	0.6373	277.00	276.90
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	19.867	0.6324	276.90	276.68
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	19.711	0.6274	276.68	276.62
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	19.555	0.6224	276.62	276.46
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	19.503	0.6208	276.46	276.43
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	14.172	0.4511	276.43	276.37
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	14.016	0.4461	276.37	276.26
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	13.831	0.4402	276.26	276.21
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	13.805	0.4394	276.21	276.15
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	13.597	0.4328	276.15	276.06
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	-36.833	1.1724	276.06	276.12
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	-36.833	1.1724	276.12	276.72
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	-37.041	1.1791	276.72	276.83
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	-37.041	1.1791	276.83	276.97
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	-37.291	1.1870	276.97	277.74
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	6.848	0.2180	277.74	277.73
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	6.796	0.2163	277.73	277.71
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	21.197	0.6747	277.88	277.84
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	21.171	0.6739	277.84	277.76
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	21.119	0.6722	277.76	277.69

Active Scenario: Max Day + Fire J-37
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	21.093	0.6714	277.69	277.65
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	26.459	0.8422	277.65	277.16
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	25.886	0.8240	276.51	276.45
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	25.756	0.8198	276.45	276.04
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	25.600	0.8149	276.04	275.98
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	25.548	0.8132	275.98	275.90
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	-50.222	1.5986	275.90	276.06
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-5.548	0.1766	277.65	277.67
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-5.652	0.1799	277.67	277.68
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-3.598	0.1145	277.68	277.69
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-3.832	0.1220	277.69	277.70
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-6.744	0.2147	277.70	277.71
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-2.262	0.0720	277.68	277.68
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-2.340	0.0745	277.68	277.68
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-2.366	0.0753	277.68	277.69
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-2.444	0.0778	277.69	277.69
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-2.548	0.0811	277.69	277.69
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-2.600	0.0828	277.69	277.69
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-2.626	0.0836	277.69	277.69
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-2.730	0.0869	277.69	277.70
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-44.295	1.4100	277.74	278.36
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-45.414	1.4456	279.42	282.47
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-26.174	0.8331	284.83	284.93
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-26.200	0.8340	284.93	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	18.676	0.5945	284.83	284.74
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	47.719	1.5189	279.75	279.03
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	47.427	1.5096	279.03	277.88
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-44.451	1.4149	278.36	279.00

Active Scenario: Max Day + Fire J-37
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-44.555	1.4182	279.00	279.38
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	26.146	0.8323	277.16	276.77
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	25.990	0.8273	276.77	276.51
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-45.466	1.4472	282.47	284.40
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-18.546	0.5903	284.40	284.74
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-27.077	1.5322	284.40	284.76
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-27.155	1.5367	284.76	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-44.685	0.9103	279.38	279.42
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-43.167	1.3740	284.83	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-50.614	1.6111	281.33	283.44
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-50.614	1.6111	283.44	284.83
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.130	0.0041	279.38	279.38
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.130	0.0041	279.38	279.38
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	279.38	279.38
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.44	283.44
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	5.279	0.1680	276.43	276.42

Active Scenario: Max Day + Fire J-37

FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	281.33	399.4
J-2	240.62	0.000	Fixed	281.30	398.1
J-3	241.30	0.713	Fixed	280.25	381.2
J-4	241.85	0.695	Fixed	279.75	370.9
J-5	241.74	0.313	Fixed	277.88	353.7
J-6	241.50	0.078	Fixed	277.71	354.3
J-7	241.82	0.104	Fixed	277.36	347.8
J-8	242.03	5.296	Fixed	277.34	345.6
J-9	241.64	0.208	Fixed	277.29	348.9
J-10	242.19	0.208	Fixed	277.00	340.7
J-11	242.04	0.156	Fixed	276.90	341.2
J-12	242.39	0.156	Fixed	276.68	335.6
J-13	242.28	0.156	Fixed	276.62	336.0
J-14	242.58	0.052	Fixed	276.46	331.5
J-15	242.58	0.052	Fixed	276.43	331.3
J-16	242.40	0.156	Fixed	276.37	332.4
J-17	242.73	0.185	Fixed	276.26	328.1
J-18	242.90	0.026	Fixed	276.21	326.0
J-19	243.06	0.208	Fixed	276.15	323.9
J-20	243.18	0.208	Fixed	276.06	321.8
J-21	243.15	0.000	Fixed	276.12	322.7
J-22	243.46	0.208	Fixed	276.72	325.5
J-23	243.53	0.000	Fixed	276.83	325.9
J-24	243.60	0.250	Fixed	276.97	326.6
J-25	243.03	0.156	Fixed	277.74	339.7
J-26	243.03	0.052	Fixed	277.73	339.6
J-27	242.65	0.052	Fixed	277.71	343.1
J-28	241.78	0.026	Fixed	277.84	352.9
J-29	241.66	0.052	Fixed	277.76	353.3
J-30	241.74	0.026	Fixed	277.69	351.9
J-31	241.79	0.182	Fixed	277.65	351.0
J-32	242.61	0.313	Fixed	277.16	338.2
J-33	242.87	0.104	Fixed	276.51	329.2
J-34	242.87	0.130	Fixed	276.45	328.7
J-35	243.28	0.156	Fixed	276.04	320.6
J-36	243.35	0.052	Fixed	275.98	319.3
J-37	243.18	75.770	Fixed	275.90	320.2
J-38	241.87	0.104	Fixed	277.67	350.4
J-39	241.97	0.208	Fixed	277.68	349.5
J-40	242.28	0.234	Fixed	277.69	346.6
J-42	242.49	0.078	Fixed	277.68	344.4
J-43	242.67	0.026	Fixed	277.68	342.7
J-44	242.85	0.078	Fixed	277.69	340.9
J-45	243.39	0.104	Fixed	277.69	335.7

Active Scenario: Max Day + Fire J-37
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.052	Fixed	277.69	336.5
J-47	243.13	0.026	Fixed	277.69	338.3
J-48	242.96	0.104	Fixed	277.69	339.9
J-49	242.65	0.182	Fixed	277.70	343.0
J-50	243.16	0.156	Fixed	278.36	344.5
J-51	242.15	0.000	Fixed	279.38	364.4
J-52	245.69	0.130	Fixed	279.38	329.7
J-53	241.96	0.729	Fixed	279.42	366.7
J-54	240.34	0.052	Fixed	284.83	435.4
J-55	240.44	0.026	Fixed	284.93	435.4
J-56	240.44	0.130	Fixed	284.74	433.6
J-57	241.35	0.292	Fixed	279.03	368.8
J-58	242.66	0.104	Fixed	279.00	355.6
J-59	242.59	0.156	Fixed	276.77	334.5
J-60	242.27	0.052	Fixed	282.47	393.4
J-64	241.33	0.156	Fixed	284.40	421.5
J-65	241.33	0.078	Fixed	284.76	425.1
J-68	240.51	0.000	Fixed	283.44	420.1
J-69	242.59	0.000	Fixed	279.38	360.0
J-70	243.84	0.000	Fixed	279.38	347.8
J-71	243.20	0.000	Fixed	283.44	393.8
J-72	242.58	5.279	Fixed	276.42	331.2

Active Scenario: Max Day + Fire J-40
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	48.750	1.5518	281.38	281.35
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	48.750	1.5518	281.35	280.31
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	48.037	1.5291	280.31	279.82
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	14.513	0.4620	277.98	277.92
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	14.435	0.4595	277.92	277.80
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	5.296	0.1686	277.80	277.79
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	9.035	0.2876	277.80	277.79
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	8.827	0.2810	277.79	277.72
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	8.619	0.2744	277.72	277.70
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	8.463	0.2694	277.70	277.66
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	8.307	0.2644	277.66	277.65
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	8.151	0.2595	277.65	277.61
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	8.099	0.2578	277.61	277.61
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	2.768	0.0881	277.61	277.61
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	2.612	0.0831	277.61	277.60
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	2.427	0.0773	277.60	277.60
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	2.401	0.0764	277.60	277.60
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	2.193	0.0698	277.60	277.59
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	-4.234	0.1348	277.59	277.60
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	-4.234	0.1348	277.60	277.61
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	-4.442	0.1414	277.61	277.61
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	-4.442	0.1414	277.61	277.61
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	-4.692	0.1494	277.61	277.63
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	39.824	1.2676	277.63	277.51
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	39.772	1.2660	277.51	276.78
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	32.224	1.0257	277.98	277.89
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	32.198	1.0249	277.89	277.71
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	32.146	1.0232	277.71	277.57

Active Scenario: Max Day + Fire J-40
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	32.120	1.0224	277.57	277.48
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	-5.308	0.1690	277.48	277.51
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	-5.881	0.1872	277.55	277.55
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	-6.011	0.1913	277.55	277.58
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	-6.167	0.1963	277.58	277.58
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	-6.219	0.1980	277.58	277.59
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	-6.219	0.1980	277.59	277.59
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	37.246	1.1856	277.48	276.82
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	37.142	1.1823	276.82	276.61
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	36.259	1.1542	276.61	275.89
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-39.745	1.2651	275.89	276.61
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-39.720	1.2643	276.61	276.78
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	0.675	0.0215	276.61	276.61
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	0.597	0.0190	276.61	276.61
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	0.571	0.0182	276.61	276.61
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	0.493	0.0157	276.61	276.61
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	0.389	0.0124	276.61	276.61
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	0.337	0.0107	276.61	276.61
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	0.311	0.0099	276.61	276.61
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	0.207	0.0066	276.61	276.61
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-44.672	1.4220	277.63	278.26
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-45.791	1.4576	279.34	282.43
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-26.105	0.8310	284.83	284.93
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-26.131	0.8318	284.93	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	18.870	0.6006	284.83	284.74
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	47.342	1.5069	279.82	279.12
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	47.050	1.4976	279.12	277.98
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-44.828	1.4269	278.26	278.91

Active Scenario: Max Day + Fire J-40
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-44.932	1.4302	278.91	279.30
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	-5.621	0.1789	277.51	277.53
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	-5.777	0.1839	277.53	277.55
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-45.843	1.4592	282.43	284.39
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-18.740	0.5965	284.39	284.74
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-27.260	1.5426	284.39	284.76
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-27.338	1.5470	284.76	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-45.062	0.9180	279.30	279.34
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-43.053	1.3704	284.83	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-50.237	1.5991	281.38	283.46
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-50.237	1.5991	283.46	284.83
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.130	0.0041	279.30	279.30
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.130	0.0041	279.30	279.30
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	279.30	279.30
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.46	283.46
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	5.279	0.1680	277.61	277.60

Active Scenario: Max Day + Fire J-40
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	281.38	399.9
J-2	240.62	0.000	Fixed	281.35	398.6
J-3	241.30	0.713	Fixed	280.31	381.8
J-4	241.85	0.695	Fixed	279.82	371.6
J-5	241.74	0.313	Fixed	277.98	354.7
J-6	241.50	0.078	Fixed	277.92	356.4
J-7	241.82	0.104	Fixed	277.80	352.2
J-8	242.03	5.296	Fixed	277.79	350.0
J-9	241.64	0.208	Fixed	277.79	353.8
J-10	242.19	0.208	Fixed	277.72	347.8
J-11	242.04	0.156	Fixed	277.70	349.0
J-12	242.39	0.156	Fixed	277.66	345.2
J-13	242.28	0.156	Fixed	277.65	346.1
J-14	242.58	0.052	Fixed	277.61	342.9
J-15	242.58	0.052	Fixed	277.61	342.8
J-16	242.40	0.156	Fixed	277.61	344.6
J-17	242.73	0.185	Fixed	277.60	341.3
J-18	242.90	0.026	Fixed	277.60	339.6
J-19	243.06	0.208	Fixed	277.60	338.0
J-20	243.18	0.208	Fixed	277.59	336.8
J-21	243.15	0.000	Fixed	277.60	337.1
J-22	243.46	0.208	Fixed	277.61	334.2
J-23	243.53	0.000	Fixed	277.61	333.5
J-24	243.60	0.250	Fixed	277.61	332.9
J-25	243.03	0.156	Fixed	277.63	338.6
J-26	243.03	0.052	Fixed	277.51	337.4
J-27	242.65	0.052	Fixed	276.78	334.1
J-28	241.78	0.026	Fixed	277.89	353.5
J-29	241.66	0.052	Fixed	277.71	352.8
J-30	241.74	0.026	Fixed	277.57	350.6
J-31	241.79	0.182	Fixed	277.48	349.3
J-32	242.61	0.313	Fixed	277.51	341.6
J-33	242.87	0.104	Fixed	277.55	339.4
J-34	242.87	0.130	Fixed	277.55	339.4
J-35	243.28	0.156	Fixed	277.58	335.7
J-36	243.35	0.052	Fixed	277.58	335.0
J-37	243.18	0.000	Fixed	277.59	336.8
J-38	241.87	0.104	Fixed	276.82	342.0
J-39	241.97	0.208	Fixed	276.61	339.1
J-40	242.28	76.004	Fixed	275.89	328.9
J-42	242.49	0.078	Fixed	276.61	334.0
J-43	242.67	0.026	Fixed	276.61	332.2
J-44	242.85	0.078	Fixed	276.61	330.4
J-45	243.39	0.104	Fixed	276.61	325.2

Active Scenario: Max Day + Fire J-40
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.052	Fixed	276.61	325.9
J-47	243.13	0.026	Fixed	276.61	327.7
J-48	242.96	0.104	Fixed	276.61	329.4
J-49	242.65	0.182	Fixed	276.61	332.4
J-50	243.16	0.156	Fixed	278.26	343.5
J-51	242.15	0.000	Fixed	279.30	363.5
J-52	245.69	0.130	Fixed	279.30	328.9
J-53	241.96	0.729	Fixed	279.34	365.8
J-54	240.34	0.052	Fixed	284.83	435.4
J-55	240.44	0.026	Fixed	284.93	435.4
J-56	240.44	0.130	Fixed	284.74	433.6
J-57	241.35	0.292	Fixed	279.12	369.6
J-58	242.66	0.104	Fixed	278.91	354.8
J-59	242.59	0.156	Fixed	277.53	342.0
J-60	242.27	0.052	Fixed	282.43	393.1
J-64	241.33	0.156	Fixed	284.39	421.5
J-65	241.33	0.078	Fixed	284.76	425.0
J-68	240.51	0.000	Fixed	283.46	420.3
J-69	242.59	0.000	Fixed	279.30	359.2
J-70	243.84	0.000	Fixed	279.30	347.0
J-71	243.20	0.000	Fixed	283.46	394.0
J-72	242.58	5.279	Fixed	277.60	342.7

Active Scenario: Max Day + Fire J-42
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	48.819	1.5540	281.37	281.34
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	48.819	1.5540	281.34	280.30
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	48.106	1.5313	280.30	279.81
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	14.227	0.4529	277.96	277.91
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	14.149	0.4504	277.91	277.79
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	5.296	0.1686	277.79	277.78
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	8.749	0.2785	277.79	277.78
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	8.541	0.2719	277.78	277.72
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	8.333	0.2652	277.72	277.70
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	8.177	0.2603	277.70	277.66
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	8.021	0.2553	277.66	277.64
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	7.865	0.2504	277.64	277.61
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	7.813	0.2487	277.61	277.61
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	2.482	0.0790	277.61	277.61
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	2.326	0.0740	277.61	277.60
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	2.141	0.0682	277.60	277.60
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	2.115	0.0673	277.60	277.60
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	1.907	0.0607	277.60	277.60
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	-5.365	0.1708	277.60	277.60
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	-5.365	0.1708	277.60	277.62
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	-5.573	0.1774	277.62	277.62
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	-5.573	0.1774	277.62	277.62
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	-5.823	0.1853	277.62	277.65
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	38.624	1.2294	277.65	277.54
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	38.572	1.2278	277.54	276.85
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	32.579	1.0370	277.96	277.87
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	32.553	1.0362	277.87	277.68
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	32.501	1.0346	277.68	277.54

Active Scenario: Max Day + Fire J-42
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	32.475	1.0337	277.54	277.46
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	-6.153	0.1959	277.46	277.49
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	-6.726	0.2141	277.54	277.54
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	-6.856	0.2182	277.54	277.58
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	-7.012	0.2232	277.58	277.59
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	-7.064	0.2248	277.59	277.59
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	-7.064	0.2248	277.59	277.60
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	38.446	1.2238	277.46	276.75
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	38.342	1.2205	276.75	276.53
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-11.306	0.3599	276.53	276.62
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-11.540	0.3673	276.62	276.69
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-38.520	1.2261	276.69	276.85
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	49.440	1.5737	276.53	275.46
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-26.408	0.8406	275.46	275.56
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-26.434	0.8414	275.56	275.65
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-26.512	0.8439	275.65	275.98
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-26.616	0.8472	275.98	276.15
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-26.668	0.8489	276.15	276.25
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-26.694	0.8497	276.25	276.35
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-26.798	0.8530	276.35	276.69
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-44.603	1.4197	277.65	278.28
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-45.722	1.4554	279.35	282.44
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-26.118	0.8314	284.83	284.93
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-26.144	0.8322	284.93	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	18.834	0.5995	284.83	284.74
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	47.411	1.5092	279.81	279.10
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	47.119	1.4999	279.10	277.96
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-44.759	1.4247	278.28	278.92

Active Scenario: Max Day + Fire J-42
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-44.863	1.4280	278.92	279.31
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	-6.466	0.2058	277.49	277.52
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	-6.622	0.2108	277.52	277.54
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-45.774	1.4570	282.44	284.40
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-18.704	0.5954	284.40	284.74
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-27.226	1.5407	284.40	284.76
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-27.304	1.5451	284.76	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-44.993	0.9166	279.31	279.35
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-43.074	1.3711	284.83	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-50.306	1.6013	281.37	283.45
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-50.306	1.6013	283.45	284.83
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.130	0.0041	279.31	279.31
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.130	0.0041	279.31	279.31
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	279.31	279.31
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.45	283.45
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	5.279	0.1680	277.61	277.60

Active Scenario: Max Day + Fire J-42
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	281.37	399.8
J-2	240.62	0.000	Fixed	281.34	398.5
J-3	241.30	0.713	Fixed	280.30	381.7
J-4	241.85	0.695	Fixed	279.81	371.5
J-5	241.74	0.313	Fixed	277.96	354.5
J-6	241.50	0.078	Fixed	277.91	356.3
J-7	241.82	0.104	Fixed	277.79	352.0
J-8	242.03	5.296	Fixed	277.78	349.9
J-9	241.64	0.208	Fixed	277.78	353.7
J-10	242.19	0.208	Fixed	277.72	347.7
J-11	242.04	0.156	Fixed	277.70	349.0
J-12	242.39	0.156	Fixed	277.66	345.1
J-13	242.28	0.156	Fixed	277.64	346.1
J-14	242.58	0.052	Fixed	277.61	342.9
J-15	242.58	0.052	Fixed	277.61	342.8
J-16	242.40	0.156	Fixed	277.61	344.6
J-17	242.73	0.185	Fixed	277.60	341.3
J-18	242.90	0.026	Fixed	277.60	339.6
J-19	243.06	0.208	Fixed	277.60	338.0
J-20	243.18	0.208	Fixed	277.60	336.8
J-21	243.15	0.000	Fixed	277.60	337.1
J-22	243.46	0.208	Fixed	277.62	334.3
J-23	243.53	0.000	Fixed	277.62	333.6
J-24	243.60	0.250	Fixed	277.62	333.0
J-25	243.03	0.156	Fixed	277.65	338.8
J-26	243.03	0.052	Fixed	277.54	337.7
J-27	242.65	0.052	Fixed	276.85	334.7
J-28	241.78	0.026	Fixed	277.87	353.3
J-29	241.66	0.052	Fixed	277.68	352.5
J-30	241.74	0.026	Fixed	277.54	350.4
J-31	241.79	0.182	Fixed	277.46	349.1
J-32	242.61	0.313	Fixed	277.49	341.4
J-33	242.87	0.104	Fixed	277.54	339.3
J-34	242.87	0.130	Fixed	277.54	339.4
J-35	243.28	0.156	Fixed	277.58	335.7
J-36	243.35	0.052	Fixed	277.59	335.1
J-37	243.18	0.000	Fixed	277.59	336.8
J-38	241.87	0.104	Fixed	276.75	341.3
J-39	241.97	0.208	Fixed	276.53	338.3
J-40	242.28	0.234	Fixed	276.62	336.0
J-42	242.49	75.848	Fixed	275.46	322.7
J-43	242.67	0.026	Fixed	275.56	321.9
J-44	242.85	0.078	Fixed	275.65	321.1
J-45	243.39	0.104	Fixed	275.98	319.0

Active Scenario: Max Day + Fire J-42
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.052	Fixed	276.15	321.4
J-47	243.13	0.026	Fixed	276.25	324.1
J-48	242.96	0.104	Fixed	276.35	326.7
J-49	242.65	0.182	Fixed	276.69	333.1
J-50	243.16	0.156	Fixed	278.28	343.7
J-51	242.15	0.000	Fixed	279.31	363.7
J-52	245.69	0.130	Fixed	279.31	329.1
J-53	241.96	0.729	Fixed	279.35	366.0
J-54	240.34	0.052	Fixed	284.83	435.4
J-55	240.44	0.026	Fixed	284.93	435.4
J-56	240.44	0.130	Fixed	284.74	433.6
J-57	241.35	0.292	Fixed	279.10	369.5
J-58	242.66	0.104	Fixed	278.92	354.9
J-59	242.59	0.156	Fixed	277.52	341.8
J-60	242.27	0.052	Fixed	282.44	393.2
J-64	241.33	0.156	Fixed	284.40	421.5
J-65	241.33	0.078	Fixed	284.76	425.0
J-68	240.51	0.000	Fixed	283.45	420.2
J-69	242.59	0.000	Fixed	279.31	359.4
J-70	243.84	0.000	Fixed	279.31	347.2
J-71	243.20	0.000	Fixed	283.45	393.9
J-72	242.58	5.279	Fixed	277.60	342.7

Active Scenario: Max Day + Fire J-46
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	48.737	1.5513	281.38	281.35
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	48.737	1.5513	281.35	280.31
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	48.024	1.5286	280.31	279.83
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	14.568	0.4637	277.98	277.92
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	14.490	0.4612	277.92	277.80
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	5.296	0.1686	277.80	277.79
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	9.090	0.2893	277.80	277.79
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	8.882	0.2827	277.79	277.73
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	8.674	0.2761	277.73	277.71
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	8.518	0.2711	277.71	277.66
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	8.362	0.2662	277.66	277.65
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	8.206	0.2612	277.65	277.61
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	8.154	0.2596	277.61	277.61
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	2.823	0.0899	277.61	277.61
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	2.667	0.0849	277.61	277.60
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	2.482	0.0790	277.60	277.60
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	2.456	0.0782	277.60	277.60
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	2.248	0.0716	277.60	277.59
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	-4.002	0.1274	277.59	277.59
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	-4.002	0.1274	277.59	277.60
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	-4.210	0.1340	277.60	277.61
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	-4.210	0.1340	277.61	277.61
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	-4.460	0.1420	277.61	277.62
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	40.069	1.2754	277.62	277.50
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	40.017	1.2738	277.50	276.77
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	32.155	1.0235	277.98	277.90
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	32.129	1.0227	277.90	277.71
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	32.077	1.0211	277.71	277.57

Active Scenario: Max Day + Fire J-46
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	32.051	1.0202	277.57	277.49
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	-5.131	0.1633	277.49	277.51
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	-5.704	0.1816	277.55	277.55
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	-5.834	0.1857	277.55	277.58
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	-5.990	0.1907	277.58	277.58
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	-6.042	0.1923	277.58	277.59
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	-6.042	0.1923	277.59	277.59
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	37.001	1.1778	277.49	276.83
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	36.897	1.1745	276.83	276.63
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	4.977	0.1584	276.63	276.61
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	4.743	0.1510	276.61	276.60
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-39.965	1.2721	276.60	276.77
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	31.712	1.0094	276.63	276.16
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	31.634	1.0069	276.16	276.03
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	31.608	1.0061	276.03	275.89
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	31.530	1.0036	275.89	275.44
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	31.426	1.0003	275.44	275.21
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-44.396	1.4132	275.21	275.46
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-44.422	1.4140	275.46	275.71
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-44.526	1.4173	275.71	276.60
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-44.685	1.4224	277.62	278.26
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-45.805	1.4580	279.33	282.43
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-26.103	0.8309	284.83	284.93
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-26.129	0.8317	284.93	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	18.877	0.6009	284.83	284.74
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	47.329	1.5065	279.83	279.12
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	47.037	1.4972	279.12	277.98
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-44.841	1.4273	278.26	278.90

Active Scenario: Max Day + Fire J-46
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-44.945	1.4307	278.90	279.29
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	-5.444	0.1733	277.51	277.54
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	-5.600	0.1783	277.54	277.55
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-45.857	1.4597	282.43	284.39
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-18.747	0.5967	284.39	284.74
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-27.266	1.5429	284.39	284.76
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-27.344	1.5473	284.76	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-45.076	0.9183	279.29	279.33
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-43.049	1.3703	284.83	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-50.224	1.5987	281.38	283.46
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-50.224	1.5987	283.46	284.83
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.130	0.0041	279.29	279.29
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.130	0.0041	279.29	279.29
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	279.29	279.29
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.46	283.46
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	5.279	0.1680	277.61	277.60

Active Scenario: Max Day + Fire J-46

FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	281.38	399.9
J-2	240.62	0.000	Fixed	281.35	398.6
J-3	241.30	0.713	Fixed	280.31	381.8
J-4	241.85	0.695	Fixed	279.83	371.7
J-5	241.74	0.313	Fixed	277.98	354.7
J-6	241.50	0.078	Fixed	277.92	356.5
J-7	241.82	0.104	Fixed	277.80	352.2
J-8	242.03	5.296	Fixed	277.79	350.0
J-9	241.64	0.208	Fixed	277.79	353.8
J-10	242.19	0.208	Fixed	277.73	347.8
J-11	242.04	0.156	Fixed	277.71	349.1
J-12	242.39	0.156	Fixed	277.66	345.2
J-13	242.28	0.156	Fixed	277.65	346.1
J-14	242.58	0.052	Fixed	277.61	342.9
J-15	242.58	0.052	Fixed	277.61	342.8
J-16	242.40	0.156	Fixed	277.61	344.6
J-17	242.73	0.185	Fixed	277.60	341.3
J-18	242.90	0.026	Fixed	277.60	339.6
J-19	243.06	0.208	Fixed	277.60	338.0
J-20	243.18	0.208	Fixed	277.59	336.8
J-21	243.15	0.000	Fixed	277.59	337.1
J-22	243.46	0.208	Fixed	277.60	334.2
J-23	243.53	0.000	Fixed	277.61	333.5
J-24	243.60	0.250	Fixed	277.61	332.8
J-25	243.03	0.156	Fixed	277.62	338.6
J-26	243.03	0.052	Fixed	277.50	337.4
J-27	242.65	0.052	Fixed	276.77	333.9
J-28	241.78	0.026	Fixed	277.90	353.5
J-29	241.66	0.052	Fixed	277.71	352.8
J-30	241.74	0.026	Fixed	277.57	350.7
J-31	241.79	0.182	Fixed	277.49	349.4
J-32	242.61	0.313	Fixed	277.51	341.6
J-33	242.87	0.104	Fixed	277.55	339.4
J-34	242.87	0.130	Fixed	277.55	339.4
J-35	243.28	0.156	Fixed	277.58	335.7
J-36	243.35	0.052	Fixed	277.58	335.0
J-37	243.18	0.000	Fixed	277.59	336.8
J-38	241.87	0.104	Fixed	276.83	342.2
J-39	241.97	0.208	Fixed	276.63	339.2
J-40	242.28	0.234	Fixed	276.61	336.0
J-42	242.49	0.078	Fixed	276.16	329.5
J-43	242.67	0.026	Fixed	276.03	326.4
J-44	242.85	0.078	Fixed	275.89	323.4
J-45	243.39	0.104	Fixed	275.44	313.7

Active Scenario: Max Day + Fire J-46
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	75.822	Fixed	275.21	312.2
J-47	243.13	0.026	Fixed	275.46	316.4
J-48	242.96	0.104	Fixed	275.71	320.6
J-49	242.65	0.182	Fixed	276.60	332.2
J-50	243.16	0.156	Fixed	278.26	343.5
J-51	242.15	0.000	Fixed	279.29	363.5
J-52	245.69	0.130	Fixed	279.29	328.9
J-53	241.96	0.729	Fixed	279.33	365.8
J-54	240.34	0.052	Fixed	284.83	435.4
J-55	240.44	0.026	Fixed	284.93	435.4
J-56	240.44	0.130	Fixed	284.74	433.6
J-57	241.35	0.292	Fixed	279.12	369.6
J-58	242.66	0.104	Fixed	278.90	354.7
J-59	242.59	0.156	Fixed	277.54	342.0
J-60	242.27	0.052	Fixed	282.43	393.1
J-64	241.33	0.156	Fixed	284.39	421.5
J-65	241.33	0.078	Fixed	284.76	425.0
J-68	240.51	0.000	Fixed	283.46	420.3
J-69	242.59	0.000	Fixed	279.29	359.2
J-70	243.84	0.000	Fixed	279.29	347.0
J-71	243.20	0.000	Fixed	283.46	394.0
J-72	242.58	5.279	Fixed	277.60	342.7

Active Scenario: Max Day + Fire J-52 upgraded P-79
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	43.313	1.3787	282.05	282.03
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	43.313	1.3787	282.03	281.19
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	42.600	1.3560	281.19	280.80
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	16.331	0.5198	279.33	279.26
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	16.253	0.5173	279.26	279.11
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	5.296	0.1686	279.11	279.10
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	10.853	0.3455	279.11	279.09
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	10.645	0.3388	279.09	279.00
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	10.437	0.3322	279.00	278.97
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	10.281	0.3273	278.97	278.91
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	10.125	0.3223	278.91	278.89
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	9.969	0.3173	278.89	278.84
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	9.917	0.3157	278.84	278.84
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	4.586	0.1460	278.84	278.83
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	4.430	0.1410	278.83	278.81
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	4.245	0.1351	278.81	278.81
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	4.219	0.1343	278.81	278.80
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	4.011	0.1277	278.80	278.79
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	11.912	0.3792	278.79	278.78
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	11.912	0.3792	278.78	278.71
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	11.704	0.3726	278.71	278.70
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	11.704	0.3726	278.70	278.68
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	11.454	0.3646	278.68	278.59
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	-14.362	0.4572	278.59	278.61
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	-14.414	0.4588	278.61	278.72
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	24.969	0.7948	279.33	279.28
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	24.943	0.7940	279.28	279.16
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	24.891	0.7923	279.16	279.08

Active Scenario: Max Day + Fire J-52 upgraded P-79
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	24.865	0.7915	279.08	279.02
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	9.020	0.2871	279.02	278.96
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	8.447	0.2689	278.87	278.87
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	8.317	0.2647	278.87	278.82
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	8.161	0.2598	278.82	278.81
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	8.109	0.2581	278.81	278.80
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	8.109	0.2581	278.80	278.79
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	15.662	0.4986	279.02	278.89
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	15.558	0.4952	278.89	278.85
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	9.087	0.2893	278.85	278.79
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	8.853	0.2818	278.79	278.75
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	14.466	0.4605	278.75	278.72
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	6.263	0.1994	278.85	278.83
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	6.185	0.1969	278.83	278.82
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	6.159	0.1960	278.82	278.81
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	6.081	0.1936	278.81	278.79
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	5.977	0.1903	278.79	278.78
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	5.925	0.1886	278.78	278.78
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	5.899	0.1878	278.78	278.77
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	5.795	0.1845	278.77	278.75
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	25.661	0.8168	278.59	278.37
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-51.228	1.6306	278.05	281.87
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-25.096	0.7988	284.84	284.93
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-25.122	0.7997	284.93	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	21.635	0.6887	284.84	284.73
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	41.905	1.3339	280.80	280.24
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	41.613	1.3246	280.24	279.33
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	25.505	0.8118	278.37	278.14

Active Scenario: Max Day + Fire J-52 upgraded P-79
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	25.401	0.8085	278.14	278.01
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	8.707	0.2772	278.96	278.91
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	8.551	0.2722	278.91	278.87
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-51.280	1.6323	281.87	284.28
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-21.505	0.6845	284.28	284.73
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-29.931	1.6938	284.28	284.71
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-30.009	1.6982	284.71	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-50.499	1.0288	278.01	278.05
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-41.390	1.3175	284.84	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-44.800	1.4260	282.05	283.73
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-44.800	1.4260	283.73	284.84
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	75.900	2.4160	278.01	277.22
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	75.900	2.4160	277.22	271.76
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	277.22	277.22
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.73	283.73
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	5.279	0.1680	278.84	278.82

Active Scenario: Max Day + Fire J-52 upgraded P-79
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	282.05	406.4
J-2	240.62	0.000	Fixed	282.03	405.2
J-3	241.30	0.713	Fixed	281.19	390.4
J-4	241.85	0.695	Fixed	280.80	381.2
J-5	241.74	0.313	Fixed	279.33	367.9
J-6	241.50	0.078	Fixed	279.26	369.5
J-7	241.82	0.104	Fixed	279.11	365.0
J-8	242.03	5.296	Fixed	279.10	362.8
J-9	241.64	0.208	Fixed	279.09	366.5
J-10	242.19	0.208	Fixed	279.00	360.3
J-11	242.04	0.156	Fixed	278.97	361.5
J-12	242.39	0.156	Fixed	278.91	357.4
J-13	242.28	0.156	Fixed	278.89	358.3
J-14	242.58	0.052	Fixed	278.84	354.9
J-15	242.58	0.052	Fixed	278.84	354.8
J-16	242.40	0.156	Fixed	278.83	356.5
J-17	242.73	0.185	Fixed	278.81	353.2
J-18	242.90	0.026	Fixed	278.81	351.4
J-19	243.06	0.208	Fixed	278.80	349.8
J-20	243.18	0.208	Fixed	278.79	348.5
J-21	243.15	0.000	Fixed	278.78	348.8
J-22	243.46	0.208	Fixed	278.71	345.0
J-23	243.53	0.000	Fixed	278.70	344.2
J-24	243.60	0.250	Fixed	278.68	343.3
J-25	243.03	0.156	Fixed	278.59	348.1
J-26	243.03	0.052	Fixed	278.61	348.2
J-27	242.65	0.052	Fixed	278.72	353.0
J-28	241.78	0.026	Fixed	279.28	367.0
J-29	241.66	0.052	Fixed	279.16	367.0
J-30	241.74	0.026	Fixed	279.08	365.4
J-31	241.79	0.182	Fixed	279.02	364.4
J-32	242.61	0.313	Fixed	278.96	355.7
J-33	242.87	0.104	Fixed	278.87	352.4
J-34	242.87	0.130	Fixed	278.87	352.3
J-35	243.28	0.156	Fixed	278.82	347.8
J-36	243.35	0.052	Fixed	278.81	347.0
J-37	243.18	0.000	Fixed	278.80	348.6
J-38	241.87	0.104	Fixed	278.89	362.3
J-39	241.97	0.208	Fixed	278.85	360.9
J-40	242.28	0.234	Fixed	278.79	357.4
J-42	242.49	0.078	Fixed	278.83	355.6
J-43	242.67	0.026	Fixed	278.82	353.8
J-44	242.85	0.078	Fixed	278.81	352.0
J-45	243.39	0.104	Fixed	278.79	346.5

Active Scenario: Max Day + Fire J-52 upgraded P-79
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.052	Fixed	278.78	347.2
J-47	243.13	0.026	Fixed	278.78	348.9
J-48	242.96	0.104	Fixed	278.77	350.5
J-49	242.65	0.182	Fixed	278.75	353.3
J-50	243.16	0.156	Fixed	278.37	344.6
J-51	242.15	0.000	Fixed	278.01	350.9
J-52	245.69	75.900	Fixed	271.76	255.1
J-53	241.96	0.729	Fixed	278.05	353.3
J-54	240.34	0.052	Fixed	284.84	435.5
J-55	240.44	0.026	Fixed	284.93	435.4
J-56	240.44	0.130	Fixed	284.73	433.5
J-57	241.35	0.292	Fixed	280.24	380.6
J-58	242.66	0.104	Fixed	278.14	347.2
J-59	242.59	0.156	Fixed	278.91	355.4
J-60	242.27	0.052	Fixed	281.87	387.5
J-64	241.33	0.156	Fixed	284.28	420.3
J-65	241.33	0.078	Fixed	284.71	424.6
J-68	240.51	0.000	Fixed	283.73	423.0
J-69	242.59	0.000	Fixed	277.22	338.9
J-70	243.84	0.000	Fixed	277.22	326.7
J-71	243.20	0.000	Fixed	283.73	396.7
J-72	242.58	5.279	Fixed	278.82	354.7

Active Scenario: Max Day + Fire J-57
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	54.116	1.7226	280.65	280.62
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	54.116	1.7226	280.62	279.36
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	53.403	1.6999	279.36	278.76
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	-0.201	0.0064	278.21	278.21
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	-0.279	0.0089	278.21	278.21
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	5.296	0.1686	278.21	278.20
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	-5.679	0.1808	278.21	278.22
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	-5.887	0.1874	278.22	278.25
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	-6.095	0.1940	278.25	278.26
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	-6.251	0.1990	278.26	278.28
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	-6.407	0.2039	278.28	278.29
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	-6.563	0.2089	278.29	278.31
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	-6.615	0.2106	278.31	278.32
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	-11.946	0.3803	278.32	278.36
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	-12.102	0.3852	278.36	278.44
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	-12.287	0.3911	278.44	278.49
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	-12.313	0.3919	278.49	278.53
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	-12.521	0.3986	278.53	278.61
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	-19.379	0.6169	278.61	278.63
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	-19.379	0.6169	278.63	278.82
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	-19.587	0.6235	278.82	278.85
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	-19.587	0.6235	278.85	278.89
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	-19.837	0.6314	278.89	279.13
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	19.313	0.6147	279.13	279.10
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	19.261	0.6131	279.10	278.91
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	-23.466	0.7469	278.21	278.26
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	-23.492	0.7478	278.26	278.36
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	-23.544	0.7494	278.36	278.44

Active Scenario: Max Day + Fire J-57
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	-23.570	0.7502	278.44	278.49
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	-5.739	0.1827	278.49	278.52
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	-6.312	0.2009	278.56	278.57
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	-6.442	0.2051	278.57	278.60
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	-6.598	0.2100	278.60	278.60
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	-6.650	0.2117	278.60	278.61
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	-6.650	0.2117	278.61	278.61
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-18.013	0.5734	278.49	278.66
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-18.117	0.5767	278.66	278.72
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-11.049	0.3517	278.72	278.80
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-11.283	0.3592	278.80	278.87
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-19.209	0.6114	278.87	278.91
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-7.276	0.2316	278.72	278.75
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-7.354	0.2341	278.75	278.76
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-7.380	0.2349	278.76	278.76
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-7.458	0.2374	278.76	278.80
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-7.562	0.2407	278.80	278.81
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-7.614	0.2423	278.81	278.82
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-7.640	0.2432	278.82	278.83
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-7.744	0.2465	278.83	278.87
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-39.306	1.2511	279.13	279.63
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-40.425	1.2868	280.48	282.94
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-27.072	0.8617	284.82	284.92
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-27.098	0.8626	284.92	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	16.065	0.5114	284.82	284.75
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	52.708	1.6778	278.76	277.90
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	-23.354	0.7434	277.90	278.21
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-39.462	1.2561	279.63	280.14

Active Scenario: Max Day + Fire J-57
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-39.566	1.2594	280.14	280.45
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	-6.052	0.1926	278.52	278.54
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	-6.208	0.1976	278.54	278.56
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-40.477	1.2884	282.94	284.49
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-15.935	0.5072	284.49	284.75
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-24.698	1.3976	284.49	284.80
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-24.776	1.4020	284.80	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-39.696	0.8087	280.45	280.48
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-44.648	1.4212	284.82	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-55.603	1.7699	280.65	283.16
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-55.603	1.7699	283.16	284.82
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.130	0.0041	280.45	280.45
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.130	0.0041	280.45	280.45
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	280.45	280.45
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.16	283.16
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	5.279	0.1680	278.32	278.30

Active Scenario: Max Day + Fire J-57
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	280.65	392.8
J-2	240.62	0.000	Fixed	280.62	391.4
J-3	241.30	0.713	Fixed	279.36	372.5
J-4	241.85	0.695	Fixed	278.76	361.3
J-5	241.74	0.313	Fixed	278.21	356.9
J-6	241.50	0.078	Fixed	278.21	359.3
J-7	241.82	0.104	Fixed	278.21	356.1
J-8	242.03	5.296	Fixed	278.20	354.0
J-9	241.64	0.208	Fixed	278.22	358.0
J-10	242.19	0.208	Fixed	278.25	352.9
J-11	242.04	0.156	Fixed	278.26	354.4
J-12	242.39	0.156	Fixed	278.28	351.3
J-13	242.28	0.156	Fixed	278.29	352.4
J-14	242.58	0.052	Fixed	278.31	349.7
J-15	242.58	0.052	Fixed	278.32	349.7
J-16	242.40	0.156	Fixed	278.36	351.9
J-17	242.73	0.185	Fixed	278.44	349.5
J-18	242.90	0.026	Fixed	278.49	348.3
J-19	243.06	0.208	Fixed	278.53	347.1
J-20	243.18	0.208	Fixed	278.61	346.8
J-21	243.15	0.000	Fixed	278.63	347.3
J-22	243.46	0.208	Fixed	278.82	346.0
J-23	243.53	0.000	Fixed	278.85	345.7
J-24	243.60	0.250	Fixed	278.89	345.4
J-25	243.03	0.156	Fixed	279.13	353.3
J-26	243.03	0.052	Fixed	279.10	353.0
J-27	242.65	0.052	Fixed	278.91	354.9
J-28	241.78	0.026	Fixed	278.26	357.0
J-29	241.66	0.052	Fixed	278.36	359.2
J-30	241.74	0.026	Fixed	278.44	359.2
J-31	241.79	0.182	Fixed	278.49	359.2
J-32	242.61	0.313	Fixed	278.52	351.4
J-33	242.87	0.104	Fixed	278.56	349.3
J-34	242.87	0.130	Fixed	278.57	349.3
J-35	243.28	0.156	Fixed	278.60	345.6
J-36	243.35	0.052	Fixed	278.60	345.0
J-37	243.18	0.000	Fixed	278.61	346.7
J-38	241.87	0.104	Fixed	278.66	360.1
J-39	241.97	0.208	Fixed	278.72	359.6
J-40	242.28	0.234	Fixed	278.80	357.4
J-42	242.49	0.078	Fixed	278.75	354.8
J-43	242.67	0.026	Fixed	278.76	353.2
J-44	242.85	0.078	Fixed	278.76	351.5
J-45	243.39	0.104	Fixed	278.80	346.5

Active Scenario: Max Day + Fire J-57
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.052	Fixed	278.81	347.5
J-47	243.13	0.026	Fixed	278.82	349.3
J-48	242.96	0.104	Fixed	278.83	351.1
J-49	242.65	0.182	Fixed	278.87	354.4
J-50	243.16	0.156	Fixed	279.63	356.9
J-51	242.15	0.000	Fixed	280.45	374.8
J-52	245.69	0.130	Fixed	280.45	340.2
J-53	241.96	0.729	Fixed	280.48	377.0
J-54	240.34	0.052	Fixed	284.82	435.3
J-55	240.44	0.026	Fixed	284.92	435.3
J-56	240.44	0.130	Fixed	284.75	433.7
J-57	241.35	76.062	Fixed	277.90	357.7
J-58	242.66	0.104	Fixed	280.14	366.8
J-59	242.59	0.156	Fixed	278.54	351.9
J-60	242.27	0.052	Fixed	282.94	398.0
J-64	241.33	0.156	Fixed	284.49	422.4
J-65	241.33	0.078	Fixed	284.80	425.4
J-68	240.51	0.000	Fixed	283.16	417.4
J-69	242.59	0.000	Fixed	280.45	370.5
J-70	243.84	0.000	Fixed	280.45	358.3
J-71	243.20	0.000	Fixed	283.16	391.1
J-72	242.58	5.279	Fixed	278.30	349.6

Active Scenario: Max Day + Fire J-59
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	49.507	1.5759	281.28	281.25
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	49.507	1.5759	281.25	280.18
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	48.794	1.5532	280.18	279.68
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	19.724	0.6278	277.78	277.68
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	19.646	0.6253	277.68	277.46
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	5.296	0.1686	277.46	277.45
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	14.246	0.4535	277.46	277.43
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	14.038	0.4468	277.43	277.28
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	13.830	0.4402	277.28	277.23
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	13.674	0.4353	277.23	277.12
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	13.518	0.4303	277.12	277.09
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	13.362	0.4253	277.09	277.01
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	13.310	0.4237	277.01	277.00
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	7.979	0.2540	277.00	276.98
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	7.823	0.2490	276.98	276.94
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	7.638	0.2431	276.94	276.92
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	7.612	0.2423	276.92	276.91
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	7.404	0.2357	276.91	276.87
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	-27.369	0.8712	276.87	276.91
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	-27.369	0.8712	276.91	277.26
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	-27.577	0.8778	277.26	277.32
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	-27.577	0.8778	277.32	277.40
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	-27.827	0.8858	277.40	277.85
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	15.932	0.5071	277.85	277.83
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	15.880	0.5055	277.83	277.70
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	27.770	0.8840	277.78	277.72
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	27.744	0.8831	277.72	277.57
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	27.692	0.8815	277.57	277.47

Active Scenario: Max Day + Fire J-59
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	27.666	0.8806	277.47	277.41
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	42.116	1.3406	277.41	276.25
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	-34.227	1.0895	275.75	275.84
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	-34.357	1.0936	275.84	276.54
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	-34.513	1.0986	276.54	276.65
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	-34.565	1.1002	276.65	276.80
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	-34.565	1.1002	276.80	276.87
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-14.632	0.4657	277.41	277.52
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-14.736	0.4691	277.52	277.56
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-9.028	0.2874	277.56	277.62
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-9.262	0.2948	277.62	277.66
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-15.828	0.5038	277.66	277.70
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-5.916	0.1883	277.56	277.58
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-5.994	0.1908	277.58	277.59
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-6.020	0.1916	277.59	277.59
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-6.098	0.1941	277.59	277.62
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-6.202	0.1974	277.62	277.63
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-6.254	0.1991	277.63	277.63
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-6.280	0.1999	277.63	277.64
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-6.384	0.2032	277.64	277.66
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-43.915	1.3979	277.85	278.46
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-45.034	1.4335	279.51	282.51
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-26.244	0.8354	284.83	284.93
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-26.270	0.8362	284.93	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	18.479	0.5882	284.83	284.75
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	48.099	1.5310	279.68	278.95
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	47.807	1.5217	278.95	277.78
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-44.071	1.4028	278.46	279.09

Active Scenario: Max Day + Fire J-59
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-44.175	1.4061	279.09	279.47
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	41.803	1.3306	276.25	275.31
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	-34.123	1.0862	275.31	275.75
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-45.086	1.4351	282.51	284.41
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-18.349	0.5841	284.41	284.75
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-26.893	1.5218	284.41	284.77
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-26.971	1.5262	284.77	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-44.305	0.9026	279.47	279.51
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-43.282	1.3777	284.83	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-50.994	1.6232	281.28	283.41
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-50.994	1.6232	283.41	284.83
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.130	0.0041	279.47	279.47
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.130	0.0041	279.47	279.47
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	279.47	279.47
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.41	283.41
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	5.279	0.1680	277.00	276.99

Active Scenario: Max Day + Fire J-59
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	281.28	398.9
J-2	240.62	0.000	Fixed	281.25	397.6
J-3	241.30	0.713	Fixed	280.18	380.5
J-4	241.85	0.695	Fixed	279.68	370.2
J-5	241.74	0.313	Fixed	277.78	352.7
J-6	241.50	0.078	Fixed	277.68	354.0
J-7	241.82	0.104	Fixed	277.46	348.9
J-8	242.03	5.296	Fixed	277.45	346.7
J-9	241.64	0.208	Fixed	277.43	350.3
J-10	242.19	0.208	Fixed	277.28	343.5
J-11	242.04	0.156	Fixed	277.23	344.4
J-12	242.39	0.156	Fixed	277.12	339.9
J-13	242.28	0.156	Fixed	277.09	340.7
J-14	242.58	0.052	Fixed	277.01	337.0
J-15	242.58	0.052	Fixed	277.00	336.9
J-16	242.40	0.156	Fixed	276.98	338.4
J-17	242.73	0.185	Fixed	276.94	334.8
J-18	242.90	0.026	Fixed	276.92	333.0
J-19	243.06	0.208	Fixed	276.91	331.2
J-20	243.18	0.208	Fixed	276.87	329.8
J-21	243.15	0.000	Fixed	276.91	330.4
J-22	243.46	0.208	Fixed	277.26	330.8
J-23	243.53	0.000	Fixed	277.32	330.7
J-24	243.60	0.250	Fixed	277.40	330.8
J-25	243.03	0.156	Fixed	277.85	340.8
J-26	243.03	0.052	Fixed	277.83	340.6
J-27	242.65	0.052	Fixed	277.70	343.0
J-28	241.78	0.026	Fixed	277.72	351.7
J-29	241.66	0.052	Fixed	277.57	351.5
J-30	241.74	0.026	Fixed	277.47	349.7
J-31	241.79	0.182	Fixed	277.41	348.6
J-32	242.61	0.313	Fixed	276.25	329.2
J-33	242.87	0.104	Fixed	275.75	321.8
J-34	242.87	0.130	Fixed	275.84	322.7
J-35	243.28	0.156	Fixed	276.54	325.5
J-36	243.35	0.052	Fixed	276.65	325.9
J-37	243.18	0.000	Fixed	276.80	329.0
J-38	241.87	0.104	Fixed	277.52	348.9
J-39	241.97	0.208	Fixed	277.56	348.3
J-40	242.28	0.234	Fixed	277.62	345.8
J-42	242.49	0.078	Fixed	277.58	343.4
J-43	242.67	0.026	Fixed	277.59	341.7
J-44	242.85	0.078	Fixed	277.59	340.0
J-45	243.39	0.104	Fixed	277.62	335.0

Active Scenario: Max Day + Fire J-59
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.052	Fixed	277.63	335.9
J-47	243.13	0.026	Fixed	277.63	337.7
J-48	242.96	0.104	Fixed	277.64	339.4
J-49	242.65	0.182	Fixed	277.66	342.7
J-50	243.16	0.156	Fixed	278.46	345.5
J-51	242.15	0.000	Fixed	279.47	365.2
J-52	245.69	0.130	Fixed	279.47	330.6
J-53	241.96	0.729	Fixed	279.51	367.5
J-54	240.34	0.052	Fixed	284.83	435.4
J-55	240.44	0.026	Fixed	284.93	435.4
J-56	240.44	0.130	Fixed	284.75	433.6
J-57	241.35	0.292	Fixed	278.95	368.0
J-58	242.66	0.104	Fixed	279.09	356.5
J-59	242.59	75.926	Fixed	275.31	320.2
J-60	242.27	0.052	Fixed	282.51	393.8
J-64	241.33	0.156	Fixed	284.41	421.6
J-65	241.33	0.078	Fixed	284.77	425.1
J-68	240.51	0.000	Fixed	283.41	419.9
J-69	242.59	0.000	Fixed	279.47	360.9
J-70	243.84	0.000	Fixed	279.47	348.7
J-71	243.20	0.000	Fixed	283.41	393.6
J-72	242.58	5.279	Fixed	276.99	336.8

Active Scenario: Max Day + Fire J-68
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	-5.891	0.1875	282.17	282.18
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	-5.891	0.1875	282.18	282.20
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	-6.604	0.2102	282.20	282.21
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	4.373	0.1392	282.27	282.26
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	4.295	0.1367	282.26	282.25
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	5.296	0.1686	282.25	282.24
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	-1.105	0.0352	282.25	282.25
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	-1.313	0.0418	282.25	282.25
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	-1.521	0.0484	282.25	282.25
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	-1.677	0.0534	282.25	282.26
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	-1.833	0.0583	282.26	282.26
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	-1.989	0.0633	282.26	282.26
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	-2.041	0.0650	282.26	282.26
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	-7.372	0.2347	282.26	282.28
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	-7.528	0.2396	282.28	282.31
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	-7.713	0.2455	282.31	282.33
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	-7.739	0.2463	282.33	282.35
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	-7.947	0.2530	282.35	282.38
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	-11.527	0.3669	282.38	282.39
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	-11.527	0.3669	282.39	282.46
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	-11.735	0.3735	282.46	282.47
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	-11.735	0.3735	282.47	282.49
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	-11.985	0.3815	282.49	282.58
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	11.401	0.3629	282.58	282.57
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	11.349	0.3613	282.57	282.50
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	-12.277	0.3908	282.27	282.28
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	-12.303	0.3916	282.28	282.32
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	-12.355	0.3933	282.32	282.34

Active Scenario: Max Day + Fire J-68
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	-12.381	0.3941	282.34	282.35
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	-2.461	0.0783	282.35	282.36
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	-3.034	0.0966	282.37	282.37
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	-3.164	0.1007	282.37	282.38
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	-3.320	0.1057	282.38	282.38
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	-3.372	0.1073	282.38	282.38
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	-3.372	0.1073	282.38	282.38
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-10.101	0.3215	282.35	282.41
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-10.205	0.3248	282.41	282.43
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-6.319	0.2012	282.43	282.46
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-6.553	0.2086	282.46	282.49
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-11.297	0.3596	282.49	282.50
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-4.094	0.1303	282.43	282.44
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-4.172	0.1328	282.44	282.44
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-4.198	0.1336	282.44	282.45
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-4.276	0.1361	282.45	282.46
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-4.380	0.1394	282.46	282.47
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-4.432	0.1411	282.47	282.47
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-4.458	0.1419	282.47	282.47
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-4.562	0.1452	282.47	282.49
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-23.543	0.7494	282.58	282.78
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-24.662	0.7850	283.11	284.09
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-29.590	0.9419	284.79	284.91
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-29.616	0.9427	284.91	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	6.969	0.2218	284.79	284.77
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	-7.299	0.2323	282.21	282.23
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	-7.591	0.2416	282.23	282.27
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-23.699	0.7544	282.78	282.98

Active Scenario: Max Day + Fire J-68
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-23.803	0.7577	282.98	283.10
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	-2.774	0.0883	282.36	282.37
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	-2.930	0.0933	282.37	282.37
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-24.714	0.7867	284.09	284.72
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-6.839	0.2177	284.72	284.77
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-18.031	1.0203	284.72	284.89
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-18.109	1.0247	284.89	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-23.933	0.4876	283.10	283.11
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-48.798	1.5533	284.79	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	4.404	0.1402	282.17	282.15
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-71.366	2.2717	282.15	284.79
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.130	0.0041	283.10	283.10
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.130	0.0041	283.10	283.10
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	283.10	283.10
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	282.15	282.15
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	5.279	0.1680	282.26	282.25

Active Scenario: Max Day + Fire J-68
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	282.17	407.7
J-2	240.62	0.000	Fixed	282.18	406.7
J-3	241.30	0.713	Fixed	282.20	400.2
J-4	241.85	0.695	Fixed	282.21	395.0
J-5	241.74	0.313	Fixed	282.27	396.7
J-6	241.50	0.078	Fixed	282.26	398.9
J-7	241.82	0.104	Fixed	282.25	395.7
J-8	242.03	5.296	Fixed	282.24	393.5
J-9	241.64	0.208	Fixed	282.25	397.4
J-10	242.19	0.208	Fixed	282.25	392.1
J-11	242.04	0.156	Fixed	282.25	393.6
J-12	242.39	0.156	Fixed	282.26	390.2
J-13	242.28	0.156	Fixed	282.26	391.2
J-14	242.58	0.052	Fixed	282.26	388.3
J-15	242.58	0.052	Fixed	282.26	388.3
J-16	242.40	0.156	Fixed	282.28	390.3
J-17	242.73	0.185	Fixed	282.31	387.4
J-18	242.90	0.026	Fixed	282.33	385.9
J-19	243.06	0.208	Fixed	282.35	384.5
J-20	243.18	0.208	Fixed	282.38	383.7
J-21	243.15	0.000	Fixed	282.39	384.0
J-22	243.46	0.208	Fixed	282.46	381.7
J-23	243.53	0.000	Fixed	282.47	381.1
J-24	243.60	0.250	Fixed	282.49	380.6
J-25	243.03	0.156	Fixed	282.58	387.1
J-26	243.03	0.052	Fixed	282.57	387.0
J-27	242.65	0.052	Fixed	282.50	390.0
J-28	241.78	0.026	Fixed	282.28	396.4
J-29	241.66	0.052	Fixed	282.32	397.9
J-30	241.74	0.026	Fixed	282.34	397.3
J-31	241.79	0.182	Fixed	282.35	397.0
J-32	242.61	0.313	Fixed	282.36	389.0
J-33	242.87	0.104	Fixed	282.37	386.6
J-34	242.87	0.130	Fixed	282.37	386.6
J-35	243.28	0.156	Fixed	282.38	382.7
J-36	243.35	0.052	Fixed	282.38	382.0
J-37	243.18	0.000	Fixed	282.38	383.7
J-38	241.87	0.104	Fixed	282.41	396.8
J-39	241.97	0.208	Fixed	282.43	396.0
J-40	242.28	0.234	Fixed	282.46	393.2
J-42	242.49	0.078	Fixed	282.44	391.0
J-43	242.67	0.026	Fixed	282.44	389.3
J-44	242.85	0.078	Fixed	282.45	387.5
J-45	243.39	0.104	Fixed	282.46	382.4

Active Scenario: Max Day + Fire J-68
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.052	Fixed	282.47	383.2
J-47	243.13	0.026	Fixed	282.47	385.0
J-48	242.96	0.104	Fixed	282.47	386.7
J-49	242.65	0.182	Fixed	282.49	389.9
J-50	243.16	0.156	Fixed	282.78	387.7
J-51	242.15	0.000	Fixed	283.10	400.7
J-52	245.69	0.130	Fixed	283.10	366.1
J-53	241.96	0.729	Fixed	283.11	402.8
J-54	240.34	0.052	Fixed	284.79	435.0
J-55	240.44	0.026	Fixed	284.91	435.2
J-56	240.44	0.130	Fixed	284.77	433.9
J-57	241.35	0.292	Fixed	282.23	400.1
J-58	242.66	0.104	Fixed	282.98	394.6
J-59	242.59	0.156	Fixed	282.37	389.3
J-60	242.27	0.052	Fixed	284.09	409.3
J-64	241.33	0.156	Fixed	284.72	424.6
J-65	241.33	0.078	Fixed	284.89	426.3
J-68	240.51	75.770	Fixed	282.15	407.5
J-69	242.59	0.000	Fixed	283.10	396.4
J-70	243.84	0.000	Fixed	283.10	384.2
J-71	243.20	0.000	Fixed	282.15	381.2
J-72	242.58	5.279	Fixed	282.25	388.2

Active Scenario: Max Day + Fire J-69 upgraded P-79

FlexTable: Pipe Table

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	43.313	1.3787	282.05	282.03
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	43.313	1.3787	282.03	281.19
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	42.600	1.3560	281.19	280.80
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	16.331	0.5198	279.33	279.26
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	16.253	0.5173	279.26	279.11
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	5.296	0.1686	279.11	279.10
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	10.853	0.3455	279.11	279.09
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	10.645	0.3388	279.09	279.00
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	10.437	0.3322	279.00	278.97
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	10.281	0.3273	278.97	278.91
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	10.125	0.3223	278.91	278.89
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	9.969	0.3173	278.89	278.84
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	9.917	0.3157	278.84	278.84
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	4.586	0.1460	278.84	278.83
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	4.430	0.1410	278.83	278.81
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	4.245	0.1351	278.81	278.81
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	4.219	0.1343	278.81	278.80
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	4.011	0.1277	278.80	278.79
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	11.912	0.3792	278.79	278.78
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	11.912	0.3792	278.78	278.71
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	11.704	0.3726	278.71	278.70
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	11.704	0.3726	278.70	278.68
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	11.454	0.3646	278.68	278.59
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	-14.362	0.4572	278.59	278.61
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	24.969	0.7948	279.33	279.28
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	24.943	0.7940	279.28	279.16
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	24.891	0.7923	279.16	279.08
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	24.865	0.7915	279.08	279.02
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	9.020	0.2871	279.02	278.96
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	8.447	0.2689	278.87	278.87

Active Scenario: Max Day + Fire J-69 upgraded P-79

FlexTable: Pipe Table

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	8.317	0.2647	278.87	278.82
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	8.161	0.2598	278.82	278.81
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	8.109	0.2581	278.81	278.80
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	8.109	0.2581	278.80	278.79
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	15.662	0.4986	279.02	278.89
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	15.558	0.4952	278.89	278.85
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	9.087	0.2893	278.85	278.79
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	8.853	0.2818	278.79	278.75
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	14.466	0.4605	278.75	278.72
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	6.263	0.1994	278.85	278.83
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	6.185	0.1969	278.83	278.82
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	6.159	0.1960	278.82	278.81
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	6.081	0.1936	278.81	278.79
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	5.977	0.1903	278.79	278.78
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	5.925	0.1886	278.78	278.78
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	5.899	0.1878	278.78	278.77
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	5.795	0.1845	278.77	278.75
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	25.661	0.8168	278.59	278.37
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-51.228	1.6306	278.05	281.87
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-25.096	0.7988	284.84	284.93
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-25.122	0.7997	284.93	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	21.635	0.6887	284.84	284.73
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	41.905	1.3339	280.80	280.24
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	41.613	1.3246	280.24	279.33
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	25.505	0.8118	278.37	278.14
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	25.401	0.8085	278.14	278.01
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	8.707	0.2772	278.96	278.91
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	8.551	0.2722	278.91	278.87
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-51.280	1.6323	281.87	284.28
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-21.505	0.6845	284.28	284.73

Active Scenario: Max Day + Fire J-69 upgraded P-79

FlexTable: Pipe Table

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-29.931	1.6938	284.28	284.71
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-30.009	1.6982	284.71	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-50.499	1.0288	278.01	278.05
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-41.390	1.3175	284.84	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-44.800	1.4260	282.05	283.73
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-44.800	1.4260	283.73	284.84
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	75.900	2.4160	278.01	277.22
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.130	0.0041	277.22	277.22
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	277.22	277.22
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.73	283.73
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	5.279	0.1680	278.84	278.82
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	-14.414	0.4588	278.61	278.72

Active Scenario: Max Day + Fire J-69 upgraded P-79
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	282.05	406.4
J-2	240.62	0.000	Fixed	282.03	405.2
J-3	241.30	0.713	Fixed	281.19	390.4
J-4	241.85	0.695	Fixed	280.80	381.2
J-5	241.74	0.313	Fixed	279.33	367.9
J-6	241.50	0.078	Fixed	279.26	369.5
J-7	241.82	0.104	Fixed	279.11	365.0
J-8	242.03	5.296	Fixed	279.10	362.8
J-9	241.64	0.208	Fixed	279.09	366.5
J-10	242.19	0.208	Fixed	279.00	360.3
J-11	242.04	0.156	Fixed	278.97	361.5
J-12	242.39	0.156	Fixed	278.91	357.4
J-13	242.28	0.156	Fixed	278.89	358.3
J-14	242.58	0.052	Fixed	278.84	354.9
J-15	242.58	0.052	Fixed	278.84	354.8
J-16	242.40	0.156	Fixed	278.83	356.5
J-17	242.73	0.185	Fixed	278.81	353.2
J-18	242.90	0.026	Fixed	278.81	351.4
J-19	243.06	0.208	Fixed	278.80	349.8
J-20	243.18	0.208	Fixed	278.79	348.5
J-21	243.15	0.000	Fixed	278.78	348.8
J-22	243.46	0.208	Fixed	278.71	345.0
J-23	243.53	0.000	Fixed	278.70	344.2
J-24	243.60	0.250	Fixed	278.68	343.3
J-25	243.03	0.156	Fixed	278.59	348.1
J-26	243.03	0.052	Fixed	278.61	348.2
J-27	242.65	0.052	Fixed	278.72	353.0
J-28	241.78	0.026	Fixed	279.28	367.0
J-29	241.66	0.052	Fixed	279.16	367.0
J-30	241.74	0.026	Fixed	279.08	365.4
J-31	241.79	0.182	Fixed	279.02	364.4
J-32	242.61	0.313	Fixed	278.96	355.7
J-33	242.87	0.104	Fixed	278.87	352.4
J-34	242.87	0.130	Fixed	278.87	352.3
J-35	243.28	0.156	Fixed	278.82	347.8
J-36	243.35	0.052	Fixed	278.81	347.0
J-37	243.18	0.000	Fixed	278.80	348.6
J-38	241.87	0.104	Fixed	278.89	362.3
J-39	241.97	0.208	Fixed	278.85	360.9
J-40	242.28	0.234	Fixed	278.79	357.4
J-42	242.49	0.078	Fixed	278.83	355.6
J-43	242.67	0.026	Fixed	278.82	353.8
J-44	242.85	0.078	Fixed	278.81	352.0
J-45	243.39	0.104	Fixed	278.79	346.5

Active Scenario: Max Day + Fire J-69 upgraded P-79
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.052	Fixed	278.78	347.2
J-47	243.13	0.026	Fixed	278.78	348.9
J-48	242.96	0.104	Fixed	278.77	350.5
J-49	242.65	0.182	Fixed	278.75	353.3
J-50	243.16	0.156	Fixed	278.37	344.6
J-51	242.15	0.000	Fixed	278.01	350.9
J-52	245.69	0.130	Fixed	277.22	308.6
J-53	241.96	0.729	Fixed	278.05	353.3
J-54	240.34	0.052	Fixed	284.84	435.5
J-55	240.44	0.026	Fixed	284.93	435.4
J-56	240.44	0.130	Fixed	284.73	433.5
J-57	241.35	0.292	Fixed	280.24	380.6
J-58	242.66	0.104	Fixed	278.14	347.2
J-59	242.59	0.156	Fixed	278.91	355.4
J-60	242.27	0.052	Fixed	281.87	387.5
J-64	241.33	0.156	Fixed	284.28	420.3
J-65	241.33	0.078	Fixed	284.71	424.6
J-68	240.51	0.000	Fixed	283.73	423.0
J-69	242.59	75.770	Fixed	277.22	338.9
J-70	243.84	0.000	Fixed	277.22	326.7
J-71	243.20	0.000	Fixed	283.73	396.7
J-72	242.58	5.279	Fixed	278.82	354.7

Active Scenario: Max Day + Fire J-72
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	35.708	1.1366	282.97	282.95
P-3	62.2	J-2	J-3	200.0	PVC	110.0	Open	35.708	1.1366	282.95	282.37
P-4	30.0	J-3	J-4	200.0	PVC	110.0	Open	34.995	1.1139	282.37	282.10
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	41.582	1.3236	281.09	280.66
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	41.504	1.3211	280.66	279.82
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	5.296	0.1686	279.82	279.81
P-9	18.9	J-7	J-9	200.0	PVC	110.0	Open	36.104	1.1492	279.82	279.64
P-10	90.0	J-9	J-10	200.0	PVC	110.0	Open	35.896	1.1426	279.64	278.79
P-11	30.0	J-10	J-11	200.0	PVC	110.0	Open	35.688	1.1360	278.79	278.51
P-12	70.0	J-11	J-12	200.0	PVC	110.0	Open	35.532	1.1310	278.51	277.86
P-13	21.0	J-12	J-13	200.0	PVC	110.0	Open	35.376	1.1261	277.86	277.66
P-14	51.6	J-13	J-14	200.0	PVC	110.0	Open	35.220	1.1211	277.66	277.19
P-15	8.4	J-14	J-15	200.0	PVC	110.0	Open	35.168	1.1194	277.19	277.11
P-16	36.8	J-15	J-16	200.0	PVC	110.0	Open	-45.933	1.4621	277.11	277.66
P-17	66.7	J-16	J-17	200.0	PVC	110.0	Open	-46.089	1.4670	277.66	278.67
P-18	32.1	J-17	J-18	200.0	PVC	110.0	Open	-46.274	1.4729	278.67	279.15
P-19	32.6	J-18	J-19	200.0	PVC	110.0	Open	-46.300	1.4738	279.15	279.65
P-20	62.1	J-19	J-20	200.0	PVC	110.0	Open	-46.508	1.4804	279.65	280.60
P-21	6.4	J-20	J-21	200.0	PVC	110.0	Open	-33.847	1.0774	280.60	280.65
P-22	60.8	J-21	J-22	200.0	PVC	110.0	Open	-33.847	1.0774	280.65	281.17
P-23	11.1	J-22	J-23	200.0	PVC	110.0	Open	-34.055	1.0840	281.17	281.26
P-24	13.9	J-23	J-24	200.0	PVC	110.0	Open	-34.055	1.0840	281.26	281.38
P-25	75.3	J-24	J-25	200.0	PVC	110.0	Open	-34.305	1.0920	281.38	282.04
P-26	10.4	J-25	J-26	200.0	PVC	110.0	Open	23.253	0.7402	282.04	281.99
P-27	63.4	J-26	J-27	200.0	PVC	110.0	Open	23.201	0.7385	281.99	281.73
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	-7.888	0.2511	281.09	281.09
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	-7.914	0.2519	281.09	281.11
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	-7.966	0.2536	281.11	281.12

Active Scenario: Max Day + Fire J-72
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	-7.992	0.2544	281.12	281.12
P-33	91.1	J-31	J-32	200.0	PVC	110.0	Open	13.779	0.4386	281.12	280.98
P-35	10.5	J-33	J-34	200.0	PVC	110.0	Open	13.206	0.4204	280.78	280.77
P-36	80.2	J-34	J-35	200.0	PVC	110.0	Open	13.076	0.4162	280.77	280.65
P-37	12.8	J-35	J-36	200.0	PVC	110.0	Open	12.920	0.4113	280.65	280.63
P-38	16.0	J-36	J-37	200.0	PVC	110.0	Open	12.868	0.4096	280.63	280.61
P-39	9.0	J-37	J-20	200.0	PVC	110.0	Open	12.868	0.4096	280.61	280.60
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-21.953	0.6988	281.12	281.37
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-22.057	0.7021	281.37	281.45
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-13.405	0.4267	281.45	281.57
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-13.639	0.4341	281.57	281.66
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-23.149	0.7369	281.66	281.73
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-8.860	0.2820	281.45	281.49
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-8.938	0.2845	281.49	281.51
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-8.964	0.2853	281.51	281.52
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-9.042	0.2878	281.52	281.57
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-9.146	0.2911	281.57	281.59
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-9.198	0.2928	281.59	281.60
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-9.224	0.2936	281.60	281.62
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-9.328	0.2969	281.62	281.66
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-57.714	1.8371	282.04	283.06
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-7.172	0.2283	284.78	284.88
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-14.100	0.4488	284.95	284.98
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-14.126	0.4496	284.98	285.00
P-62	29.9	J-54	J-56	200.0	PVC	110.0	Open	0.115	0.0037	284.95	284.95
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	34.300	1.0918	282.10	281.71
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	34.008	1.0825	281.71	281.09
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-57.870	1.8421	283.06	284.09

Active Scenario: Max Day + Fire J-72
FlexTable: Pipe Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-57.974	1.8454	284.09	284.72
P-68	74.5	J-32	J-59	200.0	PVC	110.0	Open	13.466	0.4286	280.98	280.86
P-69	50.9	J-59	J-33	200.0	PVC	110.0	Open	13.310	0.4237	280.86	280.78
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-7.224	0.2299	284.88	284.95
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	0.015	0.0005	284.95	284.95
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-7.395	0.4185	284.95	284.98
P-76	8.7	J-65	R-10	150.0	PVC	100.0	Open	-7.473	0.4229	284.98	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-58.104	1.1837	284.72	284.78
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-23.262	0.7405	284.95	285.00
P-84	117.9	J-1	J-68	200.0	PVC	110.0	Open	-37.195	1.1839	282.97	284.16
P-85	78.0	J-68	J-54	200.0	PVC	110.0	Open	-37.195	1.1839	284.16	284.95
P-86	20.6	J-51	J-69	200.0	PVC	110.0	Open	0.130	0.0041	284.72	284.72
P-87	144.3	J-69	J-52	200.0	PVC	110.0	Open	0.130	0.0041	284.72	284.72
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	284.72	284.72
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	284.16	284.16
P-90	11.8	J-53	R-11	200.0	PVC	110.0	Open	-51.661	1.6444	284.78	285.00
P-91	38.6	J-15	J-72	200.0	PVC	110.0	Open	81.049	2.5799	277.11	275.46

Active Scenario: Max Day + Fire J-72
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	281.22	398.4
J-2	240.62	0.000	Fixed	281.19	397.1
J-3	241.30	0.713	Fixed	280.11	379.8
J-4	241.85	0.695	Fixed	279.60	369.4
J-5	241.74	0.313	Fixed	277.67	351.6
J-6	241.50	0.078	Fixed	277.23	349.7
J-7	241.82	0.104	Fixed	276.35	337.9
J-8	242.03	5.296	Fixed	276.34	335.8
J-9	241.64	0.208	Fixed	276.16	337.8
J-10	242.19	0.208	Fixed	275.26	323.7
J-11	242.04	0.156	Fixed	274.97	322.3
J-12	242.39	0.156	Fixed	274.28	312.2
J-13	242.28	0.156	Fixed	274.08	311.2
J-14	242.58	0.052	Fixed	273.59	303.4
J-15	242.58	0.052	Fixed	273.51	302.7
J-16	242.40	0.156	Fixed	274.03	309.6
J-17	242.73	0.185	Fixed	275.00	315.8
J-18	242.90	0.026	Fixed	275.47	318.7
J-19	243.06	0.208	Fixed	275.94	321.8
J-20	243.18	0.208	Fixed	276.86	329.6
J-21	243.15	0.000	Fixed	276.90	330.3
J-22	243.46	0.208	Fixed	277.30	331.1
J-23	243.53	0.000	Fixed	277.37	331.2
J-24	243.60	0.250	Fixed	277.46	331.4
J-25	243.03	0.156	Fixed	277.97	342.0
J-26	243.03	0.052	Fixed	277.96	341.8
J-27	242.65	0.052	Fixed	277.86	344.6
J-28	241.78	0.026	Fixed	277.67	351.2
J-29	241.66	0.052	Fixed	277.66	352.3
J-30	241.74	0.026	Fixed	277.66	351.5
J-31	241.79	0.182	Fixed	277.65	351.0
J-32	242.61	0.313	Fixed	277.43	340.8
J-33	242.87	0.104	Fixed	277.14	335.4
J-34	242.87	0.130	Fixed	277.12	335.2
J-35	243.28	0.156	Fixed	276.94	329.4
J-36	243.35	0.052	Fixed	276.91	328.4
J-37	243.18	0.000	Fixed	276.87	329.8
J-38	241.87	0.104	Fixed	277.74	351.0
J-39	241.97	0.208	Fixed	277.76	350.3
J-40	242.28	0.234	Fixed	277.80	347.6
J-42	242.49	0.078	Fixed	277.78	345.4
J-43	242.67	0.026	Fixed	277.78	343.6
J-44	242.85	0.078	Fixed	277.79	341.9
J-45	243.39	0.104	Fixed	277.80	336.8

Active Scenario: Max Day + Fire J-72
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-46	243.31	0.052	Fixed	277.81	337.6
J-47	243.13	0.026	Fixed	277.81	339.4
J-48	242.96	0.104	Fixed	277.82	341.2
J-49	242.65	0.182	Fixed	277.84	344.4
J-50	243.16	0.156	Fixed	278.58	346.6
J-51	242.15	0.000	Fixed	279.56	366.1
J-52	245.69	0.130	Fixed	279.56	331.5
J-53	241.96	0.729	Fixed	279.60	368.4
J-54	240.34	0.052	Fixed	284.83	435.4
J-55	240.44	0.026	Fixed	284.93	435.4
J-56	240.44	0.130	Fixed	284.75	433.6
J-57	241.35	0.292	Fixed	278.86	367.1
J-58	242.66	0.104	Fixed	279.19	357.5
J-59	242.59	0.156	Fixed	277.26	339.3
J-60	242.27	0.052	Fixed	282.55	394.2
J-64	241.33	0.156	Fixed	284.42	421.7
J-65	241.33	0.078	Fixed	284.77	425.1
J-68	240.51	0.000	Fixed	283.39	419.7
J-69	242.59	0.000	Fixed	279.56	361.8
J-70	243.84	0.000	Fixed	279.56	349.6
J-71	243.20	0.000	Fixed	283.39	393.4
J-72	242.58	81.049	Fixed	271.85	286.5

APPENDIX F

Water Quality Results – Full Subdivision

Active Scenario: 72 hr water quality
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 72.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)	Age (Calculated) (hours)
J-1	240.52	0.541	Fixed	284.99	435.2	1.014
J-2	240.62	0.000	Fixed	284.99	434.2	1.114
J-3	241.30	0.259	Fixed	284.99	427.6	1.483
J-4	241.85	0.253	Fixed	284.99	422.2	1.698
J-5	241.74	0.114	Fixed	284.99	423.3	2.845
J-6	241.50	0.028	Fixed	284.99	425.6	3.596
J-7	241.82	0.038	Fixed	284.99	422.5	5.210
J-8	242.03	0.009	Fixed	284.99	420.4	44.653
J-9	241.64	0.076	Fixed	284.99	424.2	5.723
J-10	242.19	0.076	Fixed	284.99	418.8	8.926
J-11	242.04	0.057	Fixed	284.99	420.3	10.474
J-12	242.39	0.057	Fixed	284.99	416.9	15.918
J-13	242.28	0.057	Fixed	284.99	418.0	20.902
J-14	242.58	0.019	Fixed	284.99	415.0	30.349
J-15	242.58	0.019	Fixed	284.99	415.0	26.835
J-16	242.40	0.057	Fixed	284.99	416.8	18.776
J-17	242.73	0.066	Fixed	284.99	413.6	12.762
J-18	242.90	0.009	Fixed	284.99	411.9	11.040
J-19	243.06	0.076	Fixed	284.99	410.3	9.382
J-20	243.18	0.076	Fixed	284.99	409.2	7.194
J-21	243.15	0.000	Fixed	284.99	409.5	7.046
J-22	243.46	0.076	Fixed	284.99	406.4	5.640
J-23	243.53	0.000	Fixed	284.99	405.7	5.425
J-24	243.60	0.091	Fixed	284.99	405.1	5.157
J-25	243.03	0.057	Fixed	284.99	410.6	3.950
J-26	243.03	0.019	Fixed	284.99	410.6	4.128
J-27	242.65	0.019	Fixed	284.99	414.3	5.259
J-28	241.78	0.009	Fixed	284.99	422.9	3.127
J-29	241.66	0.019	Fixed	284.99	424.0	3.758
J-30	241.74	0.009	Fixed	284.99	423.3	4.255
J-31	241.79	0.066	Fixed	284.99	422.8	7.922
J-32	242.61	0.114	Fixed	284.99	414.7	10.761
J-33	242.87	0.038	Fixed	284.99	412.2	18.718
J-34	242.87	0.047	Fixed	284.99	412.2	20.014
J-35	243.28	0.057	Fixed	284.99	408.2	28.743
J-36	243.35	0.019	Fixed	284.99	407.5	11.298
J-37	243.18	0.000	Fixed	284.99	409.2	8.669
J-38	241.87	0.038	Fixed	284.99	422.0	20.740
J-39	241.97	0.076	Fixed	284.99	421.0	18.373
J-40	242.28	0.085	Fixed	284.99	418.0	8.103
J-42	242.49	0.028	Fixed	284.99	415.9	24.901
J-43	242.67	0.009	Fixed	284.99	414.2	21.653
J-44	242.85	0.028	Fixed	284.99	412.4	18.930
J-45	243.39	0.038	Fixed	284.99	407.1	12.734

Active Scenario: 72 hr water quality
FlexTable: Junction Table (ACAD2013-1389-1 BASE-1.wtg)

Current Time: 72.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)	Age (Calculated) (hours)
J-46	243.31	0.019	Fixed	284.99	407.9	10.551
J-47	243.13	0.009	Fixed	284.99	409.7	9.454
J-48	242.96	0.038	Fixed	284.99	411.3	8.422
J-49	242.65	0.066	Fixed	284.99	414.3	5.535
J-50	243.16	0.057	Fixed	284.99	409.4	3.598
J-51	242.15	0.000	Fixed	284.99	419.3	3.064
J-52	245.69	0.047	Fixed	284.99	384.6	33.689
J-53	241.96	0.265	Fixed	284.99	421.2	2.964
J-54	240.34	0.019	Fixed	285.00	437.1	0.166
J-55	240.44	0.009	Fixed	285.00	436.1	0.118
J-56	240.44	0.047	Fixed	285.00	436.1	0.551
J-57	241.35	0.106	Fixed	284.99	427.1	2.105
J-58	242.66	0.038	Fixed	284.99	414.3	3.260
J-59	242.59	0.057	Fixed	284.99	414.9	14.651
J-60	242.27	0.019	Fixed	285.00	418.1	1.763
J-64	241.33	0.057	Fixed	285.00	427.4	1.015
J-65	241.33	0.028	Fixed	285.00	427.4	0.100
J-68	240.51	0.000	Fixed	285.00	435.4	0.504
J-69	242.59	0.000	Fixed	284.99	414.9	6.891
J-70	243.84	0.000	Fixed	284.99	402.7	17.991
J-71	243.20	0.000	Fixed	285.00	409.1	13.994
J-72	242.58	0.000	Fixed	284.99	415.0	27.554

APPENDIX G

WaterCAD Results – Phase 1

Average Day Demand

Active Scenario: average day with all external upgrades - phase 1

FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	0.838	0.0267	285.00	285.00
P-3	62.4	J-2	J-3	200.0	PVC	110.0	Open	0.838	0.0267	285.00	284.99
P-4	29.8	J-3	J-4	200.0	PVC	110.0	Open	0.579	0.0184	284.99	284.99
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	0.075	0.0024	284.99	284.99
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	0.047	0.0015	284.99	284.99
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	0.009	0.0003	284.99	284.99
P-25	35.6	J-25	J-24	200.0	PVC	110.0	Open	0.009	0.0003	284.99	284.99
P-26	10.4	J-26	J-25	200.0	PVC	110.0	Open	-0.496	0.0158	284.99	284.99
P-27	63.4	J-27	J-26	200.0	PVC	110.0	Open	-0.477	0.0152	284.99	284.99
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	0.031	0.0010	284.99	284.99
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	0.022	0.0007	284.99	284.99
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	0.003	0.0001	284.99	284.99
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	-0.006	0.0002	284.99	284.99
P-33	15.4	J-31	J-32	200.0	PVC	110.0	Open	0.009	0.0003	284.99	284.99
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-0.034	0.0011	284.99	284.99
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-0.072	0.0023	284.99	284.99
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-0.123	0.0039	284.99	284.99
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-0.208	0.0066	284.99	284.99
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-0.458	0.0146	284.99	284.99
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-0.015	0.0005	284.99	284.99
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-0.043	0.0014	284.99	284.99
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-0.052	0.0017	284.99	284.99
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-0.080	0.0025	284.99	284.99
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-0.118	0.0038	284.99	284.99
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-0.137	0.0044	284.99	284.99
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-0.146	0.0047	284.99	284.99
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-0.184	0.0059	284.99	284.99
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-0.552	0.0176	284.99	285.00

Active Scenario: average day with all external upgrades - phase 1

FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-0.959	0.0305	285.00	285.00
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-0.692	0.0220	285.00	285.00
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-0.701	0.0223	285.00	285.00
P-62	29.9	J-56	J-54	200.0	PVC	110.0	Open	-0.442	0.0141	285.00	285.00
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	0.326	0.0104	284.99	284.99
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	0.220	0.0070	284.99	284.99
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-0.609	0.0194	285.00	285.00
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-0.647	0.0206	285.00	285.00
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-0.978	0.0311	285.00	285.00
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-0.395	0.0126	285.00	285.00
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-0.640	0.0362	285.00	285.00
P-76	7.4	J-65	R-10	150.0	PVC	100.0	Open	-0.668	0.0378	285.00	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-0.694	0.0141	285.00	285.00
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-1.148	0.0365	285.00	285.00
P-84	117.9	J-68	J-1	200.0	PVC	110.0	Open	1.379	0.0439	285.00	285.00
P-85	78.0	J-54	J-68	200.0	PVC	110.0	Open	1.379	0.0439	285.00	285.00
P-86	20.6	J-69	J-51	200.0	PVC	110.0	Open	-0.047	0.0015	285.00	285.00
P-87	144.3	J-52	J-69	200.0	PVC	110.0	Open	-0.047	0.0015	285.00	285.00
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	285.00	285.00
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	285.00	285.00

Active Scenario: average day with all external upgrades - phase 1
FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	0.541	Fixed	285.00	435.3
J-2	240.52	0.000	Fixed	285.00	435.3
J-3	241.30	0.259	Fixed	284.99	427.6
J-4	241.85	0.253	Fixed	284.99	422.3
J-5	241.74	0.114	Fixed	284.99	423.3
J-6	241.50	0.028	Fixed	284.99	425.7
J-7	241.82	0.038	Fixed	284.99	422.5
J-8	242.03	0.009	Fixed	284.99	420.5
J-24	243.30	0.009	Fixed	284.99	408.1
J-25	243.03	0.047	Fixed	284.99	410.7
J-26	243.03	0.019	Fixed	284.99	410.7
J-27	242.65	0.019	Fixed	284.99	414.4
J-28	241.78	0.009	Fixed	284.99	422.9
J-29	241.66	0.019	Fixed	284.99	424.1
J-30	241.74	0.009	Fixed	284.99	423.3
J-31	241.79	0.019	Fixed	284.99	422.8
J-32	241.93	0.009	Fixed	284.99	421.5
J-38	241.87	0.038	Fixed	284.99	422.1
J-39	241.97	0.066	Fixed	284.99	421.1
J-40	242.28	0.085	Fixed	284.99	418.0
J-42	242.49	0.028	Fixed	284.99	416.0
J-43	242.67	0.009	Fixed	284.99	414.2
J-44	242.85	0.028	Fixed	284.99	412.5
J-45	243.39	0.038	Fixed	284.99	407.2
J-46	243.31	0.019	Fixed	284.99	408.0
J-47	243.13	0.009	Fixed	284.99	409.7
J-48	242.96	0.038	Fixed	284.99	411.4
J-49	242.65	0.066	Fixed	284.99	414.4
J-50	243.16	0.057	Fixed	285.00	409.4
J-51	242.25	0.000	Fixed	285.00	418.3
J-52	245.69	0.047	Fixed	285.00	384.7
J-53	241.85	0.265	Fixed	285.00	422.3
J-54	240.34	0.019	Fixed	285.00	437.1
J-55	240.44	0.009	Fixed	285.00	436.1
J-56	240.44	0.047	Fixed	285.00	436.1
J-57	241.35	0.106	Fixed	284.99	427.1
J-58	242.66	0.038	Fixed	285.00	414.3
J-60	242.27	0.019	Fixed	285.00	418.2
J-64	241.33	0.057	Fixed	285.00	427.4
J-65	241.33	0.028	Fixed	285.00	427.4
J-68	240.44	0.000	Fixed	285.00	436.1
J-69	242.59	0.000	Fixed	285.00	415.0
J-70	243.84	0.000	Fixed	285.00	402.8

Active Scenario: average day with all external upgrades - phase 1
FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-71	243.20	0.000	Fixed	285.00	409.1

Maximum Hour Demand

Active Scenario: Max Hour with all external upgrades - phase 1
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	3.470	0.1104	284.94	284.94
P-3	62.4	J-2	J-3	200.0	PVC	110.0	Open	3.470	0.1104	284.94	284.93
P-4	29.8	J-3	J-4	200.0	PVC	110.0	Open	2.399	0.0764	284.93	284.93
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	0.312	0.0099	284.92	284.92
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	0.195	0.0062	284.92	284.92
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	0.039	0.0012	284.92	284.92
P-25	35.6	J-25	J-24	200.0	PVC	110.0	Open	0.039	0.0012	284.93	284.93
P-26	10.4	J-26	J-25	200.0	PVC	110.0	Open	-2.051	0.0653	284.93	284.93
P-27	63.4	J-27	J-26	200.0	PVC	110.0	Open	-1.973	0.0628	284.93	284.93
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	0.136	0.0043	284.92	284.92
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	0.097	0.0031	284.92	284.92
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	0.019	0.0006	284.92	284.92
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	-0.020	0.0006	284.92	284.92
P-33	15.4	J-31	J-32	200.0	PVC	110.0	Open	0.039	0.0012	284.92	284.92
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-0.137	0.0044	284.92	284.92
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-0.293	0.0093	284.92	284.92
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-0.508	0.0162	284.92	284.92
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-0.860	0.0274	284.92	284.92
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-1.895	0.0603	284.92	284.93
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-0.059	0.0019	284.92	284.92
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-0.176	0.0056	284.92	284.92
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-0.215	0.0069	284.92	284.92
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-0.332	0.0106	284.92	284.92
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-0.488	0.0155	284.92	284.92
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-0.566	0.0180	284.92	284.92
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-0.605	0.0193	284.92	284.92
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-0.761	0.0242	284.92	284.92
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-2.286	0.0728	284.93	284.93

Active Scenario: Max Hour with all external upgrades - phase 1
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-3.968	0.1263	284.94	284.97
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-2.863	0.0911	285.00	285.00
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-2.902	0.0924	285.00	285.00
P-62	29.9	J-56	J-54	200.0	PVC	110.0	Open	-1.830	0.0582	285.00	285.00
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	1.355	0.0431	284.93	284.92
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	0.917	0.0292	284.92	284.92
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-2.521	0.0803	284.93	284.93
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-2.677	0.0852	284.93	284.94
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-4.046	0.1288	284.97	284.99
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-1.634	0.0520	284.99	285.00
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-2.647	0.1498	284.99	285.00
P-76	7.4	J-65	R-10	150.0	PVC	100.0	Open	-2.764	0.1564	285.00	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-2.873	0.0585	284.94	284.94
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-4.748	0.1511	285.00	285.00
P-84	117.9	J-68	J-1	200.0	PVC	110.0	Open	5.704	0.1816	284.97	284.94
P-85	78.0	J-54	J-68	200.0	PVC	110.0	Open	5.704	0.1816	285.00	284.97
P-86	20.6	J-69	J-51	200.0	PVC	110.0	Open	-0.196	0.0062	284.94	284.94
P-87	144.3	J-52	J-69	200.0	PVC	110.0	Open	-0.196	0.0062	284.94	284.94
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	284.94	284.94
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	284.97	284.97

Active Scenario: Max Hour with all external upgrades - phase 1
FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	2.234	Fixed	284.94	434.7
J-2	240.52	0.000	Fixed	284.94	434.7
J-3	241.30	1.071	Fixed	284.93	427.0
J-4	241.85	1.044	Fixed	284.93	421.6
J-5	241.74	0.469	Fixed	284.92	422.6
J-6	241.50	0.117	Fixed	284.92	425.0
J-7	241.82	0.156	Fixed	284.92	421.9
J-8	242.03	0.039	Fixed	284.92	419.8
J-24	243.30	0.039	Fixed	284.93	407.4
J-25	243.03	0.196	Fixed	284.93	410.1
J-26	243.03	0.078	Fixed	284.93	410.1
J-27	242.65	0.078	Fixed	284.93	413.7
J-28	241.78	0.039	Fixed	284.92	422.2
J-29	241.66	0.078	Fixed	284.92	423.4
J-30	241.74	0.039	Fixed	284.92	422.6
J-31	241.79	0.078	Fixed	284.92	422.1
J-32	241.93	0.039	Fixed	284.92	420.8
J-38	241.87	0.156	Fixed	284.92	421.4
J-39	241.97	0.274	Fixed	284.92	420.4
J-40	242.28	0.352	Fixed	284.92	417.4
J-42	242.49	0.117	Fixed	284.92	415.3
J-43	242.67	0.039	Fixed	284.92	413.5
J-44	242.85	0.117	Fixed	284.92	411.8
J-45	243.39	0.156	Fixed	284.92	406.5
J-46	243.31	0.078	Fixed	284.92	407.3
J-47	243.13	0.039	Fixed	284.92	409.0
J-48	242.96	0.156	Fixed	284.92	410.7
J-49	242.65	0.274	Fixed	284.92	413.7
J-50	243.16	0.235	Fixed	284.93	408.8
J-51	242.25	0.000	Fixed	284.94	417.8
J-52	245.69	0.196	Fixed	284.94	384.1
J-53	241.85	1.095	Fixed	284.94	421.7
J-54	240.34	0.078	Fixed	285.00	437.1
J-55	240.44	0.039	Fixed	285.00	436.1
J-56	240.44	0.196	Fixed	285.00	436.1
J-57	241.35	0.438	Fixed	284.92	426.5
J-58	242.66	0.156	Fixed	284.93	413.7
J-60	242.27	0.078	Fixed	284.97	417.9
J-64	241.33	0.235	Fixed	284.99	427.3
J-65	241.33	0.117	Fixed	285.00	427.4
J-68	240.44	0.000	Fixed	284.97	435.8
J-69	242.59	0.000	Fixed	284.94	414.4
J-70	243.84	0.000	Fixed	284.94	402.2

Active Scenario: Max Hour with all external upgrades - phase 1
FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-71	243.20	0.000	Fixed	284.97	408.8

Maximum Day Demand + Fire Flow

Active Scenario: Max Day + Fire J-1
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	-20.391	0.6491	280.50	280.51
P-3	62.4	J-2	J-3	200.0	PVC	110.0	Open	-20.391	0.6491	280.51	280.72
P-4	29.8	J-3	J-4	200.0	PVC	110.0	Open	-21.104	0.6718	280.72	280.82
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	0.208	0.0066	281.27	281.27
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	0.130	0.0041	281.27	281.27
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	0.026	0.0008	281.27	281.27
P-25	35.6	J-25	J-24	200.0	PVC	110.0	Open	0.026	0.0008	282.51	282.51
P-26	10.4	J-26	J-25	200.0	PVC	110.0	Open	-24.068	0.7661	282.46	282.51
P-27	63.4	J-27	J-26	200.0	PVC	110.0	Open	-24.016	0.7645	282.18	282.46
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	-22.612	0.7198	281.27	281.31
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	-22.638	0.7206	281.31	281.41
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	-22.690	0.7223	281.41	281.49
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	-22.716	0.7231	281.49	281.53
P-33	15.4	J-31	J-32	200.0	PVC	110.0	Open	0.026	0.0008	281.53	281.53
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-22.794	0.7256	281.53	281.80
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-22.898	0.7289	281.80	281.88
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-13.892	0.4422	281.88	282.00
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-14.126	0.4497	282.00	282.11
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-23.964	0.7628	282.11	282.18
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-9.188	0.2925	281.88	281.93
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-9.266	0.2949	281.93	281.94
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-9.292	0.2958	281.94	281.96
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-9.370	0.2983	281.96	282.00
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-9.474	0.3016	282.00	282.03
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-9.526	0.3032	282.03	282.04
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-9.552	0.3040	282.04	282.06
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-9.656	0.3074	282.06	282.11
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-24.224	0.7711	282.51	282.71

Active Scenario: Max Day + Fire J-1
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-25.343	0.8067	283.06	284.10
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-24.632	0.7841	284.85	284.93
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-24.658	0.7849	284.93	285.00
P-62	29.9	J-56	J-54	200.0	PVC	110.0	Open	-8.340	0.2655	284.83	284.85
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	-21.799	0.6939	280.82	280.99
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	-22.091	0.7032	280.99	281.27
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-24.380	0.7760	282.71	282.92
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-24.484	0.7794	282.92	283.05
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-25.395	0.8084	284.10	284.75
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-8.210	0.2613	284.75	284.83
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-17.341	0.9813	284.75	284.91
P-76	7.4	J-65	R-10	150.0	PVC	100.0	Open	-17.419	0.9857	284.91	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-24.614	0.5014	283.05	283.06
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-40.625	1.2931	284.85	285.00
P-84	117.9	J-68	J-1	200.0	PVC	110.0	Open	56.866	1.8101	283.12	280.50
P-85	78.0	J-54	J-68	200.0	PVC	110.0	Open	56.866	1.8101	284.85	283.12
P-86	20.6	J-69	J-51	200.0	PVC	110.0	Open	-0.130	0.0041	283.05	283.05
P-87	144.3	J-52	J-69	200.0	PVC	110.0	Open	-0.130	0.0041	283.05	283.05
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	283.05	283.05
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.12	283.12

Active Scenario: Max Day + Fire J-1
FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	77.257	Fixed	280.50	391.3
J-2	240.52	0.000	Fixed	280.51	391.4
J-3	241.30	0.713	Fixed	280.72	385.8
J-4	241.85	0.695	Fixed	280.82	381.4
J-5	241.74	0.313	Fixed	281.27	386.9
J-6	241.50	0.078	Fixed	281.27	389.2
J-7	241.82	0.104	Fixed	281.27	386.1
J-8	242.03	0.026	Fixed	281.27	384.0
J-24	243.30	0.026	Fixed	282.51	383.7
J-25	243.03	0.130	Fixed	282.51	386.4
J-26	243.03	0.052	Fixed	282.46	385.9
J-27	242.65	0.052	Fixed	282.18	386.8
J-28	241.78	0.026	Fixed	281.31	386.9
J-29	241.66	0.052	Fixed	281.41	389.1
J-30	241.74	0.026	Fixed	281.49	389.0
J-31	241.79	0.052	Fixed	281.53	388.9
J-32	241.93	0.026	Fixed	281.53	387.5
J-38	241.87	0.104	Fixed	281.80	390.8
J-39	241.97	0.182	Fixed	281.88	390.6
J-40	242.28	0.234	Fixed	282.00	388.8
J-42	242.49	0.078	Fixed	281.93	386.0
J-43	242.67	0.026	Fixed	281.94	384.3
J-44	242.85	0.078	Fixed	281.96	382.7
J-45	243.39	0.104	Fixed	282.00	377.9
J-46	243.31	0.052	Fixed	282.03	378.9
J-47	243.13	0.026	Fixed	282.04	380.8
J-48	242.96	0.104	Fixed	282.06	382.6
J-49	242.65	0.182	Fixed	282.11	386.2
J-50	243.16	0.156	Fixed	282.71	387.1
J-51	242.25	0.000	Fixed	283.05	399.3
J-52	245.69	0.130	Fixed	283.05	365.6
J-53	241.85	0.729	Fixed	283.06	403.3
J-54	240.34	0.052	Fixed	284.85	435.6
J-55	240.44	0.026	Fixed	284.93	435.5
J-56	240.44	0.130	Fixed	284.83	434.4
J-57	241.35	0.292	Fixed	280.99	388.0
J-58	242.66	0.104	Fixed	282.92	394.0
J-60	242.27	0.052	Fixed	284.10	409.3
J-64	241.33	0.156	Fixed	284.75	425.0
J-65	241.33	0.078	Fixed	284.91	426.5
J-68	240.44	0.000	Fixed	283.12	417.7
J-69	242.59	0.000	Fixed	283.05	395.9
J-70	243.84	0.000	Fixed	283.05	383.7

Active Scenario: Max Day + Fire J-1

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-71	243.20	0.000	Fixed	283.12	390.7

Active Scenario: Max Day + Fire J-3
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	52.383	1.6674	280.92	280.89
P-3	62.4	J-2	J-3	200.0	PVC	110.0	Open	52.383	1.6674	280.89	279.70
P-4	29.8	J-3	J-4	200.0	PVC	110.0	Open	-24.100	0.7671	279.70	279.84
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	0.208	0.0066	280.40	280.40
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	0.130	0.0041	280.40	280.40
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	0.026	0.0008	280.40	280.40
P-25	35.6	J-25	J-24	200.0	PVC	110.0	Open	0.026	0.0008	281.95	281.95
P-26	10.4	J-26	J-25	200.0	PVC	110.0	Open	-27.064	0.8615	281.89	281.95
P-27	63.4	J-27	J-26	200.0	PVC	110.0	Open	-27.012	0.8598	281.54	281.89
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	-25.608	0.8151	280.40	280.46
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	-25.634	0.8159	280.46	280.58
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	-25.686	0.8176	280.58	280.67
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	-25.712	0.8184	280.67	280.73
P-33	15.4	J-31	J-32	200.0	PVC	110.0	Open	0.026	0.0008	280.73	280.73
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-25.790	0.8209	280.73	281.07
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-25.894	0.8242	281.07	281.17
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-15.683	0.4992	281.17	281.32
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-15.917	0.5067	281.32	281.46
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-26.960	0.8581	281.46	281.54
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-10.392	0.3308	281.17	281.23
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-10.470	0.3333	281.23	281.25
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-10.496	0.3341	281.25	281.27
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-10.574	0.3366	281.27	281.32
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-10.678	0.3399	281.32	281.36
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-10.730	0.3416	281.36	281.37
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-10.756	0.3424	281.37	281.39
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-10.860	0.3457	281.39	281.46
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-27.220	0.8664	281.95	282.21

Active Scenario: Max Day + Fire J-3
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-28.339	0.9020	282.64	283.91
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-24.153	0.7688	284.85	284.94
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-24.179	0.7696	284.94	285.00
P-62	29.9	J-56	J-54	200.0	PVC	110.0	Open	-10.065	0.3204	284.83	284.85
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	-24.795	0.7892	279.84	280.05
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	-25.087	0.7985	280.05	280.40
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-27.376	0.8714	282.21	282.46
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-27.480	0.8747	282.46	282.62
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-28.391	0.9037	283.91	284.72
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-9.935	0.3162	284.72	284.83
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-18.612	1.0532	284.72	284.90
P-76	7.4	J-65	R-10	150.0	PVC	100.0	Open	-18.690	1.0576	284.90	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-27.610	0.5625	282.62	282.64
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-39.834	1.2680	284.85	285.00
P-84	117.9	J-68	J-1	200.0	PVC	110.0	Open	53.870	1.7147	283.29	280.92
P-85	78.0	J-54	J-68	200.0	PVC	110.0	Open	53.870	1.7147	284.85	283.29
P-86	20.6	J-69	J-51	200.0	PVC	110.0	Open	-0.130	0.0041	282.62	282.62
P-87	144.3	J-52	J-69	200.0	PVC	110.0	Open	-0.130	0.0041	282.62	282.62
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	282.62	282.62
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.29	283.29

Active Scenario: Max Day + Fire J-3
FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	280.92	395.4
J-2	240.52	0.000	Fixed	280.89	395.1
J-3	241.30	76.483	Fixed	279.70	375.8
J-4	241.85	0.695	Fixed	279.84	371.8
J-5	241.74	0.313	Fixed	280.40	378.4
J-6	241.50	0.078	Fixed	280.40	380.7
J-7	241.82	0.104	Fixed	280.40	377.6
J-8	242.03	0.026	Fixed	280.40	375.5
J-24	243.30	0.026	Fixed	281.95	378.3
J-25	243.03	0.130	Fixed	281.95	380.9
J-26	243.03	0.052	Fixed	281.89	380.4
J-27	242.65	0.052	Fixed	281.54	380.6
J-28	241.78	0.026	Fixed	280.46	378.5
J-29	241.66	0.052	Fixed	280.58	380.9
J-30	241.74	0.026	Fixed	280.67	381.0
J-31	241.79	0.052	Fixed	280.73	381.1
J-32	241.93	0.026	Fixed	280.73	379.7
J-38	241.87	0.104	Fixed	281.07	383.6
J-39	241.97	0.182	Fixed	281.17	383.7
J-40	242.28	0.234	Fixed	281.32	382.1
J-42	242.49	0.078	Fixed	281.23	379.1
J-43	242.67	0.026	Fixed	281.25	377.6
J-44	242.85	0.078	Fixed	281.27	376.0
J-45	243.39	0.104	Fixed	281.32	371.3
J-46	243.31	0.052	Fixed	281.36	372.3
J-47	243.13	0.026	Fixed	281.37	374.3
J-48	242.96	0.104	Fixed	281.39	376.1
J-49	242.65	0.182	Fixed	281.46	379.8
J-50	243.16	0.156	Fixed	282.21	382.1
J-51	242.25	0.000	Fixed	282.62	395.1
J-52	245.69	0.130	Fixed	282.62	361.4
J-53	241.85	0.729	Fixed	282.64	399.2
J-54	240.34	0.052	Fixed	284.85	435.6
J-55	240.44	0.026	Fixed	284.94	435.5
J-56	240.44	0.130	Fixed	284.83	434.4
J-57	241.35	0.292	Fixed	280.05	378.7
J-58	242.66	0.104	Fixed	282.46	389.6
J-60	242.27	0.052	Fixed	283.91	407.5
J-64	241.33	0.156	Fixed	284.72	424.6
J-65	241.33	0.078	Fixed	284.90	426.4
J-68	240.44	0.000	Fixed	283.29	419.3
J-69	242.59	0.000	Fixed	282.62	391.8
J-70	243.84	0.000	Fixed	282.62	379.5

Active Scenario: Max Day + Fire J-3

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-71	243.20	0.000	Fixed	283.29	392.3

Active Scenario: Max Day + Fire J-4
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	51.133	1.6276	281.09	281.06
P-3	62.4	J-2	J-3	200.0	PVC	110.0	Open	51.133	1.6276	281.06	279.92
P-4	29.8	J-3	J-4	200.0	PVC	110.0	Open	50.420	1.6049	279.92	279.39
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	0.208	0.0066	280.02	280.02
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	0.130	0.0041	280.02	280.02
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	0.026	0.0008	280.02	280.02
P-25	35.6	J-25	J-24	200.0	PVC	110.0	Open	0.026	0.0008	281.70	281.70
P-26	10.4	J-26	J-25	200.0	PVC	110.0	Open	-28.314	0.9013	281.64	281.70
P-27	63.4	J-27	J-26	200.0	PVC	110.0	Open	-28.262	0.8996	281.26	281.64
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	-26.858	0.8549	280.02	280.08
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	-26.884	0.8557	280.08	280.21
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	-26.936	0.8574	280.21	280.31
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	-26.962	0.8582	280.31	280.37
P-33	15.4	J-31	J-32	200.0	PVC	110.0	Open	0.026	0.0008	280.37	280.37
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-27.040	0.8607	280.37	280.74
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-27.144	0.8640	280.74	280.85
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-16.431	0.5230	280.85	281.02
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-16.665	0.5305	281.02	281.17
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-28.210	0.8980	281.17	281.26
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-10.895	0.3468	280.85	280.92
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-10.973	0.3493	280.92	280.94
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-10.999	0.3501	280.94	280.96
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-11.077	0.3526	280.96	281.02
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-11.181	0.3559	281.02	281.06
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-11.233	0.3576	281.06	281.08
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-11.259	0.3584	281.08	281.10
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-11.363	0.3617	281.10	281.17
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-28.470	0.9062	281.70	281.98

Active Scenario: Max Day + Fire J-4
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-29.589	0.9418	282.45	283.83
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-23.944	0.7622	284.86	284.94
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-23.970	0.7630	284.94	285.00
P-62	29.9	J-56	J-54	200.0	PVC	110.0	Open	-10.763	0.3426	284.82	284.86
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	-26.045	0.8290	279.39	279.63
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	-26.337	0.8383	279.63	280.02
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-28.626	0.9112	281.98	282.26
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-28.730	0.9145	282.26	282.43
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-29.641	0.9435	283.83	284.70
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-10.633	0.3384	284.70	284.82
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-19.164	1.0845	284.70	284.89
P-76	7.4	J-65	R-10	150.0	PVC	100.0	Open	-19.242	1.0889	284.89	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-28.860	0.5879	282.43	282.45
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-39.491	1.2570	284.86	285.00
P-84	117.9	J-68	J-1	200.0	PVC	110.0	Open	52.620	1.6749	283.36	281.09
P-85	78.0	J-54	J-68	200.0	PVC	110.0	Open	52.620	1.6749	284.86	283.36
P-86	20.6	J-69	J-51	200.0	PVC	110.0	Open	-0.130	0.0041	282.43	282.43
P-87	144.3	J-52	J-69	200.0	PVC	110.0	Open	-0.130	0.0041	282.43	282.43
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	282.43	282.43
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.36	283.36

Active Scenario: Max Day + Fire J-4
FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	281.09	397.1
J-2	240.52	0.000	Fixed	281.06	396.8
J-3	241.30	0.713	Fixed	279.92	378.0
J-4	241.85	76.465	Fixed	279.39	367.4
J-5	241.74	0.313	Fixed	280.02	374.6
J-6	241.50	0.078	Fixed	280.02	376.9
J-7	241.82	0.104	Fixed	280.02	373.8
J-8	242.03	0.026	Fixed	280.02	371.8
J-24	243.30	0.026	Fixed	281.70	375.9
J-25	243.03	0.130	Fixed	281.70	378.5
J-26	243.03	0.052	Fixed	281.64	377.9
J-27	242.65	0.052	Fixed	281.26	377.8
J-28	241.78	0.026	Fixed	280.08	374.8
J-29	241.66	0.052	Fixed	280.21	377.3
J-30	241.74	0.026	Fixed	280.31	377.5
J-31	241.79	0.052	Fixed	280.37	377.6
J-32	241.93	0.026	Fixed	280.37	376.2
J-38	241.87	0.104	Fixed	280.74	380.4
J-39	241.97	0.182	Fixed	280.85	380.6
J-40	242.28	0.234	Fixed	281.02	379.2
J-42	242.49	0.078	Fixed	280.92	376.1
J-43	242.67	0.026	Fixed	280.94	374.5
J-44	242.85	0.078	Fixed	280.96	372.9
J-45	243.39	0.104	Fixed	281.02	368.3
J-46	243.31	0.052	Fixed	281.06	369.4
J-47	243.13	0.026	Fixed	281.08	371.4
J-48	242.96	0.104	Fixed	281.10	373.2
J-49	242.65	0.182	Fixed	281.17	376.9
J-50	243.16	0.156	Fixed	281.98	379.9
J-51	242.25	0.000	Fixed	282.43	393.2
J-52	245.69	0.130	Fixed	282.43	359.6
J-53	241.85	0.729	Fixed	282.45	397.3
J-54	240.34	0.052	Fixed	284.86	435.7
J-55	240.44	0.026	Fixed	284.94	435.5
J-56	240.44	0.130	Fixed	284.82	434.4
J-57	241.35	0.292	Fixed	279.63	374.6
J-58	242.66	0.104	Fixed	282.26	387.6
J-60	242.27	0.052	Fixed	283.83	406.7
J-64	241.33	0.156	Fixed	284.70	424.5
J-65	241.33	0.078	Fixed	284.89	426.3
J-68	240.44	0.000	Fixed	283.36	420.0
J-69	242.59	0.000	Fixed	282.43	389.9
J-70	243.84	0.000	Fixed	282.43	377.7

Active Scenario: Max Day + Fire J-4

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-71	243.20	0.000	Fixed	283.36	393.0

Active Scenario: Max Day + Fire J-5
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	46.721	1.4872	281.66	281.64
P-3	62.4	J-2	J-3	200.0	PVC	110.0	Open	46.721	1.4872	281.64	280.67
P-4	29.8	J-3	J-4	200.0	PVC	110.0	Open	46.008	1.4645	280.67	280.23
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	0.208	0.0066	278.53	278.53
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	0.130	0.0041	278.53	278.53
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	0.026	0.0008	278.53	278.53
P-25	35.6	J-25	J-24	200.0	PVC	110.0	Open	0.026	0.0008	280.76	280.76
P-26	10.4	J-26	J-25	200.0	PVC	110.0	Open	-32.726	1.0417	280.67	280.76
P-27	63.4	J-27	J-26	200.0	PVC	110.0	Open	-32.674	1.0400	280.17	280.67
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	-31.270	0.9953	278.53	278.61
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	-31.296	0.9962	278.61	278.79
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	-31.348	0.9978	278.79	278.92
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	-31.374	0.9987	278.92	279.00
P-33	15.4	J-31	J-32	200.0	PVC	110.0	Open	0.026	0.0008	279.00	279.00
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-31.452	1.0011	279.00	279.49
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-31.556	1.0044	279.49	279.64
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-19.069	0.6070	279.64	279.86
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-19.303	0.6144	279.86	280.05
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-32.622	1.0384	280.05	280.17
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-12.669	0.4033	279.64	279.73
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-12.747	0.4057	279.73	279.75
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-12.773	0.4066	279.75	279.78
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-12.851	0.4091	279.78	279.86
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-12.955	0.4124	279.86	279.91
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-13.007	0.4140	279.91	279.93
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-13.033	0.4149	279.93	279.96
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-13.137	0.4182	279.96	280.05
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-32.882	1.0467	280.76	281.12

Active Scenario: Max Day + Fire J-5
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-34.001	1.0823	281.73	283.51
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-23.179	0.7378	284.86	284.94
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-23.205	0.7386	284.94	285.00
P-62	29.9	J-56	J-54	200.0	PVC	110.0	Open	-13.147	0.4185	284.82	284.86
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	45.313	1.4424	280.23	279.58
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	45.021	1.4331	279.58	278.53
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-33.038	1.0516	281.12	281.48
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-33.142	1.0549	281.48	281.70
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-34.053	1.0839	283.51	284.64
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-13.017	0.4143	284.64	284.82
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-21.192	1.1992	284.64	284.87
P-76	7.4	J-65	R-10	150.0	PVC	100.0	Open	-21.270	1.2036	284.87	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-33.272	0.6778	281.70	281.73
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-38.229	1.2169	284.86	285.00
P-84	117.9	J-68	J-1	200.0	PVC	110.0	Open	48.208	1.5345	283.59	281.66
P-85	78.0	J-54	J-68	200.0	PVC	110.0	Open	48.208	1.5345	284.86	283.59
P-86	20.6	J-69	J-51	200.0	PVC	110.0	Open	-0.130	0.0041	281.70	281.70
P-87	144.3	J-52	J-69	200.0	PVC	110.0	Open	-0.130	0.0041	281.70	281.70
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	281.70	281.70
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.59	283.59

Active Scenario: Max Day + Fire J-5
FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	281.66	402.7
J-2	240.52	0.000	Fixed	281.64	402.4
J-3	241.30	0.713	Fixed	280.67	385.4
J-4	241.85	0.695	Fixed	280.23	375.6
J-5	241.74	76.083	Fixed	278.53	360.1
J-6	241.50	0.078	Fixed	278.53	362.4
J-7	241.82	0.104	Fixed	278.53	359.3
J-8	242.03	0.026	Fixed	278.53	357.2
J-24	243.30	0.026	Fixed	280.76	366.6
J-25	243.03	0.130	Fixed	280.76	369.2
J-26	243.03	0.052	Fixed	280.67	368.4
J-27	242.65	0.052	Fixed	280.17	367.2
J-28	241.78	0.026	Fixed	278.61	360.5
J-29	241.66	0.052	Fixed	278.79	363.4
J-30	241.74	0.026	Fixed	278.92	363.9
J-31	241.79	0.052	Fixed	279.00	364.2
J-32	241.93	0.026	Fixed	279.00	362.8
J-38	241.87	0.104	Fixed	279.49	368.2
J-39	241.97	0.182	Fixed	279.64	368.7
J-40	242.28	0.234	Fixed	279.86	367.8
J-42	242.49	0.078	Fixed	279.73	364.4
J-43	242.67	0.026	Fixed	279.75	362.9
J-44	242.85	0.078	Fixed	279.78	361.4
J-45	243.39	0.104	Fixed	279.86	357.0
J-46	243.31	0.052	Fixed	279.91	358.2
J-47	243.13	0.026	Fixed	279.93	360.2
J-48	242.96	0.104	Fixed	279.96	362.1
J-49	242.65	0.182	Fixed	280.05	366.0
J-50	243.16	0.156	Fixed	281.12	371.5
J-51	242.25	0.000	Fixed	281.70	386.1
J-52	245.69	0.130	Fixed	281.70	352.5
J-53	241.85	0.729	Fixed	281.73	390.3
J-54	240.34	0.052	Fixed	284.86	435.7
J-55	240.44	0.026	Fixed	284.94	435.5
J-56	240.44	0.130	Fixed	284.82	434.3
J-57	241.35	0.292	Fixed	279.58	374.1
J-58	242.66	0.104	Fixed	281.48	379.9
J-60	242.27	0.052	Fixed	283.51	403.6
J-64	241.33	0.156	Fixed	284.64	423.9
J-65	241.33	0.078	Fixed	284.87	426.1
J-68	240.44	0.000	Fixed	283.59	422.3
J-69	242.59	0.000	Fixed	281.70	382.8
J-70	243.84	0.000	Fixed	281.70	370.6

Active Scenario: Max Day + Fire J-5

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-71	243.20	0.000	Fixed	283.59	395.3

Active Scenario: Max Day + Fire J-6
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	46.721	1.4872	281.66	281.64
P-3	62.4	J-2	J-3	200.0	PVC	110.0	Open	46.721	1.4872	281.64	280.67
P-4	29.8	J-3	J-4	200.0	PVC	110.0	Open	46.008	1.4645	280.67	280.23
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	75.978	2.4185	278.53	277.24
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	0.130	0.0041	277.24	277.24
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	0.026	0.0008	277.24	277.24
P-25	35.6	J-25	J-24	200.0	PVC	110.0	Open	0.026	0.0008	280.76	280.76
P-26	10.4	J-26	J-25	200.0	PVC	110.0	Open	-32.726	1.0417	280.67	280.76
P-27	63.4	J-27	J-26	200.0	PVC	110.0	Open	-32.674	1.0400	280.17	280.67
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	-31.270	0.9953	278.53	278.61
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	-31.296	0.9962	278.61	278.79
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	-31.348	0.9978	278.79	278.92
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	-31.374	0.9987	278.92	279.00
P-33	15.4	J-31	J-32	200.0	PVC	110.0	Open	0.026	0.0008	279.00	279.00
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-31.452	1.0011	279.00	279.49
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-31.556	1.0044	279.49	279.64
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-19.069	0.6070	279.64	279.86
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-19.303	0.6144	279.86	280.05
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-32.622	1.0384	280.05	280.17
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-12.669	0.4033	279.64	279.73
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-12.747	0.4057	279.73	279.75
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-12.773	0.4066	279.75	279.78
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-12.851	0.4091	279.78	279.86
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-12.955	0.4124	279.86	279.91
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-13.007	0.4140	279.91	279.93
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-13.033	0.4149	279.93	279.96
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-13.137	0.4182	279.96	280.05
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-32.882	1.0467	280.76	281.12

Active Scenario: Max Day + Fire J-6
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-34.001	1.0823	281.73	283.51
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-23.179	0.7378	284.86	284.94
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-23.205	0.7386	284.94	285.00
P-62	29.9	J-56	J-54	200.0	PVC	110.0	Open	-13.147	0.4185	284.82	284.86
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	45.313	1.4424	280.23	279.58
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	45.021	1.4331	279.58	278.53
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-33.038	1.0516	281.12	281.48
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-33.142	1.0549	281.48	281.70
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-34.053	1.0839	283.51	284.64
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-13.017	0.4143	284.64	284.82
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-21.192	1.1992	284.64	284.87
P-76	7.4	J-65	R-10	150.0	PVC	100.0	Open	-21.270	1.2036	284.87	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-33.272	0.6778	281.70	281.73
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-38.229	1.2169	284.86	285.00
P-84	117.9	J-68	J-1	200.0	PVC	110.0	Open	48.208	1.5345	283.59	281.66
P-85	78.0	J-54	J-68	200.0	PVC	110.0	Open	48.208	1.5345	284.86	283.59
P-86	20.6	J-69	J-51	200.0	PVC	110.0	Open	-0.130	0.0041	281.70	281.70
P-87	144.3	J-52	J-69	200.0	PVC	110.0	Open	-0.130	0.0041	281.70	281.70
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	281.70	281.70
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.59	283.59

Active Scenario: Max Day + Fire J-6
FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	281.66	402.7
J-2	240.52	0.000	Fixed	281.64	402.4
J-3	241.30	0.713	Fixed	280.67	385.4
J-4	241.85	0.695	Fixed	280.23	375.6
J-5	241.74	0.313	Fixed	278.53	360.1
J-6	241.50	75.848	Fixed	277.24	349.7
J-7	241.82	0.104	Fixed	277.24	346.6
J-8	242.03	0.026	Fixed	277.24	344.6
J-24	243.30	0.026	Fixed	280.76	366.6
J-25	243.03	0.130	Fixed	280.76	369.2
J-26	243.03	0.052	Fixed	280.67	368.4
J-27	242.65	0.052	Fixed	280.17	367.2
J-28	241.78	0.026	Fixed	278.61	360.5
J-29	241.66	0.052	Fixed	278.79	363.4
J-30	241.74	0.026	Fixed	278.92	363.9
J-31	241.79	0.052	Fixed	279.00	364.2
J-32	241.93	0.026	Fixed	279.00	362.8
J-38	241.87	0.104	Fixed	279.49	368.2
J-39	241.97	0.182	Fixed	279.64	368.7
J-40	242.28	0.234	Fixed	279.86	367.8
J-42	242.49	0.078	Fixed	279.73	364.4
J-43	242.67	0.026	Fixed	279.75	362.9
J-44	242.85	0.078	Fixed	279.78	361.4
J-45	243.39	0.104	Fixed	279.86	357.0
J-46	243.31	0.052	Fixed	279.91	358.2
J-47	243.13	0.026	Fixed	279.93	360.2
J-48	242.96	0.104	Fixed	279.96	362.1
J-49	242.65	0.182	Fixed	280.05	366.0
J-50	243.16	0.156	Fixed	281.12	371.5
J-51	242.25	0.000	Fixed	281.70	386.1
J-52	245.69	0.130	Fixed	281.70	352.5
J-53	241.85	0.729	Fixed	281.73	390.3
J-54	240.34	0.052	Fixed	284.86	435.7
J-55	240.44	0.026	Fixed	284.94	435.5
J-56	240.44	0.130	Fixed	284.82	434.3
J-57	241.35	0.292	Fixed	279.58	374.1
J-58	242.66	0.104	Fixed	281.48	379.9
J-60	242.27	0.052	Fixed	283.51	403.6
J-64	241.33	0.156	Fixed	284.64	423.9
J-65	241.33	0.078	Fixed	284.87	426.1
J-68	240.44	0.000	Fixed	283.59	422.3
J-69	242.59	0.000	Fixed	281.70	382.8
J-70	243.84	0.000	Fixed	281.70	370.6

Active Scenario: Max Day + Fire J-6

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-71	243.20	0.000	Fixed	283.59	395.3

Active Scenario: Max Day + Fire J-25
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	36.954	1.1763	282.78	282.76
P-3	62.4	J-2	J-3	200.0	PVC	110.0	Open	36.954	1.1763	282.76	282.14
P-4	29.8	J-3	J-4	200.0	PVC	110.0	Open	36.241	1.1536	282.14	281.85
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	0.208	0.0066	280.77	280.77
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	0.130	0.0041	280.77	280.77
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	0.026	0.0008	280.77	280.77
P-25	35.6	J-25	J-24	200.0	PVC	110.0	Open	0.026	0.0008	278.26	278.26
P-26	10.4	J-26	J-25	200.0	PVC	110.0	Open	33.277	1.0592	278.34	278.26
P-27	63.4	J-27	J-26	200.0	PVC	110.0	Open	33.329	1.0609	278.86	278.34
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	34.733	1.1056	280.77	280.67
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	34.707	1.1047	280.67	280.45
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	34.655	1.1031	280.45	280.29
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	34.629	1.1023	280.29	280.20
P-33	15.4	J-31	J-32	200.0	PVC	110.0	Open	0.026	0.0008	280.20	280.20
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	34.551	1.0998	280.20	279.62
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	34.447	1.0965	279.62	279.44
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	20.396	0.6492	279.44	279.19
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	20.162	0.6418	279.19	278.99
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	33.381	1.0625	278.99	278.86
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	13.869	0.4415	279.44	279.34
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	13.791	0.4390	279.34	279.31
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	13.765	0.4381	279.31	279.28
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	13.687	0.4357	279.28	279.19
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	13.583	0.4323	279.19	279.14
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	13.531	0.4307	279.14	279.11
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	13.505	0.4299	279.11	279.08
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	13.401	0.4266	279.08	278.99
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-42.649	1.3576	278.26	278.84

Active Scenario: Max Day + Fire J-25
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-43.768	1.3932	279.83	282.68
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-21.375	0.6804	284.88	284.95
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-21.401	0.6812	284.95	285.00
P-62	29.9	J-56	J-54	200.0	PVC	110.0	Open	-18.138	0.5773	284.80	284.88
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	35.546	1.1315	281.85	281.43
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	35.254	1.1222	281.43	280.77
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-42.805	1.3625	278.84	279.43
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-42.909	1.3658	279.43	279.79
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-43.820	1.3948	282.68	284.48
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-18.008	0.5732	284.48	284.80
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-25.968	1.4695	284.48	284.81
P-76	7.4	J-65	R-10	150.0	PVC	100.0	Open	-26.046	1.4739	284.81	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-43.039	0.8768	279.79	279.83
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-35.256	1.1222	284.88	285.00
P-84	117.9	J-68	J-1	200.0	PVC	110.0	Open	38.441	1.2236	284.05	282.78
P-85	78.0	J-54	J-68	200.0	PVC	110.0	Open	38.441	1.2236	284.88	284.05
P-86	20.6	J-69	J-51	200.0	PVC	110.0	Open	-0.130	0.0041	279.79	279.79
P-87	144.3	J-52	J-69	200.0	PVC	110.0	Open	-0.130	0.0041	279.79	279.79
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	279.79	279.79
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	284.05	284.05

Active Scenario: Max Day + Fire J-25

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	282.78	413.6
J-2	240.52	0.000	Fixed	282.76	413.4
J-3	241.30	0.713	Fixed	282.14	399.7
J-4	241.85	0.695	Fixed	281.85	391.5
J-5	241.74	0.313	Fixed	280.77	382.0
J-6	241.50	0.078	Fixed	280.77	384.3
J-7	241.82	0.104	Fixed	280.77	381.2
J-8	242.03	0.026	Fixed	280.77	379.1
J-24	243.30	0.026	Fixed	278.26	342.1
J-25	243.03	75.900	Fixed	278.26	344.8
J-26	243.03	0.052	Fixed	278.34	345.6
J-27	242.65	0.052	Fixed	278.86	354.4
J-28	241.78	0.026	Fixed	280.67	380.6
J-29	241.66	0.052	Fixed	280.45	379.7
J-30	241.74	0.026	Fixed	280.29	377.3
J-31	241.79	0.052	Fixed	280.20	375.9
J-32	241.93	0.026	Fixed	280.20	374.5
J-38	241.87	0.104	Fixed	279.62	369.4
J-39	241.97	0.182	Fixed	279.44	366.7
J-40	242.28	0.234	Fixed	279.19	361.3
J-42	242.49	0.078	Fixed	279.34	360.7
J-43	242.67	0.026	Fixed	279.31	358.6
J-44	242.85	0.078	Fixed	279.28	356.6
J-45	243.39	0.104	Fixed	279.19	350.3
J-46	243.31	0.052	Fixed	279.14	350.7
J-47	243.13	0.026	Fixed	279.11	352.1
J-48	242.96	0.104	Fixed	279.08	353.5
J-49	242.65	0.182	Fixed	278.99	355.6
J-50	243.16	0.156	Fixed	278.84	349.2
J-51	242.25	0.000	Fixed	279.79	367.4
J-52	245.69	0.130	Fixed	279.79	333.7
J-53	241.85	0.729	Fixed	279.83	371.7
J-54	240.34	0.052	Fixed	284.88	435.9
J-55	240.44	0.026	Fixed	284.95	435.6
J-56	240.44	0.130	Fixed	284.80	434.2
J-57	241.35	0.292	Fixed	281.43	392.3
J-58	242.66	0.104	Fixed	279.43	359.9
J-60	242.27	0.052	Fixed	282.68	395.4
J-64	241.33	0.156	Fixed	284.48	422.3
J-65	241.33	0.078	Fixed	284.81	425.5
J-68	240.44	0.000	Fixed	284.05	426.8
J-69	242.59	0.000	Fixed	279.79	364.1
J-70	243.84	0.000	Fixed	279.79	351.8

Active Scenario: Max Day + Fire J-25

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-71	243.20	0.000	Fixed	284.05	399.7

Active Scenario: Max Day + Fire J-31
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	44.508	1.4167	281.94	281.91
P-3	62.4	J-2	J-3	200.0	PVC	110.0	Open	44.508	1.4167	281.91	281.03
P-4	29.8	J-3	J-4	200.0	PVC	110.0	Open	43.795	1.3940	281.03	280.62
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	0.208	0.0066	279.08	279.08
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	0.130	0.0041	279.08	279.08
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	0.026	0.0008	279.08	279.08
P-25	35.6	J-25	J-24	200.0	PVC	110.0	Open	0.026	0.0008	280.24	280.24
P-26	10.4	J-26	J-25	200.0	PVC	110.0	Open	-34.939	1.1122	280.14	280.24
P-27	63.4	J-27	J-26	200.0	PVC	110.0	Open	-34.887	1.1105	279.57	280.14
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	42.287	1.3460	279.08	278.93
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	42.261	1.3452	278.93	278.62
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	42.209	1.3435	278.62	278.39
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	42.183	1.3427	278.39	278.25
P-33	15.4	J-31	J-32	200.0	PVC	110.0	Open	0.026	0.0008	278.25	278.25
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-33.665	1.0716	278.25	278.81
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-33.769	1.0749	278.81	278.98
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-20.392	0.6491	278.98	279.23
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-20.626	0.6566	279.23	279.44
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-34.835	1.1088	279.44	279.57
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-13.559	0.4316	278.98	279.08
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-13.637	0.4341	279.08	279.10
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-13.663	0.4349	279.10	279.13
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-13.741	0.4374	279.13	279.23
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-13.845	0.4407	279.23	279.28
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-13.897	0.4424	279.28	279.31
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-13.923	0.4432	279.31	279.34
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-14.027	0.4465	279.34	279.44
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-35.095	1.1171	280.24	280.64

Active Scenario: Max Day + Fire J-31
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-36.214	1.1527	281.33	283.34
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-22.781	0.7251	284.87	284.94
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-22.807	0.7260	284.94	285.00
P-62	29.9	J-56	J-54	200.0	PVC	110.0	Open	-14.307	0.4554	284.82	284.87
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	43.100	1.3719	280.62	280.03
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	42.808	1.3626	280.03	279.08
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-35.251	1.1221	280.64	281.06
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-35.355	1.1254	281.06	281.31
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-36.266	1.1544	283.34	284.61
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-14.177	0.4513	284.61	284.82
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-22.245	1.2588	284.61	284.86
P-76	7.4	J-65	R-10	150.0	PVC	100.0	Open	-22.323	1.2632	284.86	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-35.485	0.7229	281.31	281.33
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-37.573	1.1960	284.87	285.00
P-84	117.9	J-68	J-1	200.0	PVC	110.0	Open	45.995	1.4641	283.70	281.94
P-85	78.0	J-54	J-68	200.0	PVC	110.0	Open	45.995	1.4641	284.87	283.70
P-86	20.6	J-69	J-51	200.0	PVC	110.0	Open	-0.130	0.0041	281.31	281.31
P-87	144.3	J-52	J-69	200.0	PVC	110.0	Open	-0.130	0.0041	281.31	281.31
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	281.31	281.31
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.70	283.70

Active Scenario: Max Day + Fire J-31

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	281.94	405.3
J-2	240.52	0.000	Fixed	281.91	405.1
J-3	241.30	0.713	Fixed	281.03	388.8
J-4	241.85	0.695	Fixed	280.62	379.5
J-5	241.74	0.313	Fixed	279.08	365.4
J-6	241.50	0.078	Fixed	279.08	367.8
J-7	241.82	0.104	Fixed	279.08	364.6
J-8	242.03	0.026	Fixed	279.08	362.6
J-24	243.30	0.026	Fixed	280.24	361.5
J-25	243.03	0.130	Fixed	280.24	364.1
J-26	243.03	0.052	Fixed	280.14	363.2
J-27	242.65	0.052	Fixed	279.57	361.4
J-28	241.78	0.026	Fixed	278.93	363.6
J-29	241.66	0.052	Fixed	278.62	361.7
J-30	241.74	0.026	Fixed	278.39	358.7
J-31	241.79	75.822	Fixed	278.25	356.9
J-32	241.93	0.026	Fixed	278.25	355.5
J-38	241.87	0.104	Fixed	278.81	361.5
J-39	241.97	0.182	Fixed	278.98	362.2
J-40	242.28	0.234	Fixed	279.23	361.6
J-42	242.49	0.078	Fixed	279.08	358.1
J-43	242.67	0.026	Fixed	279.10	356.6
J-44	242.85	0.078	Fixed	279.13	355.1
J-45	243.39	0.104	Fixed	279.23	350.8
J-46	243.31	0.052	Fixed	279.28	352.0
J-47	243.13	0.026	Fixed	279.31	354.1
J-48	242.96	0.104	Fixed	279.34	356.0
J-49	242.65	0.182	Fixed	279.44	360.1
J-50	243.16	0.156	Fixed	280.64	366.8
J-51	242.25	0.000	Fixed	281.31	382.2
J-52	245.69	0.130	Fixed	281.31	348.6
J-53	241.85	0.729	Fixed	281.33	386.4
J-54	240.34	0.052	Fixed	284.87	435.8
J-55	240.44	0.026	Fixed	284.94	435.5
J-56	240.44	0.130	Fixed	284.82	434.3
J-57	241.35	0.292	Fixed	280.03	378.5
J-58	242.66	0.104	Fixed	281.06	375.8
J-60	242.27	0.052	Fixed	283.34	401.9
J-64	241.33	0.156	Fixed	284.61	423.6
J-65	241.33	0.078	Fixed	284.86	426.0
J-68	240.44	0.000	Fixed	283.70	423.4
J-69	242.59	0.000	Fixed	281.31	378.9
J-70	243.84	0.000	Fixed	281.31	366.7

Active Scenario: Max Day + Fire J-31

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-71	243.20	0.000	Fixed	283.70	396.4

Active Scenario: Max Day + Fire J-40
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	40.756	1.2973	282.37	282.35
P-3	62.4	J-2	J-3	200.0	PVC	110.0	Open	40.756	1.2973	282.35	281.60
P-4	29.8	J-3	J-4	200.0	PVC	110.0	Open	40.043	1.2746	281.60	281.26
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	0.208	0.0066	279.95	279.95
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	0.130	0.0041	279.95	279.95
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	0.026	0.0008	279.95	279.95
P-25	35.6	J-25	J-24	200.0	PVC	110.0	Open	0.026	0.0008	279.29	279.29
P-26	10.4	J-26	J-25	200.0	PVC	110.0	Open	-38.691	1.2316	279.18	279.29
P-27	63.4	J-27	J-26	200.0	PVC	110.0	Open	-38.639	1.2299	278.49	279.18
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	38.535	1.2266	279.95	279.83
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	38.509	1.2258	279.83	279.57
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	38.457	1.2241	279.57	279.37
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	38.431	1.2233	279.37	279.26
P-33	15.4	J-31	J-32	200.0	PVC	110.0	Open	0.026	0.0008	279.26	279.26
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	38.353	1.2208	279.26	278.55
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	38.249	1.2175	278.55	278.34
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	36.353	1.1572	278.34	277.61
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-39.651	1.2621	277.61	278.33
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-38.587	1.2283	278.33	278.49
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	1.713	0.0545	278.34	278.34
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	1.635	0.0521	278.34	278.34
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	1.609	0.0512	278.34	278.34
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	1.531	0.0487	278.34	278.34
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	1.427	0.0454	278.34	278.33
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	1.375	0.0438	278.33	278.33
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	1.349	0.0429	278.33	278.33
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	1.245	0.0396	278.33	278.33
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-38.847	1.2366	279.29	279.78

Active Scenario: Max Day + Fire J-40
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-39.967	1.2722	280.61	283.02
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-22.091	0.7032	284.88	284.95
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-22.117	0.7040	284.95	285.00
P-62	29.9	J-56	J-54	200.0	PVC	110.0	Open	-16.231	0.5167	284.81	284.88
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	39.348	1.2525	281.26	280.75
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	39.056	1.2432	280.75	279.95
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-39.003	1.2415	279.78	280.28
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-39.107	1.2448	280.28	280.58
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-40.019	1.2738	283.02	284.55
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-16.101	0.5125	284.55	284.81
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-24.073	1.3623	284.55	284.84
P-76	7.4	J-65	R-10	150.0	PVC	100.0	Open	-24.151	1.3667	284.84	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-39.238	0.7993	280.58	280.61
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-36.435	1.1598	284.88	285.00
P-84	117.9	J-68	J-1	200.0	PVC	110.0	Open	42.243	1.3446	283.88	282.37
P-85	78.0	J-54	J-68	200.0	PVC	110.0	Open	42.243	1.3446	284.88	283.88
P-86	20.6	J-69	J-51	200.0	PVC	110.0	Open	-0.130	0.0041	280.58	280.58
P-87	144.3	J-52	J-69	200.0	PVC	110.0	Open	-0.130	0.0041	280.58	280.58
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	280.58	280.58
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.88	283.88

Active Scenario: Max Day + Fire J-40

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	282.37	409.6
J-2	240.52	0.000	Fixed	282.35	409.4
J-3	241.30	0.713	Fixed	281.60	394.4
J-4	241.85	0.695	Fixed	281.26	385.7
J-5	241.74	0.313	Fixed	279.95	374.0
J-6	241.50	0.078	Fixed	279.95	376.3
J-7	241.82	0.104	Fixed	279.95	373.2
J-8	242.03	0.026	Fixed	279.95	371.1
J-24	243.30	0.026	Fixed	279.29	352.3
J-25	243.03	0.130	Fixed	279.29	354.9
J-26	243.03	0.052	Fixed	279.18	353.8
J-27	242.65	0.052	Fixed	278.49	350.8
J-28	241.78	0.026	Fixed	279.83	372.4
J-29	241.66	0.052	Fixed	279.57	371.0
J-30	241.74	0.026	Fixed	279.37	368.3
J-31	241.79	0.052	Fixed	279.26	366.7
J-32	241.93	0.026	Fixed	279.26	365.3
J-38	241.87	0.104	Fixed	278.55	359.0
J-39	241.97	0.182	Fixed	278.34	355.9
J-40	242.28	76.004	Fixed	277.61	345.8
J-42	242.49	0.078	Fixed	278.34	350.8
J-43	242.67	0.026	Fixed	278.34	349.1
J-44	242.85	0.078	Fixed	278.34	347.3
J-45	243.39	0.104	Fixed	278.34	342.0
J-46	243.31	0.052	Fixed	278.33	342.8
J-47	243.13	0.026	Fixed	278.33	344.5
J-48	242.96	0.104	Fixed	278.33	346.2
J-49	242.65	0.182	Fixed	278.33	349.2
J-50	243.16	0.156	Fixed	279.78	358.4
J-51	242.25	0.000	Fixed	280.58	375.2
J-52	245.69	0.130	Fixed	280.58	341.5
J-53	241.85	0.729	Fixed	280.61	379.4
J-54	240.34	0.052	Fixed	284.88	435.9
J-55	240.44	0.026	Fixed	284.95	435.6
J-56	240.44	0.130	Fixed	284.81	434.2
J-57	241.35	0.292	Fixed	280.75	385.6
J-58	242.66	0.104	Fixed	280.28	368.2
J-60	242.27	0.052	Fixed	283.02	398.8
J-64	241.33	0.156	Fixed	284.55	422.9
J-65	241.33	0.078	Fixed	284.84	425.8
J-68	240.44	0.000	Fixed	283.88	425.1
J-69	242.59	0.000	Fixed	280.58	371.8
J-70	243.84	0.000	Fixed	280.58	359.6

Active Scenario: Max Day + Fire J-40

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-71	243.20	0.000	Fixed	283.88	398.1

Active Scenario: Max Day + Fire J-42
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	41.018	1.3056	282.34	282.32
P-3	62.4	J-2	J-3	200.0	PVC	110.0	Open	41.018	1.3056	282.32	281.56
P-4	29.8	J-3	J-4	200.0	PVC	110.0	Open	40.305	1.2829	281.56	281.21
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	0.208	0.0066	279.89	279.89
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	0.130	0.0041	279.89	279.89
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	0.026	0.0008	279.89	279.89
P-25	35.6	J-25	J-24	200.0	PVC	110.0	Open	0.026	0.0008	279.36	279.36
P-26	10.4	J-26	J-25	200.0	PVC	110.0	Open	-38.429	1.2232	279.25	279.36
P-27	63.4	J-27	J-26	200.0	PVC	110.0	Open	-38.377	1.2216	278.57	279.25
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	38.797	1.2349	279.89	279.77
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	38.771	1.2341	279.77	279.50
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	38.719	1.2325	279.50	279.31
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	38.693	1.2316	279.31	279.19
P-33	15.4	J-31	J-32	200.0	PVC	110.0	Open	0.026	0.0008	279.19	279.19
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	38.615	1.2292	279.19	278.48
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	38.511	1.2258	278.48	278.26
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-11.144	0.3547	278.26	278.34
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-11.378	0.3622	278.34	278.41
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-38.325	1.2199	278.41	278.57
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	49.473	1.5748	278.26	277.19
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-26.375	0.8395	277.19	277.28
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-26.401	0.8404	277.28	277.38
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-26.479	0.8429	277.38	277.71
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-26.583	0.8462	277.71	277.87
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-26.635	0.8478	277.87	277.97
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-26.661	0.8486	277.97	278.07
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-26.765	0.8520	278.07	278.41
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-38.585	1.2282	279.36	279.85

Active Scenario: Max Day + Fire J-42
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-39.704	1.2638	280.67	283.05
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-22.139	0.7047	284.87	284.95
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-22.165	0.7055	284.95	285.00
P-62	29.9	J-56	J-54	200.0	PVC	110.0	Open	-16.098	0.5124	284.81	284.87
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	39.610	1.2608	281.21	280.71
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	39.318	1.2515	280.71	279.89
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-38.741	1.2332	279.85	280.34
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-38.845	1.2365	280.34	280.64
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-39.756	1.2655	283.05	284.55
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-15.968	0.5083	284.55	284.81
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-23.944	1.3550	284.55	284.84
P-76	7.4	J-65	R-10	150.0	PVC	100.0	Open	-24.022	1.3594	284.84	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-38.975	0.7940	280.64	280.67
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-36.516	1.1623	284.87	285.00
P-84	117.9	J-68	J-1	200.0	PVC	110.0	Open	42.505	1.3530	283.87	282.34
P-85	78.0	J-54	J-68	200.0	PVC	110.0	Open	42.505	1.3530	284.87	283.87
P-86	20.6	J-69	J-51	200.0	PVC	110.0	Open	-0.130	0.0041	280.64	280.64
P-87	144.3	J-52	J-69	200.0	PVC	110.0	Open	-0.130	0.0041	280.64	280.64
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	280.64	280.64
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.87	283.87

Active Scenario: Max Day + Fire J-42

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	282.34	409.3
J-2	240.52	0.000	Fixed	282.32	409.1
J-3	241.30	0.713	Fixed	281.56	394.1
J-4	241.85	0.695	Fixed	281.21	385.2
J-5	241.74	0.313	Fixed	279.89	373.4
J-6	241.50	0.078	Fixed	279.89	375.7
J-7	241.82	0.104	Fixed	279.89	372.6
J-8	242.03	0.026	Fixed	279.89	370.6
J-24	243.30	0.026	Fixed	279.36	352.9
J-25	243.03	0.130	Fixed	279.36	355.6
J-26	243.03	0.052	Fixed	279.25	354.5
J-27	242.65	0.052	Fixed	278.57	351.6
J-28	241.78	0.026	Fixed	279.77	371.8
J-29	241.66	0.052	Fixed	279.50	370.4
J-30	241.74	0.026	Fixed	279.31	367.7
J-31	241.79	0.052	Fixed	279.19	366.0
J-32	241.93	0.026	Fixed	279.19	364.7
J-38	241.87	0.104	Fixed	278.48	358.3
J-39	241.97	0.182	Fixed	278.26	355.2
J-40	242.28	0.234	Fixed	278.34	352.9
J-42	242.49	75.848	Fixed	277.19	339.6
J-43	242.67	0.026	Fixed	277.28	338.8
J-44	242.85	0.078	Fixed	277.38	337.9
J-45	243.39	0.104	Fixed	277.71	335.9
J-46	243.31	0.052	Fixed	277.87	338.3
J-47	243.13	0.026	Fixed	277.97	341.0
J-48	242.96	0.104	Fixed	278.07	343.6
J-49	242.65	0.182	Fixed	278.41	350.0
J-50	243.16	0.156	Fixed	279.85	359.0
J-51	242.25	0.000	Fixed	280.64	375.7
J-52	245.69	0.130	Fixed	280.64	342.0
J-53	241.85	0.729	Fixed	280.67	379.9
J-54	240.34	0.052	Fixed	284.87	435.9
J-55	240.44	0.026	Fixed	284.95	435.6
J-56	240.44	0.130	Fixed	284.81	434.2
J-57	241.35	0.292	Fixed	280.71	385.2
J-58	242.66	0.104	Fixed	280.34	368.8
J-60	242.27	0.052	Fixed	283.05	399.1
J-64	241.33	0.156	Fixed	284.55	423.0
J-65	241.33	0.078	Fixed	284.84	425.8
J-68	240.44	0.000	Fixed	283.87	425.0
J-69	242.59	0.000	Fixed	280.64	372.3
J-70	243.84	0.000	Fixed	280.64	360.1

Active Scenario: Max Day + Fire J-42

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-71	243.20	0.000	Fixed	283.87	398.0

Active Scenario: Max Day + Fire J-46
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	40.688	1.2951	282.38	282.36
P-3	62.4	J-2	J-3	200.0	PVC	110.0	Open	40.688	1.2951	282.36	281.61
P-4	29.8	J-3	J-4	200.0	PVC	110.0	Open	39.975	1.2725	281.61	281.27
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	0.208	0.0066	279.97	279.97
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	0.130	0.0041	279.97	279.97
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	0.026	0.0008	279.97	279.97
P-25	35.6	J-25	J-24	200.0	PVC	110.0	Open	0.026	0.0008	279.28	279.28
P-26	10.4	J-26	J-25	200.0	PVC	110.0	Open	-38.759	1.2337	279.16	279.28
P-27	63.4	J-27	J-26	200.0	PVC	110.0	Open	-38.707	1.2321	278.47	279.16
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	38.467	1.2245	279.97	279.85
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	38.441	1.2236	279.85	279.58
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	38.389	1.2220	279.58	279.39
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	38.363	1.2211	279.39	279.28
P-33	15.4	J-31	J-32	200.0	PVC	110.0	Open	0.026	0.0008	279.28	279.28
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	38.285	1.2187	279.28	278.57
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	38.181	1.2153	278.57	278.36
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	6.173	0.1965	278.36	278.33
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	5.939	0.1890	278.33	278.31
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-38.655	1.2304	278.31	278.47
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	31.827	1.0131	278.36	277.89
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	31.749	1.0106	277.89	277.75
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	31.723	1.0098	277.75	277.62
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	31.645	1.0073	277.62	277.16
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	31.541	1.0040	277.16	276.93
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-44.281	1.4095	276.93	277.18
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-44.307	1.4103	277.18	277.43
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-44.411	1.4137	277.43	278.31
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-38.915	1.2387	279.28	279.77

Active Scenario: Max Day + Fire J-46
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-40.034	1.2743	280.60	283.02
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-22.078	0.7028	284.88	284.95
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-22.104	0.7036	284.95	285.00
P-62	29.9	J-56	J-54	200.0	PVC	110.0	Open	-16.265	0.5177	284.81	284.88
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	39.280	1.2503	281.27	280.77
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	38.988	1.2410	280.77	279.97
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-39.071	1.2437	279.77	280.27
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-39.175	1.2470	280.27	280.57
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-40.086	1.2760	283.02	284.54
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-16.135	0.5136	284.54	284.81
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-24.107	1.3642	284.54	284.84
P-76	7.4	J-65	R-10	150.0	PVC	100.0	Open	-24.185	1.3686	284.84	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-39.305	0.8007	280.57	280.60
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-36.414	1.1591	284.88	285.00
P-84	117.9	J-68	J-1	200.0	PVC	110.0	Open	42.175	1.3425	283.88	282.38
P-85	78.0	J-54	J-68	200.0	PVC	110.0	Open	42.175	1.3425	284.88	283.88
P-86	20.6	J-69	J-51	200.0	PVC	110.0	Open	-0.130	0.0041	280.57	280.57
P-87	144.3	J-52	J-69	200.0	PVC	110.0	Open	-0.130	0.0041	280.57	280.57
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	280.57	280.57
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.88	283.88

Active Scenario: Max Day + Fire J-46

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	282.38	409.7
J-2	240.52	0.000	Fixed	282.36	409.4
J-3	241.30	0.713	Fixed	281.61	394.5
J-4	241.85	0.695	Fixed	281.27	385.8
J-5	241.74	0.313	Fixed	279.97	374.1
J-6	241.50	0.078	Fixed	279.97	376.5
J-7	241.82	0.104	Fixed	279.97	373.3
J-8	242.03	0.026	Fixed	279.97	371.3
J-24	243.30	0.026	Fixed	279.28	352.1
J-25	243.03	0.130	Fixed	279.28	354.7
J-26	243.03	0.052	Fixed	279.16	353.6
J-27	242.65	0.052	Fixed	278.47	350.6
J-28	241.78	0.026	Fixed	279.85	372.5
J-29	241.66	0.052	Fixed	279.58	371.2
J-30	241.74	0.026	Fixed	279.39	368.5
J-31	241.79	0.052	Fixed	279.28	366.9
J-32	241.93	0.026	Fixed	279.28	365.5
J-38	241.87	0.104	Fixed	278.57	359.2
J-39	241.97	0.182	Fixed	278.36	356.1
J-40	242.28	0.234	Fixed	278.33	352.8
J-42	242.49	0.078	Fixed	277.89	346.4
J-43	242.67	0.026	Fixed	277.75	343.3
J-44	242.85	0.078	Fixed	277.62	340.3
J-45	243.39	0.104	Fixed	277.16	330.5
J-46	243.31	75.822	Fixed	276.93	329.1
J-47	243.13	0.026	Fixed	277.18	333.3
J-48	242.96	0.104	Fixed	277.43	337.4
J-49	242.65	0.182	Fixed	278.31	349.0
J-50	243.16	0.156	Fixed	279.77	358.3
J-51	242.25	0.000	Fixed	280.57	375.0
J-52	245.69	0.130	Fixed	280.57	341.4
J-53	241.85	0.729	Fixed	280.60	379.2
J-54	240.34	0.052	Fixed	284.88	435.9
J-55	240.44	0.026	Fixed	284.95	435.6
J-56	240.44	0.130	Fixed	284.81	434.2
J-57	241.35	0.292	Fixed	280.77	385.8
J-58	242.66	0.104	Fixed	280.27	368.1
J-60	242.27	0.052	Fixed	283.02	398.8
J-64	241.33	0.156	Fixed	284.54	422.9
J-65	241.33	0.078	Fixed	284.84	425.8
J-68	240.44	0.000	Fixed	283.88	425.2
J-69	242.59	0.000	Fixed	280.57	371.7
J-70	243.84	0.000	Fixed	280.57	359.5

Active Scenario: Max Day + Fire J-46

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-71	243.20	0.000	Fixed	283.88	398.1

Active Scenario: Max Day + Fire J-52
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	32.838	1.0453	283.18	283.17
P-3	62.4	J-2	J-3	200.0	PVC	110.0	Open	32.838	1.0453	283.17	282.67
P-4	29.8	J-3	J-4	200.0	PVC	110.0	Open	32.125	1.0226	282.67	282.44
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	0.208	0.0066	281.58	281.58
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	0.130	0.0041	281.58	281.58
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	0.026	0.0008	281.58	281.58
P-25	35.6	J-25	J-24	200.0	PVC	110.0	Open	0.026	0.0008	279.60	279.60
P-26	10.4	J-26	J-25	200.0	PVC	110.0	Open	29.161	0.9282	279.67	279.60
P-27	63.4	J-27	J-26	200.0	PVC	110.0	Open	29.213	0.9299	280.08	279.67
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	30.617	0.9746	281.58	281.50
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	30.591	0.9737	281.50	281.33
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	30.539	0.9721	281.33	281.20
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	30.513	0.9713	281.20	281.13
P-33	15.4	J-31	J-32	200.0	PVC	110.0	Open	0.026	0.0008	281.13	281.13
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	30.435	0.9688	281.13	280.67
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	30.331	0.9655	280.67	280.53
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	17.935	0.5709	280.53	280.33
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	17.701	0.5634	280.33	280.17
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	29.265	0.9315	280.17	280.08
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	12.214	0.3888	280.53	280.45
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	12.136	0.3863	280.45	280.43
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	12.110	0.3855	280.43	280.40
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	12.032	0.3830	280.40	280.33
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	11.928	0.3797	280.33	280.29
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	11.876	0.3780	280.29	280.27
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	11.850	0.3772	280.27	280.25
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	11.746	0.3739	280.25	280.17
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	29.005	0.9233	279.60	279.31

Active Scenario: Max Day + Fire J-52
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-47.884	1.5242	278.90	282.27
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-20.586	0.6553	284.89	284.95
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-20.612	0.6561	284.95	285.00
P-62	29.9	J-56	J-54	200.0	PVC	110.0	Open	-20.165	0.6419	284.79	284.89
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	31.430	1.0004	282.44	282.11
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	31.138	0.9911	282.11	281.58
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	28.849	0.9183	279.31	279.03
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	28.745	0.9150	279.03	278.86
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-47.936	1.5259	282.27	284.40
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-20.035	0.6377	284.40	284.79
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-28.058	1.5877	284.40	284.78
P-76	7.4	J-65	R-10	150.0	PVC	100.0	Open	-28.136	1.5922	284.78	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-47.155	0.9606	278.86	278.90
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-33.955	1.0808	284.89	285.00
P-84	117.9	J-68	J-1	200.0	PVC	110.0	Open	34.325	1.0926	284.21	283.18
P-85	78.0	J-54	J-68	200.0	PVC	110.0	Open	34.325	1.0926	284.89	284.21
P-86	20.6	J-69	J-51	200.0	PVC	110.0	Open	-75.900	2.4160	278.08	278.86
P-87	144.3	J-52	J-69	200.0	PVC	110.0	Open	-75.900	2.4160	272.61	278.08
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	278.08	278.08
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	284.21	284.21

Active Scenario: Max Day + Fire J-52

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	283.18	417.6
J-2	240.52	0.000	Fixed	283.17	417.4
J-3	241.30	0.713	Fixed	282.67	404.9
J-4	241.85	0.695	Fixed	282.44	397.3
J-5	241.74	0.313	Fixed	281.58	389.9
J-6	241.50	0.078	Fixed	281.58	392.3
J-7	241.82	0.104	Fixed	281.58	389.1
J-8	242.03	0.026	Fixed	281.58	387.1
J-24	243.30	0.026	Fixed	279.60	355.3
J-25	243.03	0.130	Fixed	279.60	357.9
J-26	243.03	0.052	Fixed	279.67	358.6
J-27	242.65	0.052	Fixed	280.08	366.3
J-28	241.78	0.026	Fixed	281.50	388.8
J-29	241.66	0.052	Fixed	281.33	388.3
J-30	241.74	0.026	Fixed	281.20	386.2
J-31	241.79	0.052	Fixed	281.13	385.0
J-32	241.93	0.026	Fixed	281.13	383.6
J-38	241.87	0.104	Fixed	280.67	379.7
J-39	241.97	0.182	Fixed	280.53	377.4
J-40	242.28	0.234	Fixed	280.33	372.4
J-42	242.49	0.078	Fixed	280.45	371.5
J-43	242.67	0.026	Fixed	280.43	369.5
J-44	242.85	0.078	Fixed	280.40	367.5
J-45	243.39	0.104	Fixed	280.33	361.5
J-46	243.31	0.052	Fixed	280.29	361.9
J-47	243.13	0.026	Fixed	280.27	363.5
J-48	242.96	0.104	Fixed	280.25	364.9
J-49	242.65	0.182	Fixed	280.17	367.2
J-50	243.16	0.156	Fixed	279.31	353.8
J-51	242.25	0.000	Fixed	278.86	358.3
J-52	245.69	75.900	Fixed	272.61	263.5
J-53	241.85	0.729	Fixed	278.90	362.6
J-54	240.34	0.052	Fixed	284.89	436.0
J-55	240.44	0.026	Fixed	284.95	435.6
J-56	240.44	0.130	Fixed	284.79	434.1
J-57	241.35	0.292	Fixed	282.11	398.9
J-58	242.66	0.104	Fixed	279.03	355.9
J-60	242.27	0.052	Fixed	282.27	391.5
J-64	241.33	0.156	Fixed	284.40	421.5
J-65	241.33	0.078	Fixed	284.78	425.3
J-68	240.44	0.000	Fixed	284.21	428.4
J-69	242.59	0.000	Fixed	278.08	347.3
J-70	243.84	0.000	Fixed	278.08	335.1

Active Scenario: Max Day + Fire J-52

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-71	243.20	0.000	Fixed	284.21	401.4

Active Scenario: Max Day + Fire J-57
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	49.374	1.5716	281.33	281.30
P-3	62.4	J-2	J-3	200.0	PVC	110.0	Open	49.374	1.5716	281.30	280.23
P-4	29.8	J-3	J-4	200.0	PVC	110.0	Open	48.661	1.5489	280.23	279.73
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	0.208	0.0066	279.45	279.45
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	0.130	0.0041	279.45	279.45
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	0.026	0.0008	279.45	279.45
P-25	35.6	J-25	J-24	200.0	PVC	110.0	Open	0.026	0.0008	281.34	281.34
P-26	10.4	J-26	J-25	200.0	PVC	110.0	Open	-30.073	0.9573	281.27	281.34
P-27	63.4	J-27	J-26	200.0	PVC	110.0	Open	-30.021	0.9556	280.84	281.27
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	-28.617	0.9109	279.45	279.51
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	-28.643	0.9117	279.51	279.67
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	-28.695	0.9134	279.67	279.78
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	-28.721	0.9142	279.78	279.85
P-33	15.4	J-31	J-32	200.0	PVC	110.0	Open	0.026	0.0008	279.85	279.85
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-28.799	0.9167	279.85	280.26
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-28.903	0.9200	280.26	280.39
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-17.483	0.5565	280.39	280.58
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-17.717	0.5639	280.58	280.74
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-29.969	0.9539	280.74	280.84
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-11.602	0.3693	280.39	280.46
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-11.680	0.3718	280.46	280.48
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-11.706	0.3726	280.48	280.50
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-11.784	0.3751	280.50	280.58
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-11.888	0.3784	280.58	280.61
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-11.940	0.3801	280.61	280.64
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-11.966	0.3809	280.64	280.66
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-12.070	0.3842	280.66	280.74
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-30.229	0.9622	281.34	281.65

Active Scenario: Max Day + Fire J-57
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-31.348	0.9978	282.17	283.71
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-23.644	0.7526	284.86	284.94
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-23.670	0.7534	284.94	285.00
P-62	29.9	J-56	J-54	200.0	PVC	110.0	Open	-11.727	0.3733	284.82	284.86
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	47.966	1.5268	279.73	279.01
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	-28.096	0.8943	279.01	279.45
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-30.385	0.9672	281.65	281.96
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-30.489	0.9705	281.96	282.15
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-31.400	0.9995	283.71	284.68
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-11.597	0.3691	284.68	284.82
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-19.959	1.1295	284.68	284.88
P-76	7.4	J-65	R-10	150.0	PVC	100.0	Open	-20.037	1.1339	284.88	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-30.619	0.6238	282.15	282.17
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-38.996	1.2413	284.86	285.00
P-84	117.9	J-68	J-1	200.0	PVC	110.0	Open	50.861	1.6190	283.45	281.33
P-85	78.0	J-54	J-68	200.0	PVC	110.0	Open	50.861	1.6190	284.86	283.45
P-86	20.6	J-69	J-51	200.0	PVC	110.0	Open	-0.130	0.0041	282.15	282.15
P-87	144.3	J-52	J-69	200.0	PVC	110.0	Open	-0.130	0.0041	282.15	282.15
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	282.15	282.15
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	283.45	283.45

Active Scenario: Max Day + Fire J-57

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	281.33	399.4
J-2	240.52	0.000	Fixed	281.30	399.1
J-3	241.30	0.713	Fixed	280.23	381.0
J-4	241.85	0.695	Fixed	279.73	370.8
J-5	241.74	0.313	Fixed	279.45	369.0
J-6	241.50	0.078	Fixed	279.45	371.4
J-7	241.82	0.104	Fixed	279.45	368.2
J-8	242.03	0.026	Fixed	279.45	366.2
J-24	243.30	0.026	Fixed	281.34	372.3
J-25	243.03	0.130	Fixed	281.34	374.9
J-26	243.03	0.052	Fixed	281.27	374.2
J-27	242.65	0.052	Fixed	280.84	373.7
J-28	241.78	0.026	Fixed	279.51	369.3
J-29	241.66	0.052	Fixed	279.67	372.0
J-30	241.74	0.026	Fixed	279.78	372.3
J-31	241.79	0.052	Fixed	279.85	372.5
J-32	241.93	0.026	Fixed	279.85	371.1
J-38	241.87	0.104	Fixed	280.26	375.7
J-39	241.97	0.182	Fixed	280.39	376.0
J-40	242.28	0.234	Fixed	280.58	374.8
J-42	242.49	0.078	Fixed	280.46	371.6
J-43	242.67	0.026	Fixed	280.48	370.1
J-44	242.85	0.078	Fixed	280.50	368.5
J-45	243.39	0.104	Fixed	280.58	363.9
J-46	243.31	0.052	Fixed	280.61	365.1
J-47	243.13	0.026	Fixed	280.64	367.1
J-48	242.96	0.104	Fixed	280.66	369.0
J-49	242.65	0.182	Fixed	280.74	372.8
J-50	243.16	0.156	Fixed	281.65	376.7
J-51	242.25	0.000	Fixed	282.15	390.5
J-52	245.69	0.130	Fixed	282.15	356.8
J-53	241.85	0.729	Fixed	282.17	394.6
J-54	240.34	0.052	Fixed	284.86	435.7
J-55	240.44	0.026	Fixed	284.94	435.5
J-56	240.44	0.130	Fixed	284.82	434.4
J-57	241.35	76.062	Fixed	279.01	368.6
J-58	242.66	0.104	Fixed	281.96	384.6
J-60	242.27	0.052	Fixed	283.71	405.5
J-64	241.33	0.156	Fixed	284.68	424.2
J-65	241.33	0.078	Fixed	284.88	426.3
J-68	240.44	0.000	Fixed	283.45	421.0
J-69	242.59	0.000	Fixed	282.15	387.2
J-70	243.84	0.000	Fixed	282.15	374.9

Active Scenario: Max Day + Fire J-57

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-71	243.20	0.000	Fixed	283.45	393.9

Active Scenario: Max Day + Fire J-68
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	-12.628	0.4019	282.77	282.77
P-3	62.4	J-2	J-3	200.0	PVC	110.0	Open	-12.628	0.4019	282.77	282.86
P-4	29.8	J-3	J-4	200.0	PVC	110.0	Open	-13.341	0.4246	282.86	282.90
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	0.208	0.0066	283.10	283.10
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	0.130	0.0041	283.10	283.10
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	0.026	0.0008	283.10	283.10
P-25	35.6	J-25	J-24	200.0	PVC	110.0	Open	0.026	0.0008	283.69	283.69
P-26	10.4	J-26	J-25	200.0	PVC	110.0	Open	-16.305	0.5190	283.66	283.69
P-27	63.4	J-27	J-26	200.0	PVC	110.0	Open	-16.253	0.5173	283.53	283.66
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	-14.849	0.4726	283.10	283.12
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	-14.875	0.4735	283.12	283.17
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	-14.927	0.4751	283.17	283.20
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	-14.953	0.4760	283.20	283.22
P-33	15.4	J-31	J-32	200.0	PVC	110.0	Open	0.026	0.0008	283.22	283.22
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	-15.031	0.4784	283.22	283.35
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	-15.135	0.4817	283.35	283.39
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	-9.251	0.2945	283.39	283.44
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	-9.485	0.3019	283.44	283.49
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	-16.201	0.5157	283.49	283.53
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	-6.066	0.1931	283.39	283.41
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	-6.144	0.1956	283.41	283.41
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	-6.170	0.1964	283.41	283.42
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	-6.248	0.1989	283.42	283.44
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	-6.352	0.2022	283.44	283.46
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	-6.404	0.2038	283.46	283.46
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	-6.430	0.2047	283.46	283.47
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	-6.534	0.2080	283.47	283.49
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	-16.461	0.5240	283.69	283.79

Active Scenario: Max Day + Fire J-68
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-17.580	0.5596	283.96	284.49
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-25.654	0.8166	284.84	284.93
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-25.680	0.8174	284.93	285.00
P-62	29.9	J-56	J-54	200.0	PVC	110.0	Open	-3.282	0.1045	284.83	284.84
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	-14.036	0.4468	282.90	282.98
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	-14.328	0.4561	282.98	283.10
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	-16.617	0.5289	283.79	283.89
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	-16.721	0.5322	283.89	283.95
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-17.632	0.5612	284.49	284.82
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-3.152	0.1003	284.82	284.83
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-14.636	0.8282	284.82	284.93
P-76	7.4	J-65	R-10	150.0	PVC	100.0	Open	-14.714	0.8326	284.93	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-16.851	0.3433	283.95	283.96
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-42.310	1.3468	284.84	285.00
P-84	117.9	J-68	J-1	200.0	PVC	110.0	Open	-11.141	0.3546	282.64	282.77
P-85	78.0	J-54	J-68	200.0	PVC	110.0	Open	64.629	2.0572	284.84	282.64
P-86	20.6	J-69	J-51	200.0	PVC	110.0	Open	-0.130	0.0041	283.95	283.95
P-87	144.3	J-52	J-69	200.0	PVC	110.0	Open	-0.130	0.0041	283.95	283.95
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	283.95	283.95
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	282.64	282.64

Active Scenario: Max Day + Fire J-68

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	282.77	413.5
J-2	240.52	0.000	Fixed	282.77	413.5
J-3	241.30	0.713	Fixed	282.86	406.7
J-4	241.85	0.695	Fixed	282.90	401.8
J-5	241.74	0.313	Fixed	283.10	404.8
J-6	241.50	0.078	Fixed	283.10	407.2
J-7	241.82	0.104	Fixed	283.10	404.0
J-8	242.03	0.026	Fixed	283.10	402.0
J-24	243.30	0.026	Fixed	283.69	395.3
J-25	243.03	0.130	Fixed	283.69	397.9
J-26	243.03	0.052	Fixed	283.66	397.7
J-27	242.65	0.052	Fixed	283.53	400.1
J-28	241.78	0.026	Fixed	283.12	404.6
J-29	241.66	0.052	Fixed	283.17	406.2
J-30	241.74	0.026	Fixed	283.20	405.8
J-31	241.79	0.052	Fixed	283.22	405.5
J-32	241.93	0.026	Fixed	283.22	404.1
J-38	241.87	0.104	Fixed	283.35	405.9
J-39	241.97	0.182	Fixed	283.39	405.3
J-40	242.28	0.234	Fixed	283.44	402.9
J-42	242.49	0.078	Fixed	283.41	400.5
J-43	242.67	0.026	Fixed	283.41	398.8
J-44	242.85	0.078	Fixed	283.42	397.1
J-45	243.39	0.104	Fixed	283.44	392.0
J-46	243.31	0.052	Fixed	283.46	392.9
J-47	243.13	0.026	Fixed	283.46	394.7
J-48	242.96	0.104	Fixed	283.47	396.5
J-49	242.65	0.182	Fixed	283.49	399.7
J-50	243.16	0.156	Fixed	283.79	397.6
J-51	242.25	0.000	Fixed	283.95	408.1
J-52	245.69	0.130	Fixed	283.95	374.5
J-53	241.85	0.729	Fixed	283.96	412.1
J-54	240.34	0.052	Fixed	284.84	435.5
J-55	240.44	0.026	Fixed	284.93	435.4
J-56	240.44	0.130	Fixed	284.83	434.5
J-57	241.35	0.292	Fixed	282.98	407.4
J-58	242.66	0.104	Fixed	283.89	403.5
J-60	242.27	0.052	Fixed	284.49	413.2
J-64	241.33	0.156	Fixed	284.82	425.6
J-65	241.33	0.078	Fixed	284.93	426.8
J-68	240.44	75.770	Fixed	282.64	413.0
J-69	242.59	0.000	Fixed	283.95	404.8
J-70	243.84	0.000	Fixed	283.95	392.6

Active Scenario: Max Day + Fire J-68

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-71	243.20	0.000	Fixed	282.64	386.0

Active Scenario: Max Day + Fire J-69
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-2	1.8	J-1	J-2	200.0	PVC	110.0	Open	32.838	1.0453	283.18	283.17
P-3	62.4	J-2	J-3	200.0	PVC	110.0	Open	32.838	1.0453	283.17	282.67
P-4	29.8	J-3	J-4	200.0	PVC	110.0	Open	32.125	1.0226	282.67	282.44
P-6	34.1	J-5	J-6	200.0	PVC	110.0	Open	0.208	0.0066	281.58	281.58
P-7	68.1	J-6	J-7	200.0	PVC	110.0	Open	0.130	0.0041	281.58	281.58
P-8	40.7	J-7	J-8	200.0	PVC	110.0	Open	0.026	0.0008	281.58	281.58
P-25	35.6	J-25	J-24	200.0	PVC	110.0	Open	0.026	0.0008	279.60	279.60
P-26	10.4	J-26	J-25	200.0	PVC	110.0	Open	29.161	0.9282	279.67	279.60
P-27	63.4	J-27	J-26	200.0	PVC	110.0	Open	29.213	0.9299	280.08	279.67
P-29	11.2	J-5	J-28	200.0	PVC	110.0	Open	30.617	0.9746	281.58	281.50
P-30	24.4	J-28	J-29	200.0	PVC	110.0	Open	30.591	0.9737	281.50	281.33
P-31	18.1	J-29	J-30	200.0	PVC	110.0	Open	30.539	0.9721	281.33	281.20
P-32	10.7	J-30	J-31	200.0	PVC	110.0	Open	30.513	0.9713	281.20	281.13
P-33	15.4	J-31	J-32	200.0	PVC	110.0	Open	0.026	0.0008	281.13	281.13
P-40	65.9	J-31	J-38	200.0	PVC	110.0	Open	30.435	0.9688	281.13	280.67
P-41	20.1	J-38	J-39	200.0	PVC	110.0	Open	30.331	0.9655	280.67	280.53
P-42	75.0	J-39	J-40	200.0	PVC	110.0	Open	17.935	0.5709	280.53	280.33
P-43	63.2	J-40	J-49	200.0	PVC	110.0	Open	17.701	0.5634	280.33	280.17
P-44	14.9	J-49	J-27	200.0	PVC	110.0	Open	29.265	0.9315	280.17	280.08
P-45	62.5	J-39	J-42	200.0	PVC	110.0	Open	12.214	0.3888	280.53	280.45
P-46	18.0	J-42	J-43	200.0	PVC	110.0	Open	12.136	0.3863	280.45	280.43
P-47	17.9	J-43	J-44	200.0	PVC	110.0	Open	12.110	0.3855	280.43	280.40
P-48	60.6	J-44	J-45	200.0	PVC	110.0	Open	12.032	0.3830	280.40	280.33
P-49	30.9	J-45	J-46	200.0	PVC	110.0	Open	11.928	0.3797	280.33	280.29
P-50	17.9	J-46	J-47	200.0	PVC	110.0	Open	11.876	0.3780	280.29	280.27
P-51	17.9	J-47	J-48	200.0	PVC	110.0	Open	11.850	0.3772	280.27	280.25
P-52	62.6	J-48	J-49	200.0	PVC	110.0	Open	11.746	0.3739	280.25	280.17
P-53	44.7	J-25	J-50	200.0	PVC	110.0	Open	29.005	0.9233	279.60	279.31

Active Scenario: Max Day + Fire J-69
FlexTable: Pipe Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen- Williams C	Status (Initial)	Flow (L/s)	Velocity (m/s)	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)
P-58	208.6	J-53	J-60	200.0	PVC	110.0	Open	-47.884	1.5242	278.90	282.27
P-60	18.5	J-54	J-55	200.0	PVC	110.0	Open	-20.586	0.6553	284.89	284.95
P-61	13.9	J-55	R-1	200.0	PVC	110.0	Open	-20.612	0.6561	284.95	285.00
P-62	29.9	J-56	J-54	200.0	PVC	110.0	Open	-20.165	0.6419	284.79	284.89
P-64	44.8	J-4	J-57	200.0	PVC	110.0	Open	31.430	1.0004	282.44	282.11
P-65	72.6	J-57	J-5	200.0	PVC	110.0	Open	31.138	0.9911	282.11	281.58
P-66	45.2	J-50	J-58	200.0	PVC	110.0	Open	28.849	0.9183	279.31	279.03
P-67	27.1	J-58	J-51	200.0	PVC	110.0	Open	28.745	0.9150	279.03	278.86
P-73	131.6	J-60	J-64	200.0	PVC	110.0	Open	-47.936	1.5259	282.27	284.40
P-74	123.3	J-64	J-56	200.0	PVC	110.0	Open	-20.035	0.6377	284.40	284.79
P-75	13.3	J-64	J-65	150.0	PVC	100.0	Open	-28.058	1.5877	284.40	284.78
P-76	7.4	J-65	R-10	150.0	PVC	100.0	Open	-28.136	1.5922	284.78	285.00
P-79	8.2	J-51	J-53	250.0	PVC	110.0	Open	-47.155	0.9606	278.86	278.90
P-83	12.8	J-54	R-3	200.0	PVC	110.0	Open	-33.955	1.0808	284.89	285.00
P-84	117.9	J-68	J-1	200.0	PVC	110.0	Open	34.325	1.0926	284.21	283.18
P-85	78.0	J-54	J-68	200.0	PVC	110.0	Open	34.325	1.0926	284.89	284.21
P-86	20.6	J-69	J-51	200.0	PVC	110.0	Open	-75.900	2.4160	278.08	278.86
P-87	144.3	J-52	J-69	200.0	PVC	110.0	Open	-0.130	0.0041	278.08	278.08
P-88	6.7	J-69	J-70	150.0	PVC	100.0	Open	0.000	0.0000	278.08	278.08
P-89	8.2	J-68	J-71	150.0	PVC	100.0	Open	0.000	0.0000	284.21	284.21

Active Scenario: Max Day + Fire J-69

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-1	240.52	1.487	Fixed	283.18	417.6
J-2	240.52	0.000	Fixed	283.17	417.4
J-3	241.30	0.713	Fixed	282.67	404.9
J-4	241.85	0.695	Fixed	282.44	397.3
J-5	241.74	0.313	Fixed	281.58	389.9
J-6	241.50	0.078	Fixed	281.58	392.3
J-7	241.82	0.104	Fixed	281.58	389.1
J-8	242.03	0.026	Fixed	281.58	387.1
J-24	243.30	0.026	Fixed	279.60	355.3
J-25	243.03	0.130	Fixed	279.60	357.9
J-26	243.03	0.052	Fixed	279.67	358.6
J-27	242.65	0.052	Fixed	280.08	366.3
J-28	241.78	0.026	Fixed	281.50	388.8
J-29	241.66	0.052	Fixed	281.33	388.3
J-30	241.74	0.026	Fixed	281.20	386.2
J-31	241.79	0.052	Fixed	281.13	385.0
J-32	241.93	0.026	Fixed	281.13	383.6
J-38	241.87	0.104	Fixed	280.67	379.7
J-39	241.97	0.182	Fixed	280.53	377.4
J-40	242.28	0.234	Fixed	280.33	372.4
J-42	242.49	0.078	Fixed	280.45	371.5
J-43	242.67	0.026	Fixed	280.43	369.5
J-44	242.85	0.078	Fixed	280.40	367.5
J-45	243.39	0.104	Fixed	280.33	361.5
J-46	243.31	0.052	Fixed	280.29	361.9
J-47	243.13	0.026	Fixed	280.27	363.5
J-48	242.96	0.104	Fixed	280.25	364.9
J-49	242.65	0.182	Fixed	280.17	367.2
J-50	243.16	0.156	Fixed	279.31	353.8
J-51	242.25	0.000	Fixed	278.86	358.3
J-52	245.69	0.130	Fixed	278.08	317.0
J-53	241.85	0.729	Fixed	278.90	362.6
J-54	240.34	0.052	Fixed	284.89	436.0
J-55	240.44	0.026	Fixed	284.95	435.6
J-56	240.44	0.130	Fixed	284.79	434.1
J-57	241.35	0.292	Fixed	282.11	398.9
J-58	242.66	0.104	Fixed	279.03	355.9
J-60	242.27	0.052	Fixed	282.27	391.5
J-64	241.33	0.156	Fixed	284.40	421.5
J-65	241.33	0.078	Fixed	284.78	425.3
J-68	240.44	0.000	Fixed	284.21	428.4
J-69	242.59	75.770	Fixed	278.08	347.3
J-70	243.84	0.000	Fixed	278.08	335.1

Active Scenario: Max Day + Fire J-69

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 0.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)
J-71	243.20	0.000	Fixed	284.21	401.4

APPENDIX H

Water Quality Results – Phase 1

Active Scenario: 72 hr phase 1 QA = 25% build out w blow off J-8,24,32

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 72.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)	Age (Calculated) (hours)
J-1	240.52	0.541	Fixed	284.56	431.1	2.127
J-2	240.52	0.000	Fixed	284.56	431.0	2.177
J-3	241.30	0.130	Fixed	284.44	422.2	3.545
J-4	241.85	0.126	Fixed	284.38	416.2	4.516
J-5	241.74	0.057	Fixed	284.15	415.1	14.506
J-6	241.50	0.014	Fixed	284.13	417.2	23.350
J-7	241.82	0.019	Fixed	284.07	413.5	24.020
J-8	242.03	9.500	Fixed	284.04	411.1	24.377
J-24	243.30	9.500	Fixed	284.14	399.7	25.483
J-25	243.03	0.024	Fixed	284.17	402.7	10.275
J-26	243.03	0.009	Fixed	284.17	402.6	10.622
J-27	242.65	0.009	Fixed	284.16	406.2	12.824
J-28	241.78	0.005	Fixed	284.15	414.7	24.020
J-29	241.66	0.009	Fixed	284.14	415.8	48.864
J-30	241.74	0.005	Fixed	284.14	414.9	47.380
J-31	241.79	0.009	Fixed	284.13	414.4	40.150
J-32	241.93	9.500	Fixed	284.12	412.9	36.740
J-38	241.87	0.019	Fixed	284.14	413.7	28.517
J-39	241.97	0.033	Fixed	284.15	412.8	27.811
J-40	242.28	0.043	Fixed	284.15	409.8	18.310
J-42	242.49	0.014	Fixed	284.15	407.7	39.711
J-43	242.67	0.005	Fixed	284.15	406.0	35.963
J-44	242.85	0.014	Fixed	284.15	404.2	30.897
J-45	243.39	0.019	Fixed	284.15	398.9	23.737
J-46	243.31	0.009	Fixed	284.15	399.7	22.158
J-47	243.13	0.005	Fixed	284.15	401.5	20.808
J-48	242.96	0.019	Fixed	284.15	403.2	18.958
J-49	242.65	0.033	Fixed	284.16	406.2	13.361
J-50	243.16	0.028	Fixed	284.24	402.1	8.901
J-51	242.25	0.000	Fixed	284.36	412.1	6.923
J-52	245.69	0.047	Fixed	284.36	378.5	37.549
J-53	241.85	0.265	Fixed	284.36	416.1	6.626
J-54	240.34	0.019	Fixed	284.98	436.9	0.307
J-55	240.44	0.009	Fixed	284.99	436.0	0.249
J-56	240.44	0.047	Fixed	284.97	435.8	1.118
J-57	241.35	0.053	Fixed	284.29	420.3	7.271
J-58	242.66	0.019	Fixed	284.32	407.7	7.637
J-60	242.27	0.019	Fixed	284.71	415.4	3.796
J-64	241.33	0.057	Fixed	284.93	426.7	2.062
J-65	241.33	0.028	Fixed	284.98	427.2	0.077
J-68	240.44	0.000	Fixed	284.81	434.3	1.031
J-69	242.59	0.000	Fixed	284.36	408.8	10.751

Active Scenario: 72 hr phase 1 QA = 25% build out w blow off J-8,24,32

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 72.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)	Age (Calculated) (hours)
J-70	243.84	0.000	Fixed	284.36	396.6	23.035
J-71	243.20	0.000	Fixed	284.81	407.3	12.092

Active Scenario: 72 hr phase 1 QA - 50% build out w blow off J-8 with lots to 24&32 built

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 72.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)	Age (Calculated) (hours)
J-1	240.52	0.541	Fixed	284.92	434.5	2.105
J-2	240.52	0.000	Fixed	284.92	434.5	2.155
J-3	241.30	0.130	Fixed	284.90	426.7	3.490
J-4	241.85	0.126	Fixed	284.89	421.2	4.427
J-5	241.74	0.057	Fixed	284.85	421.9	13.414
J-6	241.50	0.014	Fixed	284.82	424.0	22.430
J-7	241.82	0.019	Fixed	284.77	420.3	38.817
J-8	242.03	9.500	Fixed	284.73	417.9	37.851
J-24	243.30	0.009	Fixed	284.90	407.1	44.619
J-25	243.03	0.024	Fixed	284.90	409.8	10.103
J-26	243.03	0.009	Fixed	284.90	409.7	10.451
J-27	242.65	0.009	Fixed	284.88	413.3	12.661
J-28	241.78	0.005	Fixed	284.85	421.5	23.671
J-29	241.66	0.009	Fixed	284.86	422.7	54.907
J-30	241.74	0.005	Fixed	284.86	422.0	47.306
J-31	241.79	0.009	Fixed	284.86	421.5	45.874
J-32	241.93	0.009	Fixed	284.86	420.1	48.783
J-38	241.87	0.019	Fixed	284.87	420.8	31.815
J-39	241.97	0.033	Fixed	284.87	419.9	29.680
J-40	242.28	0.043	Fixed	284.88	416.9	18.171
J-42	242.49	0.014	Fixed	284.88	414.8	39.567
J-43	242.67	0.005	Fixed	284.88	413.1	35.804
J-44	242.85	0.014	Fixed	284.88	411.3	32.062
J-45	243.39	0.019	Fixed	284.88	406.0	25.099
J-46	243.31	0.009	Fixed	284.88	406.8	22.184
J-47	243.13	0.005	Fixed	284.88	408.6	20.728
J-48	242.96	0.019	Fixed	284.88	410.3	18.819
J-49	242.65	0.033	Fixed	284.88	413.3	13.200
J-50	243.16	0.028	Fixed	284.91	408.6	8.767
J-51	242.25	0.000	Fixed	284.92	417.6	6.838
J-52	245.69	0.047	Fixed	284.92	383.9	37.464
J-53	241.85	0.265	Fixed	284.92	421.5	6.548
J-54	240.34	0.019	Fixed	285.00	437.0	0.304
J-55	240.44	0.009	Fixed	285.00	436.1	0.246
J-56	240.44	0.047	Fixed	285.00	436.1	1.107
J-57	241.35	0.053	Fixed	284.87	425.9	7.003
J-58	242.66	0.019	Fixed	284.91	413.5	7.535
J-60	242.27	0.019	Fixed	284.96	417.8	3.753
J-64	241.33	0.057	Fixed	284.99	427.3	2.039
J-65	241.33	0.028	Fixed	285.00	427.4	0.077
J-68	240.44	0.000	Fixed	284.97	435.8	1.021
J-69	242.59	0.000	Fixed	284.92	414.3	10.666

**Active Scenario: 72 hr phase 1 QA - 50% build out w blow off J-8 with
lots to 24&32 built**

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 72.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)	Age (Calculated) (hours)
J-70	243.84	0.000	Fixed	284.92	402.0	23.230
J-71	243.20	0.000	Fixed	284.97	408.8	13.139

**Active Scenario: 72 hr phase 1 QA -75% build out w blow off J-8 with
lots to J-24,32 built**

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 72.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)	Age (Calculated) (hours)
J-1	240.52	0.541	Fixed	284.91	434.5	1.717
J-2	240.52	0.000	Fixed	284.91	434.5	1.767
J-3	241.30	0.194	Fixed	284.89	426.6	2.640
J-4	241.85	0.190	Fixed	284.88	421.1	3.244
J-5	241.74	0.085	Fixed	284.84	421.8	8.825
J-6	241.50	0.021	Fixed	284.81	423.9	14.142
J-7	241.82	0.028	Fixed	284.76	420.2	24.708
J-8	242.03	9.507	Fixed	284.73	417.9	35.480
J-24	243.30	0.009	Fixed	284.89	407.0	42.362
J-25	243.03	0.036	Fixed	284.89	409.7	7.797
J-26	243.03	0.014	Fixed	284.89	409.7	8.036
J-27	242.65	0.014	Fixed	284.88	413.3	9.556
J-28	241.78	0.007	Fixed	284.84	421.5	13.899
J-29	241.66	0.014	Fixed	284.85	422.7	27.673
J-30	241.74	0.007	Fixed	284.85	421.9	41.931
J-31	241.79	0.014	Fixed	284.85	421.4	35.142
J-32	241.93	0.009	Fixed	284.85	420.1	42.966
J-38	241.87	0.028	Fixed	284.86	420.8	25.795
J-39	241.97	0.050	Fixed	284.87	419.8	23.665
J-40	242.28	0.064	Fixed	284.87	416.8	13.387
J-42	242.49	0.021	Fixed	284.87	414.7	31.279
J-43	242.67	0.007	Fixed	284.87	413.0	28.477
J-44	242.85	0.021	Fixed	284.87	411.2	25.610
J-45	243.39	0.028	Fixed	284.87	406.0	19.648
J-46	243.31	0.014	Fixed	284.87	406.8	16.698
J-47	243.13	0.007	Fixed	284.87	408.5	15.215
J-48	242.96	0.028	Fixed	284.87	410.2	13.824
J-49	242.65	0.050	Fixed	284.87	413.2	9.928
J-50	243.16	0.043	Fixed	284.90	408.5	6.874
J-51	242.25	0.000	Fixed	284.91	417.5	5.548
J-52	245.69	0.047	Fixed	284.91	383.9	36.174
J-53	241.85	0.265	Fixed	284.91	421.5	5.341
J-54	240.34	0.019	Fixed	285.00	437.0	0.251
J-55	240.44	0.009	Fixed	285.00	436.1	0.203
J-56	240.44	0.047	Fixed	285.00	436.1	0.931
J-57	241.35	0.080	Fixed	284.86	425.9	4.872
J-58	242.66	0.028	Fixed	284.91	413.5	6.027
J-60	242.27	0.019	Fixed	284.96	417.8	3.082
J-64	241.33	0.057	Fixed	284.99	427.3	1.689
J-65	241.33	0.028	Fixed	285.00	427.4	0.064
J-68	240.44	0.000	Fixed	284.96	435.7	0.834
J-69	242.59	0.000	Fixed	284.91	414.2	9.376

**Active Scenario: 72 hr phase 1 QA -75% build out w blow off J-8 with
lots to J-24,32 built**

FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 72.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)	Age (Calculated) (hours)
J-70	243.84	0.000	Fixed	284.91	402.0	21.906
J-71	243.20	0.000	Fixed	284.96	408.7	12.903

Active Scenario: 72 hour phase 1 quality analysis
FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 72.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)	Age (Calculated) (hours)
J-1	240.52	0.541	Fixed	285.00	435.3	1.453
J-2	240.52	0.000	Fixed	285.00	435.3	1.503
J-3	241.30	0.259	Fixed	284.99	427.6	2.153
J-4	241.85	0.253	Fixed	284.99	422.3	2.602
J-5	241.74	0.114	Fixed	284.99	423.3	6.681
J-6	241.50	0.028	Fixed	284.99	425.7	10.651
J-7	241.82	0.038	Fixed	284.99	422.5	23.294
J-8	242.03	0.009	Fixed	284.99	420.5	62.737
J-24	243.30	0.009	Fixed	284.99	408.1	40.963
J-25	243.03	0.047	Fixed	284.99	410.7	6.398
J-26	243.03	0.019	Fixed	284.99	410.7	6.580
J-27	242.65	0.019	Fixed	284.99	414.4	7.739
J-28	241.78	0.009	Fixed	284.99	422.9	9.829
J-29	241.66	0.019	Fixed	284.99	424.1	19.502
J-30	241.74	0.009	Fixed	284.99	423.3	59.344
J-31	241.79	0.019	Fixed	284.99	422.8	39.344
J-32	241.93	0.009	Fixed	284.99	421.5	52.607
J-38	241.87	0.038	Fixed	284.99	422.1	23.781
J-39	241.97	0.066	Fixed	284.99	421.1	21.346
J-40	242.28	0.085	Fixed	284.99	418.0	10.676
J-42	242.49	0.028	Fixed	284.99	416.0	28.718
J-43	242.67	0.009	Fixed	284.99	414.2	25.077
J-44	242.85	0.028	Fixed	284.99	412.5	22.079
J-45	243.39	0.038	Fixed	284.99	407.2	15.479
J-46	243.31	0.019	Fixed	284.99	408.0	13.200
J-47	243.13	0.009	Fixed	284.99	409.7	12.060
J-48	242.96	0.038	Fixed	284.99	411.4	10.992
J-49	242.65	0.066	Fixed	284.99	414.4	8.023
J-50	243.16	0.057	Fixed	285.00	409.4	5.691
J-51	242.25	0.000	Fixed	285.00	418.3	4.677
J-52	245.69	0.047	Fixed	285.00	384.7	35.303
J-53	241.85	0.265	Fixed	285.00	422.3	4.516
J-54	240.34	0.019	Fixed	285.00	437.1	0.214
J-55	240.44	0.009	Fixed	285.00	436.1	0.174
J-56	240.44	0.047	Fixed	285.00	436.1	0.804
J-57	241.35	0.106	Fixed	284.99	427.1	3.802
J-58	242.66	0.038	Fixed	285.00	414.3	5.043
J-60	242.27	0.019	Fixed	285.00	418.2	2.618
J-64	241.33	0.057	Fixed	285.00	427.4	1.443
J-65	241.33	0.028	Fixed	285.00	427.4	0.055
J-68	240.44	0.000	Fixed	285.00	436.1	0.707
J-69	242.59	0.000	Fixed	285.00	415.0	8.505
J-70	243.84	0.000	Fixed	285.00	402.8	20.934

Active Scenario: 72 hour phase 1 quality analysis
FlexTable: Junction Table (ACAD2013-1389-1 BASE phase 1.wtg)

Current Time: 72.000 hours

Label	Elevation (m)	Demand (Calculated) (L/s)	Pattern (Constituent)	Calculated Hydraulic Grade (m)	Pressure (kPa)	Age (Calculated) (hours)
J-71	243.20	0.000	Fixed	285.00	409.1	12.357

Planning Justification Report

RENWICK ESTATES

ADDRESS: 9904 OXBOW DRIVE KOMOKA ON
PREPARED FOR: BRANTAM DEVELOPMENTS INC.



Submitted by: Stanlake Consulting and Mgmt. Services
In association with AGM Engineering LTD.

April 18, 2019

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1. Introduction

This Planning Justification Report has been prepared in support of applications by Brantam Developments Inc. to amend the Middlesex Centre Official Plan, amend the municipal comprehensive zoning bylaw and an application for draft plan of subdivision approval for a property addressed as 9904 Oxbow Drive, Komoka Ontario.

This report has been prepared at the request of Municipal and County staff as noted in the minutes of the pre-consultation meeting of April 11, 2018.

This Report constitutes part of the requirements to file a 'complete' set of applications together with the following documents:

- ▶ Archaeological Assessment
- ▶ Functional Servicing Report
- ▶ Noise Study and Vibration Report
- ▶ Traffic Impact Study
- ▶ Aggregate Resources Assessment

2. Site Context

1) Subject Lands

Located in the northwest area of the urban settlement area of Komoka, the subject site is generally northwest of the intersection of Oxbow Drive and Komoka Road. The site is a 20.7ha parcel with frontage on Oxbow Drive and borders on Komoka Road. The lands are currently being used for agricultural cash crop production. There are no significant natural features on the property. The subdivision will be accessed by an extension of Union Drive on the east and a new road accessing Oxbow Drive on the south frontage.

The property is relatively flat with a minor increase in elevation in the central north part of the site. The highest elevation is 246m and the lowest part of the site at 241.5 m is in the southwest corner of the property. Overland storm flows from external drainage areas results in a sheet flow area primarily on the east side of the property meandering through the site generally in a south to southeast, then in a westerly direction, and exiting the property in the southwest corner.

An existing access easement is in the extreme southwest corner which provides access for agricultural equipment on the property abutting to the west. Conditions within the easement establish that the easement will be relinquished once access through the subject site can be provided via a public road connection.

2) Surrounding Neighbourhoods

The subject site is a separated block within the Komoka urban area not directly connected to other neighbourhoods within the urban area due to the interface with two major roads. Several single family dwellings abut the subject site and utilize a portion of the frontages bordering the property on Oxbow Drive and Komoka Road.

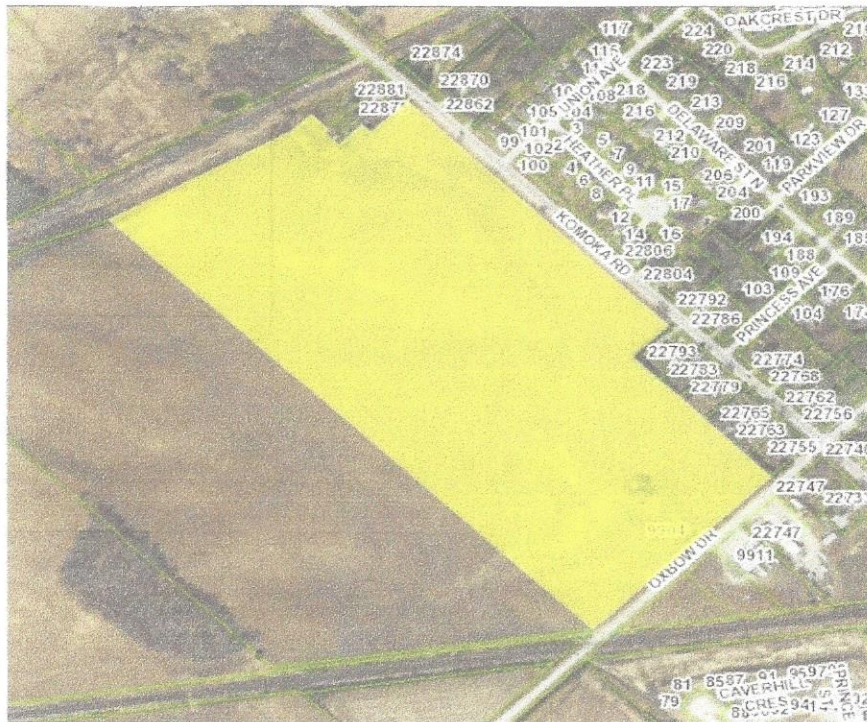
Land uses within a 400 metre radius of the subject lands include a mix of low-density residential uses, light industrial uses, a licensed aggregate operation, two rail lines and agricultural cash crop operations.

On the east side of Komoka Road, is an existing low-density residential neighbourhood, consisting primarily of single detached dwellings.

To the north lies the CP main line railway track and a cash crop agricultural holding. Additional cash crop agricultural uses dominate the lands to the west as well as the CP and CN rail lines.

South of Oxbow Drive are several single family homes associated with agricultural operations, additional residential subdivisions, a licensed aggregate pit and several light industrial uses.

3. Location Map



Northwest corner of Komoka Road and Oxbow Drive - 9904 Oxbow Drive, Komoka

4. Existing Planning Controls

1) County of Middlesex Official Plan

The County Official Plan provides a regional policy framework within which development proposals are to be evaluated. Komoka is identified as a settlement area on Schedule A of the County's Official Plan. As a Settlement Area, development is expected to proceed on full municipal services. Section 3.2.1 of the County Official Plan directs that growth within the County is to be directed to the County's Settlement Areas in order to protect agricultural areas, protect natural heritage and promote efficient use of water and sewage services. Detailed land use policies, and particularly those that pertain to development within settlement areas, are to be provided in the official plans of the County's municipalities.

Policy Section 2.3.4 of the County Official Plan promotes diversity in its economic base and encourages its member municipalities to provide a balanced mix of housing to ensure a sufficient labour force and to reduce the need for commuting.

With the approval of the requested amendment to the Municipal Official Plan, requested changes in rezoning of the site, and development of the property on full municipal services, the proposed development is consistent with the policies of the County Official Plan. No amendment is required to the County Official Plan.

2) Middlesex Centre Official Plan

The property is currently designated as Residential on Schedule A-2: Komoka-Kilworth Urban Settlement Area in the Middlesex Centre Official Plan. The predominant land use within areas designated Residential is intended to be residential dwellings, including single detached, semi-detached, townhouses, duplex / triplex / fourplex dwellings, and low/medium rise apartments.

However, within the Komoka-Kilworth Settlement Secondary Plan Area, certain lands are more specifically designated on Schedule A-2 as Medium Density Residential. These lands permit higher density residential uses and are subject to the more detailed Secondary Plan policies of the Official Plan which are in effect for the Komoka-Kilworth Urban Settlement Area. To permit the development of the site with a variety of residential units at increased density, several blocks in the draft plan will require a redesignation to Medium Density Residential.

3) Zoning Bylaw

Under the Municipality of Middlesex Centre Comprehensive Zoning Bylaw 2005-005, the subject property is zoned on Map U-9 as Existing Use (EU). Uses permitted are limited to any use existing on the date of passing of the bylaw. Amendments to the zoning bylaw will be required to implement all the uses proposed in the draft plan of subdivision.

5. Servicing

1) Sanitary Servicing

There are existing sanitary sewers fronting the subdivision along Komoka Road and Oxbow Drive. The existing sanitary collection system takes flows south along Komoka Road to a pumping station located just north of Railway Avenue.

The proposed outlet for the subdivision will be the existing 250mm diameter sewer on Oxbow Drive. The 250mm diameter pipe has been evaluated and has a capacity of 33.11L/s. The existing pipe will provide sufficient conveyance capacity for the proposed land uses and expected population.

2) Storm Water Drainage

The subject property currently receives flows from three external drainage areas. The combined internal and external flows outlet to the west along the surface of the neighbouring agricultural lands, before crossing under the Canadian National Railway via a 750 culvert.

There is a 120.88ha external drainage area to the north of the Canadian Pacific Railway and east of Komoka Road which presently passes through the Komoka Station Subdivision and enters the east ditch on Komoka Road. The Komoka Road right of way also contributes a second external area of 1.21ha of flows that, under severe storm events enter the subject property by way of a 900x1400 elliptical culvert. A channel has been introduced to convey these external flows around the development portion of the subdivision via a swale system generally parallel to the east and south property limits and then to the natural outlet at the west boundary of the subdivision.

The third external drainage area is 26.51ha in size directly to the north of the Canadian Pacific Railway. The flows enter the site through an open bottom concrete culvert that crosses the railway right of way and ultimately enters the site. These major flows will also be generally directed around the subdivision via the swale system along the east and south property lines.

Internal flows will be conveyed to a stormwater management pond by the internal storm sewer network system for the minor flow events and by overland flow for the major flow events. The retention pond has been sized on a preliminary basis for the 100 year design storm as per Middlesex Centre's Stormwater Management Policy Manual.

3) Water Distribution

There are existing watermains fronting the proposed subdivision in two locations; a 200mm diameter watermain on Komoka Road and a 150mm diameter watermain along Oxbow Drive. A preliminary water model of the proposed subdivision was prepared, and the results indicate that the existing 150mm diameter watermain on Oxbow Drive will need to be upsized to a 200mm diameter. Connections on both Komoka Road and Oxbow Drive will be required to feed the proposed development in order to create a looped system. During detailed design, the required internal watermain sizes will be determined for domestic and firefighting purposes.

AGM Engineering completed in 2019 a Servicing Report which will be submitted as part of the complete submission for the subdivision application.

4) External Road Works

With frontages on both Komoka Road and Oxbow Drive, two access points have been planned to provide vehicular traffic and pedestrian access to the subdivision. Paradigm Consultants completed a Traffic Impact Report in 2019 which provides recommendations for road requirements to service the subject subdivision. The report outlines the need for any improvements required to be made to external roadways. Their report will also be filed with the Approval Authority as part of the complete application submission for the plan of subdivision. The County Engineer has requested left turn lanes on Komoka Road at the intersection of Union Avenue and Street 'A'. It is expected any works required to be completed on external roadways will be addressed as conditions of draft approval.

6. Archaeological/Built Heritage

Archaeological investigations were undertaken in 2018 under the direction of Lincoln Environmental Consulting Corp. An acknowledge of acceptance of the recommendations in the Lincoln Environmental Consulting report from the Ministry of Tourism, Culture and Sport was obtained in April 2019. With completion of a Phase 4 report, the site has been cleared for development and no further investigations are required.

7. Subdivision Design

The proposed subdivision (see Appendix A) includes 173 single family lots, with frontages ranging from 12 to 16 m. Lot depths are typically 30 to 33 m. Five multi-family blocks are proposed, to allow for a range of housing types such as townhouses, cluster single family and one apartment block. The Medium Density multi-family blocks are dispersed but are primarily located on the site's perimeter along the north, east and south sides of the development. The location of the blocks allows any issues associated with noise attenuation to be managed by proceeding as condominium developments and through the site plan approval process.

The road pattern within the subdivision has maintained a slightly modified grid pattern due to required alignments shifts to accommodate the proximity of a rail line and the existing residential units which have frontages on Komoka Road. The road layout also is designed to manage surface run-off flows throughout the relatively flat site. The pattern of development is similar to the road configuration of the existing residential neighbourhood on the east side of Komoka Road.

It is expected that sidewalks, on at least on one side of every road, will be required as a condition of draft approval. Linkages to other neighbourhoods will be limited due to the railway properties, existing residential development, the boundary of the urban settlement area and the access points in conjunction with the proposed road locations intersecting with Komoka Road and Oxbow Drive.

8. Subsequent Applications

Blocks proposed to be zoned to permit townhomes and an apartment will require site plan applications to be submitted to the Municipality to ensure the requested zoning addresses the site specific details as identified through the public circulation of the zoning bylaw amendment process and Municipal staff reviews of the site plan. Based on the requested rezoning, a public process will be required for several of the multi-family blocks regardless of the form of housing.

In addition, Blocks 178 and 179 the requested zoning would permit a Vacant Land plan of condominium. A public meeting process is required should the owner decide that a Vacant Land Condominium be the form of development on these two blocks. These additional applications will confirm the design details of the sites, screening and fencing requirements, landscaping, the ongoing maintenance of the buildings, communal infrastructure and legal obligations.

9. Applications being submitted

Two applications are being submitted to the Municipality of Middlesex Centre to support the development of the residential subdivision. An application to amend the Middlesex Centre Official Plan and an application to amend the comprehensive Zoning Bylaw to implement the draft plan of subdivision proposed uses. An application is required be made to the County of Middlesex acting as the approval authority under the Planning Act for the draft plan of subdivision.

1) Middlesex Centre Official Plan Amendments

The Municipality's Official Plan contains Municipal General Principles: Traditional Town and Country Planning in Middlesex Centre policies. For the purpose of the development of a plan of subdivision, the policy concepts have been interpreted to include the following relevant general principles:

- e) Development within Urban Settlement Areas, and limited development within Community Settlement Areas and Hamlets, is expected to provide an opportunity for a full range of housing opportunities at varying densities and levels of affordability, in a manner that is compatible with existing neighbourhoods, and the traditional character of the Municipality's settlement areas
- h) To promote efficient, cost effective development and land use patterns to minimize land consumption, reduce servicing costs and encourage intensification.
- i) To provide an adequate supply and diversity of housing types in appropriate locations within the settlement area.
- l) To encourage settlement design, including the lay-out of streets, in a manner that is in keeping with the traditional or historic urban form of existing settlement areas. Street patterns that disrupt or are not in character with existing settlement street patterns will be discouraged. New neighbourhood development is encouraged to maintain and continue traditional settlement area patterns and provide a high level of street and pedestrian connectivity within settlements to facilitate walkability and a highly connected village pattern.

To accomplish these general principles, two changes are proposed to Schedule A-2 to the Komoka-Kilworth Secondary Plan. Several blocks within the subdivision are proposed to be re-designated from Residential to Medium Density Residential. The requests for the Official Plan Amendment incorporate revisions as shown on the attached figure Appendix 1.

a. Land Use Changes - Residential to Medium Density Residential

a) Block 177

Blocks 176 and 177 are impacted by the CP rail line. It is expected CP will request that a safety berm with a berm footprint of approximately 30m in width be constructed parallel to the rail line. Block 176 has been proposed as possibly being conveyed to CP. Should the railway not want to accept the Block 176, then 176 will be merged with 177 in the plan to be registered. Associated factors to be addressed with the berm once constructed will be the ongoing maintenance of low maintenance vegetative cover for the sides of the berm, access to the north side of the berm, use and potential ownership of the north side of the berm and the expected ownership and maintenance of a noise attenuation fence. Various options were considered how this could be accomplished. Municipal administration rejected the possibility of using the entire block for a linear park. Also, eliminated was the possibility of multiple smaller freehold lots which would result in many challenges to effectively manage the berm either co-operatively or through various legal means. As a result, a condominium form of development is being proposed with street-oriented townhouse units. Blocks 176 and 177 require a change in designation to permit this type of housing form. Eliminating the footprint for the safety berm results in a developable area for Block 177 of approximately 1.038 ha. On the assumption an acceptable site plan could result in 29 units being built on the block, this would result in a density of 27.9 units per hectare based on the useable area of the block. Density and form of housing is consistent with the policy of the secondary plan for Medium Density Residential.

b) Block 178

Block 178 is requested to have a compound zone applied to the block to permit either a vacant land condominium (VLC) development or zoning to permit townhomes. For the VLC with 12 m lots, a density of 21.8 units /ha could be achieved which meets the density policy targets for Medium Density Residential. The VLC also provides a different form of ownership for future owners than freehold single family lots proposed in other sectors of the subdivision. The VLC also provides the opportunity to provide a different price point for future unit owners.

Compounded with the requested zoning for single family VLC land units is a request to zone the block to permit townhouse units. Preliminary concept site plans prepared for the block propose 23 townhouse units in a condominium development which would result in a density of 35.8 units /ha. Both the forms of housing and the density require the block be designated Medium Density Residential.

c) Block 179

Block 179 is also proposed to be rezoned with compound zoning to permit either a VLC or a condominium townhouse development or a multiple unit building. At a minimum of 12m for the frontage of the land units in a VLC, this would result in a density of 22.5 units/ha. The concept plan prepared for the development of the block as townhomes would generate a development with a density of 24.7 units per ha. Policies of the secondary plan require that the block be designated Medium Density

Residential. Additionally, the requested zoning would permit a multiple unit dwelling after a public site plan process.

For Blocks 178 and 179, market demand and future owners/developers of the blocks will determine which form of housing will be developed at the time when either a plan of condominium or a site plan approval is sought from the municipality.

d) Block 180

Block 180 is proposed to be developed as a townhouse block. The form of housing and the density of 34.4 units/ha both require a change in land use designation under the policies of the Official Plan.

e) Block 181

Block 181 proposes residential housing in the form of a low-rise apartment building. With approximately 40 units proposed in a possible five storey apartment building, both the form of housing and the density of 62.89 units per ha need to be designated for Medium Density Residential.

As part of the Official Plan application to amend Schedule A-2 to the Komoka- Kilworth Secondary Plan, these five (5) blocks have been requested be re-designation to Medium Density Residential.

b. Collector Road

Section 9.4.1 of the Middlesex Center Official Plan provides direction with respect to transportation systems within the Municipality. It is noted that the Municipality's goal is to facilitate the efficient movement of people and goods to and from the Municipality and within the Municipality. Further, it is a policy of the plan to limit direct access to County Roads. Given the size of the property and the number of residential units proposed, two access points will be required.

The subject site is a gateway parcel to a triangular track of land westerly from the site formed by the CN and CP rail lands. Land to the west of the subject site although outside the current settlement area has been identified as possible future urban development lands in the Master Servicing Plan as an area suitable for service extension with few (if any) issues or constraints should future expansion occur along with other land holdings around the current settlement area. Getting approvals for more road crossings of rail lines is a difficult process. Somewhat in anticipation of the possibility Street "A" maybe a prime public accessway to future development for lands to the west, Brantam is prepared to dedicate Street 'A' with a width of 21.5m and to request Street 'A' be classified as a collector road even though only a local street is needed for the build out of the subject site. As a result, Schedule A-2 of the Komoka -Kilworth Secondary Plan will need to be amended to establish Street 'A' as a future Collector Road.

c. Urban Design Policy Amendment

Brantam Developments Inc. is a land developer and intends to be the seller of lots and blocks once the subdivision has been approved and serviced. Brantam when selling the building lots and blocks will be exerting control over design through the review of proposed dwellings as a condition of purchase and sale agreements. It is important to Brantam that the design of dwellings is appropriate to achieve a certain character for the whole subdivision. The vision for the subdivision will be a diversity in housing design and variation in façade treatment. Variation in setback for dwellings with front porches is also a

vision for the development. Avoidance of the dominance of attached garages which has a significant impact on house design and street scape appearance will be an objective. Also, sameness in facades and a constant pattern of house design and façade treatment/setback can also be a detriment to achieve a diverse range of dwelling design and creating a pleasant pedestrian experience. The current policy in the Official Plan does not lend itself to provide flexibility in house design and façade orientation for single family homes. As a result, the zoning bylaw amendment will be seeking some special setback amendments for both the habitable portion of the dwelling and attached garages.

Section 5.7.1 d) of the Secondary Plan policies states "Private garages for residential development shall not be located closer to the street than the habitable portion or porch on the main floor of the building and may be subject to maximum width and other requirements within the Municipality's Zoning By-law to limit the visual and streetscape impacts of garages and encourage a positive street frontage oriented to pedestrians, and shall have regard for the Municipality's Site Plan Manual and Urban Design Guidelines."

However, the municipality's Site Plan Manual and Urban Design Guidelines which were prepared and accepted by Council prior to OPA 29 (Komoka-Kilworth Secondary Plan Policy) states in Section 4.2.8 that "Garages attached to the fronts or sides of houses or townhouses shall not project more than 2.4m (8ft.) beyond the face of the main front wall of the house on the first floor". There is an inconsistency within the two documents as it pertains to this issue.

Prohibiting habitable portions or porches on the main floor from being setback further than the private garage as envisioned within the Official Plan policy prohibits diversity in built form being permitted. The Municipality strives within its Official Plan policies to provide for a mix and variety of housing types (and styles) to ensure the community is diversified and stylish. The depth of the lots proposed within the subdivision does present some challenges in providing reasonable footprints for particular housing units on lots with somewhat shallow depths. The Municipality's Needs Assessment and Market Demand report speaks to flexibility of zoning. The zoning for freehold lots greater than 12m, Brantam is seeking to have a reduced front yard setback to 4.5 m for the porch or the habitable part of the dwelling. This reduced setback provides the opportunity for a variation in the streetscape and an interesting pedestrian walk within the subdivision.

By providing flexibility in the reduced setback from the street line for the habitable portion of the dwelling and allowing for some garages to be projected slightly forward of the habitable portion of the dwelling, it will allow for the fuller range of house design and style which can be developed within the subdivision. This variation is still consistent with the vision for the Municipality as per their Site Plan Manual and Urban Design Guidelines and is in keeping with County and Municipal policies (Section 5.2, 5.7.1 & 5.7.4) as it relates to residential development.

Brantam is seeking a special policy be incorporated into the Official Plan in Section 5.7.1d) be adding a policy to provide for limited number of habitable portions of a dwelling or porches to be permitted to be recessed 1.5m from the garage building line for freehold single family dwellings within the subdivision.

d. Removal of Aggregate Overlay

Schedule A-2 of the Komoka-Kilworth Secondary Plan has Aggregate Resource area shown as a policy overlay on the Schedule. This overlay affects any underlying land use designation illustrated in the

Schedules of the Official Plan. The purpose of this overlay is to protect existing licensed pits and to identify areas of potential aggregate extraction.

The municipality several years ago designated the subject property as Residential and applied the aggregate overlay to a small portion of the property in the southwest corner of the site. In Section 4.3, the Official Plan policy indicates where extraction may be hindered or precluded, development may occur only if: a) resource use would not be feasible; or b) the proposed land uses or development serves a greater long term public interest; and c) issues of public health, safety and environmental impact are addressed.

Brantam Developments commissioned in early 2019 a geotechnical study of the area plotted as having aggregate potential. The results of the study completed by EXP Services Inc. on April 10, 2019 concluded that:

Based on the frequency and inconsistency of the isolated pockets of sand and gravel, punctuated and separated by numerous silt and sandy silt lenses, seams and layers, aggregate extraction would likely require significant sorting and processing to render usable quantities of commercially viable aggregate due to the inconsistent, intimate layering of sands and silts. It is our opinion that there is insufficient quantity of aggregate resource of commercial grade quality at this site to consider this site commercially viable as an aggregate resource.

It should be noted although the aggregate on site is not of a quantity and quality to justify seeking an aggregate pit license, the aggregate is of a quality which can be used for bedding material of on-site infrastructure and road building. The owner does anticipate being able to use the on-site aggregate resource in servicing the site and possible unit construction. Other factors such as likely requiring substantial processing operations, the close proximity to existing residential land uses east of the site, the required capital investment required to implement measures to abate noise and dust to within provincially acceptable tolerances would have to be factored into the production costs, further limiting the feasibility of creating a commercially viable aggregate extraction operation on the property.

Given the numerous factors implicated, the owner has concluded a commercially viable aggregate pit is not possible on the property as the extraction of the resource use would not be feasible and the proposed land uses and development serves a greater long term public interest. As a result, a component of the application to amend the Official Plan is to remove the aggregate overlay on Schedule A-2 as it applies to the subject property.

The purpose of the application to amend the Municipal Official Plan is to ensure beyond any reasonable doubt that the draft plan of subdivision conforms to Schedule "A-2" of the secondary plan.

2) Zoning Bylaw Amendments

The subject site is zoned Existing Use (EU) which permits only the uses existing on the day the zoning was put into effect for the property. As a result, to implement all the uses proposed by the draft plan of subdivision, rezoning of the entire property is necessary.

The requested zoning bylaw amendments outlined on Appendices 2 and 2A are as follows:

- EU to UR1 (A), a Residential zone to permit freehold single family dwellings with a minimum of 12m of frontage with Special Provisions for Lot area, Lot frontage, Front yard, Side yard, Rear yard and Lot coverage.
- EU to UR1 (B), Residential zone to permit single family dwellings on land units within a VLC with a minimum of 12 m of frontage with Special Provisions for Lot area, Lot frontage, Side yard and Lot coverage. As a VLC, a public meeting for a plan of condominium is required.
- EU to UR3 (C) /h-6, Residential zone to permit Townhouses and a Multiple Unit Dwelling with Special Provisions for Front yard, Side yard, Rear Yard, Lot coverage, Minimum Landscape Open Space and Maximum Density with a Holding Provision requiring a public site plan process to approval a site plan.
- EU to UR3 (D)/h-6, Residential zone to permit only Townhouse dwelling units with Special Provisions for Side yard, Rear Yard, Lot coverage, Minimum Landscape Open Space and Maximum density. Holding Provisions for a public site plan process prior to approval of a site plan.
- EU to UR3 (E), Residential zone to permit only Townhouse dwelling units with Special Provisions for Side yard, Rear Yard, Lot coverage, Minimum Landscape Open Space, Maximum density and Dwelling Unit Setback from Rail R-of-W.
- EU to UR3 (F), Residential zone to permit only an Apartment building with Special Provisions for Side yard, Minimum Landscape Open Space, Maximum Density.
- EU to OS Open Space zone. This change will apply to both the proposed stormwater management facility and the drainage swales around the subdivision.

3) Plan of Subdivision

A draft plan of subdivision has been prepared in association with AGM Engineering laying out proposed residential lots and blocks together with new roads to be constructed to service the site. A block has been proposed to accommodate a conceptual stormwater management facility to manage the stormwater generated within the subdivision. To manage stormwater which currently traverses the site, a system of swales has been designed and are included as several blocks within the subdivision plan.

10. Policy Analysis

1) Provincial Policy Statement 2014

With regards to the Provincial Policy Statement, the proposal is consistent with following policies in support of the application:

Building Strong Communities: The proposal supports the policies and guidelines of this section of the Provincial Policy Statement (noted in brackets) in the following ways:

- It's an efficient land use and will contribute to the mix of residential options within the neighborhood; (1.1.1 a/b);
- The proposed land uses will not cause environmental or public health and safety concerns; (1.1.1 c);

- The proposed development proposes full municipal services currently available; (1.1.1 e);
- Infrastructure is readily available; (1.1.1 g);
- The development portion of the site is not within a regulated area and no natural heritage features exist on the property. (1.1.1h); and
- The plan of subdivision will assist in meeting the residential needs of Komoka/Kilworth and Middlesex Centre for the 20 year planning horizon within a designated growth area (1.1.2)

It also supports the *Settlement Area* objectives of:

- The proposed development is within a designated Settlement Area (1.1.3.1);
- The proposed development contributes to a desirable land use pattern within the settlement area as the site is currently designated for residential development, makes use of available services, and is located in proximity to existing residential development. A mix of housing forms is proposed in the development which will be complementary within nearby residential neighbourhoods. The development will provide a land use pattern and density that will efficiently use the land and infrastructure. (1.1.3.2); and
- The proposed development is adjacent to an existing residential area to the east. (1.1.3.6)

Housing Objectives

The subject application supports the *Housing* objectives by:

- The proposed residential development will provide a range and mix of housing types and densities to meet the projected current and future residents' needs of Komoka/Kilworth. (1.4.1.a b);
- The development of new housing is in a location where appropriate levels of infrastructure and public service facilities are available to support current and projected needs; (1.4.3 c); and
- The proposed development promotes densities for new housing which efficiently use land, resources, infrastructure and public service facilities and supports active transportation when it becomes available; (1.4.3 d).

Existing infrastructure has capacity or will be upgraded to accommodate the development resulting in an efficient and cost-effective manner to service the site (1.6).

The proposed Official Plan amendments, the requested rezoning and the draft plan of subdivision are consistent with the policies outlined in the Provincial Policy Statement.

2) County of Middlesex Official Plan

With regard to the County of Middlesex Official Plan, the proposal is consistent with following policies in support of the applications:

- The plan of subdivision is located within the Komoka/Kilworth Settlement Area conceptually identified on Schedule A to the Official Plan; (2.3.5);
- The proposed development provides a mix of housing by both type and tenure which supports the County housing policies; (2.3.7 1st bullet);
- The plan of subdivision is to be developed on vacant lands already designated residential contributing to the infilling in Komoka/Kilworth Settlement Area. (2.3.7.3 b);

- The plan of subdivision and the requested zoning will utilize the existing or planned physical services to provide new households in the Komoka/Kilworth Settlement area; (2.3.7.3 2nd bullet);
- The proposed plan of subdivision will be fully serviced by municipal water and sewage disposal systems; (2.3.8.1); and

A Traffic Impact Study has been completed by a qualified person and recommendations have been made which address the changes needed to the county road which will provide a primary access point for the development. (2.4.2.2 g).

The proposed Official Plan amendment, the requested rezoning and the draft plan of subdivision are consistent with the policies outlined in the County of Middlesex Official Plan.

3) Middlesex Centre Official Plan

With regards to the Municipality of Middlesex Centre Official Plan, the proposal is consistent with following policies in support of the applications:

The proposed subdivision complies with the General Residential Policies (5.2.1) in the following ways:

- A variety of housing types and ownership tenure is provided when the blocks for multi-family and cluster housing are considered;
- The approval of the plan of subdivision with the requested rezoning adds to the supply of lots to meet the short term and long term market demand for housing units in the Municipality;
- With the number of units projected to be built within the five multi-family blocks, and the size of the lots proposed, the build out of the subdivision will provide housing units in line with the intensification goals;
- Given the range of housing units proposed and the variances in the tenure of proposed units, the opportunity will be available to reach the affordability goals; and
- The subdivision represents a development which is an efficient use of land designated for residential use at a density consistent with the stated goals of the Municipality.
- The proposed subdivision and requested implementing zoning bylaw amendment is consistent with Section 5.2.2 as it will allow for single detached dwellings of different size and various forms of multi-family housing.
- The densities proposed are generally compatible with adjacent densities although somewhat higher to meet intensification policies. Adequate separation distance to other residential development within the neighbourhood and abutting the limits of the subdivision assist in lessening the impact of marginally higher densities. The location of the apartment building has been located adjoining Oxbow Drive a major roadway. (5.2.3 b) c) d).
- With the approval of the Official Plan Amendment to re-designated certain blocks within the subdivision, a diverse mix of multi-unit housing forms and choices to accommodate the needs and lifestyles of people at different stages throughout their life can be made available. One block has been requested to be zoned to permit a multiple unit dwelling.
- Parkland is not provided within the subdivision as Schedule A-2 of the Komoka-Kilworth did not define that a park was required. (5.7.2 a) b) & 5.7.7 e).
- Full municipal services are proposed for the development. (5.7.11 c) & d).
- A Stormwater Management facility has been proposed consistent with the conceptual locations for future Stormwater Management (SWM) ponds shown on Schedule A-2. (5.7.11 h).

The proposed Official Plan amendment, the requested rezoning and the draft plan of subdivision are consistent with the policies outlined in the general policies and the more specific policies of the Komoka-Kilworth Secondary plan within the Middlesex Centre Official Plan.

11. SUMMARY

The proposed plan of subdivision is consistent with the Middlesex Centre Official Plan and will be compatible with existing land uses and future land uses surrounding it. It will offer a range of housing opportunities for future residents in a new neighborhood.

The applications for approval of a draft plan of subdivision and implementing zoning by-law amendments and Official Plan Amendments are consistent with the Provincial Policy Statement and relevant sections of the Middlesex Centre and County of Middlesex Official Plans, and as such, represent good planning.

Report prepared by:



Douglas Stanlake

Principal, Stanlake Consulting

Attachments:

Proposed Official Plan Amendment Schedule

Draft plan of subdivision

Proposed Rezoning of the subdivision

Proposed Special Provision Zoning requirements



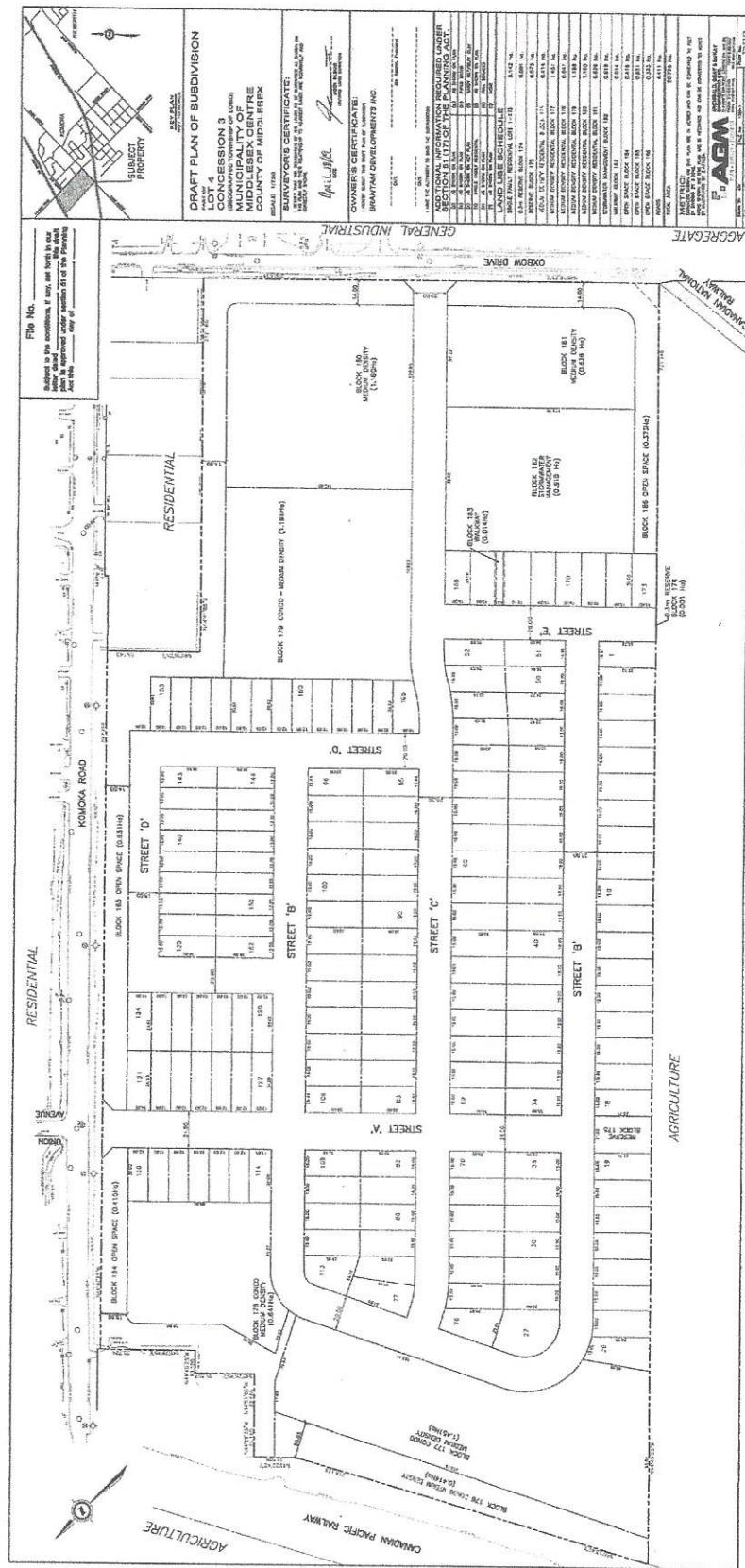
APPENDIX 1

OFFICIAL PLAN AMENDMENT
Brantam Developments - Komoka

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PLAN + SURVEY + ENGINEER

SCALE 1:4000
APRIL 2019

Plot date: Apr 22, 2019 G:\CLIENT\1389\1389-1 official plan board.dwg



Appendix 2A

Requested Rezoning to be read in conjunction with Appendix 2 to this Report.

Special Provision Zoning - Freehold Lots

- a) Defined Area
UR1- (A) as shown on Appendix 2
- b) Minimum Lot Area 360.0 m² (3,875 ft²)
- c) Minimum Lot Frontage 12.0m (49 ft)
- d) Minimum Front Yard Setback
 - (i) Porch or habitable portion of dwelling 4.5 m (14.8 ft)
 - (ii) Attached garage 6.00 m (19.7 ft), but not more than 1.5 metre (4.9 ft) closer to the front lot line than the porch or habitable portion of the dwelling
- e) Minimum Side Yard
 - (i) interior lot 1.2 m (3 ft);
 - (ii) corner lot 1.2 m (3 ft) on both sides except attached garages abutting the road
 - (iii) attached garages abutting the road 4.5 m (14.8 ft)
- f) Minimum Rear yard Setback 6.0m (19.6 ft)
- g) Maximum Lot Coverage
 - (i) main building, including dwelling and attached garage
 - a. Lot for single storey 50%
 - b. Lots for all other dwellings 40%
 - (ii) all buildings, including accessory buildings and structures
 - a. Lot for single storey 53%
 - b. Lot for all other dwellings 43%

VLC SF Land Units Blocks 178 and 179

UR1-(B) for *Block 178 & Block 179, both* compounded with a UR3 zone

Defined Area

UR1- (B) as shown on Appendix 2

- a) Number of Dwellings
Notwithstanding any other provisions of this By-law, multiple dwellings are permitted on a single lot in advance of the registration of a vacant land condominium plan against the land. All other provisions of this zoning category must be adhered to as if the vacant land condominium plan, forming part of the condominium agreement that applies to the land, is registered.
This clause shall not apply after the registration of a vacant land condominium plan against the land.
- b) Minimum Lot Area 360.0 m² (3,875 ft²)
- c) Minimum Lot Frontage 12.0m (49 ft)
- d) Minimum Side Yard
 - (i) interior lot 1.2 m (3 ft);
 - (ii) corner lot 3.0 m (9 ft) on the side abutting the road and 1.2 m (3 ft) on the other side

- e) Maximum Lot Coverage
 - i) main building, including dwelling and attached garage 40%
 - ii) all buildings, including accessory buildings and structures 43%

Blocks - 179 and 178

UR3-(C) (h-6) for *Block 179* & UR3-(D) (h-6) for *Block 178* compounded with a UR1-(B) zone

- a) Defined Area
 - UR-3 (C) as shown on Appendix 2
- b) Permitted Uses
 - i) Accessory Use
 - ii) Townhouse Dwelling
 - iii) Multiple Unit Dwelling
- c) Minimum Front Yard
 - i) Porch or habitable portion of dwelling 4.5 m (14.8 ft)
 - ii) Attached Garage 6.00 m (19.7 ft)
- d) MINIMUM SIDE YARD SETBACK
 - i) Townhouse Dwelling 3.0 m (10 ft) on an interior lot,
on a corner lot, 4.5 m (14.7 ft) on
the side abutting a street and
3.0 m (10 ft) on the other side
 - ii) Multiple Unit Dwelling 10.0 m (33 ft)
- e) Minimum Rear Yard Setback 6m (19.7ft)
- f) Maximum Lot Coverage
 - i) habitable building/s 40%
 - ii) all buildings including accessory buildings 45%
- g) Minimum Landscape Open Space 35%
- h) Maximum Density 35 units/ha

Block 180 Townhomes

UR3-(D) (h-6)

- a) Defined Area
 - UR-3 (D) as shown on Appendix 2
- b) Permitted Uses
 - i) Accessory Use
 - ii) Townhouse Dwelling
- c) MINIMUM SIDE YARD SETBACK
 - i) Townhouse Dwelling 3.0 m (10 ft) on an interior lot, and
4.5 m (14.7 ft) on the side abutting a street and
3.0 m (10 ft) on the other side on a corner lot
- d) Minimum Rear Yard Setback 6m (19.7ft)
- e) Maximum Lot Coverage
 - i) habitable building/s 40%
 - ii) all buildings including accessory buildings 45%

- | | |
|---------------------------------|-------------|
| f) Minimum Landscape Open Space | 35% |
| g) Maximum Density | 35 units/ha |

Block 177 Townhomes

UR3-(E)

- | | |
|---|--|
| a) Defined Area | |
| UR-3 (E) as shown on Appendix 2 | |
| b) Permitted Uses | |
| i. Accessory Use | |
| ii. Townhouse Dwelling | |
| c) MINIMUM SIDE YARD SETBACK | |
| i. Townhouse Dwelling | 3.0 m (10 ft) on an interior lot, and 4.5 m (14.7 ft) on the side abutting a street and 3.0 m (10 ft) on the other side on a corner lot. |
| d) Minimum Rear Yard Setback | 6m (19.7ft) |
| e) Maximum Lot Coverage | |
| i) habitable building/s | 40% |
| ii) all buildings including accessory buildings | 45% |
| f) Minimum Landscape Open Space | 35% |
| i) a 15m landscape open space area in width and parallel southerly from the existing railway right of way shall be maintained. | |
| g) Maximum Density | 35 units/ha |
| h) Dwelling Unit Setback from Rail Line (Minimum) | |
| i) 60 metres (394 feet) from the existing railway right of way in the absence of a combination safety berm and acoustical mitigation fence adjoining and parallel to the existing railway right of way, or 30 metres (98 feet) in conjunction with a safety berm and acoustical mitigation fence. | |

Block 181 Apartment

UR-3(F)

- | | |
|---------------------------------|---|
| a) Defined Area | |
| UR-3 (F) as shown on Appendix 2 | |
| b) Permitted Uses | |
| i) Accessory Use | |
| ii) Apartment Dwelling | |
| c) Minimum Side Yard Setback | 15m on the north side and
5m on the south side |
| d) Minimum Outdoor Amenity Area | NA |
| e) Maximum Density | 65 units per ha |
| f) Minimum Landscape Open Space | 30% |

Project No.: DEL18-059
Date: December 4, 2018
Revised: April 3, 2019

PREPARED FOR:
Brantam Developments Inc.

9904 Oxbow Drive Subdivision

9904 Oxbow Drive
Komoka, Ontario
Noise and Vibration Assessment



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Appendix A – Noise Level Calculations
Appendix B – Vibration Level Calculations

1.0 INTRODUCTION

At the request of the Brantam Developments Inc., Development Engineering (London) Limited (DevEng) has undertaken the following noise and vibration assessment of the proposed residential subdivision to be constructed at 9904 Oxbow Drive in London, Ontario. The site lies in close proximity to four (4) major vehicular noise sources, north of the Canadian National (CN) Railway's right-of-way, south of the Canadian Pacific (CP) Railway's right-of-way, west of Komoka Road (Middlesex County Road #16) and north of Oxbow Drive. The proposed development includes 173 low density single family residential lots, five (5) medium density multi-family blocks and several open space and Stormwater Management (SWM) blocks. Vehicular access is proposed from Komoka Road and Oxbow Drive as well as stub connections to future development lands to the west. The Corporation of the Municipality of Middlesex Centre has indicated that a noise and vibration study will be a condition of final approval of this development. This report has been prepared to meet that condition. Proposed lot layouts have been provided by Archibald, Gray & McKay Engineering Ltd. (AGM) to facilitate assessment of noise on the site. However, detailed Site Plans have not yet been developed for the proposed multi-family blocks (blocks 177-181). Secondary assessment of each of the blocks should be conducted at the Site Plan Approval stage to reflect the final building layouts and confirm general conformance with this report.

The purpose of this report will be, therefore, to assess noise and vibration levels resulting from the adjacent CN and CP operated railways, as well as Komoka Road and Oxbow Drive, and offer recommendations for their mitigation, if required.

2.0 NOISE STUDY PARAMETERS

The Ministry of the Environment, Conservation and Parks Ontario (MECP) has created explicit criteria regarding what levels of noise are acceptable within residential developments, and what measures are to be taken, should these criteria be exceeded. These guidelines, as outlined in the Environmental Noise Guideline: Stationary and Transportation Sources – Approval and Planning (Publication NPC-300), are as follows:

- Maximum outdoor noise level - 55 dbA as measured in the Outdoor Living area between the hours of 0700 and 2300 (7:00 am and 11:00 pm).
- When this criterion is met, no abatement measures are required.
- If the outdoor noise level is greater than 55 dbA and less than 60 dbA, physical control measures may be applied to reduce the sound level to 55 dbA. If no physical measures are provided, the prospective purchasers or tenants must be made aware of potential problems through a suitable noise warning clause.
- When this criterion is exceeded by 5 dbA or more, future tenants must be made aware of potential problems through a suitable noise warning clause, and physical abatement measures are required.
- Maximum indoor rail noise level: 40 dbA as measured at the plane of the open living room window at all times throughout the day and at the pane of the open bedroom window between the hours of 0700 and 2300 (7:00 am and 11:00 pm, day-time);
and/or : 35 dbA as measured at the plane of the open bedroom window between the hours of 2300 and 0700 (11:00 pm and 7:00 am, night-time)
- When the above criteria are met, no abatement measures are required.
- When the above criteria is exceeded by 1 to 10 dbA, it is required to design the dwelling with a provision for future installation of central air conditioning. This requirement usually implies forced air heating with the ducts sized for central air conditioning. Future tenants must also be made aware of potential road noise through a suitable warning clause.
- When the above criteria is exceeded by more than 10 dbA installation of central air conditioning is mandatory, and exterior building components must be specified.

Noise levels are to be predicted through the use of the MECP's model, "Stamson, 5.0", utilizing rail traffic data as supplied by CN/CP and road traffic data from Middlesex County and the Municipality of Middlesex Centre.

3.0 VIBRATION STUDY PARAMETERS

The Canadian Pacific Railway and Canadian National Railway have developed a series of guidelines that govern the development of land adjacent to railway lands. These guidelines which are assumed to be acceptable are used herein. Therefore, the line in question has the following requirements with respect to ground-borne vibration:

"Ground-borne vibration transmission to be evaluated in a report through site testing to determine if dwellings within 75 metres of the railway right-of-way will be impacted by vibration conditions in excess of 0.14 mm/sec RMS between 4 Hz and 200 Hz. The monitoring system should be capable of measuring frequencies between 4 Hz and 200 Hz, +/- 3 dB with an RMS averaging time constant of 1 second. If in excess, isolation measures will be required to ensure living areas do not exceed 0.14 mm/sec RMS on and above the first floor of the dwelling."

On site vibration data was collected on September 6th and 10th, 2018 with an InstanTel Blastmate II, model No. DS-677. The instrument had been calibrated and certified for accuracy by InstanTel. Measurements were taken on three (3) occasions at distances from the track as noted on Figure No. 1.

Because vibration consists of rapidly fluctuating motions, both positive and negative, with an average motion of zero, it is necessary to "smooth" the signal by means of a root mean square (RMS) analysis, which is the square root of the average of the squared amplitude of the signal (amplitudes being both positive and negative). In accordance with Canadian National Railway & Canadian Pacific Railway standards, the RMS velocities of the vertical peak particle velocities (PPVs) were extracted graphically from the selected one-second interval and calculated.

See Appendix B for a complete set of vibration test data results.

4.0 NOISE SOURCES

4.1 ROAD TRAFFIC DATA

Road traffic frequencies are summarized below in Table 1. The 2015 AADT for Komoka Road (Middlesex County Road #16) is 1,581 vehicles/day with assumed 10.0% heavy truck traffic and a 90/10 day/night split, as obtained from the Middlesex County traffic counts spreadsheet available on their website. This data has been extrapolated to a 2028 build out at a 5.6% annual growth rate for 13 years. The 2017 AADT for Oxbow Drive is 2,024 vehicles/day with an assumed 10% heavy truck traffic and a 90/10 day/night split, as obtained from the Municipality of Middlesex Centre. This data has been extrapolated to a 2028 build-out at a 4.3% annual growth rate for 11 years. While a growth rate of 2.0% would be considered typical for both roads in lieu of specific information from the municipality or traffic consultant, the proposed 5.6% and 4.3% growth rates were required to achieve a minimum of 40 vehicles per hour for night time-traffic for the STAMSON modelling software. For this reason, the calculations can be considered a conservative estimate. Correspondence with Middlesex County and the MTO is included in Appendix A

Table 1 - Road Traffic Data (Hyde Park Road)

Time (Hours)	No. of Cars (97%)	No of Heavy Trucks	Posted Speed Limit km/hr
Komoka Road (County Road #16) (10% Heavy)			
Day-Time (0700-2300)	2,600	289	50
Night-Time (2300-0700)	289	32	50
Oxbow Drive (10% Heavy)			
Day-Time (0700-2300)	2,605	289	60
Night-Time (2300-0700)	289	32	60

4.2 RAIL TRAFFIC DATA

Rail traffic frequencies for the CN/CP Railways are summarized below in Table 2. The figures represent the average daily rail volumes, as supplied by CN and CP in letters dated November 20, 2017 and September 5, 2017 respectively. For the Stamson modelling results, the data has been extrapolated at a growth rate of 2.5% per year for a 2028 build-out scenario. Both the CN and CP data has been extrapolated for a period of 11 years to reflect the age of the data received.

Table 2- Rail Traffic Data

Time (Hours)	Type of Train	No. of Cars per Train	No. of Locomotives per Train	No. of Trains	Max Speed of Train km/hr
Canadian National Railway					
Day-Time (0700-2300)	Freight	140	4	13	72
	Way Freight	25	4	2	72
	Passenger	10	2	1	72
Night-Time (2300-0700)	Freight	140	4	3	72
	Way Freight	25	4	2	72
	Passenger	10	2	1	72
Canadian Pacific Railway					
Day-Time (0700-2300)	Freight	173	4	6	97
Night-Time (2300-0700)	Freight	173	4	3	97

5.0 NOISE LEVEL PREDICTIONS

Utilizing the MECP's noise prediction model, the projected noise levels for the site were calculated for two sample times during the daylight hours of 0700 to 2300 (7:00 a.m. to 11:00 p.m.) and the night time hours of 2300-0700 (11:00 p.m. to 7:00 a.m.). A 'barrier free' situation was assumed for all calculations due to the existing topography. For all calculations the intervening topography and the distance to the noise source were considered as the only other impediments to noise transmission. In addition, the following assumptions were made:

- The proposed units will have setbacks as per the attached noise study figure (see Figure 1);
- All units are assumed to be two (2) storeys;
- Indoor night-time receiver elevations are as identified on Figure 1; and,
- Outdoor daytime receiver elevation was assumed to be 1.5 m and are located 3 m from the rear facade of the units.

Refer to Figure 1 for the building, Stamson and vibration test locations within the proposed development. The findings are summarized below:

Table 3 - Stamson Noise Levels

Point of Assessment	Stamson Daytime Outdoor Noise Level (dBA)		Stamson Day-time Indoor Noise Level (dBA)*	Stamson Night-Time Indoor Noise Level (dBA)*	Warning Clauses/Mitigation Measures
	Unattenuated	Attenuated			
POA1	56.93	N/A	46.93	45.37	WC 'AD', AC, BC
POA2	55.01	N/A	45.01	43.54	WC 'C', Provisions
POA19	46.77	N/A	36.77	46.54	WC 'C', Provisions
POA25	53.33	N/A	43.33	44.22	WC 'C', Provisions
POA26	55.38	N/A	45.38	46.29	WC 'AD', AC, BC
POA50	46.35	N/A	36.35	34.99	None
POA51	53.05	N/A	43.05	31.64	WC 'C', Provisions
POA73	44.23	N/A	34.23	35.04	None
POA74	46.01	N/A	36.01	36.86	WC 'C', Provisions
POA76	53.93	N/A	43.93	44.84	WC 'C', Provisions
POA114	52.51	N/A	42.51	43.40	WC 'C', Provisions
POA119	55.02	N/A	45.02	44.44	WC 'C', Provisions
POA120	59.66	N/A	49.66	49.01	WC 'AD', AC, BC
POA121	56.13	N/A	46.13	41.98	WC 'AC', Provisions
POA122	47.98	N/A	37.98	37.39	WC 'C', Provisions
POA123	45.78	N/A	35.78	36.07	WC 'C', Provisions
POA124	44.33	N/A	34.33	34.23	None
POA132	44.85	N/A	34.85	34.03	None
POA133	46.91	N/A	36.91	35.74	WC 'C', Provisions
POA134	56.42	N/A	46.42	41.26	WC 'AC', Provisions
POA135	53.46	N/A	43.46	38.56	WC 'C', Provisions
POA153	53.77	N/A	43.77	38.16	WC 'C', Provisions
POA154	47.41	N/A	37.41	32.84	None
POA165	44.79	N/A	34.79	32.97	None
POA166	56.28	N/A	46.28	44.63	WC 'AC', Provisions
POA167	56.50	N/A	46.50	44.86	WC 'AC', Provisions
POA168	56.91	N/A	46.91	45.26	WC 'AD', AC, BC
POA173	58.58	N/A	48.58	46.89	WC 'AD', AC, BC

*Note – The indoor noise levels presented in Table 3 reflect the STAMSON model data at the building face less 10 dBA to reflect reductions caused by a typical wall assembly constructed in accordance with the Ontario Building Code (OBC).

See Appendix A for a Complete set of noise level calculations. In addition to preparing Stamson noise modelling, our firm visited the site with an Intertan Model 33-2055 sound level meter on October 16, 2018 at 9:00 AM and October 17, 2018 at 8:00 a.m. to register stationary noise level readings from the nearby industrial property located on the opposite site of Oxbow Drive from the subject property (MN#9919 Oxbow Drive).

Readings were taken approximately at the south faces of the proposed units that would be most impacted by the stationary noise source within Block 176 (approximately 50 m from the source) at a setback of approximately 15m from the Oxbow Drive right-of-way. An average of 64 dBA was measured for the on-site ambient background noise based upon readings taken every 30 seconds over a 30 minute period on two separate occasions. As noted previously, when activities occurred within the industrial site, the noise metre was not triggered and remained below the 50 dBA level due to the setback. It is our suggestion the impacts from the adjacent rail and road traffic will far outweigh the impact of the industrial site and thus the stationary noise levels have not been added for a cumulative effect.

6.0 ATTENUATION RECOMMENDATIONS & SUMMARY

6.1 INTERIOR NOISE LEVELS

As per Table 3, indoor noise level exceeds the MECP criteria at several locations across the site. For the unit whose maximum predicted noise levels exceed these guidelines by more than 10 dbA, the installation of central air conditioning will be mandatory. In addition, the provision to notify the potential tenant with the appropriate warning clause is required.

Installation of central air conditioning and the following warning clause should be applied to units 1, 26, 120 and 168-173 within this development. The warning clause will be included in all agreements of purchase and sale or lease of these dwellings.

"This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment. (Note: The location and installation of the air conditioning device should be done so as to minimize the noise impacts and comply with criteria of MOECC Publication NPC-216, Residential Air Conditioning Devices.)"

For those units whose maximum predicted indoor noise level exceed the guidelines by 1-10 dBA, an appropriate warning clause should be applied. In addition, provisions must be made for the future installation of central air conditioning. This can be achieved through providing a forced air heating system adequately sized to allow such an installation thus enabling future residents the ability to close their windows should they find noise levels too much of a nuisance.

The following warning clause should be applied to units 2-25, 27-29, 51-52, 74-79, 112-119, 121-123, 133-134, 135-145, 153, 166-167 within this development. This warning clause will be included in all agreements of purchase and sale or lease of these dwellings.

"This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of Environment. (Note: The location and installation of the outdoor air conditioning device should be done so as to minimize the noise impacts and comply with criteria of MECP Publication NPC-216, Residential Air Conditioning Devices.)"

6.2 BUILDING COMPONENTS

For all units with a night time sound level that exceeds 55 dBA outside the bedroom window or day time sound level that exceeds 60 dBA outside the living room window, building components including windows, walls and doors must be designed so that the indoor sound levels comply with the noise criteria outlined by the MECP.

Noise reduction building components will be required for units 1, 26, 120 and 166-173 within the development. For these units a EW5 construction rating from foundation to rafters should be utilized along with the installation of glazed windows for all building faces that have exposure to the CN/CP rail lines, Komoka Road and Oxbow Drive. EW5 construction is an exterior wall composed of 12.7mm gypsum board, vapour barrier and 38x89 studs with 50mm (or thicker) mineral wool or glass fibre batts in inter-stud cavities plus sheathing, 25mm air space and 100mm brick veneer. For alternate EW5 construction methods refer to Section 8 of the Supplemental Guidelines of the Ontario Building Code for applicable STC ratings for various construction methodology.

6.3 EXTERIOR NOISE LEVELS

The outdoor noise levels, as presented in Table 3, are in excess of MECP guidelines and will therefore require additional mitigation measures. For those units whose maximum predicted noise levels exceeds these guidelines by 1-5 dbA, the provision to notify the potential tenant with the appropriate warning clause is required.

The following warning clause should be applied to units 1, 26, 120-121, 134 and 166-173 within this development. This warning clause will be included in all agreements of purchase and sale or lease of these dwellings.

"Purchasers/tenants are advised that sound levels due to increasing rail and road traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of Environment."

No noise barriers are anticipated to be required in support of the proposed development

A wording similar to the following should also be included in all agreements of purchase of sale or lease for all dwellings within this development:

"Warning: The Canadian National and Canadian Pacific Railway Companies or their assigns or successors in interest has or have a right-of-way within 300metres from the land the subject hereof. There may be alterations to or expansions of the rail facilities on such right-of-way in the future including the possibility that the railway or its assigns or successors as aforesaid may expand its operations, which expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the development and individual dwellings; the Canadian National and Canadian Pacific Railways will not be responsible for any complaints or claims arising from the use of such facilities and/or operations on, over or under the aforesaid rights-of-way."

"The Municipality of Middlesex Centre assumes no responsibility for noise issues which may arise from the existing or increased traffic of the Canadian National Railway, the Canadian Pacific Railway, Komoka Road (Middlesex County Road #16) or Oxbow Drive as it relates to the interior or outdoor living areas of any dwelling unit within the development. The Municipality of Middlesex Centre will not be responsible for constructing any form of noise mitigation for this development."

As noted earlier, detailed site plans were not available for the proposed medium density Blocks 173-176 and 178 as of the date of this report. Supplemental noise assessments will be required at the Site Plan Approval stage for each block. Proper implementation of the abatement program above will result in noise levels that will meet the MECP's requirements for this development.

7.0 VIBRATION LEVEL MEASUREMENTS

For this project. Three (3) separate measurements were taken to determine the effects of ground vibration. The tests were conducted on September 6th and 10th, 2018 and were located at 40m and 50m from the Canadian Pacific Railway track. Vibration data was collected on the ground surface for all locations for a series of one second intervals for the entire length of time when the trigger level was exceeded. It should be noted that no vibration testing was conducted adjacent to the Canadian National Railway track as the nearest residential units are greater than 75 m away.

For all tests carried out the Longitudinal (L-compression wave or P-wave), Transverse (T-shear wave or S-wave), Vertical (V-surface wave or Rayleigh wave) were analysed and a RMS (root mean square) was determined graphically for each. Only the vertical component of the resulting vibration due to surface waves was analysed since Rayleigh waves account for 2/3 of the seismic energy of train vibration. The longitudinal and transverse waves were examined for consistency but were not incorporated in the assessment in accordance with standard practice for train vibration. Refer to Table 4 for a summary of vibration level readings and Appendix B for detailed test results.

8.0 VIBRATION ATTENUATION RECOMMENDATIONS & SUMMARY

The vibration levels measured on this site are higher than the Canadian National/Canadian Pacific Railway guideline of 0.14 mm/sec RMS, averaged over 1 second. Exceedances ranging from (0.03-0.24 mm/sec RMS) were noted at a distance of 50 m from the track which represents approximately the western limit of multi family Blocks 173-174.

The north, west and south foundation walls for any buildings proposed on the western side of Block 177-178 may require vibration isolation measures to be implemented during construction depending on the type of development proposed. For mid and high rise developments, per typical design process wind would loads typically exceed any impacts resulting from rail vibration and are designed accordingly. Refer to structural plans for recommendations. For low rise buildings with more standard foundations, previous studies applied in the region have shown that sufficient vibration isolation could be accomplished by increasing the thickness of the effected foundations from 200mm to 300mm, supplemented by adding a 50mm lining of DOW Ethafoam 220 planks directly onto the exterior foundation walls facing the rail tracks. In addition, a 600mm wide layer of 50mm diameter clear stone will need to be placed against the foundation wall from the footing to 300mm below grade. Refer to the sample cross sections included in Appendix B.

Appendix B contains the vibration level calculations and graphs. See Figure 1 for the test locations.

DEVELOPMENT ENGINEERING (LONDON) LIMITED



Derek J. Hoevenaars, P. Eng.

A handwritten signature in black ink that reads "Jeff Thomas". The signature is fluid and extends to the right with a long horizontal stroke.

Jeff Thomas, Certified Noise Consultant

APPENDIX A

NOISE LEVEL CALCULATIONS

ROAD NO.	LOCATION	AVERAGE TRAFFIC COUNT	LENGTH (Km)	BOUNDARY LENGTH	EQUIVALENT LENGTH	DAILY VEH-(Km)
GLENDON DR. 14	CR#81 TO CR#9	3526	10.6		10.6	37376
GLENDON DR. 14	CR#9 APPIN TO CR#8	3657	7.5		7.5	27428
GLENDON DR. 14	CR#8 APPIN TO CR#80	3597	7.3		7.3	26258
CONCESSION DR. 14	CR#80 GLENCOE TO CR#1 NEWBURY	2821	10.1		10.1	28492
CONCESSION DR. 14	CR#1 TO THE KENT COUNTY BOUNDARY	1679	9.7	4.4	7.5	12593
CARRAGE RD. 15	CR#2 TO CR#35	1388	8		8	11104
KOMOKA RD. 16	CR#3 TO CR #14	4060	1.7		1.7	6902
KOMOKA RD. 16	CR#14 TO CR#22	1581	9.4		9.4	14861
ILDERTON RD. 16	CR#22 TO CR#17	2315	5.8		5.8	13427
ILDERTON RD. 16	CR#17 TO CR#20 SOUTH	3924	9.5		9.5	37278
ILDERTON RD. 16	CR#20 SOUTH TO HIGHWAY #4	4557	5		5	22785
ILDERTON RD. 16	HIGHWAY #4 TO CR#23	3500	5		5	17500
PLOVER MILLS RD. 16	CR#23 TO CR#27	2339	7.8		7.8	18244
PLOVER MILLS RD. 16	CR#27 TO CR#31	4071	2.8		2.8	11399
PLOVER MILLS RD. 16	CR#31 TO THE OXFORD COUNTY BOUNDARY	2514	4.3		4.3	10810
GAINSBOROUGH RD. 17	LONDON TO CR#22	5484	6.5		6.5	35646
NAIRN RD. 17	CR#22 TO CR#16	2558	5.8		5.8	14836
NAIRN RD. 17	CR#16 TO CR#19	2995	10.3		10.3	30849
NAIRN RD. 17	CR#19 TO CR#81	2741	9.6		9.6	26314
NAIRN RD. 17	CR#81 TO CR#7	1498	2.7		2.7	4045

Derek Hoevenaars

From: Jake DeRidder <deridder@middlesexcentre.on.ca>
Sent: August 29, 2018 3:42 PM
To: Derek Hoevenaars
Cc: Jake Straus; khenderson@middlesex.ca; Jeff Thomas
Subject: RE: 9904 Oxbow Drive - Traffic Information Request

Hi Derek,

See below my comments in red.

Let me know if you have any further questions.



Jake DeRidder, C.Tech.

Development Review Coordinator

[Middlesex Centre](#) | deridder@middlesexcentre.on.ca

10227 Ilderton Road, RR#2 | Ilderton, Ontario, N0M 2A0

Tel: 519.666.0190 ext.269 | Fax: 519.666.0271

Good afternoon Jake,

Thank you for the phone call earlier this afternoon. As discussed, we are conducting a noise assessment for a proposed subdivision development to be constructed at 9904 Oxbow Drive in Komoka Ontario and are looking for some information regarding traffic counts on Oxbow Drive in vicinity of the subject site (we are also looking for Komoka Road (Middlesex County Road #16) but we understand that information will be provided directly from the County). At your earliest convenience, can you please provide the following:

- AADT traffic volume and year of the count;
Traffic counts from 2017 is 2024 AADT
- Anticipated growth rate over the next 10 years for the road in question;
I would suggest this be determined by the Traffic Engineer who is completing the TIS for this development. At this time we don't foresee an expansion of that portion of Oxbow within the next 10 years, however the TIS may determine otherwise.
- Posted speed limit of the section of road in question;
60 km/h
- Percentage of medium and heavy trucks; and,
Unfortunately we don't have this data, you would have to conduct a traffic survey of your own
- Day/Night splits (typically assumed 90/10 for non-highways).
Agreed

Feel free to contact us with any questions or concerns. Thanks,

Derek Hoevenaars, P.Eng | Senior Project Engineer

Ext. 148 dhoevenaars@deveng.net www.deveng.net



Train Count Data

TRANSMITTAL

To: Development
Destinataire : Engineering (London)
Limited
41 Adelaide St N
London, ON
N6B 3P4

Project : STY – 19.50 – Queen St. Komoka, ON

Att'n: Derek J. Hoevenaars
From: Michael Vallins
Expéditeur :

Routing: dhoevenaars@deveng.net
Date: 11/20/2017

Cc: Adjacent Development
CN via e-mail

☐ Urgent ☐ For Your Use ☐ For Review ☒ For Your Information ☐ Confidential

**Re: Train Traffic Data – CN Strathroy Subdivision near Queen St in
Komoka, ON**

Please find attached the requested Train Traffic Data; this data does not reflect GO Metrolinx Traffic. The application fee in the amount of **\$500.00** +HST will be invoiced.

Should you have any questions, please do not hesitate to contact the undersigned at 905-669-3264.

Sincerely,
CN Design & Construction

Michael Vallins P.Eng
Manager of Public Works
public_works_gld@cn.ca

Date: 2017/11/16

Project Number: STY – 19.50 – Queen St. Komoka, ON

Dear Derek J. Hoevenaars:

Re: Train Traffic Data – CN Strathroy Subdivision near Queen St in Komoka, ON

The following is provided in response to Derek's 2017/10/26 request for information regarding rail traffic in the vicinity of Queen St in Komoka at approximately Mile 19.50 on CN's Strathroy Subdivision.

Typical daily traffic volumes are recorded below. However, traffic volumes may fluctuate due to overall economic conditions, varying traffic demands, weather conditions, track maintenance programs, statutory holidays and traffic detours that when required may be heavy although temporary. For the purpose of noise and vibration reports, train volumes must be escalated by 2.5% per annum for a 10-year period.

Typical daily traffic volumes at this site location are as follows:

***Maximum train speed is given in Miles per Hour**

	0700-2300			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	13	140	45	4
Way Freight	2	25	45	4
Passenger	1	10	45	2

	2300-0700			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	3	140	45	4
Way Freight	2	25	45	4
Passenger	1	10	45	2

The volumes recorded reflect westbound and eastbound freight and passenger operations on CN's Strathroy Subdivision.

Except where anti-whistling bylaws are in effect, engine-warning whistles and bells are normally sounded at all at-grade crossings. There are 6 (six) at-grade crossing in the immediate vicinity of the study area at Mile 15.45-19.50. Anti-whistling bylaws are in effect from 23:00-6:00 at this crossing. Please note that engine warning whistles may be sounded in cases of emergency, as a safety and or warning precaution at station locations and pedestrian crossings and occasionally for operating requirements.

With respect to equipment restrictions, the gross weight of the heaviest permissible car is 286,000 lbs.

The single mainline track is considered to be continuously welded rail throughout the study area.

The Canadian National Railway continues to be strongly opposed to locating developments near railway facilities and rights-of-way due to potential safety and environmental conflicts. Development adjacent to the Railway Right-of-Way is not appropriate without sound impact mitigation measures to reduce the incompatibility. For confirmation of the applicable rail noise, vibration and safety standards, Adjacent Development, Canadian National Railway Properties at Proximity@cn.ca should be contacted directly.

I trust the above information will satisfy your current request.

Sincerely,

A handwritten signature in black ink, appearing to read 'Michael Vallins', with a long horizontal flourish extending to the right.

Michael Vallins P.Eng
Manager of Public Works
public_works_gld@cn.ca



1290 Central Parkway West
Mississauga, Ontario
Canada L5C 4R3

T 905 803 3429
E josie_tomei@cpr.ca

September 5, 2017

Via email: DHoevenaars@deveng.net

Derek Hoevenaars
Development Engineering Ltd.
41 Adelaide Street North
Unit #71
London, ON N6B 3P4

Dear Sir/Madam:

**Re: Rail Traffic Volumes, CP Mileage 9.8, Windsor Subdivision,
Between Oxbow Road and Komoka Road**

This is in reference to your request for rail traffic data in the vicinity of Between Oxbow Road and Komoka Road in the Municipality of Middlesex Centre. The study area is located near mile 9.8 of our Windsor Subdivision, which is classified as a Principal Main line.

The information requested is as follows:

1. Number of freight trains between 0700 & 2300: 6
Number of freight trains between 2300 & 0700: 3
2. Average number of cars per train: 109
Maximum cars per train freight: 173
3. Number of locomotives per train: 2 (4 Maximum)
4. Maximum permissible train speed is 60 miles per hour (freight)
5. The whistle signal is prohibited approaching the Komoka Road public grade crossing but is sounded at the Oxbow Road crossing. Please note, the whistle may be sounded if deemed necessary by the train crew for safety reasons.

The information provided is based on recent rail traffic. Variations of the above may exist on a day-to-day basis. Specific measurements may also vary significantly depending on customer needs.

Yours truly,

Josie Tomei SR/WA
Specialist Real Estate Sales & Acquisitions – Ontario

STAMSON 5.0 NORMAL REPORT Date: 27-09-2018 12:09:09
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: POA1.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	17.1/3.9	72.0	4.0	1140.0 !Diesel! Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0 !Diesel! Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !
1. Freight	13.0/3.0	2.50	11.00
2. Way Freight	2.0/2.0	2.50	11.00
3. Passenger	1.0/1.0	2.50	11.00

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 0	0
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 194.00	/ 194.00 m
Receiver height	: 1.50	/ 4.50 m
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Rail data, segment # 2: CP Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	7.9/3.9	97.0	4.0	1173.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !
1. Freight	6.0/3.0	2.50	11.00

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 7	7
House density	: 50	%
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 500.00	/ 500.00 m
Receiver height	: 1.50	/ 4.50 m
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 55.98 + 0.00) = 55.98 dBA
Angle1 Angle2 Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.93	-17.62	-1.33	0.00	0.00	0.00	55.98
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WHEEL (0.00 + 48.18 + 0.00) = 48.18 dBA

Angle1 Angle2 Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.66	68.09	-18.45	-1.46	0.00	0.00	0.00	48.18
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Segment Leq : 56.65 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 37.40 + 0.00) = 37.40 dBA

Angle1 Angle2 Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.27	-24.14	-1.33	0.00	-11.40	0.00	37.40
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WHEEL (0.00 + 29.37 + 0.00) = 29.37 dBA

Angle1 Angle2 Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.66	67.51	-25.28	-1.46	0.00	-11.40	0.00	29.37
-----	----	------	-------	--------	-------	------	--------	------	-------

Segment Leq : 38.03 dBA

Total Leq All Segments: 56.71 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 54.60 + 0.00) = 54.60 dBA

Angle1 Angle2 Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.50	72.39	-16.62	-1.17	0.00	0.00	0.00	54.60
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WHEEL (0.00 + 46.04 + 0.00) = 46.04 dBA

Angle1 Angle2 Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.60	65.18	-17.79	-1.35	0.00	0.00	0.00	46.04
-----	----	------	-------	--------	-------	------	------	------	-------

Segment Leq : 55.17 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 38.88 + 0.00) = 38.88 dBA

Angle1 Angle2 Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.50	74.21	-22.77	-1.17	0.00	-11.40	0.00	38.88
-----	----	------	-------	--------	-------	------	--------	------	-------

WHEEL (0.00 + 30.33 + 0.00) = 30.33 dBA

Angle1 Angle2 Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.60	67.45	-24.37	-1.35	0.00	-11.40	0.00	30.33
-----	----	------	-------	--------	-------	------	--------	------	-------

Segment Leq : 39.45 dBA

Total Leq All Segments: 55.28 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume	: 2600/289	veh/TimePeriod	*
Medium truck volume	: 0/0	veh/TimePeriod	*
Heavy truck volume	: 289/32	veh/TimePeriod	*
Posted speed limit	: 50	km/h	

Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 1581
Percentage of Annual Growth : 5.60
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Komoka Rd. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 7 / 7
House density : 95 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 327.90 / 327.90 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Oxbow Dr. (day/night)

Car traffic volume : 2605/289 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 289/32 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 2024
Percentage of Annual Growth : 4.30
Number of Years of Growth : 11.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Oxbow Dr. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 221.60 / 221.60 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Komoka Rd. (day)

Source height = 1.78 m

ROAD (0.00 + 23.18 + 0.00) = 23.18 dBA

Angle1 Angle2 Alpha RefLeq P.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 63.22 0.00 -22.13 -1.44 0.00 -16.47 0.00 23.18

Segment Leq : 23.18 dBA

Results segment # 2: Oxbow Dr. (day)

Source height = 1.78 m

ROAD (0.00 + 43.77 + 0.00) = 43.77 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 64.52 0.00 -19.32 -1.44 0.00 0.00 0.00 43.77

Segment Leq : 43.77 dBA

Total Leq All Segments: 43.81 dBA

Results segment # 1: Komoka Rd. (night)

Source height = 1.78 m

ROAD (0.00 + 17.99 + 0.00) = 17.99 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 56.67 0.00 -20.92 -1.29 0.00 -16.47 0.00 17.99

Segment Leq : 17.99 dBA

Results segment # 2: Oxbow Dr. (night)

Source height = 1.78 m

ROAD (0.00 + 38.43 + 0.00) = 38.43 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 57.98 0.00 -18.26 -1.29 0.00 0.00 0.00 38.43

Segment Leq : 38.43 dBA

Total Leq All Segments: 38.47 dBA

TOTAL Leq FROM ALL SOURCES (DAY) : 56.93
(NIGHT) : 55.37

STAMSON 5.0 NORMAL REPORT Date: 27-09-2018 12:12:48
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: POA2.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed ! (km/h)	loc ! (/Train)	Cars ! (/Train)	Eng ! (weld)	!Cont
* 1. Freight	17.1/3.9	72.0	4.0	1140.0	!Diesel	!Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0	!Diesel	!Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0	!Diesel	!Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	! Unadj.	! Annual %	! Years of !
No Name	! Trains !	! Increase !	! Growth !
1. Freight	13.0/3.0	2.50	11.00
2. Way Freight	2.0/2.0	2.50	11.00
3. Passenger	1.0/1.0	2.50	11.00

Data for Segment # 1: CN Rail (day/night)

Angle1	Angle2	: -90.00 deg	90.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	1	1
House density	:	33	% (Absorptive ground surface)
Surface	:	1	
Receiver source distance	:	205.00	/ 205.00 m
Receiver height	:	1.50	/ 4.50 m
Topography	:	1	(Flat/gentle slope; no barrier)
No Whistle	:		
Reference angle	:	0.00	

Rail data, segment # 2: CP Rail (day/night)

Train Type	Trains	Speed ! (km/h)	loc ! (/Train)	Cars ! (/Train)	Eng ! (weld)	!Cont
* 1. Freight	7.9/3.9	97.0	4.0	1173.0	!Diesel	!Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	! Unadj.	! Annual %	! Years of !
No Name	! Trains !	! Increase !	! Growth !
1. Freight	6.0/3.0	2.50	11.00

Data for Segment # 2: CP Rail (day/night)

Angle1	Angle2	: -90.00 deg	90.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	7	7
House density	:	50	% (Absorptive ground surface)
Surface	:	1	
Receiver source distance	:	500.00	/ 500.00 m
Receiver height	:	1.50	/ 4.50 m
Topography	:	1	(Flat/gentle slope; no barrier)
No Whistle	:		
Reference angle	:	0.00	

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 54.09 + 0.00) = 54.09 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.93	-18.00	-1.33	0.00	-1.51	0.00	54.09
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WHEEL (0.00 + 46.27 + 0.00) = 46.27 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	68.09	-18.85	-1.46	0.00	-1.51	0.00	46.27

Segment Leq : 54.75 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 37.40 + 0.00) = 37.40 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	74.27	-24.14	-1.33	0.00	-11.40	0.00	37.40

WHEEL (0.00 + 29.37 + 0.00) = 29.37 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	67.51	-25.28	-1.46	0.00	-11.40	0.00	29.37

Segment Leq : 38.03 dBA

Total Leq All Segments: 54.84 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 52.73 + 0.00) = 52.73 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	72.39	-16.98	-1.17	0.00	-1.51	0.00	52.73

WHEEL (0.00 + 44.14 + 0.00) = 44.14 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	65.18	-18.17	-1.35	0.00	-1.51	0.00	44.14

Segment Leq : 53.29 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 38.88 + 0.00) = 38.88 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	74.21	-22.77	-1.17	0.00	-11.40	0.00	38.88

WHEEL (0.00 + 30.33 + 0.00) = 30.33 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	67.45	-24.37	-1.35	0.00	-11.40	0.00	30.33

Segment Leq : 39.45 dBA

Total Leq All Segments: 53.47 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume	:	2600/289	veh/TimePeriod	*
Medium truck volume	:	0/0	veh/TimePeriod	*
Heavy truck volume	:	289/32	veh/TimePeriod	*

Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 1581
Percentage of Annual Growth : 5.60
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 10.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Komoka Rd. (day/night)

Angle1	Angle2	: -90.00 deg	90.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	7 / 7	
House density	:	95 %	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	:	327.80 / 327.80 m	
Receiver height	:	1.50 / 4.50 m	
Topography	:	1	(Flat/gentle slope; no barrier)
Reference angle	:	0.00	

Road data, segment # 2: Oxbow Dr. (day/night)

Car traffic volume	:	2605/289	veh/TimePeriod *
Medium truck volume	:	0/0	veh/TimePeriod *
Heavy truck volume	:	289/32	veh/TimePeriod *
Posted speed limit	:	60 km/h	
Road gradient	:	0 %	
Road pavement	:	1	(Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 2024
Percentage of Annual Growth : 4.30
Number of Years of Growth : 11.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Oxbow Dr. (day/night)

Angle1	Angle2	: -90.00 deg	90.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	1 / 1	
House density	:	50 %	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	:	236.40 / 236.40 m	
Receiver height	:	1.50 / 4.50 m	
Topography	:	1	(Flat/gentle slope; no barrier)
Reference angle	:	0.00	

Results segment # 1: Komoka Rd. (day)

Source height = 1.78 m

ROAD (0.00 + 23.18 + 0.00) = 23.18 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 63.22 0.00 -22.12 -1.44 0.00 -16.47 0.00 23.18

Segment Leq : 23.18 dBA

Results segment # 2: Oxbow Dr. (day)

Source height = 1.78 m

ROAD (0.00 + 40.80 + 0.00) = 40.80 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 64.52 0.00 -19.78 -1.44 0.00 -2.50 0.00 40.80

Segment Leq : 40.80 dBA

Total Leq All Segments: 40.87 dBA

Results segment # 1: Komoka Rd. (night)

Source height = 1.78 m

ROAD (0.00 + 17.99 + 0.00) = 17.99 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 56.67 0.00 -20.92 -1.29 0.00 -16.47 0.00 17.99

Segment Leq : 17.99 dBA

Results segment # 2: Oxbow Dr. (night)

Source height = 1.78 m

ROAD (0.00 + 35.49 + 0.00) = 35.49 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 57.98 0.00 -18.70 -1.29 0.00 -2.50 0.00 35.49

Segment Leq : 35.49 dBA

Total Leq All Segments: 35.57 dBA

TOTAL Leq FROM ALL SOURCES (DAY) : 55.01
(NIGHT) : 53.54

STAMSON 5.0 NORMAL REPORT Date: 27-09-2018 12:07:12
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: POA19.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	17.1/3.9	72.0	4.0	1140.0 !Diesel! Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0 !Diesel! Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	! Unadj. ! Annual % ! Years of !
No Name	! Trains ! Increase ! Growth !
1. Freight	! 13.0/3.0 ! 2.50 ! 11.00 !
2. Way Freight	! 2.0/2.0 ! 2.50 ! 11.00 !
3. Passenger	! 1.0/1.0 ! 2.50 ! 11.00 !

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 7 / 7
House density	: 33 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 247.70 / 247.70 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
No Whistle	
Reference angle	: 0.00

Rail data, segment # 2: CP Rail (day/night)

Train Type	! Unadj. ! Annual % ! Years of !
No Name	! Trains ! Increase ! Growth !
1. Freight	! 7.9/3.9 ! 97.0 ! 4.0 !173.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	! Unadj. ! Annual % ! Years of !
No Name	! Trains ! Increase ! Growth !
1. Freight	! 6.0/3.0 ! 2.50 ! 11.00 !

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 7 / 7
House density	: 50 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 250.20 / 250.20 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
No Whistle	
Reference angle	: 0.00

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 43.82 + 0.00) = 43.82 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.93	-19.30	-1.33	0.00	-10.48	0.00	43.82
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WHEEL (0.00 + 35.94 + 0.00) = 35.94 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.66	68.09	-20.22	-1.46	0.00	-10.48	0.00	35.94

Segment Leq : 44.48 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 42.07 + 0.00) = 42.07 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.58	74.27	-19.37	-1.33	0.00	-11.50	0.00	42.07

WHEEL (0.00 + 34.27 + 0.00) = 34.27 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.66	67.51	-20.29	-1.46	0.00	-11.50	0.00	34.27

Segment Leq : 42.74 dBA

Total Leq All Segments: 46.71 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 42.54 + 0.00) = 42.54 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.50	72.39	-18.21	-1.17	0.00	-10.48	0.00	42.54

WHEEL (0.00 + 33.86 + 0.00) = 33.86 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.60	65.18	-19.49	-1.35	0.00	-10.48	0.00	33.86

Segment Leq : 43.09 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 43.28 + 0.00) = 43.28 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.50	74.21	-18.27	-1.17	0.00	-11.50	0.00	43.28

WHEEL (0.00 + 35.05 + 0.00) = 35.05 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.60	67.45	-19.56	-1.35	0.00	-11.50	0.00	35.05

Segment Leq : 43.89 dBA

Total Leq All Segments: 46.52 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume	: 2600/289	veh/TimePeriod	*
Medium truck volume	: 0/0	veh/TimePeriod	*
Heavy truck volume	: 289/32	veh/TimePeriod	*

Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 1581
Percentage of Annual Growth : 5.60
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 10.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Komoka Rd. (day/night)

Angle1	Angle2	: -90.00 deg	90.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	7 / 7	
House density	:	95 %	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	:	326.40 / 326.40 m	
Receiver height	:	1.50 / 4.50 m	
Topography	:	1	(Flat/gentle slope; no barrier)
Reference angle	:	0.00	

Road data, segment # 2: Oxbow Dr. (day/night)

Car traffic volume	: 2605/289	veh/TimePeriod	*
Medium truck volume	: 0/0	veh/TimePeriod	*
Heavy truck volume	: 289/32	veh/TimePeriod	*
Posted speed limit	: 60 km/h		
Road gradient	: 0 %		
Road pavement	: 1	(Typical asphalt or concrete)	

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 2024
Percentage of Annual Growth : 4.30
Number of Years of Growth : 11.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Oxbow Dr. (day/night)

Angle1	Angle2	: -90.00 deg	90.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	7 / 7	
House density	:	50 %	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	:	500.00 / 500.00 m	
Receiver height	:	1.50 / 4.50 m	
Topography	:	1	(Flat/gentle slope; no barrier)
Reference angle	:	0.00	

Results segment # 1: Komoka Rd. (day)

Source height = 1.78 m

ROAD (0.00 + 23.21 + 0.00) = 23.21 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 63.22 0.00 -22.09 -1.44 0.00 -16.48 0.00 23.21

Segment Leq : 23.21 dBA

Results segment # 2: Oxbow Dr. (day)

Source height = 1.78 m

ROAD (0.00 + 26.53 + 0.00) = 26.53 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 64.52 0.00 -25.15 -1.44 0.00 -11.40 0.00 26.53

Segment Leq : 26.53 dBA

Total Leq All Segments: 28.19 dBA

Results segment # 1: Komoka Rd. (night)

Source height = 1.78 m

ROAD (0.00 + 18.02 + 0.00) = 18.02 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 56.67 0.00 -20.89 -1.29 0.00 -16.48 0.00 18.02

Segment Leq : 18.02 dBA

Results segment # 2: Oxbow Dr. (night)

Source height = 1.78 m

ROAD (0.00 + 21.51 + 0.00) = 21.51 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 57.98 0.00 -23.78 -1.29 0.00 -11.40 0.00 21.51

Segment Leq : 21.51 dBA

Total Leq All Segments: 23.12 dBA

TOTAL Leq FROM ALL SOURCES (DAY) : 46.77
(NIGHT) : 46.54

STAMSON 5.0 NORMAL REPORT Date: 01-10-2018 11:45:37
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: POA25.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	17.1/3.9	72.0	4.0	1140.0 !Diesel! Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0 !Diesel! Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	! Unadj. ! Annual % ! Years of !
No Name	! Trains ! Increase ! Growth !
1. Freight	13.0/3.0 ! 2.50 ! 11.00 !
2. Way Freight	2.0/2.0 ! 2.50 ! 11.00 !
3. Passenger	1.0/1.0 ! 2.50 ! 11.00 !

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 7 / 7
House density	: 33 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 499.90 / 499.90 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
No Whistle	
Reference angle	: 0.00

Rail data, segment # 2: CP Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	7.9/3.9	97.0	4.0	1173.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	! Unadj. ! Annual % ! Years of !
No Name	! Trains ! Increase ! Growth !
1. Freight	6.0/3.0 ! 2.50 ! 11.00 !

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 2 / 2
House density	: 50 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 163.60 / 163.60 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
No Whistle	
Reference angle	: 0.00

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 39.04 + 0.00) = 39.04 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.93	-24.14	-1.33	0.00	-10.42	0.00	39.04
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WHEEL (0.00 + 30.94 + 0.00) = 30.94 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.66	68.09	-25.28	-1.46	0.00	-10.42	0.00	30.94

Segment Leq : 39.67 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 52.43 + 0.00) = 52.43 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.58	74.27	-16.45	-1.33	0.00	-4.06	0.00	52.43

WHEEL (0.00 + 44.76 + 0.00) = 44.76 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.66	67.51	-17.23	-1.46	0.00	-4.06	0.00	44.76

Segment Leq : 53.12 dBA

Total Leq All Segments: 53.31 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 38.03 + 0.00) = 38.03 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.50	72.39	-22.77	-1.17	0.00	-10.42	0.00	38.03

WHEEL (0.00 + 29.04 + 0.00) = 29.04 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.60	65.18	-24.36	-1.35	0.00	-10.42	0.00	29.04

Segment Leq : 38.55 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 53.47 + 0.00) = 53.47 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.50	74.21	-15.51	-1.17	0.00	-4.06	0.00	53.47

WHEEL (0.00 + 45.43 + 0.00) = 45.43 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.60	67.45	-16.60	-1.35	0.00	-4.06	0.00	45.43

Segment Leq : 54.10 dBA

Total Leq All Segments: 54.22 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume	: 2600/289	veh/TimePeriod	*
Medium truck volume	: 0/0	veh/TimePeriod	*
Heavy truck volume	: 289/32	veh/TimePeriod	*

Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 1581
Percentage of Annual Growth : 5.60
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 10.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Komoka Rd. (day/night)

Angle1	Angle2	: -90.00 deg	90.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	7 / 7	
House density	:	95 %	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	:	326.00 / 326.00 m	
Receiver height	:	1.50 / 4.50 m	
Topography	:	1	(Flat/gentle slope; no barrier)
Reference angle	:	0.00	

Road data, segment # 2: Oxbow Dr. (day/night)

Car traffic volume	: 2605/289	veh/TimePeriod	*
Medium truck volume	: 0/0	veh/TimePeriod	*
Heavy truck volume	: 289/32	veh/TimePeriod	*
Posted speed limit	:	60 km/h	
Road gradient	:	0 %	
Road pavement	:	1 (Typical asphalt or concrete)	

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 2024
Percentage of Annual Growth : 4.30
Number of Years of Growth : 11.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Oxbow Dr. (day/night)

Angle1	Angle2	: -90.00 deg	90.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	7 / 7	
House density	:	50 %	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	:	500.00 / 500.00 m	
Receiver height	:	1.50 / 4.50 m	
Topography	:	1	(Flat/gentle slope; no barrier)
Reference angle	:	0.00	

Results segment # 1: Komoka Rd. (day)

Source height = 1.78 m

ROAD (0.00 + 23.21 + 0.00) = 23.21 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 63.22 0.00 -22.08 -1.44 0.00 -16.48 0.00 23.21

Segment Leq : 23.21 dBA
Results segment # 2: Oxbow Dr. (day)

Source height = 1.78 m

ROAD (0.00 + 26.53 + 0.00) = 26.53 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 64.52 0.00 -25.15 -1.44 0.00 -11.40 0.00 26.53

Segment Leq : 26.53 dBA
Total Leq All Segments: 28.19 dBA
Results segment # 1: Komoka Rd. (night)

Source height = 1.78 m

ROAD (0.00 + 18.03 + 0.00) = 18.03 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 56.67 0.00 -20.88 -1.29 0.00 -16.48 0.00 18.03

Segment Leq : 18.03 dBA
Results segment # 2: Oxbow Dr. (night)

Source height = 1.78 m

ROAD (0.00 + 21.51 + 0.00) = 21.51 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 57.98 0.00 -23.78 -1.29 0.00 -11.40 0.00 21.51

Segment Leq : 21.51 dBA
Total Leq All Segments: 23.12 dBA
TOTAL Leq FROM ALL SOURCES (DAY) : 53.33
(NIGHT) : 54.22

STAMSON 5.0 NORMAL REPORT Date: 01-10-2018 11:45:08
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: POA26.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont	!weld
* 1. Freight	17.1/3.9	72.0	4.0	1140.0	!Diesel! Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0	!Diesel! Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0	!Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	! Unadj. ! Annual % ! Years of !
No Name	! Trains ! Increase ! Growth !
1. Freight	13.0/3.0 ! 2.50 ! 11.00 !
2. Way Freight	2.0/2.0 ! 2.50 ! 11.00 !
3. Passenger	1.0/1.0 ! 2.50 ! 11.00 !

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 7 / 7
House density	: 33 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 500.00 / 500.00 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
No Whistle	
Reference angle	: 0.00

Rail data, segment # 2: CP Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont	!weld
* 1. Freight	7.9/3.9	97.0	4.0	1173.0	!Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	! Unadj. ! Annual % ! Years of !
No Name	! Trains ! Increase ! Growth !
1. Freight	6.0/3.0 ! 2.50 ! 11.00 !

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 1 / 1
House density	: 50 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 148.90 / 148.90 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
No Whistle	
Reference angle	: 0.00

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 39.04 + 0.00) = 39.04 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.93	-24.14	-1.33	0.00	-10.42	0.00	39.04
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WHEEL (0.00 + 30.94 + 0.00) = 30.94 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.66	68.09	-25.28	-1.46	0.00	-10.42	0.00	30.94

Segment Leq : 39.67 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 54.56 + 0.00) = 54.56 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.58	74.27	-15.80	-1.33	0.00	-2.58	0.00	54.56

WHEEL (0.00 + 46.93 + 0.00) = 46.93 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.66	67.51	-16.55	-1.46	0.00	-2.58	0.00	46.93

Segment Leq : 55.25 dBA

Total Leq All Segments: 55.37 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 38.03 + 0.00) = 38.03 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.50	72.39	-22.77	-1.17	0.00	-10.42	0.00	38.03

WHEEL (0.00 + 29.04 + 0.00) = 29.04 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.60	65.18	-24.37	-1.35	0.00	-10.42	0.00	29.04

Segment Leq : 38.55 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 55.57 + 0.00) = 55.57 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.50	74.21	-14.90	-1.17	0.00	-2.58	0.00	55.57

WHEEL (0.00 + 47.57 + 0.00) = 47.57 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.60	67.45	-15.95	-1.35	0.00	-2.58	0.00	47.57

Segment Leq : 56.21 dBA

Total Leq All Segments: 56.28 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume	: 2600/289	veh/TimePeriod	*
Medium truck volume	: 0/0	veh/TimePeriod	*
Heavy truck volume	: 289/32	veh/TimePeriod	*

Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 1581
Percentage of Annual Growth : 5.60
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 10.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Komoka Rd. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 7 / 7
House density : 95 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 325.00 / 325.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Oxbow Dr. (day/night)

Car traffic volume : 2605/289 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 289/32 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 2024
Percentage of Annual Growth : 4.30
Number of Years of Growth : 11.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Oxbow Dr. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 7 / 7
House density : 50 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 500.00 / 500.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Komoka Rd. (day)

Source height = 1.78 m

ROAD (0.00 + 23.23 + 0.00) = 23.23 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.65 63.22 0.00 -22.06 -1.44 0.00 -16.48 0.00 23.23

Segment Leq : 23.23 dBA

Results segment # 2: Oxbow Dr. (day)

Source height = 1.78 m

ROAD (0.00 + 26.53 + 0.00) = 26.53 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.65 64.52 0.00 -25.15 -1.44 0.00 -11.40 0.00 26.53

Segment Leq : 26.53 dBA

Total Leq All Segments: 28.20 dBA

Results segment # 1: Komoka Rd. (night)

Source height = 1.78 m

ROAD (0.00 + 18.04 + 0.00) = 18.04 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.56 56.67 0.00 -20.86 -1.29 0.00 -16.48 0.00 18.04

Segment Leq : 18.04 dBA

Results segment # 2: Oxbow Dr. (night)

Source height = 1.78 m

ROAD (0.00 + 21.51 + 0.00) = 21.51 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.56 57.98 0.00 -23.78 -1.29 0.00 -11.40 0.00 21.51

Segment Leq : 21.51 dBA

Total Leq All Segments: 23.12 dBA

TOTAL Leq FROM ALL SOURCES (DAY) : 55.38
(NIGHT) : 56.29

STAMSON 5.0 NORMAL REPORT Date: 03-04-2019 14:25:28
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: POA50.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed !# (km/h)	Loc !# /Train!	Cars! Eng !Cont
* 1. Freight	17.1/3.9	72.0	4.0	1140.0 !Diesel! Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0 !Diesel! Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !
1. Freight	13.0/3.0	2.50	11.00
2. Way Freight	2.0/2.0	2.50	11.00
3. Passenger	1.0/1.0	2.50	11.00

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 2	/ 2
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 242.70	/ 242.70 m
Receiver height	: 1.50	/ 4.50 m
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Rail data, segment # 2: CP Rail (day/night)

Train Type	Trains	Speed !# (km/h)	Loc !# /Train!	Cars! Eng !Cont
* 1. Freight	7.9/3.9	97.0	4.0	1173.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !
1. Freight	6.0/3.0	2.50	11.00

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 7	/ 7
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 500.00	/ 500.00 m
Receiver height	: 1.50	/ 4.50 m
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 45.15 + 0.00) = 45.15 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.93	-19.16	-1.33	0.00	-9.29	0.00	45.15
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WHEEL (0.00 + 37.28 + 0.00) = 37.28 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.66	68.09	-20.07	-1.46	0.00	-9.29	0.00	37.28
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Segment Leq : 45.81 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 32.90 + 0.00) = 32.90 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.58	74.27	-24.14	-1.33	0.00	-15.90	0.00	32.90
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WHEEL (0.00 + 24.87 + 0.00) = 24.87 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.66	67.51	-25.28	-1.46	0.00	-15.90	0.00	24.87
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Segment Leq : 33.53 dBA

Total Leq All Segments: 46.06 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 43.86 + 0.00) = 43.86 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.50	72.39	-18.07	-1.17	0.00	-9.29	0.00	43.86
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WHEEL (0.00 + 35.19 + 0.00) = 35.19 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.60	65.18	-19.34	-1.35	0.00	-9.29	0.00	35.19
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Segment Leq : 44.41 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 34.38 + 0.00) = 34.38 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.50	74.21	-22.77	-1.17	0.00	-15.90	0.00	34.38
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WHEEL (0.00 + 25.83 + 0.00) = 25.83 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.60	67.45	-24.37	-1.35	0.00	-15.90	0.00	25.83
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Segment Leq : 34.95 dBA

Total Leq All Segments: 44.88 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume	: 2600/289	veh/TimePeriod	*
Medium truck volume	: 0/0	veh/TimePeriod	*
Heavy truck volume	: 289/32	veh/TimePeriod	*

Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 1581
Percentage of Annual Growth : 5.60
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 10.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Komoka Rd. (day/night)

Angle1	Angle2	: -90.00 deg	90.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	7 / 7	
House density	:	95 %	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	:	265.90 / 265.90 m	
Receiver height	:	1.50 / 4.50 m	
Topography	:	1	(Flat/gentle slope; no barrier)
Reference angle	:	0.00	

Road data, segment # 2: Oxbow Dr. (day/night)

Car traffic volume	:	2605/289	veh/TimePeriod *
Medium truck volume	:	0/0	veh/TimePeriod *
Heavy truck volume	:	289/32	veh/TimePeriod *
Posted speed limit	:	60 km/h	
Road gradient	:	0 %	
Road pavement	:	1	(Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 2024
Percentage of Annual Growth : 4.30
Number of Years of Growth : 11.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Oxbow Dr. (day/night)

Angle1	Angle2	: -90.00 deg	90.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	2 / 2	
House density	:	95 %	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	:	236.40 / 236.40 m	
Receiver height	:	1.50 / 4.50 m	
Topography	:	1	(Flat/gentle slope; no barrier)
Reference angle	:	0.00	

Results segment # 1: Komoka Rd. (day)

Source height = 1.78 m

ROAD (0.00 + 24.45 + 0.00) = 24.45 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 63.22 0.00 -20.62 -1.44 0.00 -16.70 0.00 24.45

Segment Leq : 24.45 dBA

Results segment # 2: Oxbow Dr. (day)

Source height = 1.78 m

ROAD (0.00 + 33.98 + 0.00) = 33.98 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 64.52 0.00 -19.78 -1.44 0.00 -9.32 0.00 33.98

Segment Leq : 33.98 dBA

Total Leq All Segments: 34.44 dBA

Results segment # 1: Komoka Rd. (night)

Source height = 1.78 m

ROAD (0.00 + 19.18 + 0.00) = 19.18 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 56.67 0.00 -19.50 -1.29 0.00 -16.70 0.00 19.18

Segment Leq : 19.18 dBA

Results segment # 2: Oxbow Dr. (night)

Source height = 1.78 m

ROAD (0.00 + 28.66 + 0.00) = 28.66 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 57.98 0.00 -18.70 -1.29 0.00 -9.32 0.00 28.66

Segment Leq : 28.66 dBA

Total Leq All Segments: 29.12 dBA

TOTAL Leq FROM ALL SOURCES (DAY) : 46.35
(NIGHT) : 44.99

STAMSON 5.0 NORMAL REPORT Date: 03-04-2019 14:28:36
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: POA51.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed !# (km/h)	Loc !# (/Train)	Cars !#	Eng !#	Cont !#
* 1. Freight	17.1/3.9	72.0	4.0	1140.0	Diesel	Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0	Diesel	Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0	Diesel	Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !
1. Freight	13.0/3.0	2.50	11.00
2. Way Freight	2.0/2.0	2.50	11.00
3. Passenger	1.0/1.0	2.50	11.00

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 1	1
House density	: 50 %	(Absorptive ground surface)
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 231.60	/ 231.60 m
Receiver height	: 1.50	/ 4.50 m
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Rail data, segment # 2: CP Rail (day/night)

Train Type	Trains	Speed !# (km/h)	Loc !# (/Train)	Cars !#	Eng !#	Cont !#
* 1. Freight	7.9/3.9	97.0	4.0	1173.0	Diesel	Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !
1. Freight	6.0/3.0	2.50	11.00

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 7	7
House density	: 95 %	(Absorptive ground surface)
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 500.00	/ 500.00 m
Receiver height	: 1.50	/ 4.50 m
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 52.25 + 0.00) = 52.25 dBA	
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	

-90	90	0.58	74.93	-18.84	-1.33	0.00	-2.51	0.00	52.25
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WHEEL (0.00 + 44.40 + 0.00) = 44.40 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	68.09	-19.73	-1.46	0.00	-2.51	0.00	44.40

Segment Leq : 52.91 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 32.90 + 0.00) = 32.90 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	74.27	-24.14	-1.33	0.00	-15.90	0.00	32.90

WHEEL (0.00 + 24.87 + 0.00) = 24.87 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	67.51	-25.28	-1.46	0.00	-15.90	0.00	24.87

Segment Leq : 33.53 dBA

Total Leq All Segments: 52.96 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 50.94 + 0.00) = 50.94 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.50	72.39	-17.77	-1.17	0.00	-2.51	0.00	50.94

WHEEL (0.00 + 42.30 + 0.00) = 42.30 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.60	65.18	-19.02	-1.35	0.00	-2.51	0.00	42.30

Segment Leq : 51.50 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 34.38 + 0.00) = 34.38 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.50	74.21	-22.77	-1.17	0.00	-15.90	0.00	34.38

WHEEL (0.00 + 25.83 + 0.00) = 25.83 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.60	67.45	-24.37	-1.35	0.00	-15.90	0.00	25.83

Segment Leq : 34.95 dBA

Total Leq All Segments: 51.60 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume	: 2600/289	veh/TimePeriod	*
Medium truck volume	: 0/0	veh/TimePeriod	*
Heavy truck volume	: 289/32	veh/TimePeriod	*

Posted speed limit	: 50 km/h
Road gradient	: 0 %
Road pavement	: 1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:	
24 hr Traffic Volume (AADT or SADT): 1581	
Percentage of Annual Growth	: 5.60
Number of Years of Growth	: 13.00
Medium Truck % of Total Volume	: 10.00
Heavy Truck % of Total Volume	: 10.00
Day (16 hrs) % of Total Volume	: 90.00
Data for Segment # 1: Komoka Rd. (day/night)	
Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 7 / 7
House density	: 95 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 265.80 / 265.80 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
Reference angle	: 0.00
Road data, segment # 2: Oxbow Dr. (day/night)	
Car traffic volume : 2605/289 veh/TimePeriod *	
Medium truck volume	: 0/0 veh/TimePeriod *
Heavy truck volume	: 289/32 veh/TimePeriod *
Posted speed limit	: 60 km/h
Road gradient	: 0 %
Road pavement	: 1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:	
24 hr Traffic Volume (AADT or SADT): 2024	
Percentage of Annual Growth	: 4.30
Number of Years of Growth	: 11.00
Medium Truck % of Total Volume	: 0.00
Heavy Truck % of Total Volume	: 10.00
Day (16 hrs) % of Total Volume	: 90.00
Data for Segment # 2: Oxbow Dr. (day/night)	
Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 1 / 1
House density	: 95 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 222.00 / 222.00 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
Reference angle	: 0.00
Results segment # 1: Komoka Rd. (day)	
Source height = 1.78 m	
ROAD (0.00 + 24.45 + 0.00) = 24.45 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.65 63.22 0.00 -20.62 -1.44 0.00 -16.70 0.00 24.45	
Segment Leq : 24.45 dBA	
Results segment # 2: Oxbow Dr. (day)	
Source height = 1.78 m	

ROAD (0.00 + 35.83 + 0.00) = 35.83 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.65 64.52 0.00 -19.33 -1.44 0.00 -7.92 0.00 35.83	
Segment Leq : 35.83 dBA	
Total Leq All Segments: 36.14 dBA	
Results segment # 1: Komoka Rd. (night)	
Source height = 1.78 m	
ROAD (0.00 + 19.18 + 0.00) = 19.18 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.56 56.67 0.00 -19.50 -1.29 0.00 -16.70 0.00 19.18	
Segment Leq : 19.18 dBA	
Results segment # 2: Oxbow Dr. (night)	
Source height = 1.78 m	
ROAD (0.00 + 30.49 + 0.00) = 30.49 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.56 57.98 0.00 -18.28 -1.29 0.00 -7.92 0.00 30.49	
Segment Leq : 30.49 dBA	
Total Leq All Segments: 30.80 dBA	
TOTAL Leq FROM ALL SOURCES (DAY) : 53.05	
(NIGHT) : 51.63	

STAMSON 5.0 NORMAL REPORT Date: 03-04-2019 14:15:05
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: POA73.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed ! (km/h)	loc !	Cars !	Eng !	Cont !
* 1. Freight	17.1/3.9	72.0	4.0	1140.0	Diesel	Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0	Diesel	Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0	Diesel	Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !

1. Freight	13.0/3.0	2.50	11.00
2. Way Freight	2.0/2.0	2.50	11.00
3. Passenger	1.0/1.0	2.50	11.00

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 7 / 7	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 500.00 / 500.00 m	
Receiver height	: 1.50 / 4.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Rail data, segment # 2: CP Rail (day/night)

Train Type	Trains	Speed ! (km/h)	loc !	Cars !	Eng !	Cont !
* 1. Freight	7.9/3.9	97.0	4.0	1173.0	Diesel	Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !

1. Freight	6.0/3.0	2.50	11.00
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Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 4 / 4	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 183.90 / 183.90 m	
Receiver height	: 1.50 / 4.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 33.56 + 0.00) = 33.56 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.93	-24.14	-1.33	0.00	-15.90	0.00	33.56
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WHEEL (0.00 + 25.46 + 0.00) = 25.46 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.66	68.09	-25.28	-1.46	0.00	-15.90	0.00	25.46

Segment Leq : 34.19 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 43.01 + 0.00) = 43.01 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.58	74.27	-17.25	-1.33	0.00	-12.67	0.00	43.01

WHEEL (0.00 + 35.31 + 0.00) = 35.31 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.66	67.51	-18.07	-1.46	0.00	-12.67	0.00	35.31

Segment Leq : 43.69 dBA

Total Leq All Segments: 44.15 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 32.55 + 0.00) = 32.55 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.50	72.39	-22.77	-1.17	0.00	-15.90	0.00	32.55

WHEEL (0.00 + 23.56 + 0.00) = 23.56 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.60	65.18	-24.37	-1.35	0.00	-15.90	0.00	23.56

Segment Leq : 33.07 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 44.10 + 0.00) = 44.10 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.50	74.21	-16.27	-1.17	0.00	-12.67	0.00	44.10

WHEEL (0.00 + 36.01 + 0.00) = 36.01 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.60	67.45	-17.42	-1.35	0.00	-12.67	0.00	36.01

Segment Leq : 44.73 dBA

Total Leq All Segments: 45.02 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume	: 2600/289	veh/TimePeriod	*
Medium truck volume	: 0/0	veh/TimePeriod	*
Heavy truck volume	: 289/32	veh/TimePeriod	*

Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 1581
Percentage of Annual Growth : 5.60
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 10.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Komoka Rd. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 7 / 7
House density : 95 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 240.20 / 240.20 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Oxbow Dr. (day/night)

Car traffic volume : 2605/289 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 289/32 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 2024
Percentage of Annual Growth : 4.30
Number of Years of Growth : 11.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Oxbow Dr. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 7 / 7
House density : 95 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 500.00 / 500.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Komoka Rd. (day)

Source height = 1.78 m

ROAD (0.00 + 25.08 + 0.00) = 25.08 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.65 63.22 0.00 -19.89 -1.44 0.00 -16.80 0.00 25.08

Segment Leq : 25.08 dBA

Results segment # 2: Oxbow Dr. (day)

Source height = 1.78 m

ROAD (0.00 + 22.03 + 0.00) = 22.03 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.65 64.52 0.00 -25.15 -1.44 0.00 -15.90 0.00 22.03

Segment Leq : 22.03 dBA

Total Leq All Segments: 26.83 dBA

Results segment # 1: Komoka Rd. (night)

Source height = 1.78 m

ROAD (0.00 + 19.77 + 0.00) = 19.77 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.56 56.67 0.00 -18.81 -1.29 0.00 -16.80 0.00 19.77

Segment Leq : 19.77 dBA

Results segment # 2: Oxbow Dr. (night)

Source height = 1.78 m

ROAD (0.00 + 17.01 + 0.00) = 17.01 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.56 57.98 0.00 -23.78 -1.29 0.00 -15.90 0.00 17.01

Segment Leq : 17.01 dBA

Total Leq All Segments: 21.62 dBA

TOTAL Leq FROM ALL SOURCES (DAY) : 44.23
(NIGHT) : 45.04

STAMSON 5.0 NORMAL REPORT Date: 03-04-2019 14:15:55
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: POA74.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	17.1/3.9	72.0	4.0	1140.0 !Diesel! Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0 !Diesel! Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !
1. Freight	13.0/3.0	2.50	11.00
2. Way Freight	2.0/2.0	2.50	11.00
3. Passenger	1.0/1.0	2.50	11.00

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 7 / 7	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 500.00 / 500.00 m	
Receiver height	: 1.50 / 4.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Rail data, segment # 2: CP Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	7.9/3.9	97.0	4.0	1173.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !
1. Freight	6.0/3.0	2.50	11.00

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 3 / 3	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 169.50 / 169.50 m	
Receiver height	: 1.50 / 4.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 33.56 + 0.00) = 33.56 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.93	-24.14	-1.33	0.00	-15.90	0.00	33.56
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WHEEL (0.00 + 25.46 + 0.00) = 25.46 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.66	68.09	-25.28	-1.46	0.00	-15.90	0.00	25.46
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Segment Leq : 34.19 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 44.98 + 0.00) = 44.98 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.58	74.27	-16.69	-1.33	0.00	-11.27	0.00	44.98
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WHEEL (0.00 + 37.30 + 0.00) = 37.30 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.66	67.51	-17.48	-1.46	0.00	-11.27	0.00	37.30
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Segment Leq : 45.66 dBA

Total Leq All Segments: 45.96 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 32.55 + 0.00) = 32.55 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.50	72.39	-22.77	-1.17	0.00	-15.90	0.00	32.55
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WHEEL (0.00 + 23.56 + 0.00) = 23.56 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.60	65.18	-24.37	-1.35	0.00	-15.90	0.00	23.56
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Segment Leq : 33.07 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 46.03 + 0.00) = 46.03 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.50	74.21	-15.74	-1.17	0.00	-11.27	0.00	46.03
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WHEEL (0.00 + 37.98 + 0.00) = 37.98 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.60	67.45	-16.85	-1.35	0.00	-11.27	0.00	37.98
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Segment Leq : 46.66 dBA

Total Leq All Segments: 46.85 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume	: 2600/289	veh/TimePeriod	*
Medium truck volume	: 0/0	veh/TimePeriod	*
Heavy truck volume	: 289/32	veh/TimePeriod	*

Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 1581
Percentage of Annual Growth : 5.60
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 10.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Komoka Rd. (day/night)

Angle1	Angle2	: -90.00 deg	90.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	7 / 7	
House density	:	95 %	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	:	240.20 / 240.20 m	
Receiver height	:	1.50 / 4.50 m	
Topography	:	1	(Flat/gentle slope; no barrier)
Reference angle	:	0.00	

Road data, segment # 2: Oxbow Dr. (day/night)

Car traffic volume	: 2605/289	veh/TimePeriod	*
Medium truck volume	: 0/0	veh/TimePeriod	*
Heavy truck volume	: 289/32	veh/TimePeriod	*
Posted speed limit	: 60 km/h		
Road gradient	: 0 %		
Road pavement	: 1	(Typical asphalt or concrete)	

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 2024
Percentage of Annual Growth : 4.30
Number of Years of Growth : 11.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Oxbow Dr. (day/night)

Angle1	Angle2	: -90.00 deg	90.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	7 / 7	
House density	:	95 %	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	: 500.00 / 500.00 m		
Receiver height	: 1.50 / 4.50 m		
Topography	: 1	(Flat/gentle slope; no barrier)	
Reference angle	: 0.00		

Results segment # 1: Komoka Rd. (day)

Source height = 1.78 m

ROAD (0.00 + 25.08 + 0.00) = 25.08 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 63.22 0.00 -19.89 -1.44 0.00 -16.80 0.00 25.08

Segment Leq : 25.08 dBA

Results segment # 2: Oxbow Dr. (day)

Source height = 1.78 m

ROAD (0.00 + 22.03 + 0.00) = 22.03 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 64.52 0.00 -25.15 -1.44 0.00 -15.90 0.00 22.03

Segment Leq : 22.03 dBA

Total Leq All Segments: 26.83 dBA

Results segment # 1: Komoka Rd. (night)

Source height = 1.78 m

ROAD (0.00 + 19.77 + 0.00) = 19.77 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 56.67 0.00 -18.81 -1.29 0.00 -16.80 0.00 19.77

Segment Leq : 19.77 dBA

Results segment # 2: Oxbow Dr. (night)

Source height = 1.78 m

ROAD (0.00 + 17.01 + 0.00) = 17.01 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 57.98 0.00 -23.78 -1.29 0.00 -15.90 0.00 17.01

Segment Leq : 17.01 dBA

Total Leq All Segments: 21.62 dBA

TOTAL Leq FROM ALL SOURCES (DAY) : 46.01
(NIGHT) : 46.86

STAMSON 5.0 NORMAL REPORT Date: 03-04-2019 13:55:27
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: POA76.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	17.1/3.9	72.0	4.0	1140.0 !Diesel! Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0 !Diesel! Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	! Unadj. ! Annual % ! Years of !
No Name	! Trains ! Increase ! Growth !
1. Freight	13.0/3.0 ! 2.50 ! 11.00 !
2. Way Freight	2.0/2.0 ! 2.50 ! 11.00 !
3. Passenger	1.0/1.0 ! 2.50 ! 11.00 !

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 7 / 7
House density	: 95 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 500.00 / 500.00 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
No Whistle	
Reference angle	: 0.00

Rail data, segment # 2: CP Rail (day/night)

Train Type	! Unadj. ! Annual % ! Years of !
No Name	! Trains ! Increase ! Growth !
1. Freight	7.9/3.9 ! 97.0 ! 4.0 !173.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	! Unadj. ! Annual % ! Years of !
No Name	! Trains ! Increase ! Growth !
1. Freight	6.0/3.0 ! 2.50 ! 11.00 !

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 1 / 1
House density	: 70 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 140.60 / 140.60 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
No Whistle	
Reference angle	: 0.00

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 33.56 + 0.00) = 33.56 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.93	-24.14	-1.33	0.00	-15.90	0.00	33.56
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WHEEL (0.00 + 25.46 + 0.00) = 25.46 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	68.09	-25.28	-1.46	0.00	-15.90	0.00	25.46

Segment Leq : 34.19 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 53.18 + 0.00) = 53.18 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	74.27	-15.40	-1.33	0.00	-4.35	0.00	53.18

WHEEL (0.00 + 45.57 + 0.00) = 45.57 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	67.51	-16.13	-1.46	0.00	-4.35	0.00	45.57

Segment Leq : 53.87 dBA

Total Leq All Segments: 53.92 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 32.55 + 0.00) = 32.55 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	72.39	-22.77	-1.17	0.00	-15.90	0.00	32.55

WHEEL (0.00 + 23.56 + 0.00) = 23.56 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	65.18	-24.37	-1.35	0.00	-15.90	0.00	23.56

Segment Leq : 33.07 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 54.17 + 0.00) = 54.17 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	74.21	-14.53	-1.17	0.00	-4.35	0.00	54.17

WHEEL (0.00 + 46.20 + 0.00) = 46.20 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	67.45	-15.55	-1.35	0.00	-4.35	0.00	46.20

Segment Leq : 54.81 dBA

Total Leq All Segments: 54.84 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume : 2600/289 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 289/32 veh/TimePeriod *

Posted speed limit	: 50 km/h
Road gradient	: 0 %
Road pavement	: 1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:	
24 hr Traffic Volume (AADT or SADT): 1581	
Percentage of Annual Growth	: 5.60
Number of Years of Growth	: 13.00
Medium Truck % of Total Volume	: 10.00
Heavy Truck % of Total Volume	: 10.00
Day (16 hrs) % of Total Volume	: 90.00
Data for Segment # 1: Komoka Rd. (day/night)	
Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 7 / 7
House density	: 95 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 240.00 / 240.00 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
Reference angle	: 0.00
Road data, segment # 2: Oxbow Dr. (day/night)	
Car traffic volume : 2605/289 veh/TimePeriod *	
Medium truck volume	: 0/0 veh/TimePeriod *
Heavy truck volume	: 289/32 veh/TimePeriod *
Posted speed limit	: 60 km/h
Road gradient	: 0 %
Road pavement	: 1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:	
24 hr Traffic Volume (AADT or SADT): 2024	
Percentage of Annual Growth	: 4.30
Number of Years of Growth	: 11.00
Medium Truck % of Total Volume	: 0.00
Heavy Truck % of Total Volume	: 10.00
Day (16 hrs) % of Total Volume	: 90.00
Data for Segment # 2: Oxbow Dr. (day/night)	
Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 7 / 7
House density	: 95 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 500.00 / 500.00 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
Reference angle	: 0.00
Results segment # 1: Komoka Rd. (day)	
Source height = 1.78 m	
ROAD (0.00 + 25.09 + 0.00) = 25.09 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.65 63.22 0.00 -19.89 -1.44 0.00 -16.80 0.00 25.09	
Segment Leq : 25.09 dBA	
Results segment # 2: Oxbow Dr. (day)	
Source height = 1.78 m	

ROAD (0.00 + 22.03 + 0.00) = 22.03 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.65 64.52 0.00 -25.15 -1.44 0.00 -15.90 0.00 22.03	
Segment Leq : 22.03 dBA	
Total Leq All Segments: 26.83 dBA	
Results segment # 1: Komoka Rd. (night)	
Source height = 1.78 m	
ROAD (0.00 + 19.78 + 0.00) = 19.78 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.56 56.67 0.00 -18.80 -1.29 0.00 -16.80 0.00 19.78	
Segment Leq : 19.78 dBA	
Results segment # 2: Oxbow Dr. (night)	
Source height = 1.78 m	
ROAD (0.00 + 17.01 + 0.00) = 17.01 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.56 57.98 0.00 -23.78 -1.29 0.00 -15.90 0.00 17.01	
Segment Leq : 17.01 dBA	
Total Leq All Segments: 21.62 dBA	
TOTAL Leq FROM ALL SOURCES (DAY) : 53.92	
(NIGHT) : 54.84	

STAMSON 5.0 NORMAL REPORT Date: 03-04-2019 13:50:54
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: POA114.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	17.1/3.9	72.0	4.0	1140.0 !Diesel! Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0 !Diesel! Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	! Unadj. ! Annual % ! Years of !
No Name	! Trains ! Increase ! Growth !
1. Freight	13.0/3.0 ! 2.50 ! 11.00 !
2. Way Freight	2.0/2.0 ! 2.50 ! 11.00 !
3. Passenger	1.0/1.0 ! 2.50 ! 11.00 !

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 7 / 7
House density	: 95 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 500.00 / 500.00 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
No Whistle	
Reference angle	: 0.00

Rail data, segment # 2: CP Rail (day/night)

Train Type	! Unadj. ! Annual % ! Years of !
No Name	! Trains ! Increase ! Growth !
1. Freight	7.9/3.9 ! 97.0 ! 4.0 !173.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	! Unadj. ! Annual % ! Years of !
No Name	! Trains ! Increase ! Growth !
1. Freight	6.0/3.0 ! 2.50 ! 11.00 !

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 1 / 1
House density	: 70 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 178.90 / 178.90 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
No Whistle	
Reference angle	: 0.00

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 33.56 + 0.00) = 33.56 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.93	-24.14	-1.33	0.00	-15.90	0.00	33.56
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WHEEL (0.00 + 25.46 + 0.00) = 25.46 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	68.09	-25.28	-1.46	0.00	-15.90	0.00	25.46

Segment Leq : 34.19 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 51.62 + 0.00) = 51.62 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	74.27	-17.06	-1.33	0.00	-4.25	0.00	51.62

WHEEL (0.00 + 43.93 + 0.00) = 43.93 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	67.51	-17.87	-1.46	0.00	-4.25	0.00	43.93

Segment Leq : 52.30 dBA

Total Leq All Segments: 52.37 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 32.55 + 0.00) = 32.55 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	72.39	-22.77	-1.17	0.00	-15.90	0.00	32.55

WHEEL (0.00 + 23.56 + 0.00) = 23.56 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	65.18	-24.37	-1.35	0.00	-15.90	0.00	23.56

Segment Leq : 33.07 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 52.70 + 0.00) = 52.70 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	74.21	-16.09	-1.17	0.00	-4.25	0.00	52.70

WHEEL (0.00 + 44.62 + 0.00) = 44.62 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	67.45	-17.22	-1.35	0.00	-4.25	0.00	44.62

Segment Leq : 53.33 dBA

Total Leq All Segments: 53.37 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume : 2600/289 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 289/32 veh/TimePeriod *

Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 1581
Percentage of Annual Growth : 5.60
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 10.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Komoka Rd. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0
(No woods.)
No of house rows : 6 / 6
House density : 50 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 107.70 / 107.70 m
Receiver height : 1.50 / 4.50 m
Topography : 1
Reference angle : 0.00
(Flat/gentle slope; no barrier)

Road data, segment # 2: Oxbow Dr. (day/night)

Car traffic volume : 2605/289 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 289/32 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 2024
Percentage of Annual Growth : 4.30
Number of Years of Growth : 11.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Oxbow Dr. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0
(No woods.)
No of house rows : 7 / 7
House density : 95 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 500.00 / 500.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1
Reference angle : 0.00
(Flat/gentle slope; no barrier)

Results segment # 1: Komoka Rd. (day)

Source height = 1.78 m

ROAD (0.00 + 37.51 + 0.00) = 37.51 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.65 63.22 0.00 -14.14 -1.44 0.00 -10.12 0.00 37.51

Segment Leq : 37.51 dBA

Results segment # 2: Oxbow Dr. (day)

Source height = 1.78 m

ROAD (0.00 + 22.03 + 0.00) = 22.03 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.65 64.52 0.00 -25.15 -1.44 0.00 -15.90 0.00 22.03

Segment Leq : 22.03 dBA

Total Leq All Segments: 37.63 dBA

Results segment # 1: Komoka Rd. (night)

Source height = 1.78 m

ROAD (0.00 + 31.89 + 0.00) = 31.89 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.56 56.67 0.00 -13.37 -1.29 0.00 -10.12 0.00 31.89

Segment Leq : 31.89 dBA

Results segment # 2: Oxbow Dr. (night)

Source height = 1.78 m

ROAD (0.00 + 17.01 + 0.00) = 17.01 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.56 57.98 0.00 -23.78 -1.29 0.00 -15.90 0.00 17.01

Segment Leq : 17.01 dBA

Total Leq All Segments: 32.03 dBA

TOTAL Leq FROM ALL SOURCES (DAY) : 52.51
(NIGHT) : 53.40

STAMSON 5.0 NORMAL REPORT Date: 03-04-2019 15:39:30
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: POA119.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	17.1/3.9	72.0	4.0	1140.0 !Diesel! Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0 !Diesel! Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	! Unadj. ! Annual % ! Years of !
No Name	! Trains ! Increase ! Growth !
1. Freight	13.0/3.0 ! 2.50 ! 11.00 !
2. Way Freight	2.0/2.0 ! 2.50 ! 11.00 !
3. Passenger	1.0/1.0 ! 2.50 ! 11.00 !

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 7 / 7
House density : 95 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 500.00 / 500.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
No Whistle
Reference angle : 0.00

Rail data, segment # 2: CP Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	7.9/3.9	97.0	4.0	1173.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	! Unadj. ! Annual % ! Years of !
No Name	! Trains ! Increase ! Growth !
1. Freight	6.0/3.0 ! 2.50 ! 11.00 !

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 70 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 162.90 / 162.90 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
No Whistle
Reference angle : 0.00

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 33.56 + 0.00) = 33.56 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.93	-24.14	-1.33	0.00	-15.90	0.00	33.56
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WHEEL (0.00 + 25.46 + 0.00) = 25.46 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	68.09	-25.28	-1.46	0.00	-15.90	0.00	25.46

Segment Leq : 34.19 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 52.23 + 0.00) = 52.23 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	

WHEEL (0.00 + 44.57 + 0.00) = 44.57 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.66	67.51	-17.19	-1.46	0.00	-4.29	0.00	44.57

Segment Leq : 52.92 dBA

Total Leq All Segments: 52.98 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 32.55 + 0.00) = 32.55 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
LOCUMOTIVE (0.00 + 32.55 + 0.00) = 32.55 QBA	

WHEEL (0.00 + 23.56 + 0.00) = 23.56 dBA

WHEEL (0.00 + 23.56 + 0.00) = 23.56 DBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.60 65.18 -24.37 -1.35 0.00 -15.90 0.00 23.56

Segment Leq : 33.07 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 53.27 + 0.00) = 53.27 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.50	74.21	-15.49	-1.17	0.00	-4.29	0.00	53.27

WHEEL (0.00 + 45.23 + 0.00) = 45.23 dBA

WHEEL	(0.00 + 45.23 + 0.00) = 45.23	dBa							
Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq

Segment Leq : 53.90 dBA

Total Leq All Segments: 53.94 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume : 2600/289 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 289/32 veh/TimePeriod *

Posted speed limit	: 50 km/h
Road gradient	: 0 %
Road pavement	: 1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:	
24 hr Traffic Volume (AADT or SADT): 1581	
Percentage of Annual Growth	: 5.60
Number of Years of Growth	: 13.00
Medium Truck % of Total Volume	: 10.00
Heavy Truck % of Total Volume	: 10.00
Day (16 hrs) % of Total Volume	: 90.00
Data for Segment # 1: Komoka Rd. (day/night)	
Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 1 / 1
House density	: 50 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 47.70 / 47.70 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
Reference angle	: 0.00
Road data, segment # 2: Oxbow Dr. (day/night)	
Car traffic volume : 2605/289 veh/TimePeriod *	
Medium truck volume	: 0/0 veh/TimePeriod *
Heavy truck volume	: 289/32 veh/TimePeriod *
Posted speed limit	: 60 km/h
Road gradient	: 0 %
Road pavement	: 1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:	
24 hr Traffic Volume (AADT or SADT): 2024	
Percentage of Annual Growth	: 4.30
Number of Years of Growth	: 11.00
Medium Truck % of Total Volume	: 0.00
Heavy Truck % of Total Volume	: 10.00
Day (16 hrs) % of Total Volume	: 90.00
Data for Segment # 2: Oxbow Dr. (day/night)	
Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 7 / 7
House density	: 95 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 500.00 / 500.00 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
Reference angle	: 0.00
Results segment # 1: Komoka Rd. (day)	
Source height = 1.78 m	
ROAD (0.00 + 50.74 + 0.00) = 50.74 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.65 63.22 0.00 -8.30 -1.44 0.00 -2.74 0.00 50.74	
Segment Leq : 50.74 dBA	
Results segment # 2: Oxbow Dr. (day)	
Source height = 1.78 m	

ROAD (0.00 + 22.03 + 0.00) = 22.03 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.65 64.52 0.00 -25.15 -1.44 0.00 -15.90 0.00 22.03	
Segment Leq : 22.03 dBA	
Total Leq All Segments: 50.75 dBA	
Results segment # 1: Komoka Rd. (night)	
Source height = 1.78 m	
ROAD (0.00 + 44.80 + 0.00) = 44.80 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.56 56.67 0.00 -7.85 -1.29 0.00 -2.74 0.00 44.80	
Segment Leq : 44.80 dBA	
Results segment # 2: Oxbow Dr. (night)	
Source height = 1.78 m	
ROAD (0.00 + 17.01 + 0.00) = 17.01 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.56 57.98 0.00 -23.78 -1.29 0.00 -15.90 0.00 17.01	
Segment Leq : 17.01 dBA	
Total Leq All Segments: 44.81 dBA	
TOTAL Leq FROM ALL SOURCES (DAY) : 55.01	
(NIGHT) : 54.44	

STAMSON 5.0 NORMAL REPORT Date: 03-04-2019 15:38:53
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: POA120.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed !# (km/h)	Loc !# /Train	Cars !# /Train	Eng !# /Train	Cont !# /Train
* 1. Freight	17.1/3.9	72.0	4.0	1140.0	1Diesel	Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0	1Diesel	Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0	1Diesel	Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !
1. Freight	13.0/3.0	2.50	11.00
2. Way Freight	2.0/2.0	2.50	11.00
3. Passenger	1.0/1.0	2.50	11.00

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 7 / 7	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 500.00	/ 500.00 m
Receiver height	: 1.50 / 4.50	m
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Rail data, segment # 2: CP Rail (day/night)

Train Type	Trains	Speed !# (km/h)	Loc !# /Train	Cars !# /Train	Eng !# /Train	Cont !# /Train
* 1. Freight	7.9/3.9	97.0	4.0	1173.0	1Diesel	Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !
1. Freight	6.0/3.0	2.50	11.00

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 0 / 0	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 155.90 / 155.90	m
Receiver height	: 1.50 / 4.50	m
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 33.56 + 0.00) = 33.56 dBA	
Angle1 Angle2 Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	

-90	90	0.58	74.93	-24.14	-1.33	0.00	-15.90	0.00	33.56
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WHEEL (0.00 + 25.46 + 0.00) = 25.46 dBA

Angle1	Angle2	Alpha	Refleq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	68.09	-25.28	-1.46	0.00	-15.90	0.00	25.46

Segment Leq : 34.19 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 56.82 + 0.00) = 56.82 dBA

Angle1	Angle2	Alpha	Refleq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	74.27	-16.12	-1.33	0.00	0.00	0.00	56.82

WHEEL (0.00 + 49.17 + 0.00) = 49.17 dBA

Angle1	Angle2	Alpha	Refreq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	67.51	-16.88	-1.46	0.00	0.00	0.00	49.17

Segment Leq : 57.51 dBA

Total Leq All Segments: 57.53 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 32.55 + 0.00) = 32.55 dBA

Angle1	Angle2	Alpha	Refleq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	72.39	-22.77	-1.17	0.00	-15.90	0.00	32.55

WHEEL (0.00 + 23.56 + 0.00) = 23.56 dBA

Angle1	Angle2	Alpha	Refleq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	65.18	-24.37	-1.35	0.00	-15.90	0.00	23.56

Segment Leq : 33.07 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 57.85 + 0.00) = 57.85 dBA

Angle1	Angle2	Alpha	Refleq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	74.21	-15.20	-1.17	0.00	0.00	0.00	57.85

WHEEL (0.00 + 49.83 + 0.00) = 49.83 dBA

Angle1	Angle2	Alpha	Refreq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	67.45	-16.27	-1.35	0.00	0.00	0.00	49.83

Segment Leq : 58.49 dBA

Total Leq All Segments: 58.50 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume	: 2600/289	veh/TimePeriod	*
Medium truck volume	: 0/0	veh/TimePeriod	*
Heavy truck volume	: 289/32	veh/TimePeriod	*
Posted speed limit	: 50	km/h	

Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 1581
Percentage of Annual Growth : 5.60
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Komoka Rd. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 35.70 / 35.70 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Oxbow Dr. (day/night)

Car traffic volume : 2605/289 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 289/32 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 2024
Percentage of Annual Growth : 4.30
Number of Years of Growth : 11.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Oxbow Dr. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 7 / 7
House density : 95 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 500.00 / 500.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Komoka Rd. (day)

Source height = 1.78 m

ROAD (0.00 + 55.55 + 0.00) = 55.55 dBA

Angle1 Angle2 Alpha RefLeq P.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 63.22 0.00 -6.22 -1.44 0.00 0.00 0.00 55.55

Segment Leq : 55.55 dBA

Results segment # 2: Oxbow Dr. (day)

Source height = 1.78 m

ROAD (0.00 + 22.03 + 0.00) = 22.03 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 64.52 0.00 -25.15 -1.44 0.00 -15.90 0.00 22.03

Segment Leq : 22.03 dBA

Total Leq All Segments: 55.55 dBA

Results segment # 1: Komoka Rd. (night)

Source height = 1.78 m

ROAD (0.00 + 49.50 + 0.00) = 49.50 dBA
Angle1 Angle2 Alpha RefLeq P.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 56.67 0.00 -5.88 -1.29 0.00 0.00 0.00 49.50

Segment Leq : 49.50 dBA

Results segment # 2: Oxbow Dr. (night)

Source height = 1.78 m

ROAD (0.00 + 17.01 + 0.00) = 17.01 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 57.98 0.00 -23.78 -1.29 0.00 -15.90 0.00 17.01

Segment Leq : 17.01 dBA

Total Leq All Segments: 49.50 dBA

TOTAL Leq FROM ALL SOURCES (DAY) : 59.66
(NIGHT) : 59.02

STAMSON 5.0 NORMAL REPORT Date: 03-04-2019 11:38:16
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: POA121B.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	17.1/3.9	72.0	4.0	1140.0 !Diesel! Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0 !Diesel! Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !
1. Freight	13.0/3.0	2.50	11.00
2. Way Freight	2.0/2.0	2.50	11.00
3. Passenger	1.0/1.0	2.50	11.00

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 7 / 7	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 500.00 / 500.00 m	
Receiver height	: 1.50 / 4.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Rail data, segment # 2: CP Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	7.9/3.9	97.0	4.0	1173.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !
1. Freight	6.0/3.0	2.50	11.00

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 1 / 1	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 220.90 / 220.90 m	
Receiver height	: 1.50 / 4.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 33.56 + 0.00) = 33.56 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.93	-24.14	-1.33	0.00	-15.90	0.00	33.56
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WHEEL (0.00 + 25.46 + 0.00) = 25.46 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.66	68.09	-25.28	-1.46	0.00	-15.90	0.00	25.46
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Segment Leq : 34.19 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 46.50 + 0.00) = 46.50 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.58	74.27	-18.51	-1.33	0.00	-7.93	0.00	46.50
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WHEEL (0.00 + 38.73 + 0.00) = 38.73 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.66	67.51	-19.39	-1.46	0.00	-7.93	0.00	38.73
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Segment Leq : 47.17 dBA

Total Leq All Segments: 47.38 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 32.55 + 0.00) = 32.55 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.50	72.39	-22.77	-1.17	0.00	-15.90	0.00	32.55
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WHEEL (0.00 + 23.56 + 0.00) = 23.56 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.60	65.18	-24.37	-1.35	0.00	-15.90	0.00	23.56
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Segment Leq : 33.07 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 47.66 + 0.00) = 47.66 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.50	74.21	-17.46	-1.17	0.00	-7.93	0.00	47.66
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WHEEL (0.00 + 39.48 + 0.00) = 39.48 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.60	67.45	-18.69	-1.35	0.00	-7.93	0.00	39.48
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Segment Leq : 48.27 dBA

Total Leq All Segments: 48.40 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume : 2600/289 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 289/32 veh/TimePeriod *

Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 1581
Percentage of Annual Growth : 5.60
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Komoka Rd. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 35.90 / 35.90 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Oxbow Dr. (day/night)

Car traffic volume : 2605/289 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 289/32 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 2024
Percentage of Annual Growth : 4.30
Number of Years of Growth : 11.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Oxbow Dr. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 7 / 7
House density : 95 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 462.30 / 462.30 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Komoka Rd. (day)

Source height = 1.78 m

ROAD (0.00 + 55.51 + 0.00) = 55.51 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 63.22 0.00 -6.26 -1.44 0.00 0.00 0.00 55.51

Segment Leq : 55.51 dBA

Results segment # 2: Oxbow Dr. (day)

Source height = 1.78 m

ROAD (0.00 + 22.52 + 0.00) = 22.52 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 64.52 0.00 -24.59 -1.44 0.00 -15.97 0.00 22.52

Segment Leq : 22.52 dBA

Total Leq All Segments: 55.51 dBA

Results segment # 1: Komoka Rd. (night)

Source height = 1.78 m

ROAD (0.00 + 49.47 + 0.00) = 49.47 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 56.67 0.00 -5.92 -1.29 0.00 0.00 0.00 49.47

Segment Leq : 49.47 dBA

Results segment # 2: Oxbow Dr. (night)

Source height = 1.78 m

ROAD (0.00 + 17.47 + 0.00) = 17.47 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 57.98 0.00 -23.25 -1.29 0.00 -15.97 0.00 17.47

Segment Leq : 17.47 dBA

Total Leq All Segments: 49.47 dBA

TOTAL Leq FROM ALL SOURCES (DAY) : 56.13
(NIGHT) : 51.98

STAMSON 5.0 NORMAL REPORT Date: 03-04-2019 11:39:04
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: POA122B.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	17.1/3.9	72.0	4.0	1140.0 !Diesel! Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0 !Diesel! Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	! Unadj. !	Annual % !	Years of !
No Name	! Trains !	Increase !	Growth !
1. Freight	13.0/3.0	2.50	11.00
2. Way Freight	2.0/2.0	2.50	11.00
3. Passenger	1.0/1.0	2.50	11.00

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	:	0 (No woods.)
No of house rows	:	7 / 7
House density	:	95 %
Surface	:	1 (Absorptive ground surface)
Receiver source distance	:	500.00 / 500.00 m
Receiver height	:	1.50 / 4.50 m
Topography	:	1 (Flat/gentle slope; no barrier)
No Whistle	:	
Reference angle	:	0.00

Rail data, segment # 2: CP Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	7.9/3.9	97.0	4.0	1173.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	! Unadj. !	Annual % !	Years of !
No Name	! Trains !	Increase !	Growth !
1. Freight	6.0/3.0	2.50	11.00

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	:	0 (No woods.)
No of house rows	:	2 / 2
House density	:	95 %
Surface	:	1 (Absorptive ground surface)
Receiver source distance	:	224.00 / 224.00 m
Receiver height	:	1.50 / 4.50 m
Topography	:	1 (Flat/gentle slope; no barrier)
No Whistle	:	
Reference angle	:	0.00

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 33.56 + 0.00) = 33.56 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.93	-24.14	-1.33	0.00	-15.90	0.00	33.56
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WHEEL (0.00 + 25.46 + 0.00) = 25.46 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.66	68.09	-25.28	-1.46	0.00	-15.90	0.00	25.46
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Segment Leq : 34.19 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 44.92 + 0.00) = 44.92 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.58	74.27	-18.61	-1.33	0.00	-9.41	0.00	44.92
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WHEEL (0.00 + 37.16 + 0.00) = 37.16 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.66	67.51	-19.49	-1.46	0.00	-9.41	0.00	37.16
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Segment Leq : 45.59 dBA

Total Leq All Segments: 45.89 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 32.55 + 0.00) = 32.55 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.50	72.39	-22.77	-1.17	0.00	-15.90	0.00	32.55
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WHEEL (0.00 + 23.56 + 0.00) = 23.56 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.60	65.18	-24.37	-1.35	0.00	-15.90	0.00	23.56
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Segment Leq : 33.07 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 46.09 + 0.00) = 46.09 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.50	74.21	-17.55	-1.17	0.00	-9.41	0.00	46.09
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WHEEL (0.00 + 37.91 + 0.00) = 37.91 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.60	67.45	-18.79	-1.35	0.00	-9.41	0.00	37.91
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Segment Leq : 46.70 dBA

Total Leq All Segments: 46.88 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume	: 2600/289	veh/TimePeriod	*
Medium truck volume	: 0/0	veh/TimePeriod	*
Heavy truck volume	: 289/32	veh/TimePeriod	*

Posted speed limit	: 50 km/h
Road gradient	: 0 %
Road pavement	: 1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:	
24 hr Traffic Volume (AADT or SADT): 1581	
Percentage of Annual Growth	: 5.60
Number of Years of Growth	: 13.00
Medium Truck % of Total Volume	: 10.00
Heavy Truck % of Total Volume	: 10.00
Day (16 hrs) % of Total Volume	: 90.00
Data for Segment # 1: Komoka Rd. (day/night)	
Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 1 / 1
House density	: 95 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 47.90 / 47.90 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
Reference angle	: 0.00
Road data, segment # 2: Oxbow Dr. (day/night)	
Car traffic volume : 2605/289 veh/TimePeriod *	
Medium truck volume	: 0/0 veh/TimePeriod *
Heavy truck volume	: 289/32 veh/TimePeriod *
Posted speed limit	: 60 km/h
Road gradient	: 0 %
Road pavement	: 1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:	
24 hr Traffic Volume (AADT or SADT): 2024	
Percentage of Annual Growth	: 4.30
Number of Years of Growth	: 11.00
Medium Truck % of Total Volume	: 0.00
Heavy Truck % of Total Volume	: 10.00
Day (16 hrs) % of Total Volume	: 90.00
Data for Segment # 2: Oxbow Dr. (day/night)	
Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 7 / 7
House density	: 95 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 462.20 / 462.20 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
Reference angle	: 0.00
Results segment # 1: Komoka Rd. (day)	
Source height = 1.78 m	
ROAD (0.00 + 43.76 + 0.00) = 43.76 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.65 63.22 0.00 -8.33 -1.44 0.00 -9.68 0.00 43.76	
Segment Leq : 43.76 dBA	
Results segment # 2: Oxbow Dr. (day)	
Source height = 1.78 m	

ROAD (0.00 + 22.53 + 0.00) = 22.53 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.65 64.52 0.00 -24.59 -1.44 0.00 -15.97 0.00 22.53	
Segment Leq : 22.53 dBA	
Total Leq All Segments: 43.79 dBA	
Results segment # 1: Komoka Rd. (night)	
Source height = 1.78 m	
ROAD (0.00 + 37.83 + 0.00) = 37.83 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.56 56.67 0.00 -7.87 -1.29 0.00 -9.68 0.00 37.83	
Segment Leq : 37.83 dBA	
Results segment # 2: Oxbow Dr. (night)	
Source height = 1.78 m	
ROAD (0.00 + 17.47 + 0.00) = 17.47 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.56 57.98 0.00 -23.25 -1.29 0.00 -15.97 0.00 17.47	
Segment Leq : 17.47 dBA	
Total Leq All Segments: 37.87 dBA	
TOTAL Leq FROM ALL SOURCES (DAY) : 47.98	
(NIGHT) : 47.40	

STAMSON 5.0 NORMAL REPORT Date: 03-04-2019 11:40:32
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: POA123.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed ! (km/h)	Loc ! (/Train)	Cars ! (/Train)	Eng ! (weld)	Cont ! (weld)
* 1. Freight	17.1/3.9	72.0	4.0	1140.0	Diesel	Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0	Diesel	Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0	Diesel	Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	No	Name	Unadj. !	Annual % !	Years of !
			Trains !	Increase !	Growth !
1. Freight	13.0/3.0	2.50	11.00		
2. Way Freight	2.0/2.0	2.50	11.00		
3. Passenger	1.0/1.0	2.50	11.00		

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 7 / 7	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 500.00 / 500.00 m	
Receiver height	: 1.50 / 4.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Rail data, segment # 2: CP Rail (day/night)

Train Type	Trains	Speed ! (km/h)	Loc ! (/Train)	Cars ! (/Train)	Eng ! (weld)	Cont ! (weld)
* 1. Freight	7.9/3.9	97.0	4.0	1173.0	Diesel	Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	No	Name	Unadj. !	Annual % !	Years of !
			Trains !	Increase !	Growth !
1. Freight	6.0/3.0	2.50	11.00		

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 3 / 3	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 227.30 / 227.30 m	
Receiver height	: 1.50 / 4.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 33.56 + 0.00) = 33.56 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.93	-24.14	-1.33	0.00	-15.90	0.00	33.56
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WHEEL (0.00 + 25.46 + 0.00) = 25.46 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.66	68.09	-25.28	-1.46	0.00	-15.90	0.00	25.46
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Segment Leq : 34.19 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 43.34 + 0.00) = 43.34 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.58	74.27	-18.71	-1.33	0.00	-10.88	0.00	43.34
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WHEEL (0.00 + 35.57 + 0.00) = 35.57 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.66	67.51	-19.60	-1.46	0.00	-10.88	0.00	35.57
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Segment Leq : 44.01 dBA

Total Leq All Segments: 44.44 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 32.55 + 0.00) = 32.55 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.50	72.39	-22.77	-1.17	0.00	-15.90	0.00	32.55
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WHEEL (0.00 + 23.56 + 0.00) = 23.56 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.60	65.18	-24.37	-1.35	0.00	-15.90	0.00	23.56
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Segment Leq : 33.07 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 44.51 + 0.00) = 44.51 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.50	74.21	-17.65	-1.17	0.00	-10.88	0.00	44.51
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WHEEL (0.00 + 36.33 + 0.00) = 36.33 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.60	67.45	-18.89	-1.35	0.00	-10.88	0.00	36.33
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Segment Leq : 45.12 dBA

Total Leq All Segments: 45.38 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume : 2600/289 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 289/32 veh/TimePeriod *

Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 1581
Percentage of Annual Growth : 5.60
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 10.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Komoka Rd. (day/night)

Angle1	Angle2	: -90.00 deg	90.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	2 / 2	
House density	:	95 %	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	:	59.80 / 59.80 m	
Receiver height	:	1.50 / 4.50 m	
Topography	:	1	(Flat/gentle slope; no barrier)
Reference angle	:	0.00	

Road data, segment # 2: Oxbow Dr. (day/night)

Car traffic volume	: 2605/289	veh/TimePeriod	*
Medium truck volume	: 0/0	veh/TimePeriod	*
Heavy truck volume	: 289/32	veh/TimePeriod	*
Posted speed limit	: 60 km/h		
Road gradient	: 0 %		
Road pavement	: 1	(Typical asphalt or concrete)	

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 2024
Percentage of Annual Growth : 4.30
Number of Years of Growth : 11.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Oxbow Dr. (day/night)

Angle1	Angle2	: -90.00 deg	90.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	7 / 7	
House density	:	95 %	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	:	436.40 / 436.40 m	
Receiver height	:	1.50 / 4.50 m	
Topography	:	1	(Flat/gentle slope; no barrier)
Reference angle	:	0.00	

Results segment # 1: Komoka Rd. (day)

Source height = 1.78 m

ROAD (0.00 + 40.95 + 0.00) = 40.95 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 63.22 0.00 -9.92 -1.44 0.00 -10.90 0.00 40.95

Segment Leq : 40.95 dBA
Results segment # 2: Oxbow Dr. (day)

Source height = 1.78 m

ROAD (0.00 + 22.84 + 0.00) = 22.84 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 64.52 0.00 -24.18 -1.44 0.00 -16.06 0.00 22.84

Segment Leq : 22.84 dBA
Total Leq All Segments: 41.02 dBA
Results segment # 1: Komoka Rd. (night)

Source height = 1.78 m

ROAD (0.00 + 35.10 + 0.00) = 35.10 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 56.67 0.00 -9.38 -1.29 0.00 -10.90 0.00 35.10

Segment Leq : 35.10 dBA
Results segment # 2: Oxbow Dr. (night)

Source height = 1.78 m

ROAD (0.00 + 17.77 + 0.00) = 17.77 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 57.98 0.00 -22.86 -1.29 0.00 -16.06 0.00 17.77

Segment Leq : 17.77 dBA
Total Leq All Segments: 35.18 dBA
TOTAL Leq FROM ALL SOURCES (DAY) : 46.07
(NIGHT) : 45.78

STAMSON 5.0 NORMAL REPORT Date: 03-04-2019 11:51:17
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: POA124.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	17.1/3.9	72.0	4.0	1140.0 !Diesel! Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0 !Diesel! Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !
1. Freight	13.0/3.0	2.50	11.00
2. Way Freight	2.0/2.0	2.50	11.00
3. Passenger	1.0/1.0	2.50	11.00

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 7 / 7	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 500.00 / 500.00 m	
Receiver height	: 1.50 / 4.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Rail data, segment # 2: CP Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	7.9/3.9	97.0	4.0	1173.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !
1. Freight	6.0/3.0	2.50	11.00

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 4 / 4	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 230.50 / 230.50 m	
Receiver height	: 1.50 / 4.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 33.56 + 0.00) = 33.56 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.93	-24.14	-1.33	0.00	-15.90	0.00	33.56
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WHEEL (0.00 + 25.46 + 0.00) = 25.46 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.66	68.09	-25.28	-1.46	0.00	-15.90	0.00	25.46

Segment Leq : 34.19 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 41.77 + 0.00) = 41.77 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.58	74.27	-18.81	-1.33	0.00	-12.36	0.00	41.77

WHEEL (0.00 + 33.99 + 0.00) = 33.99 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.66	67.51	-19.70	-1.46	0.00	-12.36	0.00	33.99

Segment Leq : 42.44 dBA

Total Leq All Segments: 43.05 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 32.55 + 0.00) = 32.55 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.50	72.39	-22.77	-1.17	0.00	-15.90	0.00	32.55

WHEEL (0.00 + 23.56 + 0.00) = 23.56 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.60	65.18	-24.37	-1.35	0.00	-15.90	0.00	23.56

Segment Leq : 33.07 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 42.94 + 0.00) = 42.94 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.50	74.21	-17.74	-1.17	0.00	-12.36	0.00	42.94

WHEEL (0.00 + 34.75 + 0.00) = 34.75 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.60	67.45	-18.99	-1.35	0.00	-12.36	0.00	34.75

Segment Leq : 43.55 dBA

Total Leq All Segments: 43.92 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume : 2600/289 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 289/32 veh/TimePeriod *

Posted speed limit	: 50 km/h
Road gradient	: 0 %
Road pavement	: 1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:	
24 hr Traffic Volume (AADT or SADT): 1581	
Percentage of Annual Growth	: 5.60
Number of Years of Growth	: 13.00
Medium Truck % of Total Volume	: 10.00
Heavy Truck % of Total Volume	: 10.00
Day (16 hrs) % of Total Volume	: 90.00
Data for Segment # 1: Komoka Rd. (day/night)	
Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 3 / 3
House density	: 95 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 71.90 / 71.90 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
Reference angle	: 0.00
Road data, segment # 2: Oxbow Dr. (day/night)	
Car traffic volume : 2605/289 veh/TimePeriod *	
Medium truck volume	: 0/0 veh/TimePeriod *
Heavy truck volume	: 289/32 veh/TimePeriod *
Posted speed limit	: 60 km/h
Road gradient	: 0 %
Road pavement	: 1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:	
24 hr Traffic Volume (AADT or SADT): 2024	
Percentage of Annual Growth	: 4.30
Number of Years of Growth	: 11.00
Medium Truck % of Total Volume	: 0.00
Heavy Truck % of Total Volume	: 10.00
Day (16 hrs) % of Total Volume	: 90.00
Data for Segment # 2: Oxbow Dr. (day/night)	
Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 7 / 7
House density	: 95 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 462.30 / 462.30 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
Reference angle	: 0.00
Results segment # 1: Komoka Rd. (day)	
Source height = 1.78 m	
ROAD (0.00 + 38.29 + 0.00) = 38.29 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.65 63.22 0.00 -11.24 -1.44 0.00 -12.24 0.00 38.29	
Segment Leq : 38.29 dBA	
Results segment # 2: Oxbow Dr. (day)	
Source height = 1.78 m	

ROAD (0.00 + 22.52 + 0.00) = 22.52 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.65 64.52 0.00 -24.59 -1.44 0.00 -15.97 0.00 22.52	
Segment Leq : 22.52 dBA	
Total Leq All Segments: 38.40 dBA	
Results segment # 1: Komoka Rd. (night)	
Source height = 1.78 m	
ROAD (0.00 + 32.51 + 0.00) = 32.51 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.56 56.67 0.00 -10.63 -1.29 0.00 -12.24 0.00 32.51	
Segment Leq : 32.51 dBA	
Results segment # 2: Oxbow Dr. (night)	
Source height = 1.78 m	
ROAD (0.00 + 17.47 + 0.00) = 17.47 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.56 57.98 0.00 -23.25 -1.29 0.00 -15.97 0.00 17.47	
Segment Leq : 17.47 dBA	
Total Leq All Segments: 32.64 dBA	
TOTAL Leq FROM ALL SOURCES (DAY) : 44.33	
(NIGHT) : 44.23	

STAMSON 5.0 NORMAL REPORT Date: 03-04-2019 11:25:05
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: POA132.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed !# (km/h)	Loc !# (/Train)	Cars !#	Eng !#	Cont !#
* 1. Freight	17.1/3.9	72.0	4.0	1140.0	Diesel	Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0	Diesel	Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0	Diesel	Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:		Unadj.	Annual %	Years of
No	Name	Trains	Increase	Growth
1.	Freight	13.0/3.0	2.50	11.00
2.	Way Freight	2.0/2.0	2.50	11.00
3.	Passenger	1.0/1.0	2.50	11.00

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 7 / 7	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 500.00 / 500.00 m	
Receiver height	: 1.50 / 4.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Rail data, segment # 2: CP Rail (day/night)

Train Type	Trains	Speed !# (km/h)	Loc !# (/Train)	Cars !#	Eng !#	Cont !#
* 1. Freight	7.9/3.9	97.0	4.0	1173.0	Diesel	Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:		! Unadj. !	Annual % !	Years of !
No	Name	! Trains !	Increase !	Growth !
-----+				
1. Freight		6.0/3.0	2.50	11.00
-----+				

Data for Segment # 2: CP Rail (day/night)

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 4 / 4	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 255.10 / 255.10 m	
Receiver height	: 1.50 / 4.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 33.56 + 0.00) = 33.56 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.93	-24.14	-1.33	0.00	-15.90	0.00	33.56
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WHEEL (0.00 + 25.46 + 0.00) = 25.46 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.66	68.09	-25.28	-1.46	0.00	-15.90	0.00	25.46

Segment Leq : 34.19 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 41.19 + 0.00) = 41.19 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.58	74.27	-19.51	-1.33	0.00	-12.24	0.00	41.19

WHEEL (0.00 + 33.38 + 0.00) = 33.38 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.66	67.51	-20.43	-1.46	0.00	-12.24	0.00	33.38

Segment Leq : 41.86 dBA

Total Leq All Segments: 42.55 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 32.55 + 0.00) = 32.55 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.50	72.39	-22.77	-1.17	0.00	-15.90	0.00	32.55

WHEEL (0.00 + 23.56 + 0.00) = 23.56 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.60	65.18	-24.37	-1.35	0.00	-15.90	0.00	23.56

Segment Leq : 33.07 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 42.40 + 0.00) = 42.40 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.50	74.21	-18.40	-1.17	0.00	-12.24	0.00	42.40

WHEEL (0.00 + 34.17 + 0.00) = 34.17 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.60	67.45	-19.69	-1.35	0.00	-12.24	0.00	34.17

Segment Leq : 43.01 dBA

Total Leq All Segments: 43.43 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume : 2600/289 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 289/32 veh/TimePeriod *

Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 1581
Percentage of Annual Growth : 5.60
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Komoka Rd. (day/night)

Angle1	Angle2	: -90.00 deg	90.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	2 / 2	
House density	:	95 %	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	:	60.10 / 60.10 m	
Receiver height	:	1.50 / 4.50 m	
Topography	:	1	(Flat/gentle slope; no barrier)
Reference angle	:	0.00	

Road data, segment # 2: Oxbow Dr. (day/night)

Car traffic volume	: 2605/289	veh/TimePeriod	*
Medium truck volume	: 0/0	veh/TimePeriod	*
Heavy truck volume	: 289/32	veh/TimePeriod	*
Posted speed limit	: 60 km/h		
Road gradient	: 0 %		
Road pavement	: 1	(Typical asphalt or concrete)	

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 2024
Percentage of Annual Growth : 4.30
Number of Years of Growth : 11.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Oxbow Dr. (day/night)

Angle1	Angle2	: -90.00 deg	90.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	7 / 7	
House density	:	95 %	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	: 433.20 / 433.20 m		
Receiver height	: 1.50 / 4.50 m		
Topography	: 1	(Flat/gentle slope; no barrier)	
Reference angle	: 0.00		

Results segment # 1: Komoka Rd. (day)

Source height = 1.78 m

ROAD (0.00 + 40.92 + 0.00) = 40.92 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 63.22 0.00 -9.96 -1.44 0.00 -10.90 0.00 40.92

Segment Leq : 40.92 dBA

Results segment # 2: Oxbow Dr. (day)

Source height = 1.78 m

ROAD (0.00 + 22.88 + 0.00) = 22.88 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 64.52 0.00 -24.12 -1.44 0.00 -16.08 0.00 22.88

Segment Leq : 22.88 dBA

Total Leq All Segments: 40.99 dBA

Results segment # 1: Komoka Rd. (night)

Source height = 1.78 m

ROAD (0.00 + 35.07 + 0.00) = 35.07 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 56.67 0.00 -9.41 -1.29 0.00 -10.90 0.00 35.07

Segment Leq : 35.07 dBA

Results segment # 2: Oxbow Dr. (night)

Source height = 1.78 m

ROAD (0.00 + 17.81 + 0.00) = 17.81 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 57.98 0.00 -22.81 -1.29 0.00 -16.08 0.00 17.81

Segment Leq : 17.81 dBA

Total Leq All Segments: 35.15 dBA

TOTAL Leq FROM ALL SOURCES (DAY) : 44.85
(NIGHT) : 44.03

STAMSON 5.0 NORMAL REPORT Date: 03-04-2019 11:24:18
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: POA133.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed !# (km/h)	Loc !# (/Train)	Cars !#	Eng !#	Cont !#
* 1. Freight	17.1/3.9	72.0	4.0	1140.0	Diesel	Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0	Diesel	Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0	Diesel	Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !
1. Freight	13.0/3.0	2.50	11.00
2. Way Freight	2.0/2.0	2.50	11.00
3. Passenger	1.0/1.0	2.50	11.00

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 7 / 7	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 500.00 / 500.00 m	
Receiver height	: 1.50 / 4.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Rail data, segment # 2: CP Rail (day/night)

Train Type	Trains	Speed !# (km/h)	Loc !# (/Train)	Cars !#	Eng !#	Cont !#
* 1. Freight	7.9/3.9	97.0	4.0	1173.0	Diesel	Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !
1. Freight	6.0/3.0	2.50	11.00

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 3 / 3	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 249.00 / 249.00 m	
Receiver height	: 1.50 / 4.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 33.56 + 0.00) = 33.56 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.93	-24.14	-1.33	0.00	-15.90	0.00	33.56
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WHEEL (0.00 + 25.46 + 0.00) = 25.46 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.66	68.09	-25.28	-1.46	0.00	-15.90	0.00	25.46

Segment Leq : 34.19 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 42.83 + 0.00) = 42.83 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.58	74.27	-19.34	-1.33	0.00	-10.77	0.00	42.83

WHEEL (0.00 + 35.03 + 0.00) = 35.03 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.66	67.51	-20.25	-1.46	0.00	-10.77	0.00	35.03

Segment Leq : 43.50 dBA

Total Leq All Segments: 43.98 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 32.55 + 0.00) = 32.55 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.50	72.39	-22.77	-1.17	0.00	-15.90	0.00	32.55

WHEEL (0.00 + 23.56 + 0.00) = 23.56 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.60	65.18	-24.37	-1.35	0.00	-15.90	0.00	23.56

Segment Leq : 33.07 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 44.04 + 0.00) = 44.04 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.50	74.21	-18.24	-1.17	0.00	-10.77	0.00	44.04

WHEEL (0.00 + 35.81 + 0.00) = 35.81 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.60	67.45	-19.52	-1.35	0.00	-10.77	0.00	35.81

Segment Leq : 44.65 dBA

Total Leq All Segments: 44.94 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume	: 2600/289	veh/TimePeriod	*
Medium truck volume	: 0/0	veh/TimePeriod	*
Heavy truck volume	: 289/32	veh/TimePeriod	*

Posted speed limit	: 50 km/h
Road gradient	: 0 %
Road pavement	: 1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:	
24 hr Traffic Volume (AADT or SADT): 1581	
Percentage of Annual Growth	: 5.60
Number of Years of Growth	: 13.00
Medium Truck % of Total Volume	: 0.00
Heavy Truck % of Total Volume	: 10.00
Day (16 hrs) % of Total Volume	: 90.00
Data for Segment # 1: Komoka Rd. (day/night)	
Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 1 / 1
House density	: 95 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 47.80 / 47.80 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
Reference angle	: 0.00
Road data, segment # 2: Oxbow Dr. (day/night)	
Car traffic volume : 2605/289 veh/TimePeriod *	
Medium truck volume	: 0/0 veh/TimePeriod *
Heavy truck volume	: 289/32 veh/TimePeriod *
Posted speed limit	: 60 km/h
Road gradient	: 0 %
Road pavement	: 1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:	
24 hr Traffic Volume (AADT or SADT): 2024	
Percentage of Annual Growth	: 4.30
Number of Years of Growth	: 11.00
Medium Truck % of Total Volume	: 0.00
Heavy Truck % of Total Volume	: 10.00
Day (16 hrs) % of Total Volume	: 90.00
Data for Segment # 2: Oxbow Dr. (day/night)	
Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 7 / 3
House density	: 95 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 436.40 / 436.40 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
Reference angle	: 0.00
Results segment # 1: Komoka Rd. (day)	
Source height = 1.78 m	
ROAD (0.00 + 43.78 + 0.00) = 43.78 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.65 63.22 0.00 -8.31 -1.44 0.00 -9.68 0.00 43.78	
Segment Leq : 43.78 dBA	
Results segment # 2: Oxbow Dr. (day)	
Source height = 1.78 m	

ROAD (0.00 + 22.84 + 0.00) = 22.84 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.65 64.52 0.00 -24.18 -1.44 0.00 -16.06 0.00 22.84	
Segment Leq : 22.84 dBA	
Total Leq All Segments: 43.81 dBA	
Results segment # 1: Komoka Rd. (night)	
Source height = 1.78 m	
ROAD (0.00 + 37.84 + 0.00) = 37.84 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.56 56.67 0.00 -7.86 -1.29 0.00 -9.68 0.00 37.84	
Segment Leq : 37.84 dBA	
Results segment # 2: Oxbow Dr. (night)	
Source height = 1.78 m	
ROAD (0.00 + 23.77 + 0.00) = 23.77 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.56 57.98 0.00 -22.86 -1.29 0.00 -10.06 0.00 23.77	
Segment Leq : 23.77 dBA	
Total Leq All Segments: 38.01 dBA	
TOTAL Leq FROM ALL SOURCES (DAY) : 46.91	
(NIGHT) : 45.74	

STAMSON 5.0 NORMAL REPORT Date: 03-04-2019 11:21:59
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: POA134.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed !# (km/h)	Loc !# /Train	Cars !# /Train	Eng !# /Train	Cont !# /Train
* 1. Freight	17.1/3.9	72.0	4.0	1140.0	!Diesel	!Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0	!Diesel	!Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0	!Diesel	!Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !
1. Freight	13.0/3.0	2.50	11.00
2. Way Freight	2.0/2.0	2.50	11.00
3. Passenger	1.0/1.0	2.50	11.00

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 7 / 7	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 500.00 / 500.00 m	
Receiver height	: 1.50 / 4.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Rail data, segment # 2: CP Rail (day/night)

Train Type	Trains	Speed !# (km/h)	Loc !# /Train	Cars !# /Train	Eng !# /Train	Cont !# /Train
* 1. Freight	7.9/3.9	97.0	4.0	1173.0	!Diesel	!Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !
1. Freight	6.0/3.0	2.50	11.00

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 3 / 3	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 244.90 / 244.90 m	
Receiver height	: 1.50 / 4.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 33.56 + 0.00) = 33.56 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.93	-24.14	-1.33	0.00	-15.90	0.00	33.56
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WHEEL (0.00 + 25.46 + 0.00) = 25.46 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.66	68.09	-25.28	-1.46	0.00	-15.90	0.00	25.46
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Segment Leq : 34.19 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 42.93 + 0.00) = 42.93 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.58	74.27	-19.22	-1.33	0.00	-10.78	0.00	42.93
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WHEEL (0.00 + 35.14 + 0.00) = 35.14 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.66	67.51	-20.13	-1.46	0.00	-10.78	0.00	35.14
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Segment Leq : 43.60 dBA

Total Leq All Segments: 44.07 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 32.55 + 0.00) = 32.55 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.50	72.39	-22.77	-1.17	0.00	-15.90	0.00	32.55
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WHEEL (0.00 + 23.56 + 0.00) = 23.56 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.60	65.18	-24.37	-1.35	0.00	-15.90	0.00	23.56
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Segment Leq : 33.07 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 44.13 + 0.00) = 44.13 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.50	74.21	-18.13	-1.17	0.00	-10.78	0.00	44.13
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WHEEL (0.00 + 35.91 + 0.00) = 35.91 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	-90	90	0.60	67.45	-19.41	-1.35	0.00	-10.78	0.00	35.91
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Segment Leq : 44.74 dBA

Total Leq All Segments: 45.03 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume : 2600/289 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 289/32 veh/TimePeriod *

Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 1581
Percentage of Annual Growth : 5.60
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Komoka Rd. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 32.80 / 32.80 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Oxbow Dr. (day/night)

Car traffic volume : 2605/289 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 289/32 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 2024
Percentage of Annual Growth : 4.30
Number of Years of Growth : 11.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Oxbow Dr. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 7 / 7
House density : 95 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 436.40 / 436.40 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Komoka Rd. (day)

Source height = 1.78 m

ROAD (0.00 + 56.16 + 0.00) = 56.16 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 63.22 0.00 -5.61 -1.44 0.00 0.00 0.00 56.16

Segment Leq : 56.16 dBA

Results segment # 2: Oxbow Dr. (day)

Source height = 1.78 m

ROAD (0.00 + 22.84 + 0.00) = 22.84 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 64.52 0.00 -24.18 -1.44 0.00 -16.06 0.00 22.84

Segment Leq : 22.84 dBA

Total Leq All Segments: 56.16 dBA

Results segment # 1: Komoka Rd. (night)

Source height = 1.78 m

ROAD (0.00 + 50.08 + 0.00) = 50.08 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 56.67 0.00 -5.31 -1.29 0.00 0.00 0.00 50.08

Segment Leq : 50.08 dBA

Results segment # 2: Oxbow Dr. (night)

Source height = 1.78 m

ROAD (0.00 + 17.77 + 0.00) = 17.77 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 57.98 0.00 -22.86 -1.29 0.00 -16.06 0.00 17.77

Segment Leq : 17.77 dBA

Total Leq All Segments: 50.08 dBA

TOTAL Leq FROM ALL SOURCES (DAY) : 56.42
(NIGHT) : 51.26

STAMSON 5.0 NORMAL REPORT Date: 03-04-2019 11:12:36
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: POA135B.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	17.1/3.9	72.0	4.0	1140.0 !Diesel! Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0 !Diesel! Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	! Unadj.	! Annual %	! Years of !
No Name	! Trains ! Increase	! Growth	!
1. Freight	13.0/3.0	2.50	11.00
2. Way Freight	2.0/2.0	2.50	11.00
3. Passenger	1.0/1.0	2.50	11.00

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 7 / 7	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 497.60 / 497.60 m	
Receiver height	: 1.50 / 4.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Rail data, segment # 2: CP Rail (day/night)

Train Type	! Unadj.	! Annual %	! Years of !
No Name	! Trains ! Increase	! Growth	!
1. Freight	7.9/3.9	97.0	4.0

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	! Unadj.	! Annual %	! Years of !
No Name	! Trains ! Increase	! Growth	!
1. Freight	6.0/3.0	2.50	11.00

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 4 / 4	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 290.10 / 290.10 m	
Receiver height	: 1.50 / 4.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 33.60 + 0.00) = 33.60 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.93	-24.10	-1.33	0.00	-15.90	0.00	33.60
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WHEEL (0.00 + 25.49 + 0.00) = 25.49 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.66	68.09	-25.25	-1.46	0.00	-15.90	0.00	25.49

Segment Leq : 34.22 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 40.44 + 0.00) = 40.44 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.58	74.27	-20.39	-1.33	0.00	-12.11	0.00	40.44

WHEEL (0.00 + 32.59 + 0.00) = 32.59 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.66	67.51	-21.36	-1.46	0.00	-12.11	0.00	32.59

Segment Leq : 41.10 dBA

Total Leq All Segments: 41.91 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 32.58 + 0.00) = 32.58 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.50	72.39	-22.74	-1.17	0.00	-15.90	0.00	32.58

WHEEL (0.00 + 23.59 + 0.00) = 23.59 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.60	65.18	-24.33	-1.35	0.00	-15.90	0.00	23.59

Segment Leq : 33.10 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 41.70 + 0.00) = 41.70 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.50	74.21	-19.23	-1.17	0.00	-12.11	0.00	41.70

WHEEL (0.00 + 33.40 + 0.00) = 33.40 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.60	67.45	-20.58	-1.35	0.00	-12.11	0.00	33.40

Segment Leq : 42.30 dBA

Total Leq All Segments: 42.79 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume : 2600/289 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 289/32 veh/TimePeriod *

Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 1581
Percentage of Annual Growth : 5.60
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 10.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Komoka Rd. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 50.00 / 50.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Oxbow Dr. (day/night)

Car traffic volume : 2605/289 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 289/32 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 2024
Percentage of Annual Growth : 4.30
Number of Years of Growth : 11.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Oxbow Dr. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 7 / 7
House density : 95 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 394.00 / 394.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Komoka Rd. (day)

Source height = 1.78 m

ROAD (0.00 + 53.14 + 0.00) = 53.14 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 63.22 0.00 -8.64 -1.44 0.00 0.00 0.00 53.14

Segment Leq : 53.14 dBA

Results segment # 2: Oxbow Dr. (day)

Source height = 1.78 m

ROAD (0.00 + 23.42 + 0.00) = 23.42 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 64.52 0.00 -23.44 -1.44 0.00 -16.22 0.00 23.42

Segment Leq : 23.42 dBA

Total Leq All Segments: 53.14 dBA

Results segment # 1: Komoka Rd. (night)

Source height = 1.78 m

ROAD (0.00 + 47.22 + 0.00) = 47.22 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 56.67 0.00 -8.17 -1.29 0.00 0.00 0.00 47.22

Segment Leq : 47.22 dBA

Results segment # 2: Oxbow Dr. (night)

Source height = 1.78 m

ROAD (0.00 + 18.30 + 0.00) = 18.30 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 57.98 0.00 -22.17 -1.29 0.00 -16.22 0.00 18.30

Segment Leq : 18.30 dBA

Total Leq All Segments: 47.23 dBA

TOTAL Leq FROM ALL SOURCES (DAY) : 53.46
(NIGHT) : 48.56

STAMSON 5.0 NORMAL REPORT Date: 03-04-2019 11:14:24
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: POA153.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	17.1/3.9	72.0	4.0	1140.0 !Diesel! Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0 !Diesel! Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	! Unadj.	! Annual %	! Years of !
No Name	! Trains ! Increase	! Growth	!
1. Freight	13.0/3.0	2.50	11.00
2. Way Freight	2.0/2.0	2.50	11.00
3. Passenger	1.0/1.0	2.50	11.00

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 7 / 7	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 383.40	/ 383.40 m
Receiver height	: 1.50	/ 4.50 m
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Rail data, segment # 2: CP Rail (day/night)

Train Type	! Unadj.	! Annual %	! Years of !
No Name	! Trains ! Increase	! Growth	!
1. Freight	7.9/3.9	97.0	4.0

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	! Unadj.	! Annual %	! Years of !
No Name	! Trains ! Increase	! Growth	!
1. Freight	6.0/3.0	2.50	11.00

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 7 / 7	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 431.50	/ 431.50 m
Receiver height	: 1.50	/ 4.50 m
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 35.03 + 0.00) = 35.03 dBA	
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	

-90	90	0.58	74.93	-22.31	-1.33	0.00	-16.26	0.00	35.03
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WHEEL (0.00 + 27.01 + 0.00) = 27.01 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.66	68.09	-23.37	-1.46	0.00	-16.26	0.00	27.01

Segment Leq : 35.67 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 33.73 + 0.00) = 33.73 dBA

ECCOMMUTIVE (0.00 + 33.73 + 0.00) = 33.73 GDA									
Angle1 Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq	
-90	90	0.58	74.27	-23.12	-1.33	0.00	-16.08	0.00	33.73

WHEEL (0.00 + 25.75 + 0.00) = 25.75 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.66	67.51	-24.22	-1.46	0.00	-16.08	0.00	25.75

Segment Leq : 34.37 dBA

Total Leq All Segments: 38.08 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 33.92 + 0.00) = 33.92 dBA

LOCOMOTIVE (0.00 + 33.92 + 0.00) = 33.92 UBA									
Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	72.39	-21.04	-1.17	0.00	-16.26	0.00	33.92

WHEEL (0.00 + 25.04 + 0.00) = 25.04 dBA

WHEEL (0.00 + 25.04 + 0.00) = 25.04 QEA									
Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	65.18	-22.52	-1.35	0.00	-16.26	0.00	25.04

Segment Leq : 34.45 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 35.15 + 0.00) = 35.15 dBA

LOCOMOTIVE (0.00 + 35.15 + 0.00) = 35.15 dBA									
Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	74.21	-21.81	-1.17	0.00	-16.08	0.00	35.15

WHEEL (0.00 + 26.67 + 0.00) = 26.67 dBA

WHEEL (0.00 + 26.67 + 0.00) = 26.67 dBA									
Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	67.45	-23.34	-1.35	0.00	-16.08	0.00	26.67

Segment Leq : 35.73 dBA

Total Leq All Segments: 38.15 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume	: 2600/289	veh/TimePeriod	*
Medium truck volume	: 0/0	veh/TimePeriod	*
Heavy truck volume	: 289/32	veh/TimePeriod	*

Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 1581
Percentage of Annual Growth : 5.60
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 10.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Komoka Rd. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 46.70 / 46.70 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Oxbow Dr. (day/night)

Car traffic volume : 2605/289 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 289/32 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 2024
Percentage of Annual Growth : 4.30
Number of Years of Growth : 11.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Oxbow Dr. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 5 / 5
House density : 95 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 246.40 / 246.40 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Komoka Rd. (day)

Source height = 1.78 m

ROAD (0.00 + 53.63 + 0.00) = 53.63 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 63.22 0.00 -8.15 -1.44 0.00 0.00 0.00 53.63

Segment Leq : 53.63 dBA

Results segment # 2: Oxbow Dr. (day)

Source height = 1.78 m

ROAD (0.00 + 29.23 + 0.00) = 29.23 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 64.52 0.00 -20.08 -1.44 0.00 -13.78 0.00 29.23

Segment Leq : 29.23 dBA

Total Leq All Segments: 53.65 dBA

Results segment # 1: Komoka Rd. (night)

Source height = 1.78 m

ROAD (0.00 + 47.68 + 0.00) = 47.68 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 56.67 0.00 -7.70 -1.29 0.00 0.00 0.00 47.68

Segment Leq : 47.68 dBA

Results segment # 2: Oxbow Dr. (night)

Source height = 1.78 m

ROAD (0.00 + 23.93 + 0.00) = 23.93 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 57.98 0.00 -18.98 -1.29 0.00 -13.78 0.00 23.93

Segment Leq : 23.93 dBA

Total Leq All Segments: 47.70 dBA

TOTAL Leq FROM ALL SOURCES (DAY) : 53.76
(NIGHT) : 48.15

STAMSON 5.0 NORMAL REPORT Date: 03-04-2019 11:18:58
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: POA154.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed !# (km/h)	Loc !# /Train	Cars !#	Eng !Cont	!weld
* 1. Freight	17.1/3.9	72.0	4.0	1140.0	!Diesel	!Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0	!Diesel	!Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0	!Diesel	!Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	No	Name	! Unadj.	! Annual %	! Years of !
			! Trains	! Increase	! Growth
1. Freight	13.0/3.0	!	2.50	!	11.00
2. Way Freight	2.0/2.0	!	2.50	!	11.00
3. Passenger	1.0/1.0	!	2.50	!	11.00

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 7 / 7	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 376.10 / 376.10 m	
Receiver height	: 1.50 / 4.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Rail data, segment # 2: CP Rail (day/night)

Train Type	Trains	Speed !# (km/h)	Loc !# /Train	Cars !#	Eng !Cont	!weld
* 1. Freight	7.9/3.9	!	97.0	!	4.0	!173.0
			!			!Diesel

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	No	Name	! Unadj.	! Annual %	! Years of !
			! Trains	! Increase	! Growth
1. Freight	6.0/3.0	!	2.50	!	11.00

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 7 / 7	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 434.70 / 434.70 m	
Receiver height	: 1.50 / 4.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 35.13 + 0.00) = 35.13 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.93	-22.18	-1.33	0.00	-16.29	0.00	35.13
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WHEEL (0.00 + 27.12 + 0.00) = 27.12 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.66	68.09	-23.23	-1.46	0.00	-16.29	0.00	27.12

Segment Leq : 35.77 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 33.69 + 0.00) = 33.69 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.58	74.27	-23.17	-1.33	0.00	-16.07	0.00	33.69

WHEEL (0.00 + 25.71 + 0.00) = 25.71 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.66	67.51	-24.27	-1.46	0.00	-16.07	0.00	25.71

Segment Leq : 34.33 dBA

Total Leq All Segments: 38.12 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 34.01 + 0.00) = 34.01 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.50	72.39	-20.92	-1.17	0.00	-16.29	0.00	34.01

WHEEL (0.00 + 25.15 + 0.00) = 25.15 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.60	65.18	-22.39	-1.35	0.00	-16.29	0.00	25.15

Segment Leq : 34.54 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 35.12 + 0.00) = 35.12 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.50	74.21	-21.86	-1.17	0.00	-16.07	0.00	35.12

WHEEL (0.00 + 26.64 + 0.00) = 26.64 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.60	67.45	-23.39	-1.35	0.00	-16.07	0.00	26.64

Segment Leq : 35.70 dBA

Total Leq All Segments: 38.17 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume : 2600/289 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 289/32 veh/TimePeriod *

Posted speed limit	: 50 km/h
Road gradient	: 0 %
Road pavement	: 1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:	
24 hr Traffic Volume (AADT or SADT): 1581	
Percentage of Annual Growth	: 5.60
Number of Years of Growth	: 13.00
Medium Truck % of Total Volume	: 10.00
Heavy Truck % of Total Volume	: 10.00
Day (16 hrs) % of Total Volume	: 90.00
Data for Segment # 1: Komoka Rd. (day/night)	
Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 1 / 1
House density	: 75 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 58.60 / 58.60 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
Reference angle	: 0.00
Road data, segment # 2: Oxbow Dr. (day/night)	
Car traffic volume : 2605/289 veh/TimePeriod *	
Medium truck volume	: 0/0 veh/TimePeriod *
Heavy truck volume	: 289/32 veh/TimePeriod *
Posted speed limit	: 60 km/h
Road gradient	: 0 %
Road pavement	: 1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:	
24 hr Traffic Volume (AADT or SADT): 2024	
Percentage of Annual Growth	: 4.30
Number of Years of Growth	: 11.00
Medium Truck % of Total Volume	: 0.00
Heavy Truck % of Total Volume	: 10.00
Day (16 hrs) % of Total Volume	: 90.00
Data for Segment # 2: Oxbow Dr. (day/night)	
Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 5 / 5
House density	: 95 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 246.40 / 246.40 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
Reference angle	: 0.00
Results segment # 1: Komoka Rd. (day)	
Source height = 1.78 m	
ROAD (0.00 + 46.79 + 0.00) = 46.79 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.65 63.22 0.00 -9.77 -1.44 0.00 -5.21 0.00 46.79	
Segment Leq : 46.79 dBA	
Results segment # 2: Oxbow Dr. (day)	
Source height = 1.78 m	

ROAD (0.00 + 29.23 + 0.00) = 29.23 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.65 64.52 0.00 -20.08 -1.44 0.00 -13.78 0.00 29.23	
Segment Leq : 29.23 dBA	
Total Leq All Segments: 46.87 dBA	
Results segment # 1: Komoka Rd. (night)	
Source height = 1.78 m	
ROAD (0.00 + 40.93 + 0.00) = 40.93 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.56 56.67 0.00 -9.24 -1.29 0.00 -5.21 0.00 40.93	
Segment Leq : 40.93 dBA	
Results segment # 2: Oxbow Dr. (night)	
Source height = 1.78 m	
ROAD (0.00 + 23.93 + 0.00) = 23.93 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.56 57.98 0.00 -18.98 -1.29 0.00 -13.78 0.00 23.93	
Segment Leq : 23.93 dBA	
Total Leq All Segments: 41.02 dBA	
TOTAL Leq FROM ALL SOURCES (DAY) : 47.41	
(NIGHT) : 42.83	

STAMSON 5.0 NORMAL REPORT Date: 03-04-2019 10:57:19
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: POA165.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed ! (km/h)	Loc ! (/Train)	Cars ! (/Train)	Eng ! (weld)	Cont ! (weld)
* 1. Freight	17.1/3.9	72.0	4.0	1140.0	Diesel	Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0	Diesel	Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0	Diesel	Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:					
No	Name	Unadj. !	Annual % !	Years of !	
		Trains !	Increase !	Growth !	
1.	Freight	13.0/3.0	2.50	11.	
2.	Way Freight	2.0/2.0	2.50	11.	
3.	Passenger	1.0/1.0	2.50	11.	

Data for Segment # 1: CN Rail (day/night)

Angle1	Angle2	:	-90.00	deg	90.00	deg
Wood depth	:	:	0		(No woods.)	
No of house rows	:	:	4	/	4	
House density	:	:	85	%		
Surface	:	:	1		(Absorptive ground surface)	
Receiver source distance	:	:	295.50	/	295.90	m
Receiver height	:	:	1.50	/	4.50	m
Topography	:	:	1		(Flat/gentle slope; no barrier)	
No Whistle	:	:				
Reference angle	:	:	0.00			

Rail data, segment # 2: CP Rail (day/night)

Train Type	Trains	Speed ! (km/h)	loc ! (/Train)	# Cars ! (/Train)	Eng ! type	Cont ! weld
* 1. Freight	7.9/3.9	97.0	4.0	173.0	Diesel	Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:					
No	Name	Unadj. !	Annual % !	Years of !	
		Trains !	Increase !	Growth !	
-----+-----+-----+-----+-----+-----					
1.	Freight		6.0/3.0	2.50	11.
Data for Segment # 2: CP Rail (day/night)					

Data for Segment # 2: CP Rail (day/night)

Angle1	Angle2	:	-90.00	deg	90.00	deg
Wood depth	:	:	0		(No woods.)	
No of house rows	:	:	7	/	7	
House density	:	:	95	%		
Surface	:	:	1		(Absorptive ground surface)	
Receiver source distance	:	:	470.40	/	470.40	m
Receiver height	:	:	1.50	/	4.50	m
Topography	:	:	1		(Flat/gentle slope; no barrier)	
No Whistle	:	:				
Reference angle	:	:	0.00			

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 42.72 + 0.00) = 42.72 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.93	-20.52	-1.33	0.00	-10.36	0.00	42.72
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WHEEL (0.00 + 34.79 + 0.00) = 34.79 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	68.09	-21.49	-1.46	0.00	-10.36	0.00	34.79

Segment Leq : 43.37 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 33.28 + 0.00) = 33.28 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	74.27	-23.72	-1.33	0.00	-15.94	0.00	33.28

WHEEL (0.00 + 25.28 + 0.00) = 25.28 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	67.51	-24.84	-1.46	0.00	-15.94	0.00	25.28

Segment Leq : 33.92 dBA

Total Leq All Segments: 43.84 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 41.50 + 0.00) = 41.50 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	72.39	-19.36	-1.17	0.00	-10.36	0.00	41.50

WHEEL (0.00 + 32.74 + 0.00) = 32.74 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	65.18	-20.72	-1.35	0.00	-10.36	0.00	32.74

Segment Leq : 42.04 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 34.74 + 0.00) = 34.74 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	74.21	-22.37	-1.17	0.00	-15.94	0.00	34.74

WHEEL (0.00 + 26.22 + 0.00) = 26.22 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	67.45	-23.94	-1.35	0.00	-15.94	0.00	26.22

Segment Leq : 35.31 dBA

Total Leq All Segments: 42.88 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume	:	:	2600/289	veh/TimePeriod	*
Medium truck volume	:	:	0/0	veh/TimePeriod	*
Heavy truck volume	:	:	289/32	veh/TimePeriod	*

Posted speed limit	: 50 km/h
Road gradient	: 0 %
Road pavement	: 1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:	
24 hr Traffic Volume (AADT or SADT): 1581	
Percentage of Annual Growth	: 5.60
Number of Years of Growth	: 13.00
Medium Truck % of Total Volume	: 10.00
Heavy Truck % of Total Volume	: 10.00
Day (16 hrs) % of Total Volume	: 90.00
Data for Segment # 1: Komoka Rd. (day/night)	
Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 7 / 7
House density	: 95 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 191.90 / 191.90 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
Reference angle	: 0.00
Road data, segment # 2: Oxbow Dr. (day/night)	
Car traffic volume : 2605/289 veh/TimePeriod *	
Medium truck volume	: 0/0 veh/TimePeriod *
Heavy truck volume	: 289/32 veh/TimePeriod *
Posted speed limit	: 60 km/h
Road gradient	: 0 %
Road pavement	: 1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:	
24 hr Traffic Volume (AADT or SADT): 2024	
Percentage of Annual Growth	: 4.30
Number of Years of Growth	: 11.00
Medium Truck % of Total Volume	: 0.00
Heavy Truck % of Total Volume	: 10.00
Day (16 hrs) % of Total Volume	: 90.00
Data for Segment # 2: Oxbow Dr. (day/night)	
Angle1 Angle2	: -90.00 deg 90.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 2 / 7
House density	: 70 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 246.60 / 246.60 m
Receiver height	: 1.50 / 4.50 m
Topography	: 1 (Flat/gentle slope; no barrier)
Reference angle	: 0.00
Results segment # 1: Komoka Rd. (day)	
Source height = 1.78 m	
ROAD (0.00 + 26.37 + 0.00) = 26.37 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.65 63.22 0.00 -18.28 -1.44 0.00 -17.12 0.00 26.37	
Segment Leq : 26.37 dBA	
Results segment # 2: Oxbow Dr. (day)	
Source height = 1.78 m	

ROAD (0.00 + 37.41 + 0.00) = 37.41 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.65 64.52 0.00 -20.08 -1.44 0.00 -5.59 0.00 37.41	
Segment Leq : 37.41 dBA	
Total Leq All Segments: 37.74 dBA	
Results segment # 1: Komoka Rd. (night)	
Source height = 1.78 m	
ROAD (0.00 + 20.98 + 0.00) = 20.98 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.56 56.67 0.00 -17.29 -1.29 0.00 -17.12 0.00 20.98	
Segment Leq : 20.98 dBA	
Results segment # 2: Oxbow Dr. (night)	
Source height = 1.78 m	
ROAD (0.00 + 24.61 + 0.00) = 24.61 dBA	
Angle1 Angle2 Alpha RefLeq P.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.56 57.98 0.00 -18.99 -1.29 0.00 -13.09 0.00 24.61	
Segment Leq : 24.61 dBA	
Total Leq All Segments: 26.17 dBA	
TOTAL Leq FROM ALL SOURCES (DAY) : 44.79	
(NIGHT) : 42.97	

STAMSON 5.0 NORMAL REPORT Date: 03-04-2019 14:44:09
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: POA166.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	17.1/3.9	72.0	4.0	1140.0 !Diesel! Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0 !Diesel! Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !
1. Freight	13.0/3.0	2.50	11.00
2. Way Freight	2.0/2.0	2.50	11.00
3. Passenger	1.0/1.0	2.50	11.00

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 0	0
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 217.30	/ 217.30 m
Receiver height	: 1.50	/ 4.50 m
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle	: 0.00	
Reference angle	: 0.00	

Rail data, segment # 2: CP Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	7.9/3.9	97.0	4.0	1173.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !
1. Freight	6.0/3.0	2.50	11.00

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 7	7
House density	: 95	%
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 500.00	/ 500.00 m
Receiver height	: 1.50	/ 4.50 m
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle	: 0.00	
Reference angle	: 0.00	

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 55.20 + 0.00) = 55.20 dBA	
Angle1 Angle2 Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	

-90	90	0.58	74.93	-18.40	-1.33	0.00	0.00	0.00	55.20
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WHEEL (0.00 + 47.36 + 0.00) = 47.36 dBA

Angle1 Angle2 Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.66	68.09	-19.27	-1.46	0.00	0.00	0.00	47.36

Segment Leq : 55.86 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 32.90 + 0.00) = 32.90 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.58	74.27	-24.14	-1.33	0.00	-15.90	0.00	32.90

WHEEL (0.00 + 24.87 + 0.00) = 24.87 dBA

Angle1	Angle2	Alpha	Refleq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeg
-90	90	0.66	67.51	-25.28	-1.46	0.00	-15.90	0.00	24.87

Segment Leq : 33.53 dBA

Total Leq All Segments: 55.89 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 53.86 + 0.00) = 53.86 dBA

Angle1 Angle2 Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.50	72.39	-17.36	-1.17	0.00	0.00	0.00	53.86

WHEEL (0.00 + 45.25 + 0.00) = 45.25 dBA

Angle1 Angle2 Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.60	65.18	-18.58	-1.35	0.00	0.00	0.00	45.25

Segment Leq : 54.42 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 34.38 + 0.00) = 34.38 dBA

RECOMBINE (0.00 + 0.00) = 34.38 GDA									
Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	74.21	-22.77	-1.17	0.00	-15.90	0.00	34.38

WHEEL (0.00 + 25.83 + 0.00) = 25.83 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq									
-90	90	0.60	67.45	-24.37	-1.35	0.00	-15.90	0.00	25.83

Segment Leq : 34.95 dBA

Total Leq All Segments: 54.47 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume	: 2600/289	veh/TimePeriod	*
Medium truck volume	: 0/0	veh/TimePeriod	*
Heavy truck volume	: 289/32	veh/TimePeriod	*
Posted speed limit	: 50	km/h	

Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 1581
Percentage of Annual Growth : 5.60
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Komoka Rd. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 7 / 7
House density : 75 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 222.60 / 222.60 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Oxbow Dr. (day/night)

Car traffic volume : 2605/289 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 289/32 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 2024
Percentage of Annual Growth : 4.30
Number of Years of Growth : 11.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Oxbow Dr. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 172.60 / 172.60 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Komoka Rd. (day)

Source height = 1.78 m

ROAD (0.00 + 28.68 + 0.00) = 28.68 dBA

Angle1 Angle2 Alpha RefLeq P.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 63.22 0.00 -19.35 -1.44 0.00 -13.74 0.00 28.68

Segment Leq : 28.68 dBA

Results segment # 2: Oxbow Dr. (day)

Source height = 1.78 m

ROAD (0.00 + 45.56 + 0.00) = 45.56 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 64.52 0.00 -17.52 -1.44 0.00 0.00 0.00 45.56

Segment Leq : 45.56 dBA

Total Leq All Segments: 45.65 dBA

Results segment # 1: Komoka Rd. (night)

Source height = 1.78 m

ROAD (0.00 + 23.35 + 0.00) = 23.35 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 56.67 0.00 -18.29 -1.29 0.00 -13.74 0.00 23.35

Segment Leq : 23.35 dBA

Results segment # 2: Oxbow Dr. (night)

Source height = 1.78 m

ROAD (0.00 + 40.12 + 0.00) = 40.12 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 57.98 0.00 -16.57 -1.29 0.00 0.00 0.00 40.12

Segment Leq : 40.12 dBA

Total Leq All Segments: 40.21 dBA

TOTAL Leq FROM ALL SOURCES (DAY) : 56.28
(NIGHT) : 54.63

STAMSON 5.0 NORMAL REPORT Date: 03-04-2019 15:09:23
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: POA167.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	17.1/3.9	72.0	4.0	1140.0 !Diesel! Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0 !Diesel! Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !
1. Freight	13.0/3.0	2.50	11.00
2. Way Freight	2.0/2.0	2.50	11.00
3. Passenger	1.0/1.0	2.50	11.00

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 0	0
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 209.50	/ 209.50 m
Receiver height	: 1.50	/ 4.50 m
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle	: 0.00	
Reference angle	: 0.00	

Rail data, segment # 2: CP Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	7.9/3.9	97.0	4.0	1173.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !
1. Freight	6.0/3.0	2.50	11.00

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 7	7
House density	: 95	%
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 500.00	/ 500.00 m
Receiver height	: 1.50	/ 4.50 m
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle	: 0.00	
Reference angle	: 0.00	

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 55.45 + 0.00) = 55.45 dBA	
Angle1 Angle2	Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.93	-18.15	-1.33	0.00	0.00	0.00	55.45
WHEEL (0.00 + 47.63 + 0.00) = 47.63 dBA									
Angle1 Angle2	Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq								
-90	90	0.66	68.09	-19.01	-1.46	0.00	0.00	0.00	47.63

Segment Leq : 56.11 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 32.90 + 0.00) = 32.90 dBA	
Angle1 Angle2	Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.27	-24.14	-1.33	0.00	-15.90	0.00	32.90
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WHEEL (0.00 + 24.87 + 0.00) = 24.87 dBA

Angle1 Angle2	Alpha	Refleq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq	
-90	90	0.66	67.51	-25.28	-1.46	0.00	-15.90	0.00	24.87

Segment Leq : 33.53 dBA

Total Leq All Segments: 56.13 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 54.10 + 0.00) = 54.10 dBA	
Angle1 Angle2	Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.50	72.39	-17.12	-1.17	0.00	0.00	0.00	54.10
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WHEEL (0.00 + 45.50 + 0.00) = 45.50 dBA

Angle1	Angle2	Alpha	Refleq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	65.18	-18.32	-1.35	0.00	0.00	0.00	45.50

Segment Leq : 54.66 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 34.38 + 0.00) = 34.38 dBA	
Angle1 Angle2	Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.50	74.21	-22.77	-1.17	0.00	-15.90	0.00	34.38
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WHEEL (0.00 + 25.83 + 0.00) = 25.83 dBA

Angle1 Angle2	Alpha	Refleq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq	
-90	90	0.60	67.45	-24.37	-1.35	0.00	-15.90	0.00	25.83

Segment Leq : 34.95 dBA

Total Leq All Segments: 54.71 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume	: 2600/289	veh/TimePeriod	*
Medium truck volume	: 0/0	veh/TimePeriod	*
Heavy truck volume	: 289/32	veh/TimePeriod	*
Posted speed limit	: 50	km/h	

Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 1581
Percentage of Annual Growth : 5.60
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Komoka Rd. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 7 / 7
House density : 75 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 237.60 / 237.60 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Oxbow Dr. (day/night)

Car traffic volume : 2605/289 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 289/32 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 2024
Percentage of Annual Growth : 4.30
Number of Years of Growth : 11.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Oxbow Dr. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 172.60 / 172.60 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Komoka Rd. (day)

Source height = 1.78 m

ROAD (0.00 + 28.25 + 0.00) = 28.25 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 63.22 0.00 -19.82 -1.44 0.00 -13.71 0.00 28.25

Segment Leq : 28.25 dBA

Results segment # 2: Oxbow Dr. (day)

Source height = 1.78 m

ROAD (0.00 + 45.56 + 0.00) = 45.56 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 64.52 0.00 -17.52 -1.44 0.00 0.00 0.00 45.56

Segment Leq : 45.56 dBA

Total Leq All Segments: 45.64 dBA

Results segment # 1: Komoka Rd. (night)

Source height = 1.78 m

ROAD (0.00 + 22.94 + 0.00) = 22.94 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 56.67 0.00 -18.74 -1.29 0.00 -13.71 0.00 22.94

Segment Leq : 22.94 dBA

Results segment # 2: Oxbow Dr. (night)

Source height = 1.78 m

ROAD (0.00 + 40.12 + 0.00) = 40.12 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 57.98 0.00 -16.57 -1.29 0.00 0.00 0.00 40.12

Segment Leq : 40.12 dBA

Total Leq All Segments: 40.20 dBA

TOTAL Leq FROM ALL SOURCES (DAY) : 56.51
(NIGHT) : 54.86

STAMSON 5.0 NORMAL REPORT Date: 03-04-2019 15:12:43
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: POA168.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	17.1/3.9	72.0	4.0	1140.0 !Diesel! Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0 !Diesel! Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !
1. Freight	13.0/3.0	2.50	11.00
2. Way Freight	2.0/2.0	2.50	11.00
3. Passenger	1.0/1.0	2.50	11.00

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 0	0
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 196.70	/ 196.70 m
Receiver height	: 1.50	/ 4.50 m
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Rail data, segment # 2: CP Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont
* 1. Freight	7.9/3.9	97.0	4.0	1173.0 !Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	Unadj. !	Annual % !	Years of !
No Name	Trains !	Increase !	Growth !
1. Freight	6.0/3.0	2.50	11.00

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 7	7
House density	: 95	%
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 500.00	/ 500.00 m
Receiver height	: 1.50	/ 4.50 m
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 55.88 + 0.00) = 55.88 dBA	
Angle1 Angle2	Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.93	-17.72	-1.33	0.00	0.00	0.00	55.88
WHEEL (0.00 + 48.08 + 0.00) = 48.08 dBA									
Angle1 Angle2	Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq								
-90	90	0.66	68.09	-18.55	-1.46	0.00	0.00	0.00	48.08

Segment Leq : 56.55 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 32.90 + 0.00) = 32.90 dBA	
Angle1 Angle2	Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

Angle1 Angle2 Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.58	74.27	-24.14	-1.33	0.00	-15.90	0.00	32.90
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WHEEL (0.00 + 24.87 + 0.00) = 24.87 dBA

Angle1 Angle2	Alpha	Refleq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq	
-90	90	0.66	67.51	-25.28	-1.46	0.00	-15.90	0.00	24.87

Segment Leq : 33.53 dBA

Total Leq All Segments: 56.57 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 54.51 + 0.00) = 54.51 dBA	
Angle1 Angle2	Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

Angle1 Angle2 Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.50	72.39	-16.71	-1.17	0.00	0.00	0.00	54.51
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WHEEL (0.00 + 45.94 + 0.00) = 45.94 dBA

Angle1 Angle2	Alpha Refleq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq	
-90	90	0.60	65.18	-17.88	-1.35	0.00	0.00	45.94

Segment Leq : 55.08 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 34.38 + 0.00) = 34.38 dBA	
Angle1 Angle2	Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

Angle1 Angle2 Alpha Refleq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	90	0.50	74.21	-22.77	-1.17	0.00	-15.90	0.00	34.38
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WHEEL (0.00 + 25.83 + 0.00) = 25.83 dBA

angle1 angle2	alpha	refl	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq	
-90	90	0.60	67.45	-24.37	-1.35	0.00	-15.90	0.00	25.83

Segment Leq : 34.95 dBA

Total Leq All Segments: 55.12 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume	: 2600/289	veh/TimePeriod	*
Medium truck volume	: 0/0	veh/TimePeriod	*
Heavy truck volume	: 289/32	veh/TimePeriod	*
Posted speed limit	: 50	km/h	

Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 1581
Percentage of Annual Growth : 5.60
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Komoka Rd. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 7 / 7
House density : 75 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 257.70 / 257.70 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Oxbow Dr. (day/night)

Car traffic volume : 2605/289 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 289/32 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 2024
Percentage of Annual Growth : 4.30
Number of Years of Growth : 11.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Oxbow Dr. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 172.60 / 172.60 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Komoka Rd. (day)

Source height = 1.78 m

ROAD (0.00 + 27.71 + 0.00) = 27.71 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 63.22 0.00 -20.40 -1.44 0.00 -13.67 0.00 27.71

Segment Leq : 27.71 dBA

Results segment # 2: Oxbow Dr. (day)

Source height = 1.78 m

ROAD (0.00 + 45.56 + 0.00) = 45.56 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 64.52 0.00 -17.52 -1.44 0.00 0.00 0.00 45.56

Segment Leq : 45.56 dBA

Total Leq All Segments: 45.63 dBA

Results segment # 1: Komoka Rd. (night)

Source height = 1.78 m

ROAD (0.00 + 22.43 + 0.00) = 22.43 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 56.67 0.00 -19.29 -1.29 0.00 -13.67 0.00 22.43

Segment Leq : 22.43 dBA

Results segment # 2: Oxbow Dr. (night)

Source height = 1.78 m

ROAD (0.00 + 40.12 + 0.00) = 40.12 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 57.98 0.00 -16.57 -1.29 0.00 0.00 0.00 40.12

Segment Leq : 40.12 dBA

Total Leq All Segments: 40.19 dBA

TOTAL Leq FROM ALL SOURCES (DAY) : 56.91
(NIGHT) : 55.26

STAMSON 5.0 NORMAL REPORT Date: 03-04-2019 14:45:54
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: POA173.te Time Period: Day/Night 16/8 hours
Description:

Rail data, segment # 1: CN Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont	!weld
* 1. Freight	17.1/3.9	72.0	4.0	1140.0	!Diesel! Yes
* 2. Way Freight	2.6/2.6	72.0	4.0	25.0	!Diesel! Yes
* 3. Passenger	1.3/1.3	72.0	2.0	10.0	!Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	! Unadj.	! Annual %	! Years of !
No Name	! Trains !	! Increase !	! Growth !
1. Freight	13.0/3.0	2.50	11.00
2. Way Freight	2.0/2.0	2.50	11.00
3. Passenger	1.0/1.0	2.50	11.00

Data for Segment # 1: CN Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 0	0
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 151.80	/ 151.80 m
Receiver height	: 1.50	/ 4.50 m
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle	: 0.00	
Reference angle	: 0.00	

Rail data, segment # 2: CP Rail (day/night)

Train Type	Trains	Speed !# (km/h)	loc !# /Train!	Cars! Eng !Cont	!weld
* 1. Freight	7.9/3.9	97.0	4.0	1173.0	!Diesel! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type:	! Unadj.	! Annual %	! Years of !
No Name	! Trains !	! Increase !	! Growth !
1. Freight	6.0/3.0	2.50	11.00

Data for Segment # 2: CP Rail (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 7	7
House density	: 95	%
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 500.00	/ 500.00 m
Receiver height	: 1.50	/ 4.50 m
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle	: 0.00	
Reference angle	: 0.00	

Results segment # 1: CN Rail (day)

LOCOMOTIVE (0.00 + 57.67 + 0.00) = 57.67 dBA	
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	

-90 90 0.58 74.93 -15.93 -1.33 0.00 0.00 0.00 57.67

WHEEL (0.00 + 49.95 + 0.00) = 49.95 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.66 68.09 -16.69 -1.46 0.00 0.00 0.00 49.95	

Segment Leq : 58.35 dBA

Results segment # 2: CP Rail (day)

LOCOMOTIVE (0.00 + 32.90 + 0.00) = 32.90 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.58 74.27 -24.14 -1.33 0.00 -15.90 0.00 32.90	

WHEEL (0.00 + 24.87 + 0.00) = 24.87 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.66 67.51 -25.28 -1.46 0.00 -15.90 0.00 24.87	

Segment Leq : 33.53 dBA

Total Leq All Segments: 58.36 dBA

Results segment # 1: CN Rail (night)

LOCOMOTIVE (0.00 + 56.19 + 0.00) = 56.19 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.50 72.39 -15.03 -1.17 0.00 0.00 0.00 56.19	

WHEEL (0.00 + 47.74 + 0.00) = 47.74 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.60 65.18 -16.08 -1.35 0.00 0.00 0.00 47.74	

Segment Leq : 56.77 dBA

Results segment # 2: CP Rail (night)

LOCOMOTIVE (0.00 + 34.38 + 0.00) = 34.38 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.50 74.21 -22.77 -1.17 0.00 -15.90 0.00 34.38	

WHEEL (0.00 + 25.83 + 0.00) = 25.83 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq	
-90 90 0.60 67.45 -24.37 -1.35 0.00 -15.90 0.00 25.83	

Segment Leq : 34.95 dBA

Total Leq All Segments: 56.80 dBA

Road data, segment # 1: Komoka Rd. (day/night)

Car traffic volume	: 2600/289	veh/TimePeriod	*
Medium truck volume	: 0/0	veh/TimePeriod	*
Heavy truck volume	: 289/32	veh/TimePeriod	*
Posted speed limit	: 50	km/h	

Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 1581
Percentage of Annual Growth : 5.60
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Komoka Rd. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 7 / 7
House density : 95 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 333.30 / 333.30 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Oxbow Dr. (day/night)

Car traffic volume : 2605/289 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 289/32 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 2024
Percentage of Annual Growth : 4.30
Number of Years of Growth : 11.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 10.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Oxbow Dr. (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 172.60 / 172.60 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Komoka Rd. (day)

Source height = 1.78 m

ROAD (0.00 + 23.08 + 0.00) = 23.08 dBA

Angle1 Angle2 Alpha RefLeq P.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 63.22 0.00 -22.24 -1.44 0.00 -16.45 0.00 23.08

Segment Leq : 23.08 dBA

Results segment # 2: Oxbow Dr. (day)

Source height = 1.78 m

ROAD (0.00 + 45.56 + 0.00) = 45.56 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.65 64.52 0.00 -17.52 -1.44 0.00 0.00 0.00 45.56

Segment Leq : 45.56 dBA

Total Leq All Segments: 45.58 dBA

Results segment # 1: Komoka Rd. (night)

Source height = 1.78 m

ROAD (0.00 + 17.90 + 0.00) = 17.90 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 56.67 0.00 -21.03 -1.29 0.00 -16.45 0.00 17.90

Segment Leq : 17.90 dBA

Results segment # 2: Oxbow Dr. (night)

Source height = 1.78 m

ROAD (0.00 + 40.12 + 0.00) = 40.12 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-90 90 0.56 57.98 0.00 -16.57 -1.29 0.00 0.00 0.00 40.12

Segment Leq : 40.12 dBA

Total Leq All Segments: 40.15 dBA

TOTAL Leq FROM ALL SOURCES (DAY) : 58.59
(NIGHT) : 56.89

APPENDIX B

VIBRATION LEVEL CALCULATIONS

Vibration Study

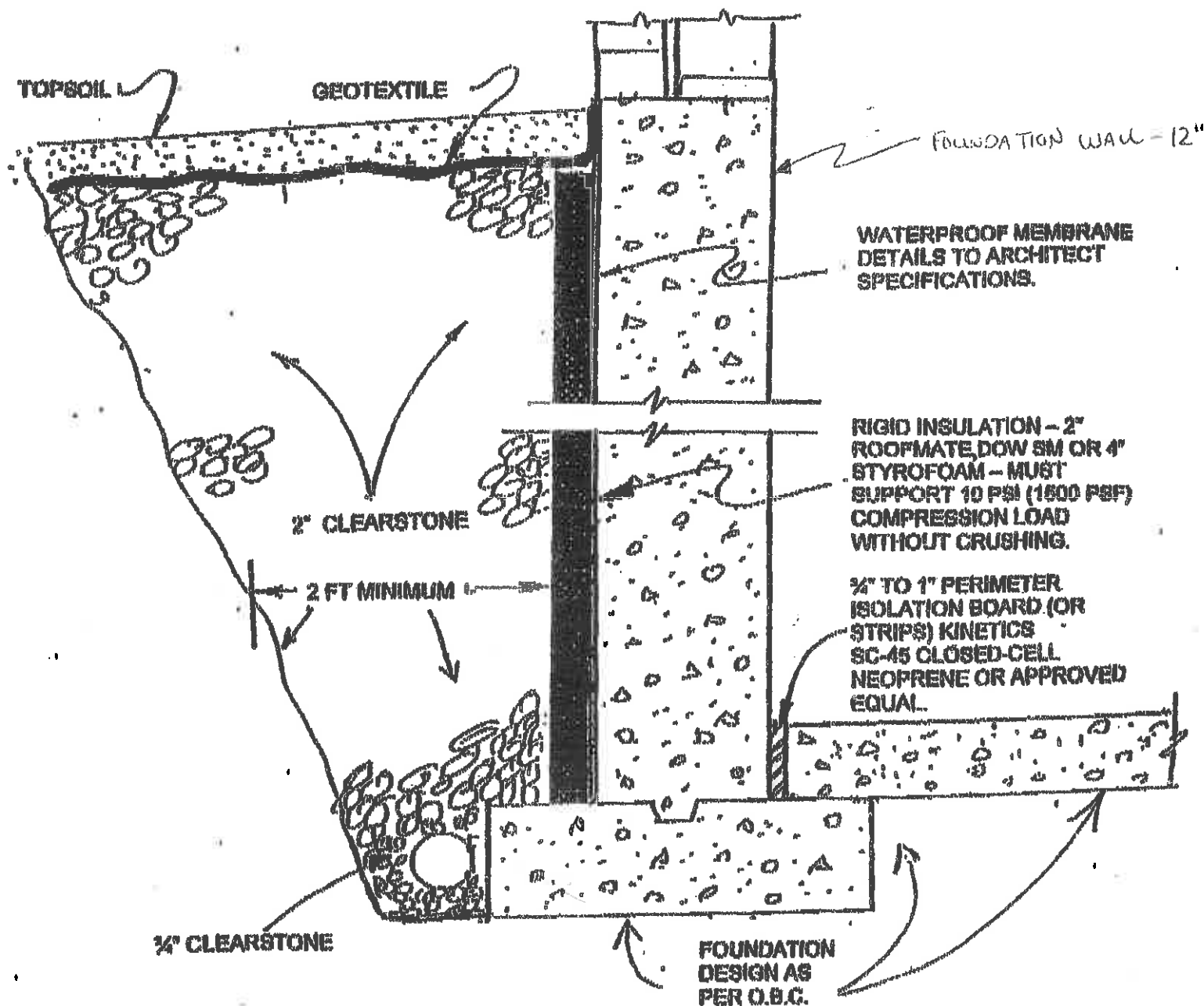
DEL18-059

1

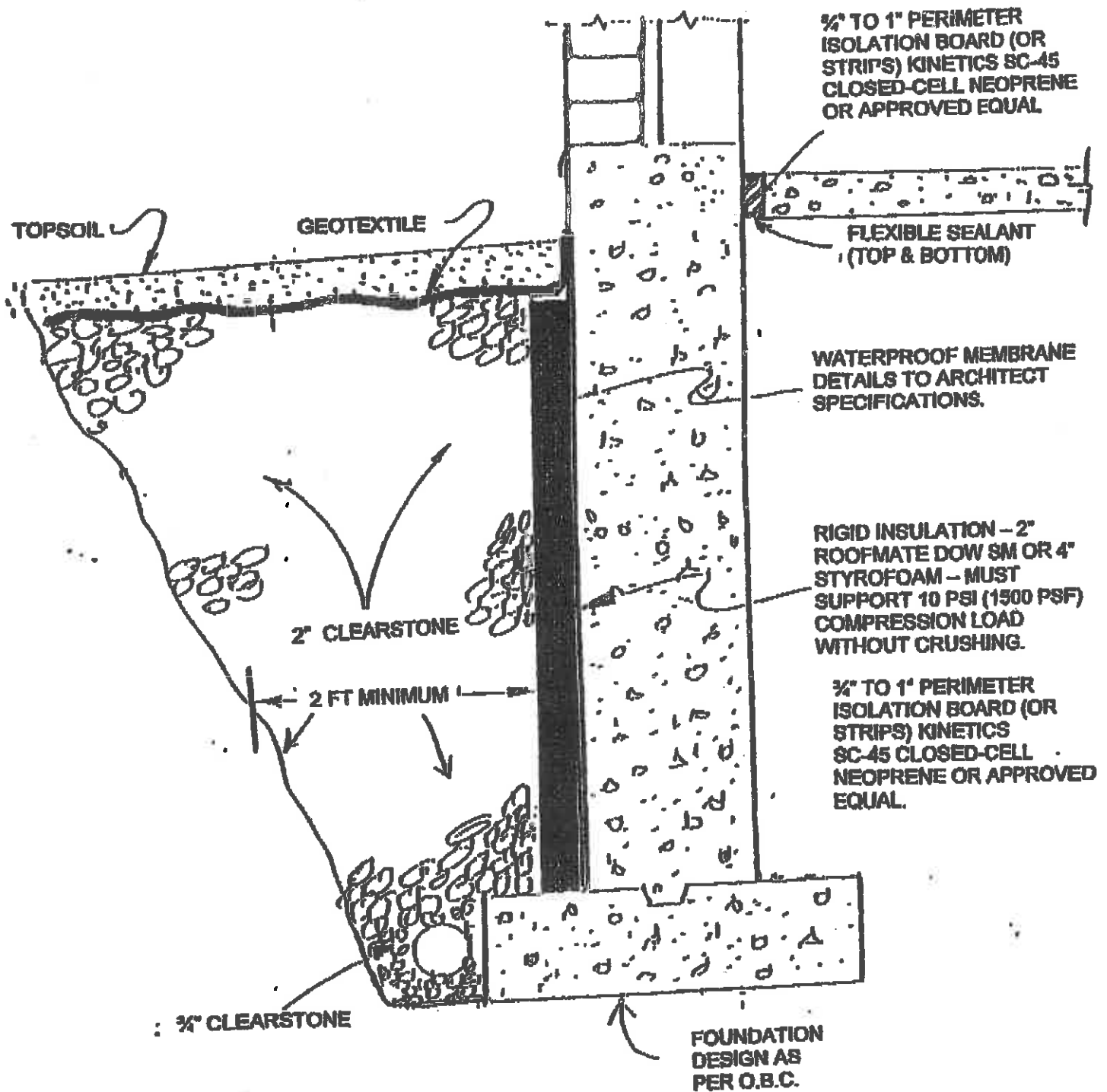
TABLE 4: VIBRATION LEVELS TESTS				
ACTUAL TEST TIME	MAX PPV (mm/sec) (vertical)	FREQUENCY (Hz) (vertical)	MAXIMUM ACCEL. (vertical)	1-SECOND RMS VEL. (mm/sec) (vertical)
SEPTEMBER 6, 2018				
14:58:22	0.127	7.8	0.013	0.111
SEPTEMBER 10, 2018				
9:59:33	0.079	7.7	0.003	0.033
9:59:39	0.095	7.7	0.003	0.030
9:59:45	0.079	7.7	0.003	0.035
9:59:51	0.254	7.7	0.005	0.078
9:59:58	1.048	7.7	0.017	0.380
10:00:04	1.111	7.7	0.017	0.350
10:00:10	1.159	7.7	0.015	0.380
10:00:16	0.683	7.7	0.017	0.270
10:00:22	1.254	7.7	0.018	0.380
10:00:28	0.841	7.7	0.017	0.260
10:00:34	0.905	7.7	0.013	0.320
10:00:40	0.762	7.7	0.012	0.280
10:00:47	0.572	7.7	0.010	0.210
10:00:53	0.508	7.7	0.008	0.190
10:00:59	0.508	7.7	0.007	0.180
10:01:05	0.397	7.7	0.007	0.140
10:01:11	0.397	7.7	0.007	0.150
10:01:17	0.429	7.7	0.008	0.180
10:01:23	0.381	7.7	0.008	0.140
10:01:30	0.333	7.7	0.007	0.130
10:01:36	0.143	7.7	0.003	0.050
SEPTEMBER 10, 2018				
14:25:04	0.127	7.7	0.003	0.043
14:25:10	0.206	7.7	0.003	0.071
14:25:16	0.540	7.7	0.013	0.190
14:25:22	0.857	7.7	0.017	0.300
14:25:29	0.794	7.7	0.020	0.230
14:25:35	0.730	7.7	0.015	0.240
14:25:41	0.794	7.7	0.012	0.290
14:25:47	0.841	7.7	0.015	0.330
14:25:53	0.889	7.7	0.013	0.330
14:25:59	0.778	7.7	0.015	0.260

TABLE 4: VIBRATION LEVELS TESTS

ACTUAL TEST TIME	MAX PPV (mm/sec) (vertical)	FREQUENCY (Hz) (vertical)	MAXIMUM ACCEL. (vertical)	1-SECOND RMS VEL. (mm/sec) (vertical)
SEPTEMBER 10, 2018				
14:26:05	0.762	7.7	0.013	0.280
14:26:11	0.873	7.7	0.015	0.350
14:26:17	0.826	7.7	0.012	0.210
14:26:24	0.667	7.7	0.013	0.240
14:26:30	0.524	7.7	0.013	0.210
14:26:36	0.587	7.7	0.013	0.220
14:26:42	0.445	7.7	0.008	0.140
14:26:48	0.778	7.7	0.015	0.290
14:26:54	0.667	7.7	0.017	0.250
14:27:00	0.826	7.7	0.018	0.280
14:27:06	0.492	7.7	0.012	0.220
14:27:12	0.397	7.7	0.010	0.140
14:27:19	0.619	7.7	0.013	0.170
14:27:26	0.111	7.7	0.003	0.044



CROSS-SECTION OF RECOMMENDED BELOW GRADE DETAILS



CROSS-SECTION OF RECOMMENDED BELOW GRADE DETAILS



Specialists in Explosives, Blasting and Vibration
Consulting Engineers

September 13, 2018

Development Engineering (London) Limited
41 Adelaide Street North, Unit 71
London, Ontario
N6B 3P4

Attention: Mr. Jeff Thomas

Re: Vibration Monitoring Program
Train Vibrations – September 2018

Dear Mr. Thomas:

As per your request, Explotech Engineering has downloaded the data from the Instantel Blastmate II Seismograph utilized by your forces to monitor train vibrations in September 2018. Attached please find digital copies of the following data:

1. Event summary list – Summary of all 46 events recorded including event date and time, maximum component velocities, peak vector sum velocities and brief description of location.
2. Event reports – Specific data for each event including system configuration, installation data, vibration waveforms and peak data recorded.
3. Advanced waveforms – Event waveforms denoting Root Mean Square values for each channel event record.

We trust the data provided will enable you to complete the required analysis for this project. Should you require any further advanced interpretation of the data, please do not hesitate to contact our office at your leisure.

Kindest regards,

Mitch Malcomson, P.Eng.

Train Monitoring
M8019E Development Engineering
September 2018

Event Report: Event List - z:\6. job files\m8000 jobs\m8019ec - dev eng - bm2 rental and rms calcs\events

Type	Serial No.	Date/Time	No. Chan	Trigger	Tran Peak (mm/s)	Vert Peak (mm/s)	Long Peak (mm/s)	Mic Peak (dB)	PVS1 (mm/s)	Description
W	2585	Sep 6 /18 14:58:22	4	Manual	0.127	0.127	0.127	<88L	0.222	Oxbow
W	2585	Sep 10 /18 09:59:33	4	Tran	0.143	0.079	0.095	<88L	0.159	Oxbow
W	2585	Sep 10 /18 09:59:39	4	Tran	0.159	0.095	0.127	103.5L	0.175	Oxbow
W	2585	Sep 10 /18 09:59:45	4	Tran	0.143	0.079	0.127	94.0L	0.175	Oxbow
W	2585	Sep 10 /18 09:59:51	4	Long	0.349	0.254	0.270	97.5L	0.397	Oxbow
W	2585	Sep 10 /18 09:59:58	4	Vert	1.016	1.048	0.905	103.5L	1.238	Oxbow
W	2585	Sep 10 /18 10:00:04	4	Tran	1.080	1.111	0.683	104.9L	1.222	Oxbow
W	2585	Sep 10 /18 10:00:10	4	Long	0.984	1.159	0.683	101.9L	1.302	Oxbow
W	2585	Sep 10 /18 10:00:16	4	Tran	0.873	0.683	0.683	100.0L	1.032	Oxbow
W	2585	Sep 10 /18 10:00:22	4	Tran	1.080	1.254	0.810	103.5L	1.365	Oxbow
W	2585	Sep 10 /18 10:00:28	4	Tran	0.984	0.841	0.746	100.0L	1.143	Oxbow
W	2585	Sep 10 /18 10:00:34	4	Tran	1.111	0.905	0.810	97.5L	1.175	Oxbow
W	2585	Sep 10 /18 10:00:41	4	Tran	0.794	0.762	0.635	97.5L	1.000	Oxbow
W	2585	Sep 10 /18 10:00:47	4	Tran	0.810	0.572	0.603	97.5L	0.921	Oxbow
W	2585	Sep 10 /18 10:00:53	4	Tran	0.619	0.508	0.445	94.0L	0.762	Oxbow
W	2585	Sep 10 /18 10:00:59	4	Long	0.365	0.508	0.445	<88L	0.603	Oxbow
W	2585	Sep 10 /18 10:01:05	4	Tran	0.572	0.397	0.445	94.0L	0.619	Oxbow
W	2585	Sep 10 /18 10:01:11	4	Tran	0.730	0.397	0.492	<88L	0.778	Oxbow
W	2585	Sep 10 /18 10:01:17	4	Tran	0.397	0.429	0.381	94.0L	0.508	Oxbow
W	2585	Sep 10 /18 10:01:23	4	Tran	0.524	0.381	0.286	94.0L	0.572	Oxbow
W	2585	Sep 10 /18 10:01:30	4	Tran	0.365	0.333	0.270	<88L	0.460	Oxbow
W	2585	Sep 10 /18 10:01:36	4	Tran	0.159	0.143	0.175	<88L	0.206	Oxbow
W	2585	Sep 10 /18 14:25:04	4	Tran	0.191	0.127	0.143	<88L	0.222	Oxbow
W	2585	Sep 10 /18 14:25:10	4	Vert	0.317	0.206	0.238	97.5L	0.365	Oxbow
W	2585	Sep 10 /18 14:25:16	4	Vert	0.540	0.540	0.587	108.8L	0.762	Oxbow
W	2585	Sep 10 /18 14:25:22	4	Tran	0.953	0.857	0.746	108.0L	1.032	Oxbow
W	2585	Sep 10 /18 14:25:29	4	Tran	0.826	0.794	0.587	100.0L	0.921	Oxbow
W	2585	Sep 10 /18 14:25:35	4	Tran	0.826	0.730	0.572	100.0L	0.984	Oxbow
W	2585	Sep 10 /18 14:25:41	4	Tran	0.746	0.794	0.476	100.0L	0.857	Oxbow
W	2585	Sep 10 /18 14:25:47	4	Tran	0.746	0.841	0.476	103.5L	0.889	Oxbow
W	2585	Sep 10 /18 14:25:53	4	Tran	0.651	0.889	0.524	103.5L	0.937	Oxbow
W	2585	Sep 10 /18 14:25:59	4	Tran	0.683	0.778	0.667	101.9L	0.810	Oxbow
W	2585	Sep 10 /18 14:26:05	4	Vert	0.667	0.762	0.619	100.0L	0.889	Oxbow
W	2585	Sep 10 /18 14:26:11	4	Tran	0.984	0.873	0.873	104.9L	1.064	Oxbow
W	2585	Sep 10 /18 14:26:17	4	Vert	0.810	0.826	0.540	97.5L	0.937	Oxbow
W	2585	Sep 10 /18 14:26:24	4	Tran	1.048	0.667	0.445	97.5L	1.143	Oxbow
W	2585	Sep 10 /18 14:26:30	4	Tran	0.873	0.524	0.476	100.0L	0.953	Oxbow
W	2585	Sep 10 /18 14:26:36	4	Tran	0.889	0.587	0.603	100.0L	0.968	Oxbow
W	2585	Sep 10 /18 14:26:42	4	Tran	0.476	0.445	0.413	100.0L	0.556	Oxbow
W	2585	Sep 10 /18 14:26:48	4	Vert	0.651	0.778	0.603	104.9L	0.857	Oxbow
W	2585	Sep 10 /18 14:26:54	4	Vert	0.683	0.667	0.540	101.9L	0.810	Oxbow
W	2585	Sep 10 /18 14:27:00	4	Vert	0.746	0.826	0.794	97.5L	0.905	Oxbow
W	2585	Sep 10 /18 14:27:06	4	Vert	0.524	0.492	0.572	97.5L	0.651	Oxbow
W	2585	Sep 10 /18 14:27:12	4	Tran	0.476	0.397	0.381	97.5L	0.492	Oxbow
W	2585	Sep 10 /18 14:27:19	4	Tran	0.492	0.619	0.381	97.5L	0.683	Oxbow
W	2585	Sep 10 /18 14:27:26	4	Tran	0.159	0.111	0.191	<88L	0.206	Oxbow

Date/Time Manual at 14:58:22 September 6, 2018
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.4 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HKUM.XA0

Notes

Location: Oxbow
 Client: Development ENG
 User Name: development eng
 Converted: September 13, 2018 10:31:15 (V 10.74)

Microphone Linear Weighting

PSPL <88 dB(L)

ZC Freq N/A

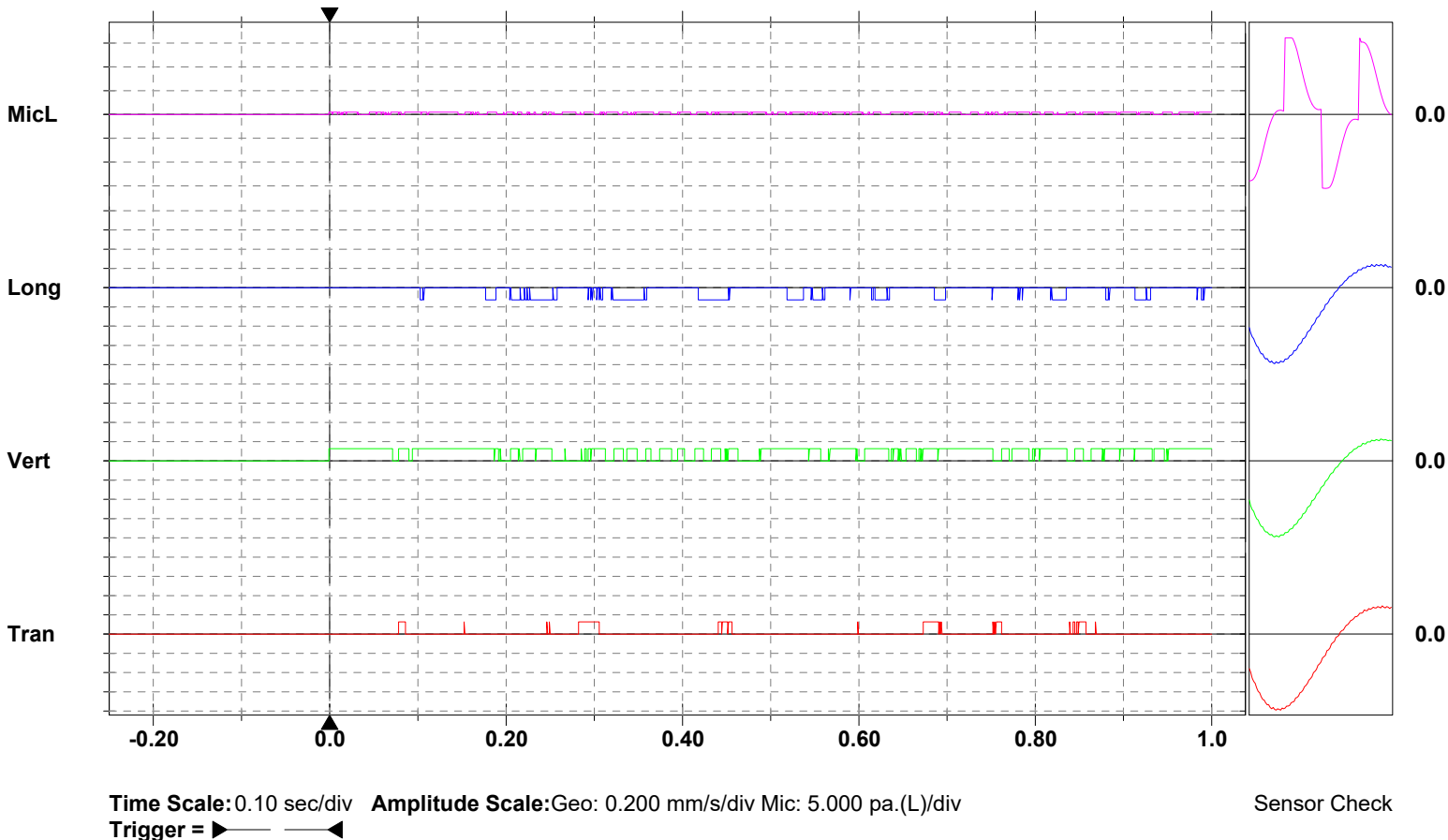
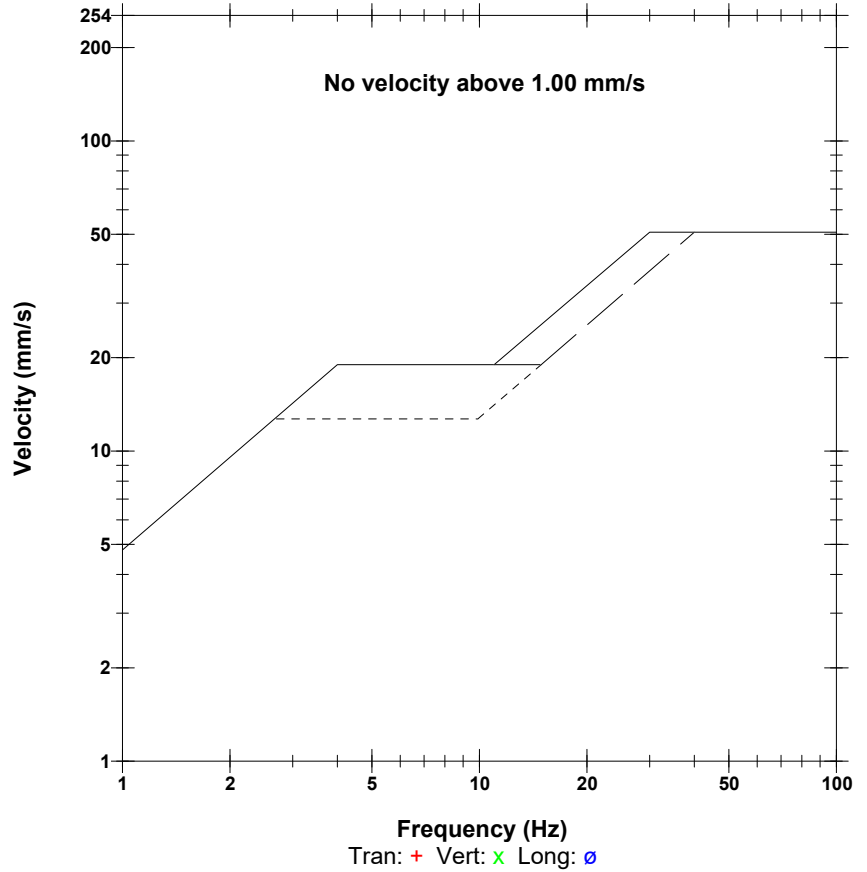
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

	Tran	Vert	Long	
PPV	0.127	0.127	0.127	mm/s
ZC Freq	N/A	N/A	N/A	Hz
Time (Rel. to Trig)	0.079	0.000	0.104	sec
Peak Acceleration	0.013	0.013	0.013	g
Peak Displacement	0.000	0.000	0.000	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.1	7.8	8.1	Hz
Overswing Ratio	3.0	3.5	3.5	

Peak Vector Sum 0.222 mm/s at 0.247 sec

N/A: Not Applicable

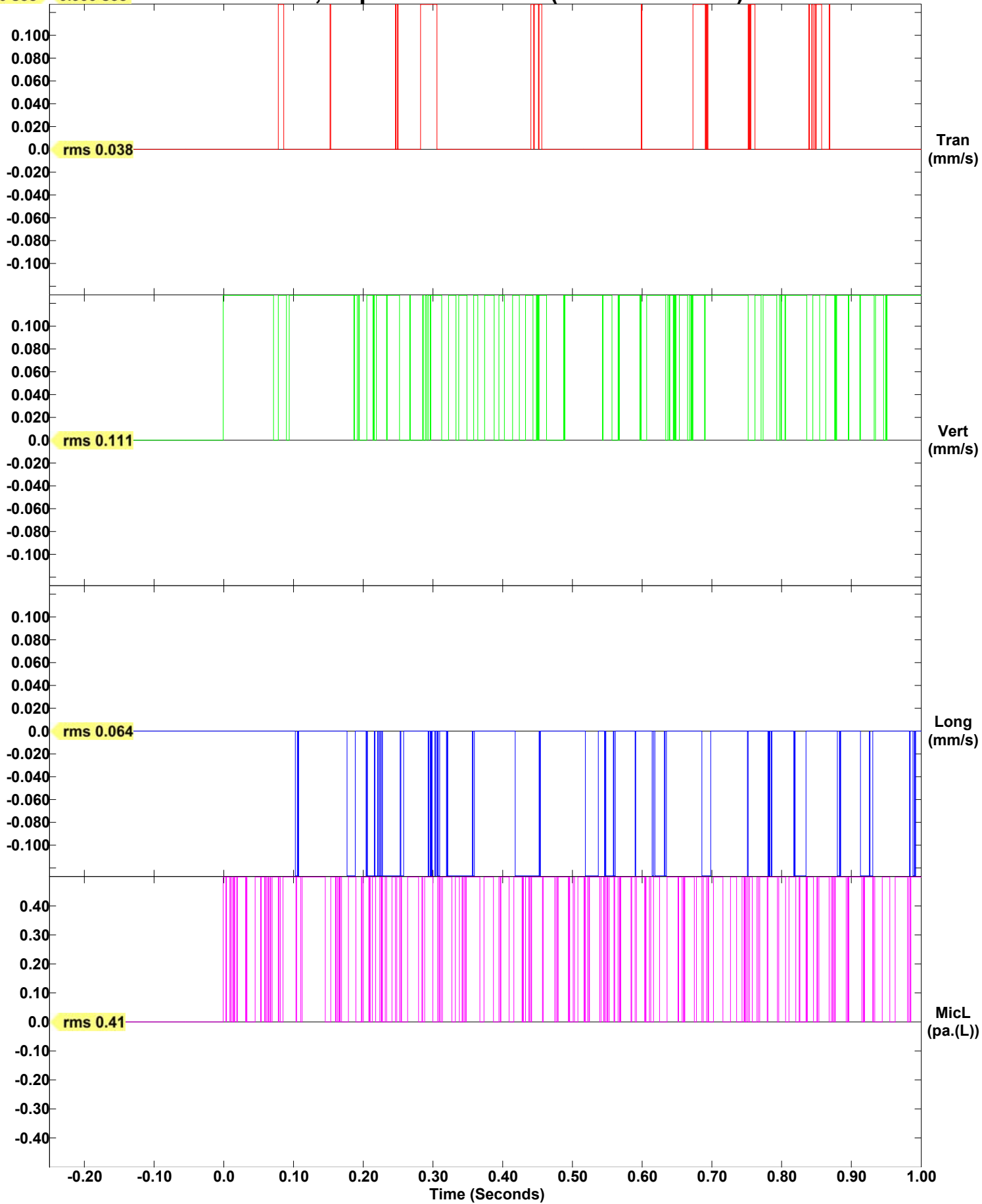
USBM RI8507 And OSMRE



2585, Sep 6 /18 14:58:22 (d585hkum.xa0)

0.0 sec

0.999 sec



Date/Time Tran at 09:59:33 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL1N.R90

Notes

Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:15 (V 10.74)

Microphone Linear Weighting

PSPL <88 dB(L)

ZC Freq N/A

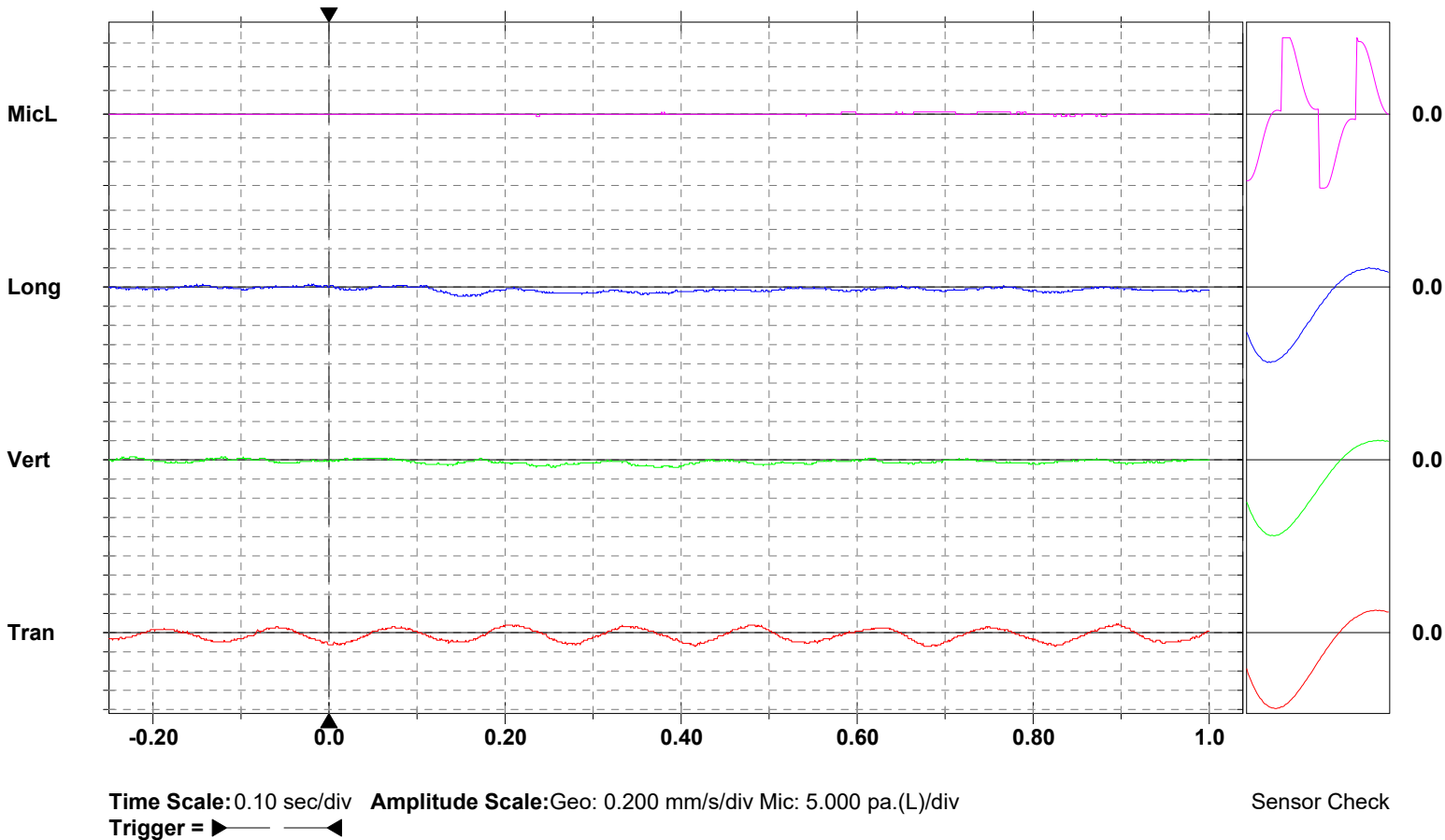
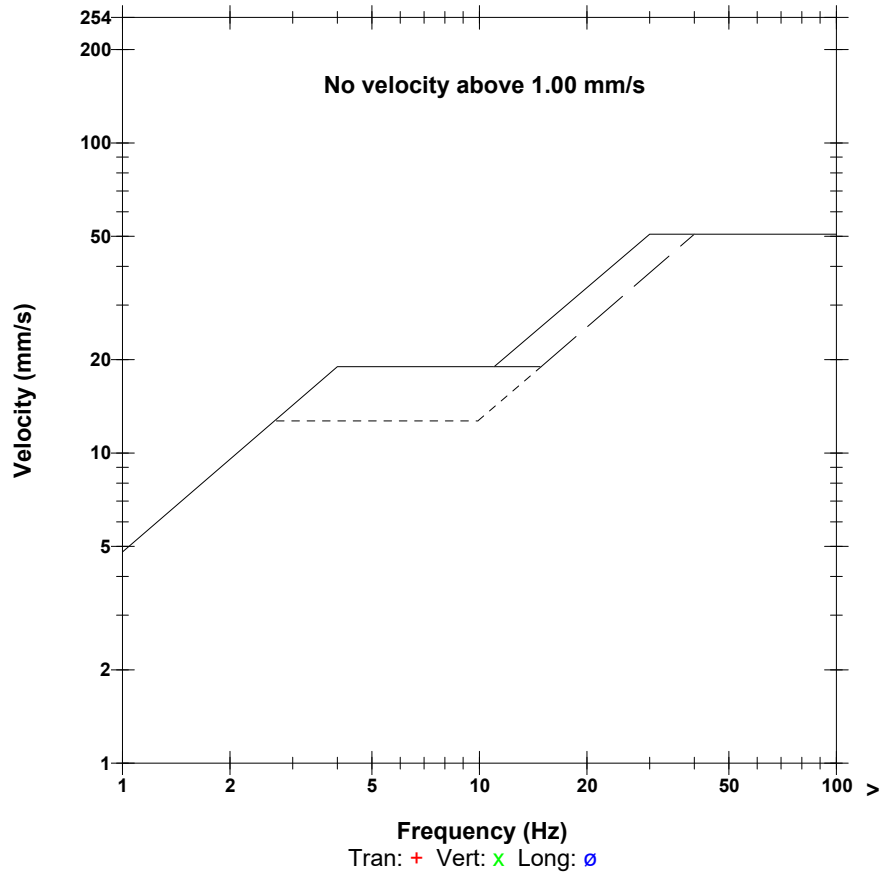
Channel Test Passed (Freq = 20.0 Hz Amp = 505 mv)

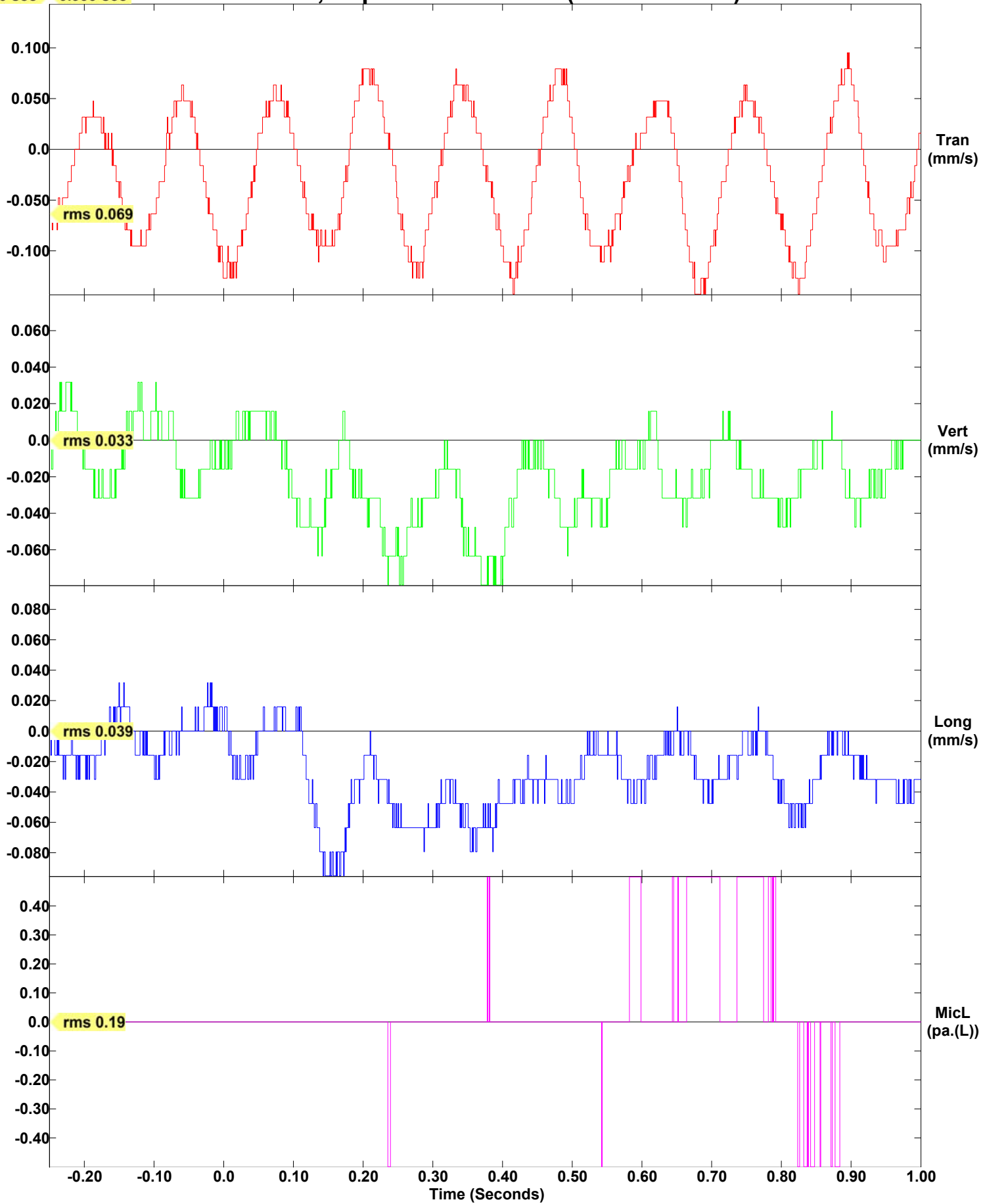
	Tran	Vert	Long	
PPV	0.143	0.079	0.095	mm/s
ZC Freq	7.0	5.0	6.0	Hz
Time (Rel. to Trig)	0.416	0.236	0.144	sec
Peak Acceleration	0.003	0.003	0.003	g
Peak Displacement	0.003	0.002	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.3	3.8	3.6	

Peak Vector Sum 0.159 mm/s at 0.825 sec

N/A: Not Applicable

USBM RI8507 And OSMRE





Date/Time Tran at 09:59:39 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL1N.RF0

Notes

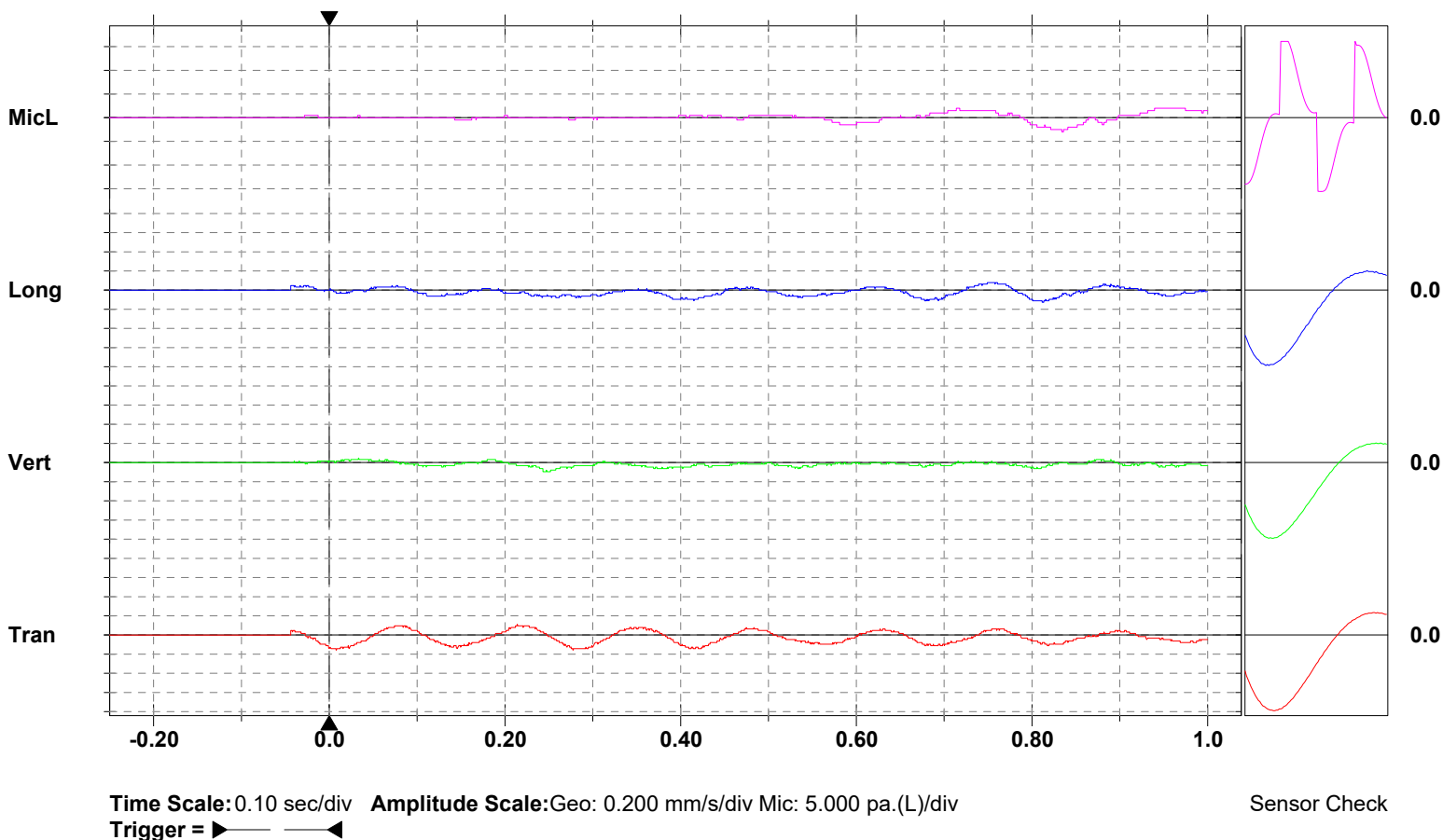
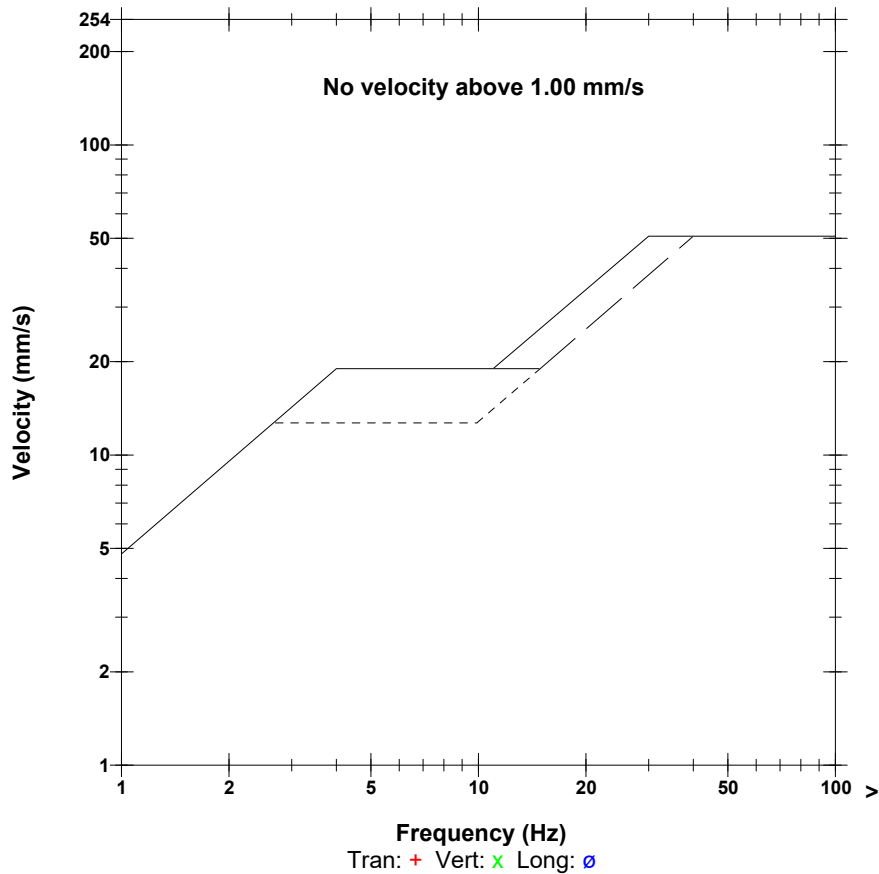
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:15 (V 10.74)

Microphone Linear Weighting
PSPL 103.5 dB(L) at 0.835 sec
ZC Freq 7.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 505 mv)

	Tran	Vert	Long	
PPV	0.159	0.095	0.127	mm/s
ZC Freq	7.0	6.0	8.0	Hz
Time (Rel. to Trig)	0.009	0.244	0.813	sec
Peak Acceleration	0.003	0.003	0.003	g
Peak Displacement	0.003	0.001	0.002	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.3	3.8	3.6	

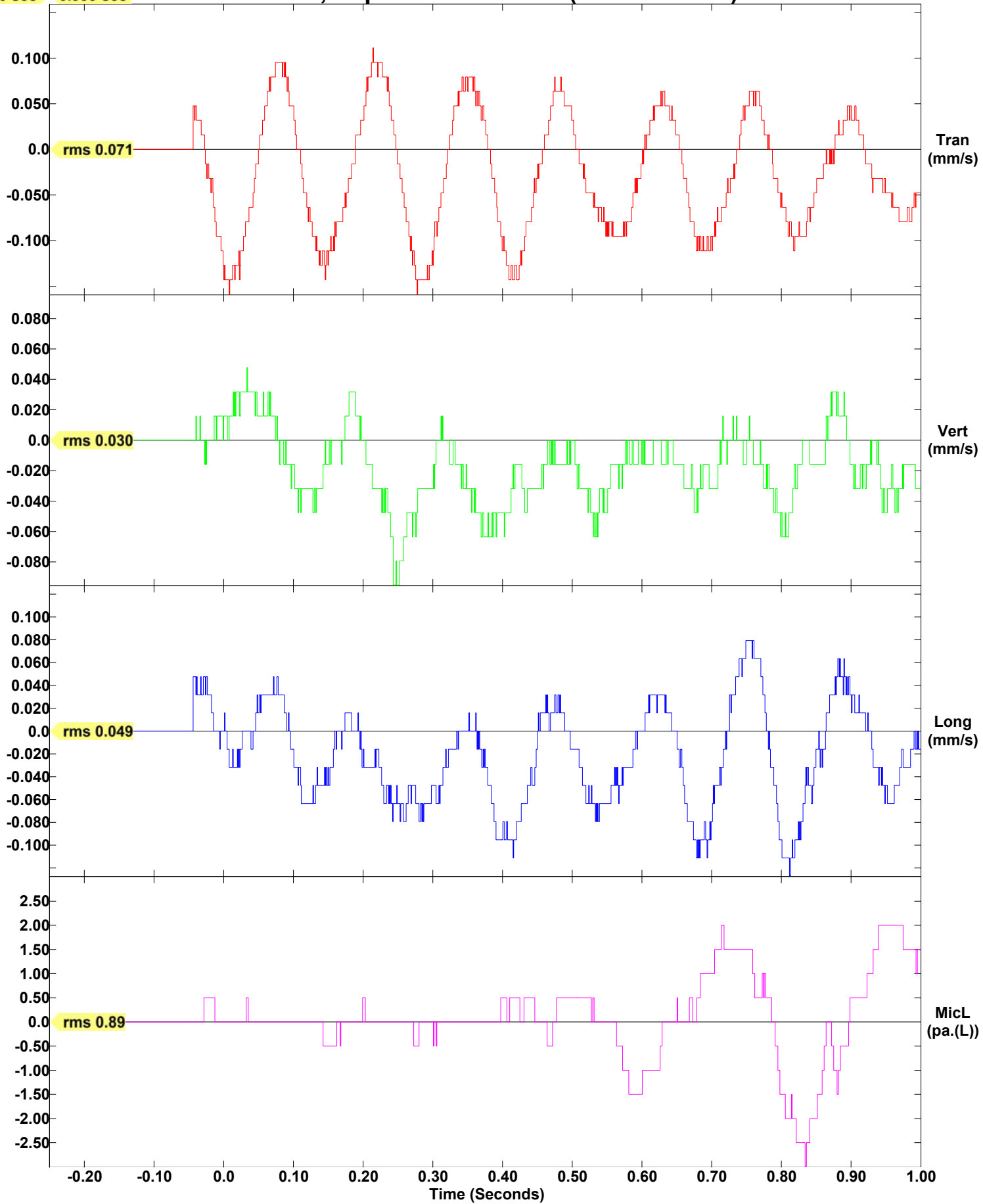
Peak Vector Sum 0.175 mm/s at 0.416 sec

USBM RI8507 And OSMRE



0.0 sec 0.999 sec

2585, Sep 10 /18 09:59:39 (d585hl1n.rf0)



Date/Time Tran at 09:59:45 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL1N.RL0

Notes

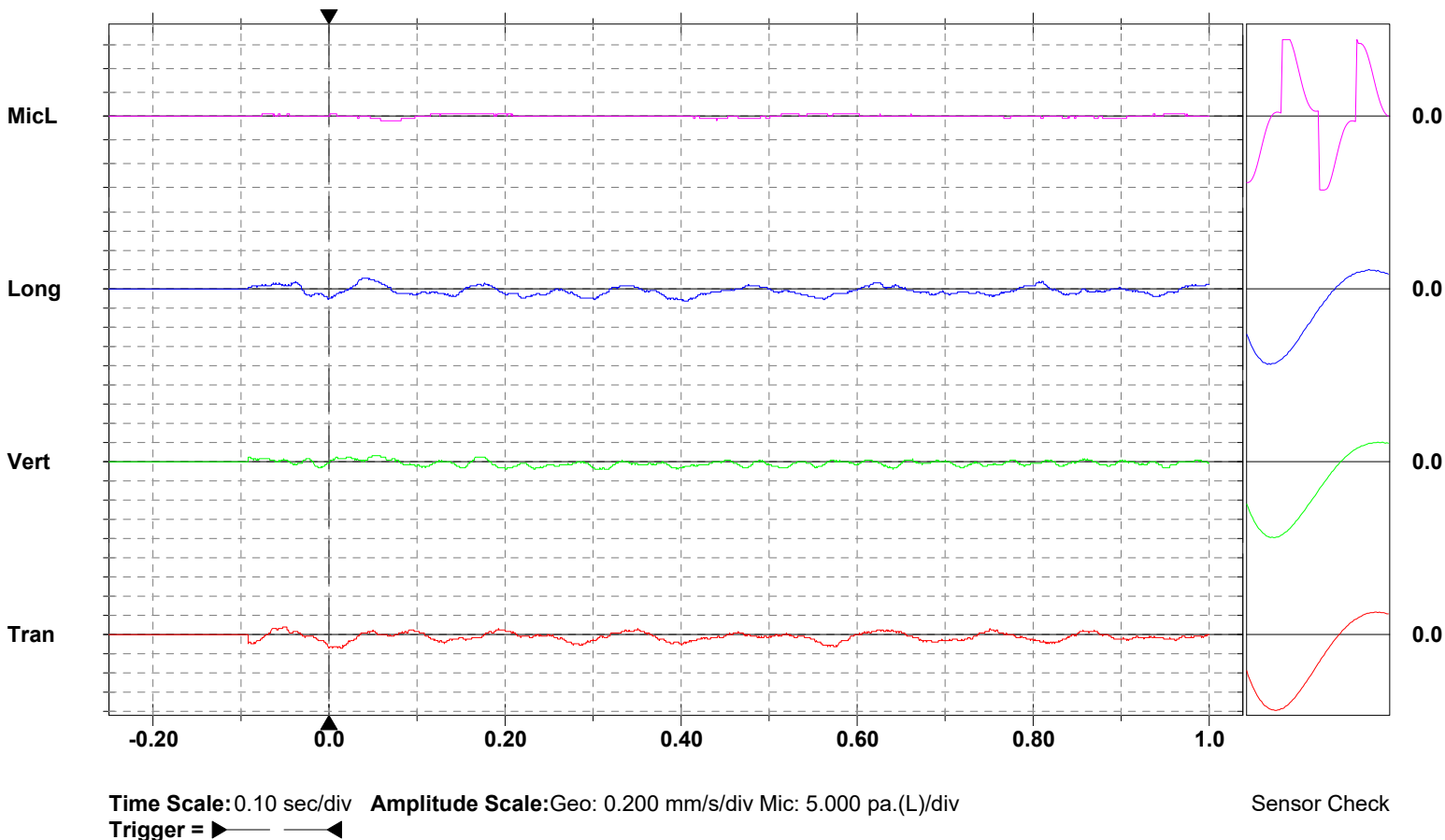
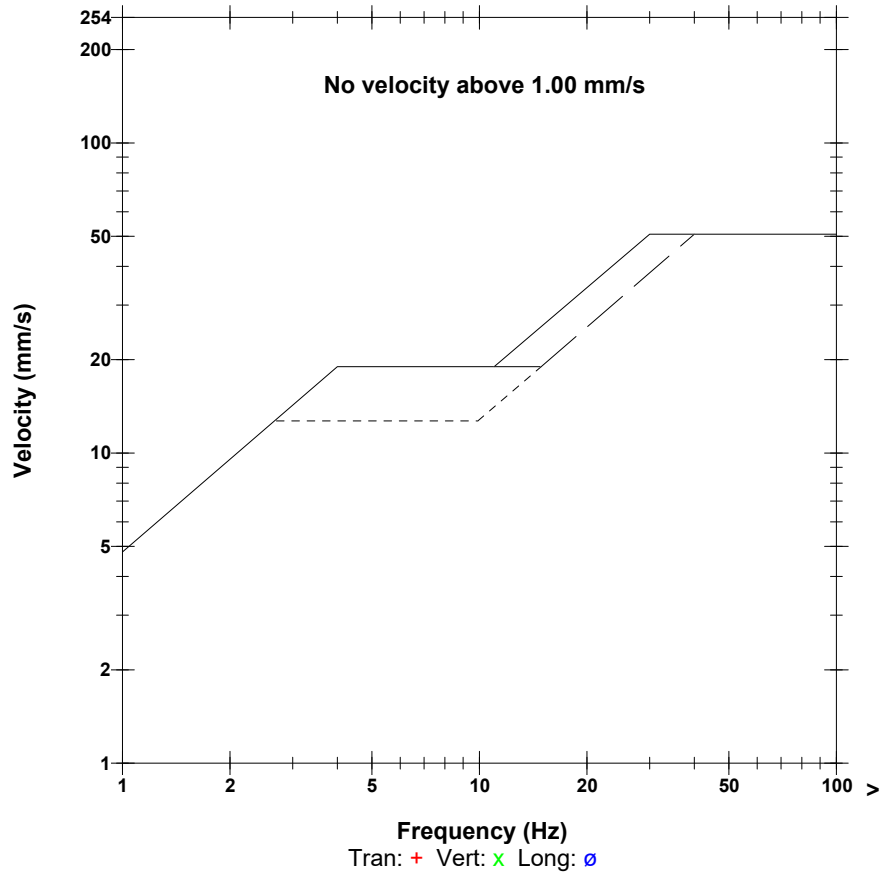
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:15 (V 10.74)

Microphone Linear Weighting
PSPL 94.0 dB(L) at 0.060 sec
ZC Freq 20 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 505 mv)

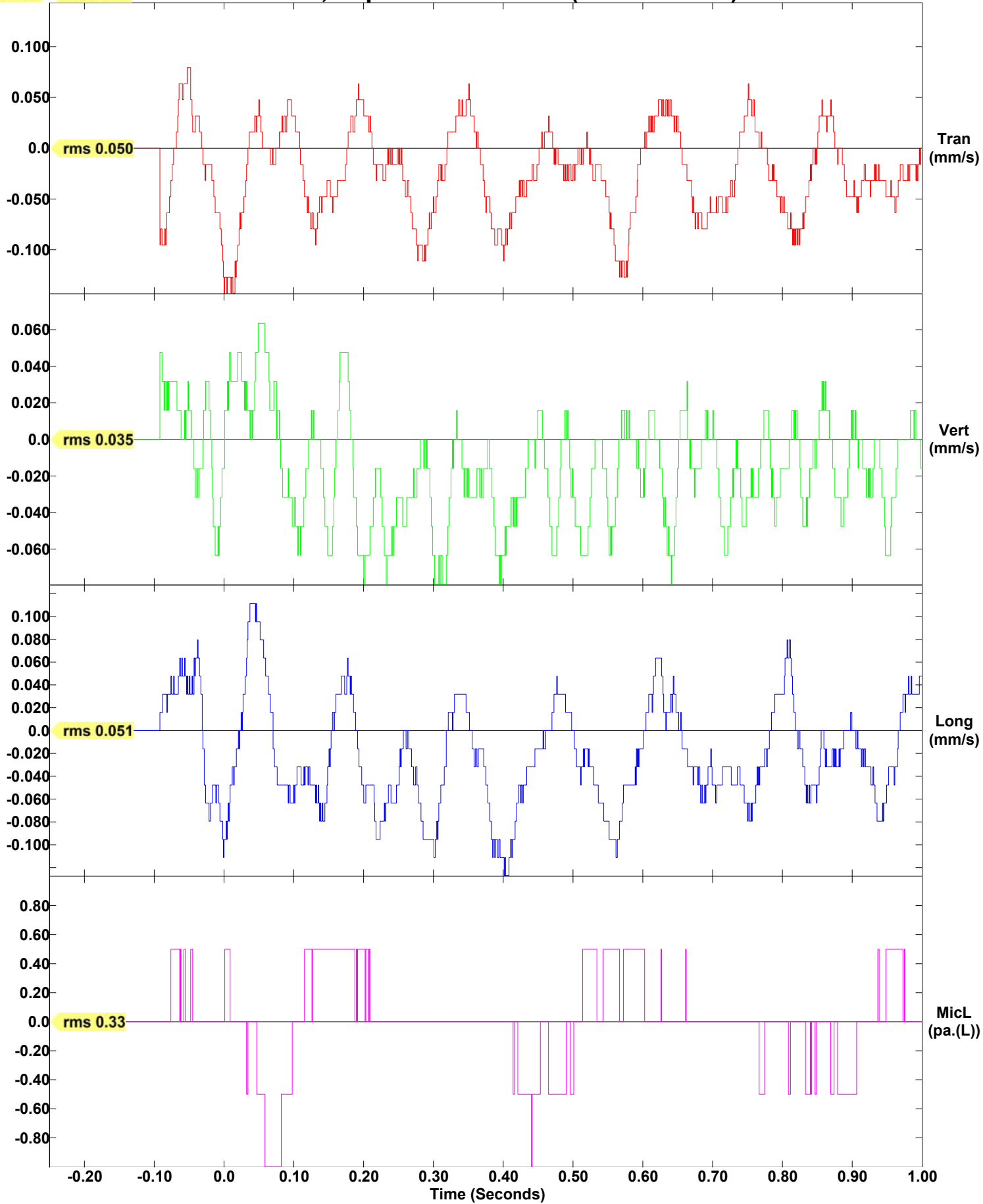
	Tran	Vert	Long	
PPV	0.143	0.079	0.127	mm/s
ZC Freq	10	16	7.0	Hz
Time (Rel. to Trig)	0.016	0.201	0.402	sec
Peak Acceleration	0.003	0.003	0.003	g
Peak Displacement	0.002	0.001	0.002	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.3	3.8	3.6	

Peak Vector Sum 0.175 mm/s at 0.001 sec

USBM RI8507 And OSMRE



0.0 sec 0.999 sec



Date/Time Long at 09:59:51 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL1N.RR0

Notes

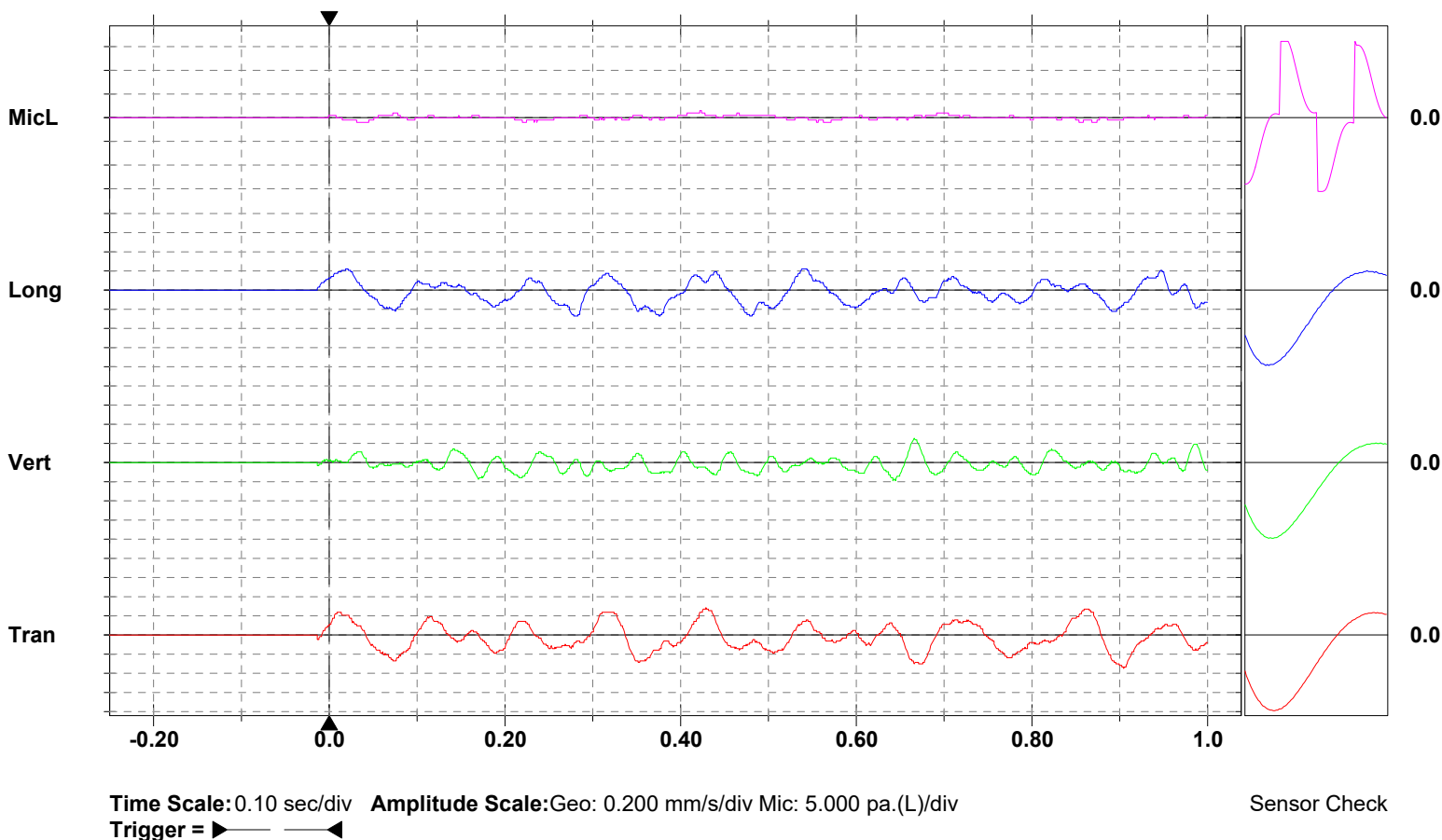
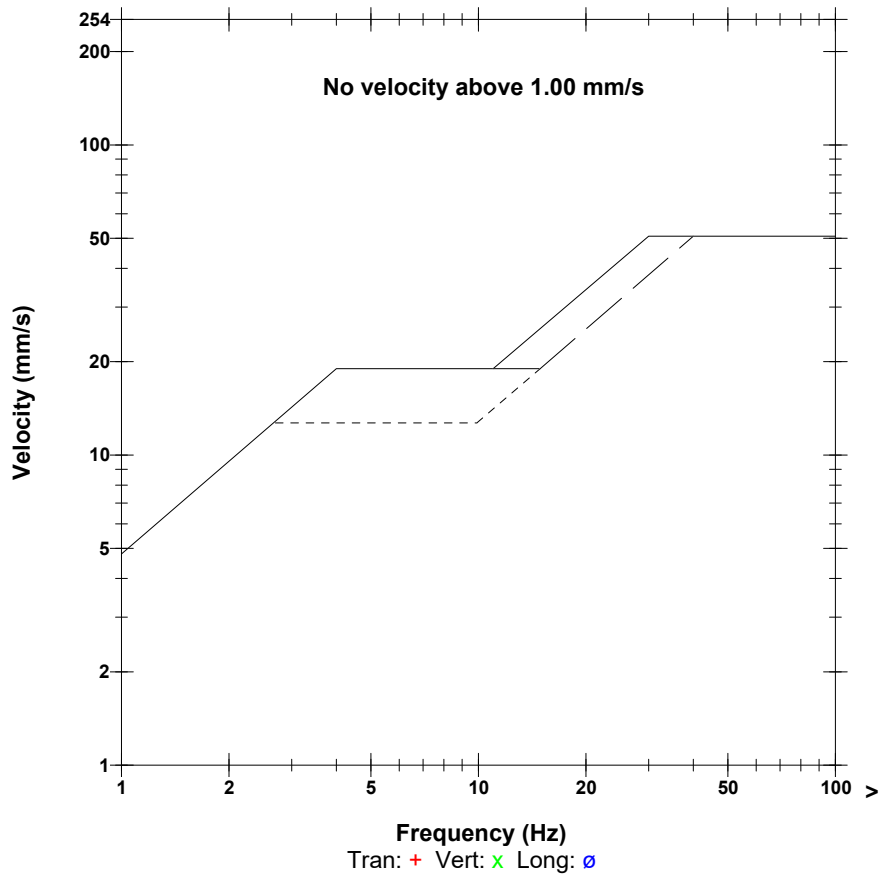
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:15 (V 10.74)

Microphone Linear Weighting
PSPL 97.5 dB(L) at 0.423 sec
ZC Freq 23 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 505 mv)

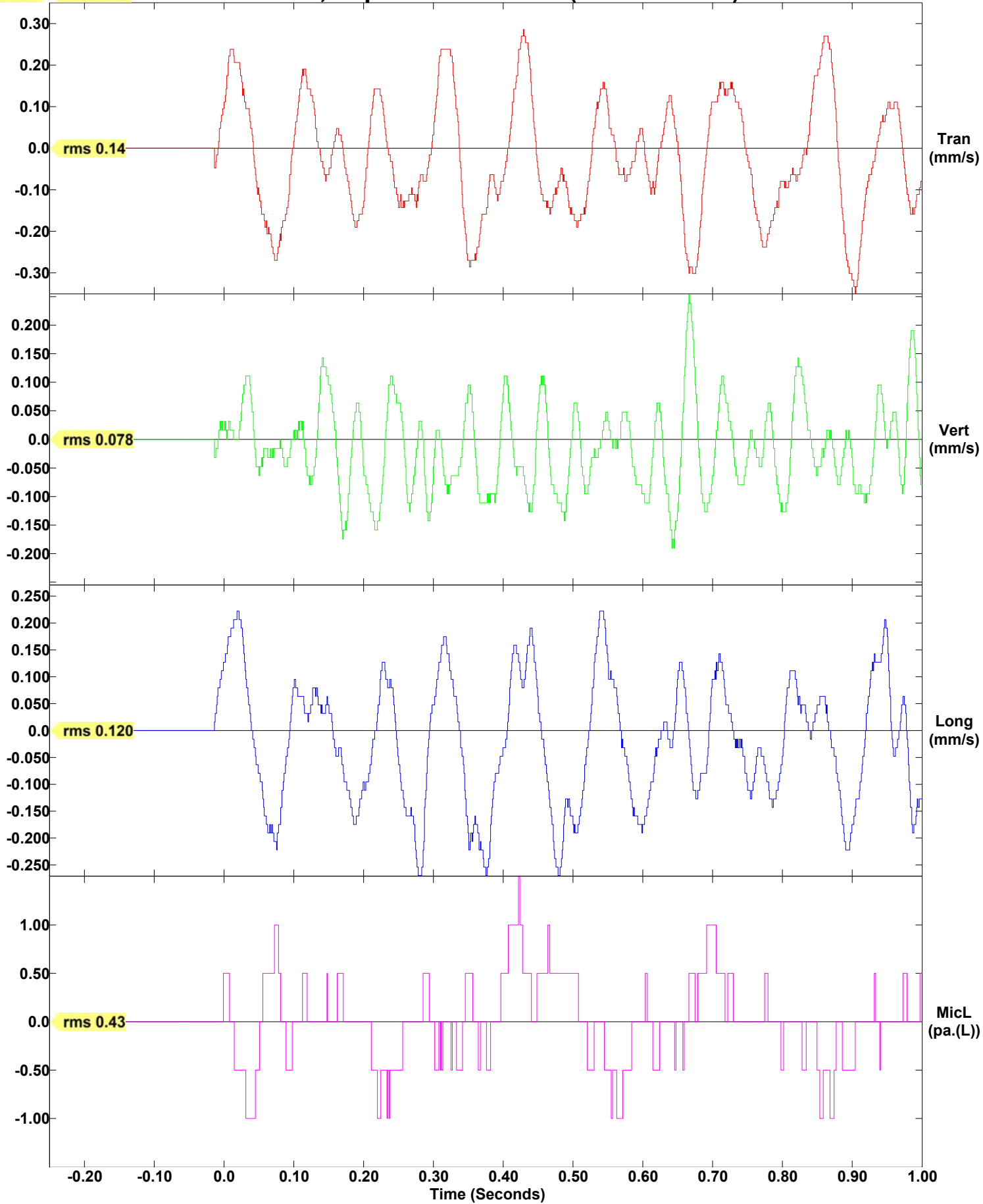
	Tran	Vert	Long	
PPV	0.349	0.254	0.270	mm/s
ZC Freq	9.0	21	11	Hz
Time (Rel. to Trig)	0.905	0.667	0.279	sec
Peak Acceleration	0.005	0.005	0.007	g
Peak Displacement	0.005	0.002	0.005	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.3	3.8	3.6	

Peak Vector Sum 0.397 mm/s at 0.667 sec

USBM RI8507 And OSMRE



0.0 sec 0.999 sec



Date/Time Vert at 09:59:58 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL1N.RY0

Notes

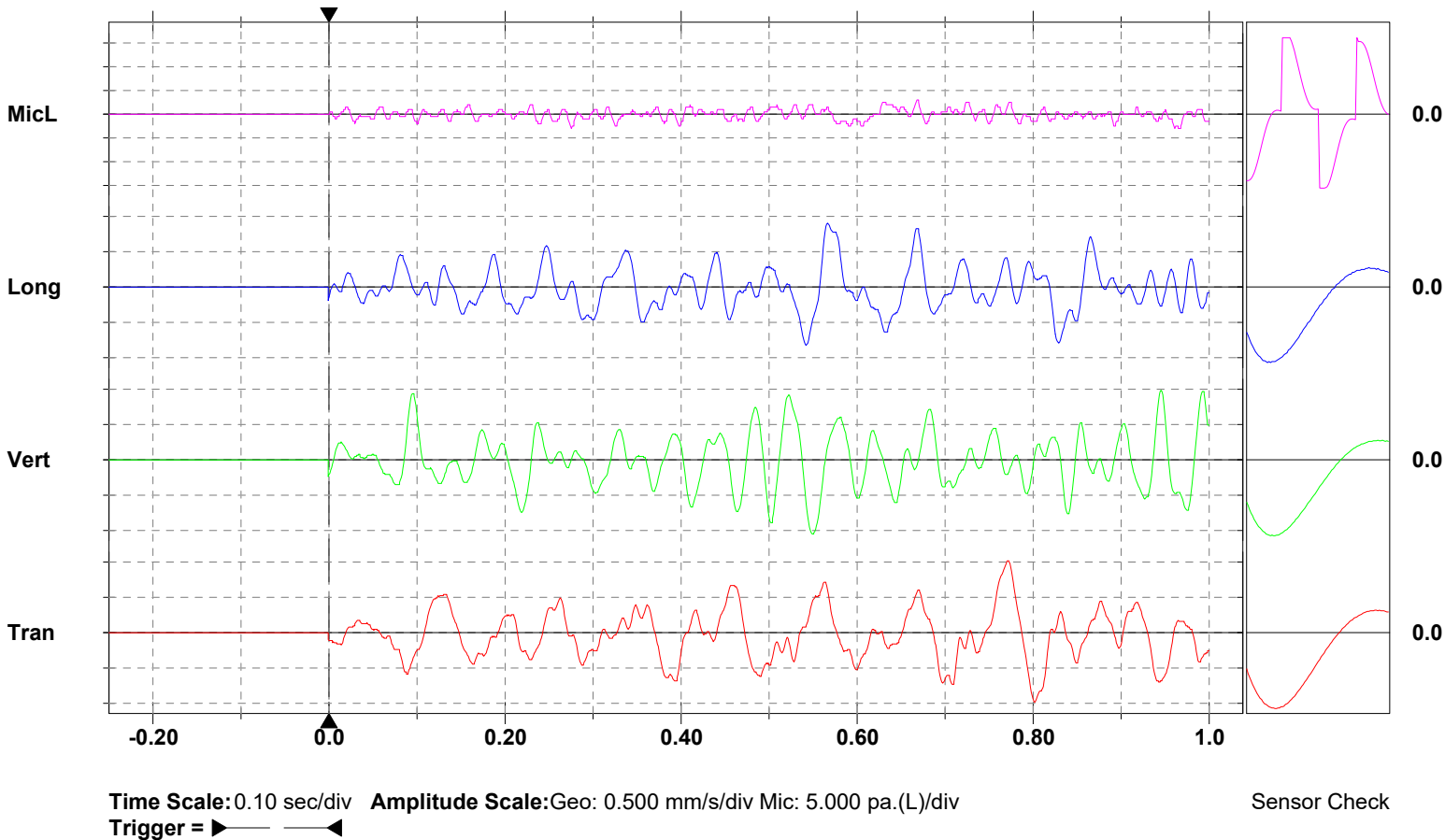
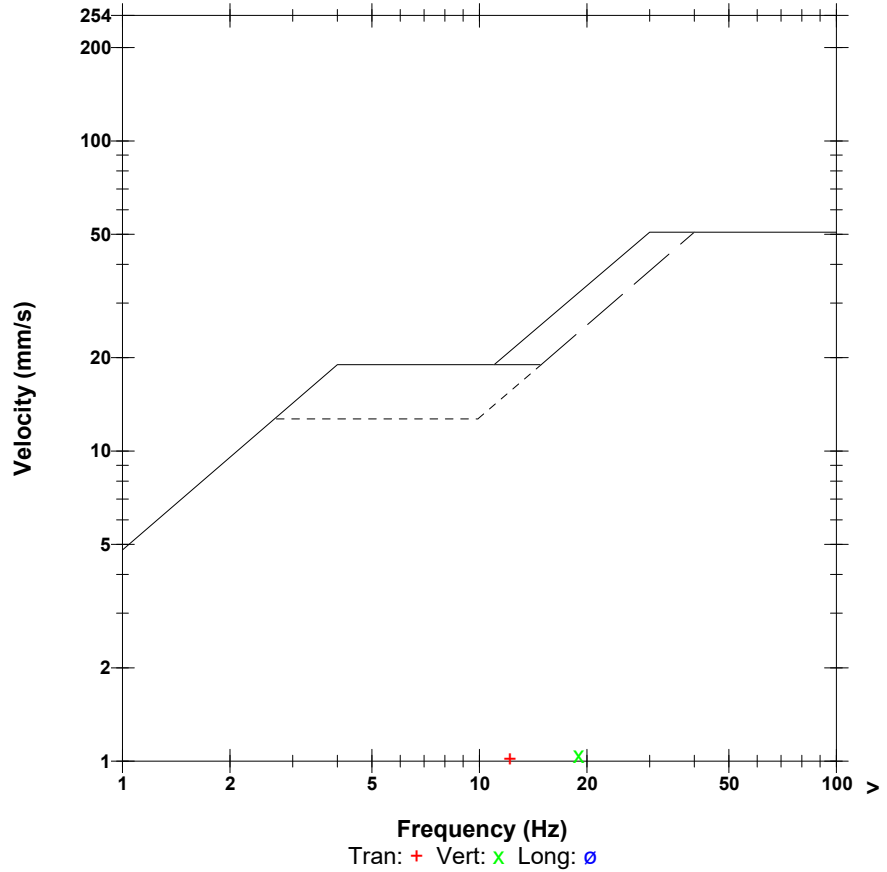
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:15 (V 10.74)

Microphone Linear Weighting
PSPL 103.5 dB(L) at 0.276 sec
ZC Freq 64 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 505 mv)

	Tran	Vert	Long	
PPV	1.016	1.048	0.905	mm/s
ZC Freq	12	19	18	Hz
Time (Rel. to Trig)	0.771	0.550	0.567	sec
Peak Acceleration	0.013	0.017	0.015	g
Peak Displacement	0.011	0.009	0.008	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.3	3.8	3.6	

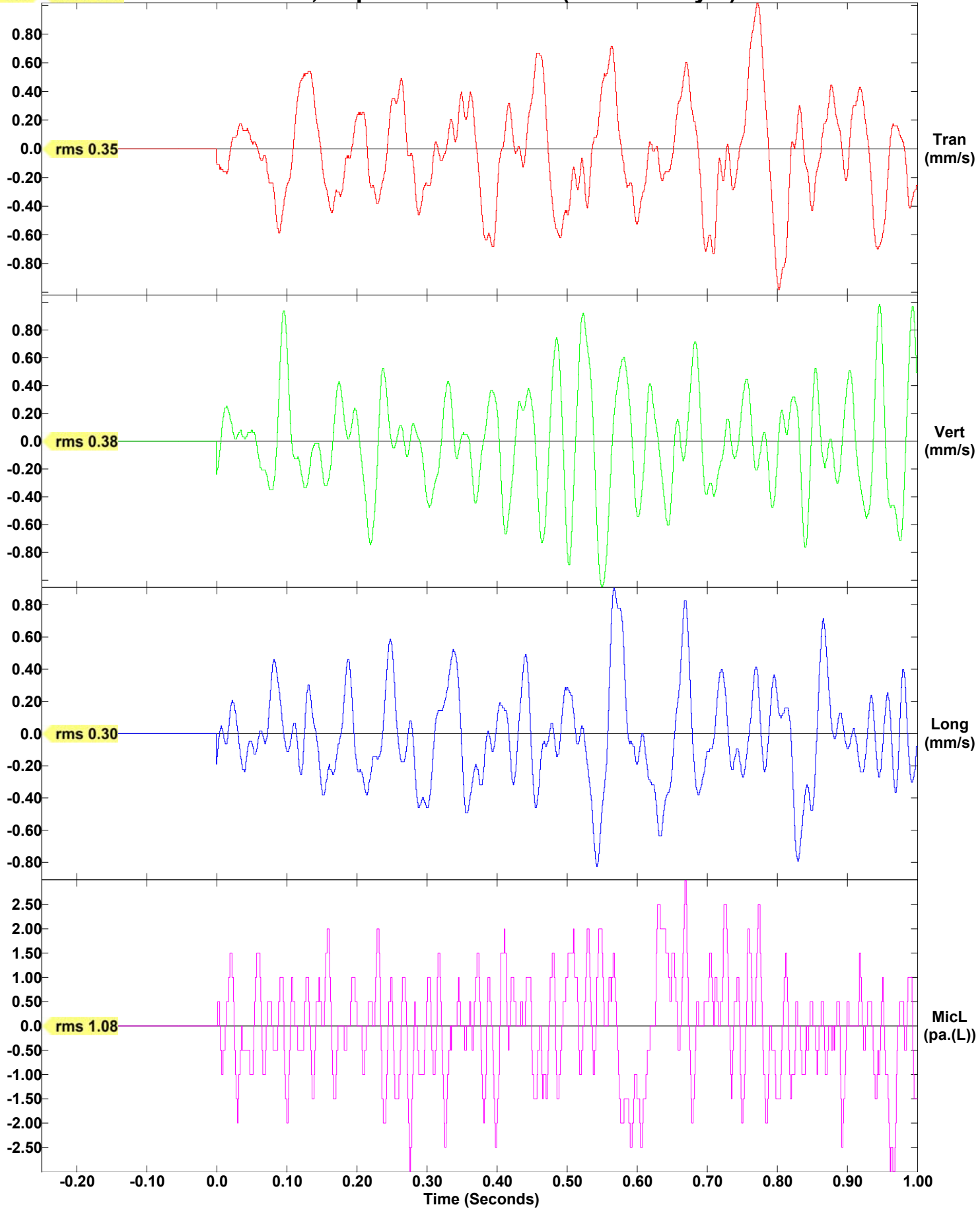
Peak Vector Sum 1.238 mm/s at 0.550 sec

USBM RI8507 And OSMRE



0.0 sec

0.999 sec



Date/Time Tran at 10:00:04 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL1N.S40

Notes

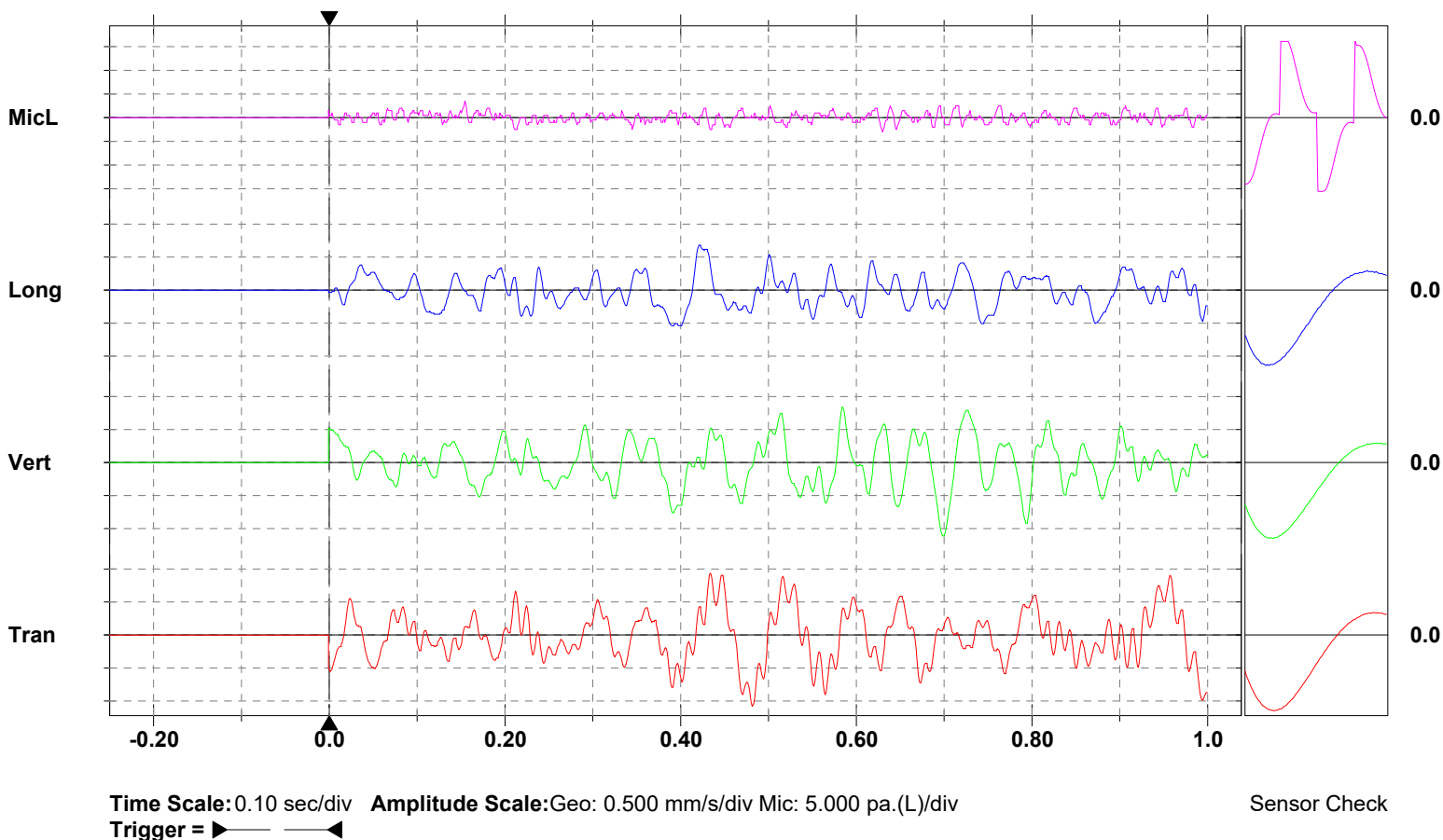
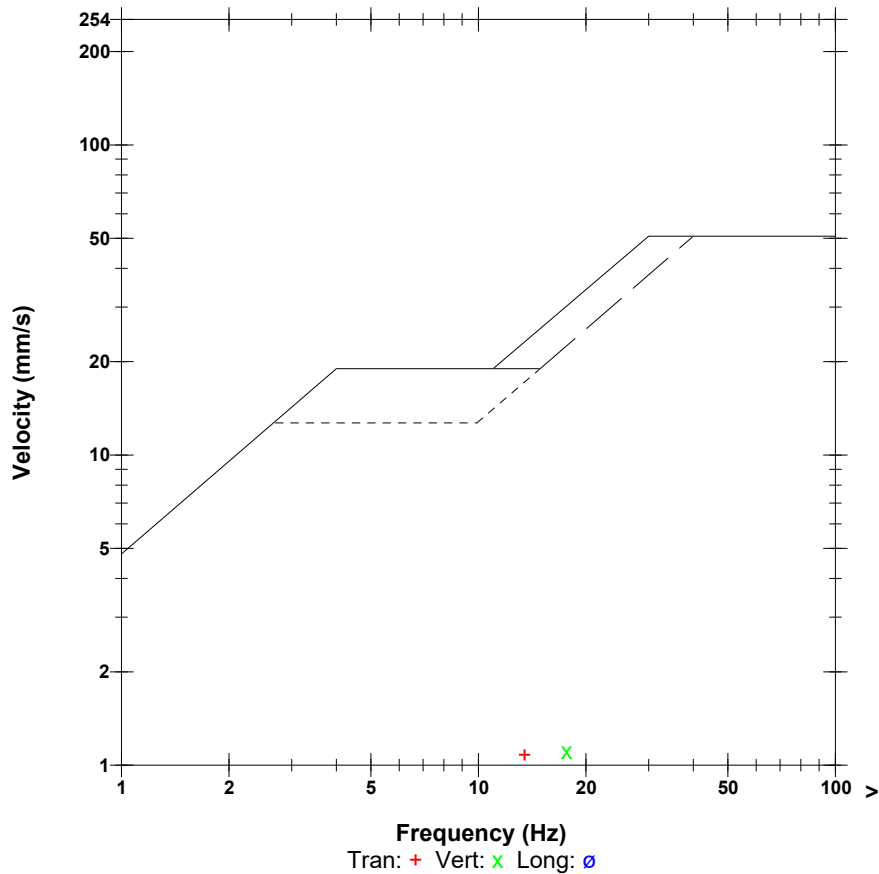
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:15 (V 10.74)

Microphone Linear Weighting
PSPL 104.9 dB(L) at 0.155 sec
ZC Freq 51 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 505 mv)

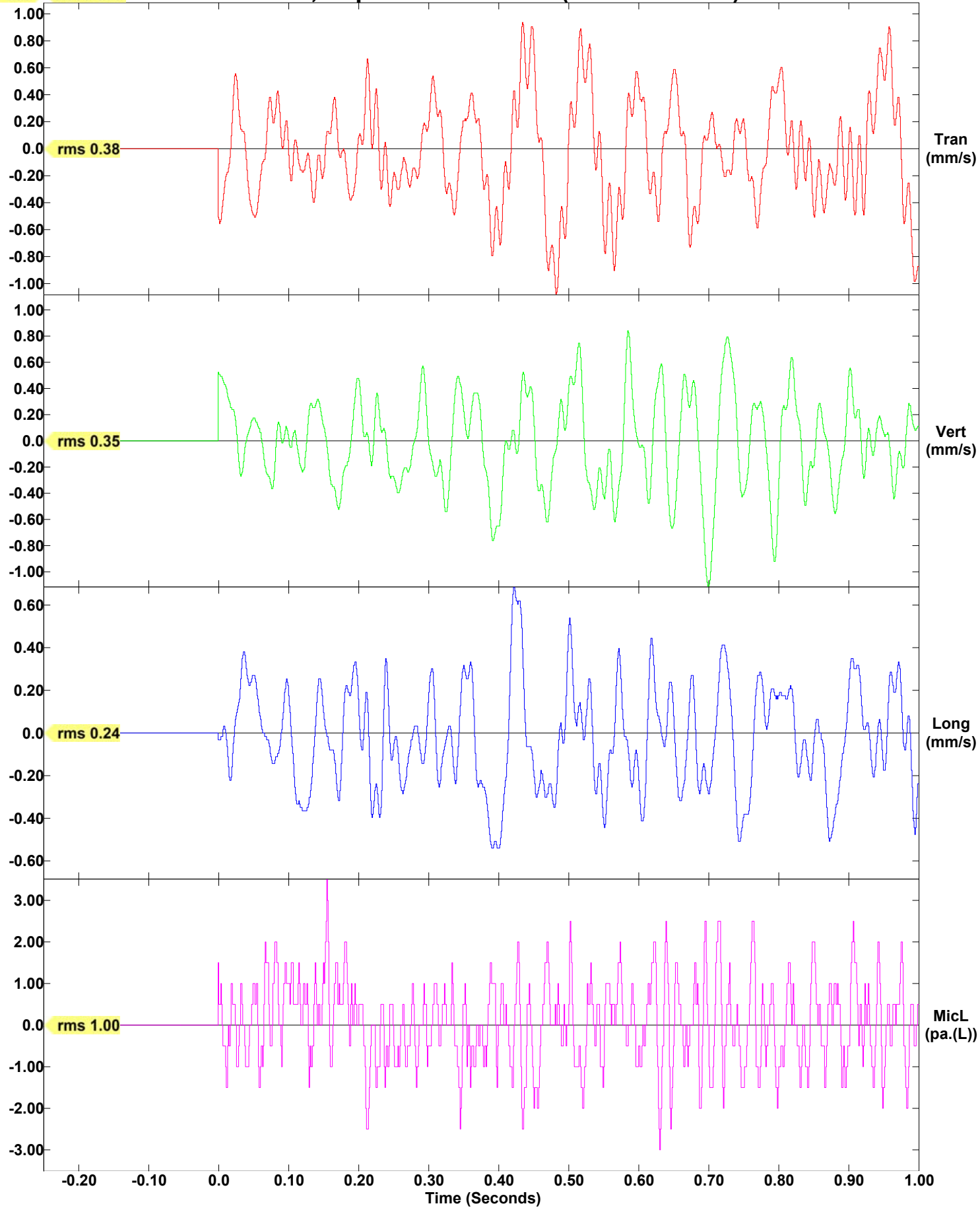
	Tran	Vert	Long	
PPV	1.080	1.111	0.683	mm/s
ZC Freq	14	18	20	Hz
Time (Rel. to Trig)	0.482	0.699	0.422	sec
Peak Acceleration	0.030	0.017	0.015	g
Peak Displacement	0.012	0.009	0.008	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.3	3.8	3.6	

Peak Vector Sum 1.222 mm/s at 0.392 sec

USBM RI8507 And OSMRE



0.0 sec 0.999 sec



Date/Time Long at 10:00:10 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL1N.SA0

Notes

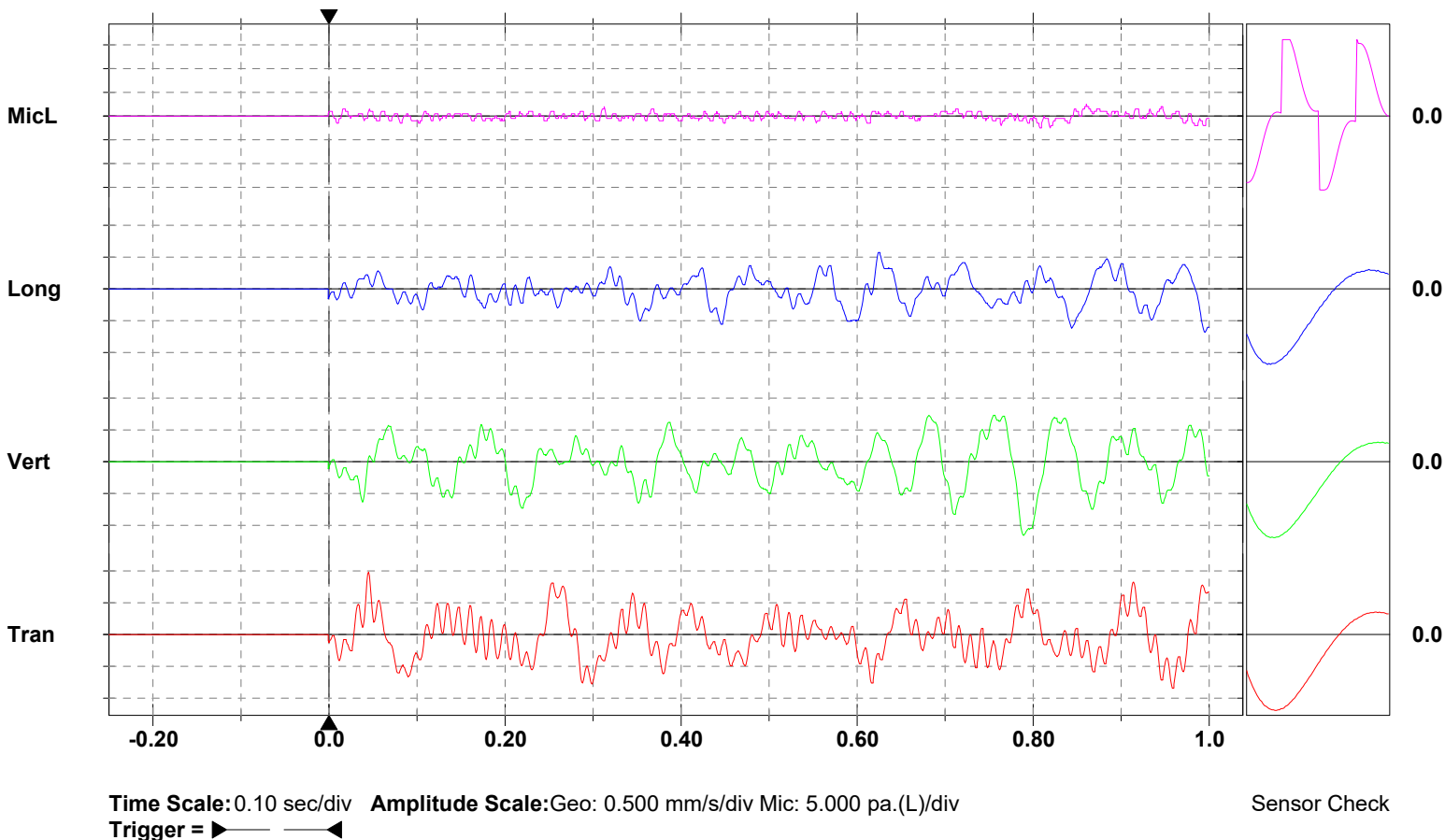
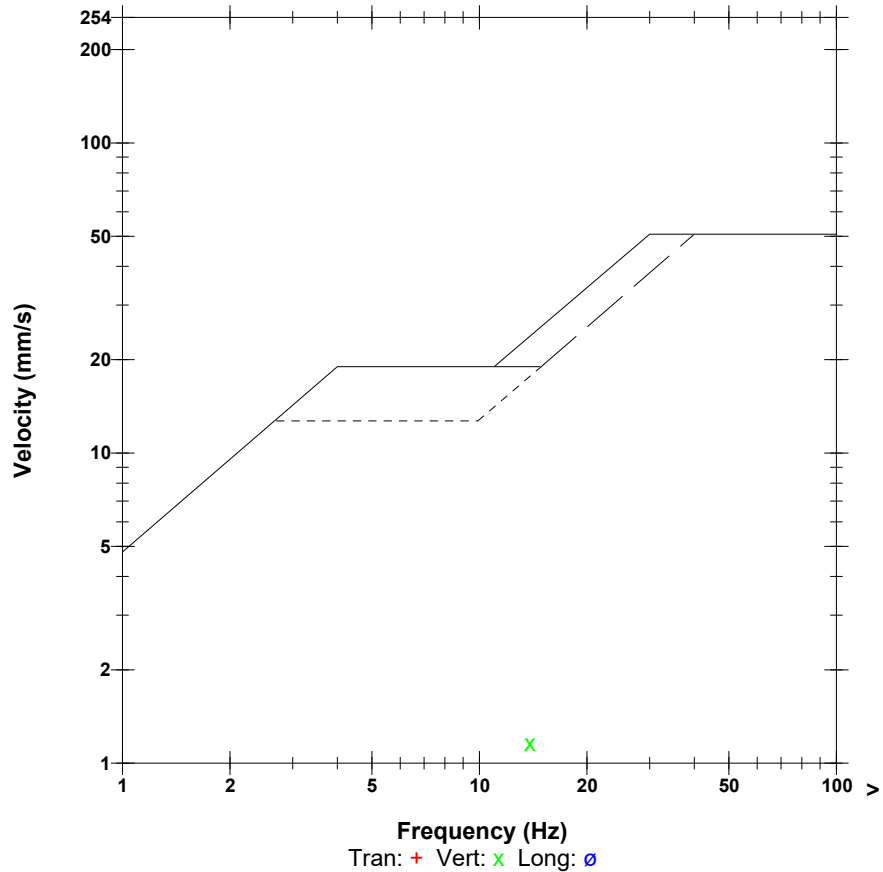
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:15 (V 10.74)

Microphone Linear Weighting
PSPL 101.9 dB(L) at 0.809 sec
ZC Freq 64 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 505 mv)

	Tran	Vert	Long	
PPV	0.984	1.159	0.683	mm/s
ZC Freq	14	14	32	Hz
Time (Rel. to Trig)	0.046	0.790	0.996	sec
Peak Acceleration	0.022	0.015	0.013	g
Peak Displacement	0.009	0.013	0.006	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.3	3.8	3.6	

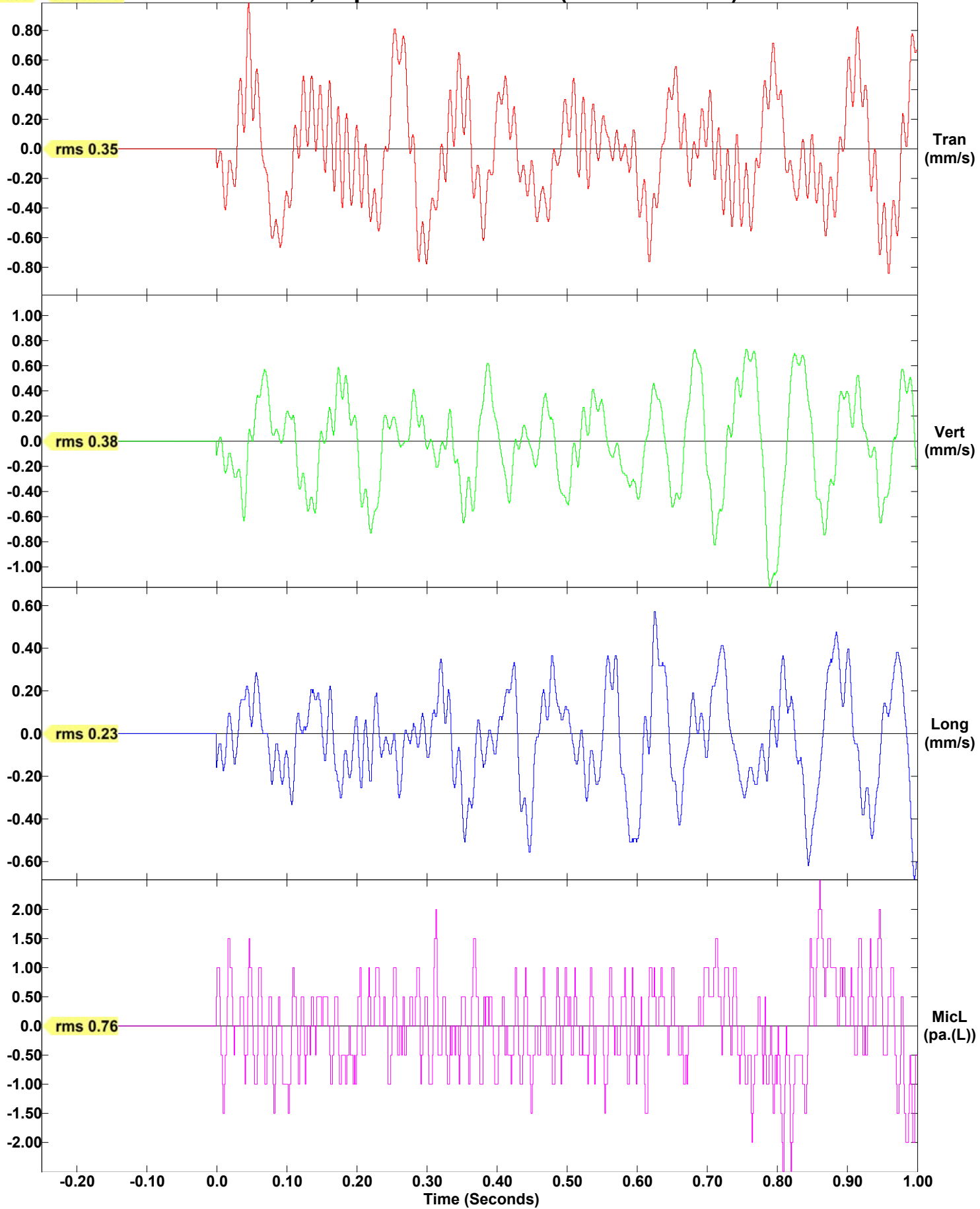
Peak Vector Sum 1.302 mm/s at 0.794 sec

USBM RI8507 And OSMRE



0.0 sec 0.999 sec

2585, Sep 10 /18 10:00:10 (d585hl1n.sa0)



Date/Time Tran at 10:00:16 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL1N.SG0

Notes

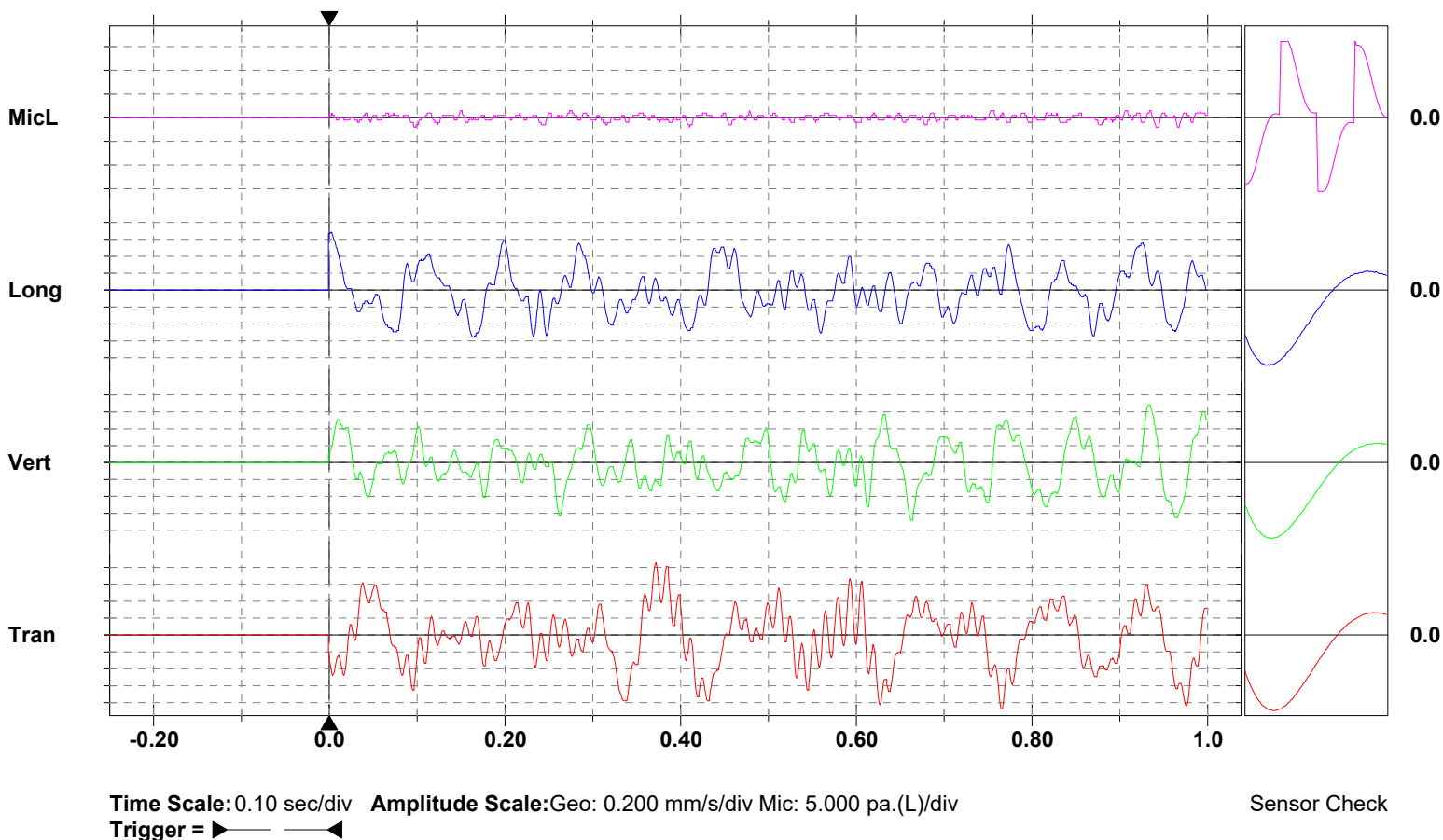
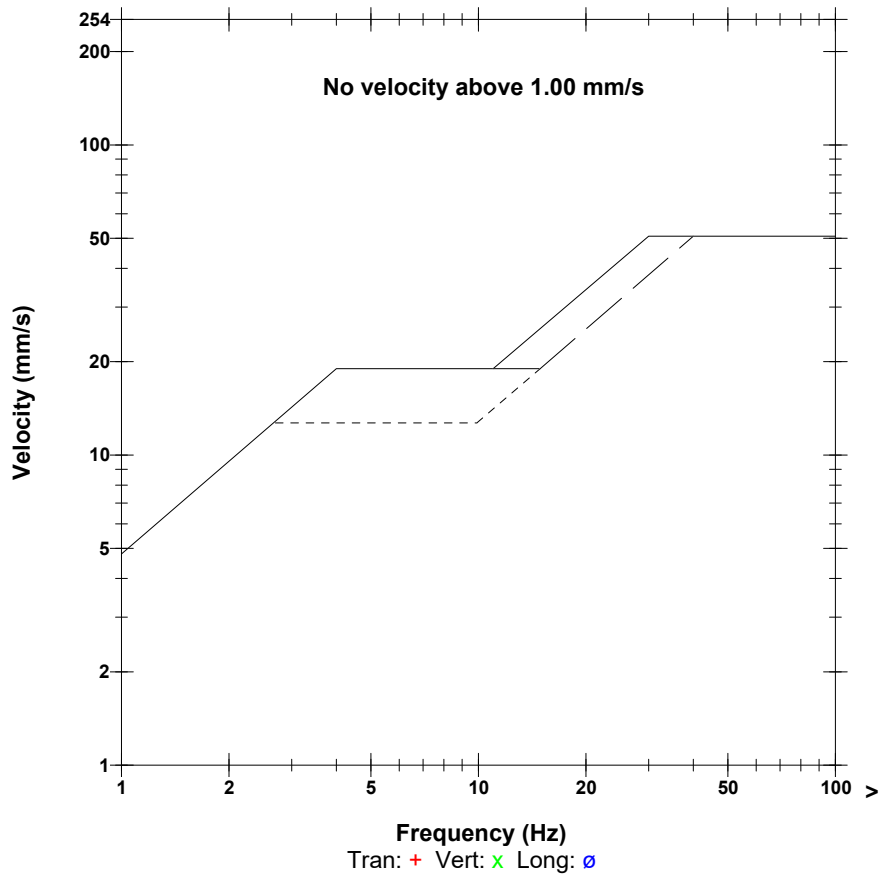
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:15 (V 10.74)

Microphone Linear Weighting
PSPL 100.0 dB(L) at 0.098 sec
ZC Freq 51 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 505 mv)

	Tran	Vert	Long	
PPV	0.873	0.683	0.683	mm/s
ZC Freq	11	13	22	Hz
Time (Rel. to Trig)	0.766	0.663	0.003	sec
Peak Acceleration	0.022	0.017	0.013	g
Peak Displacement	0.011	0.007	0.007	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.3	3.8	3.6	

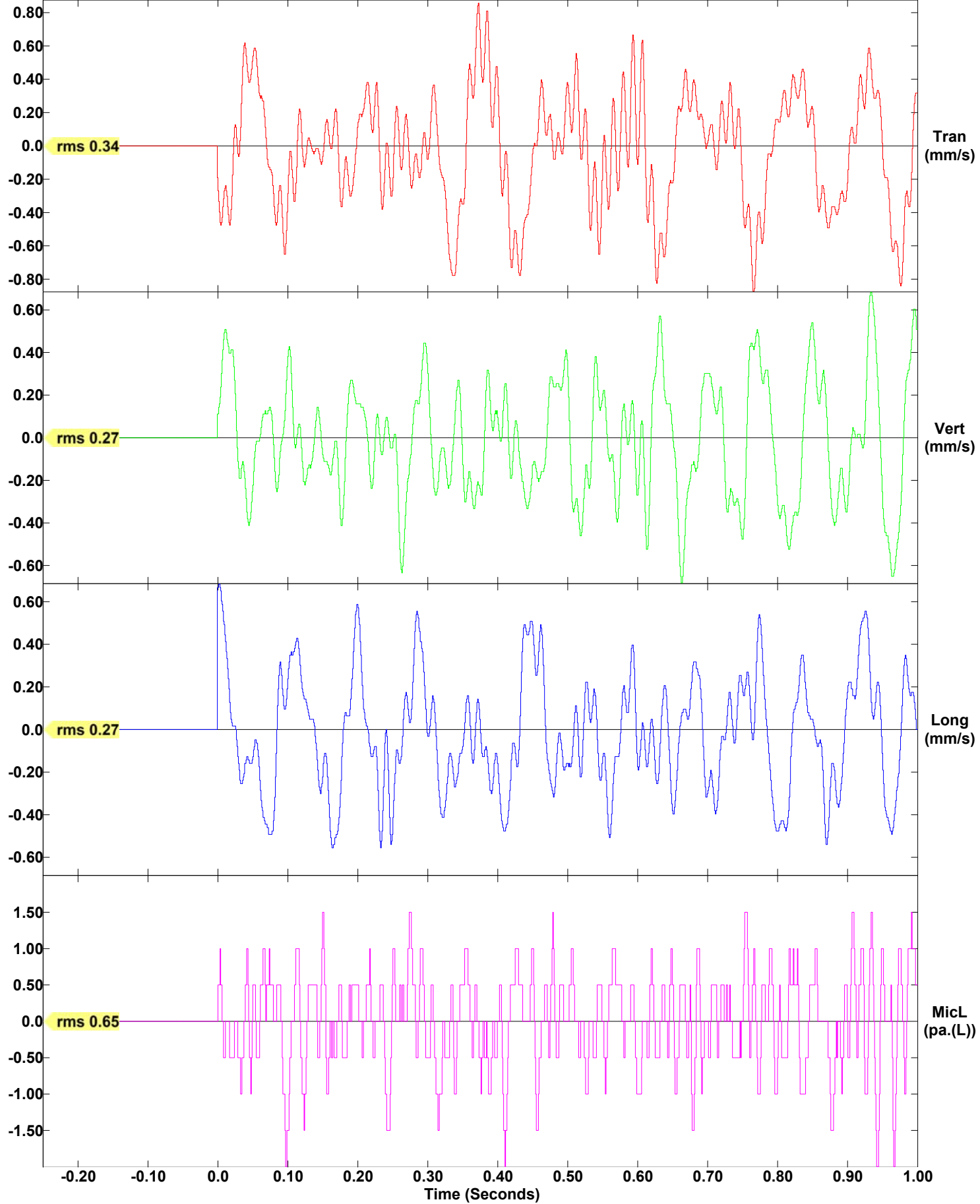
Peak Vector Sum 1.032 mm/s at 0.965 sec

USBM RI8507 And OSMRE



2585, Sep 10 /18 10:00:16 (d585hl1n.sg0)

0.0 sec 0.999 sec



Date/Time Tran at 10:00:22 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL1N.SMO

Notes

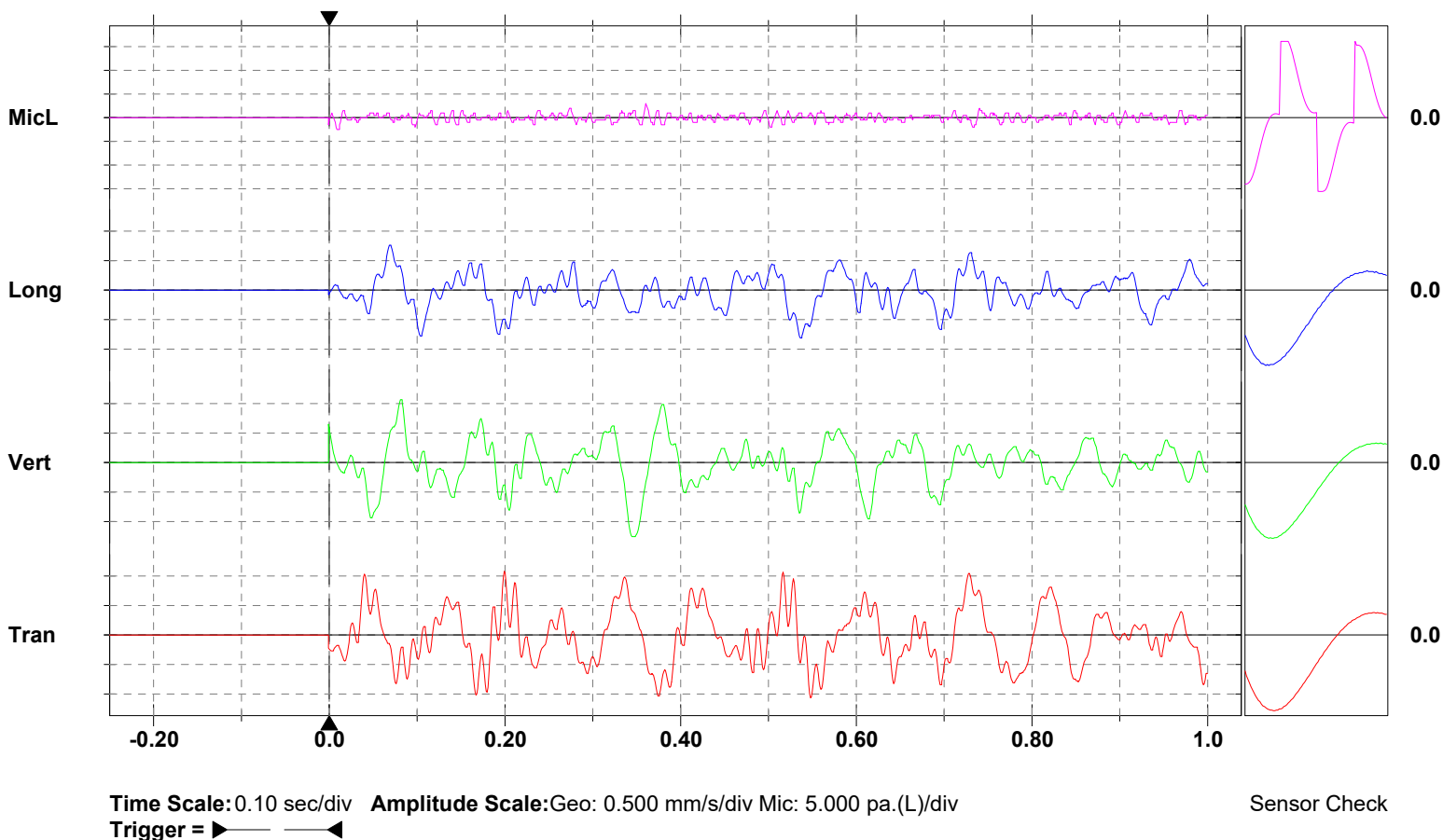
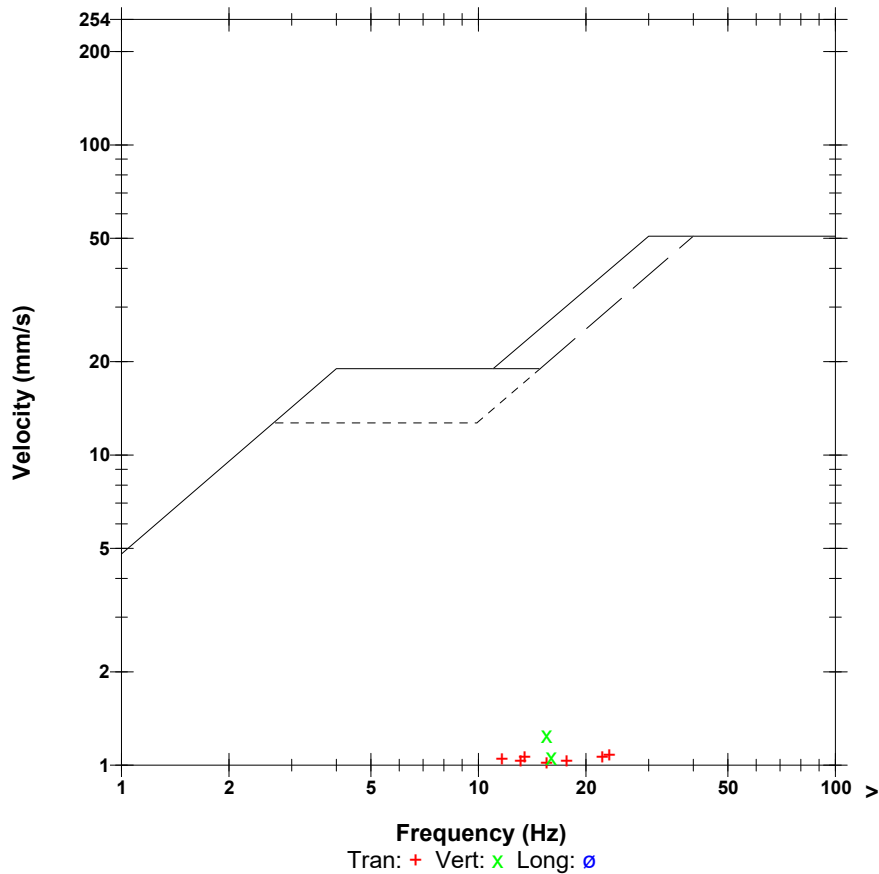
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:15 (V 10.74)

Microphone Linear Weighting
PSPL 103.5 dB(L) at 0.361 sec
ZC Freq 73 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 505 mv)

	Tran	Vert	Long	
PPV	1.080	1.254	0.810	mm/s
ZC Freq	23	16	12	Hz
Time (Rel. to Trig)	0.200	0.346	0.537	sec
Peak Acceleration	0.031	0.018	0.017	g
Peak Displacement	0.012	0.012	0.009	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.3	3.8	3.6	

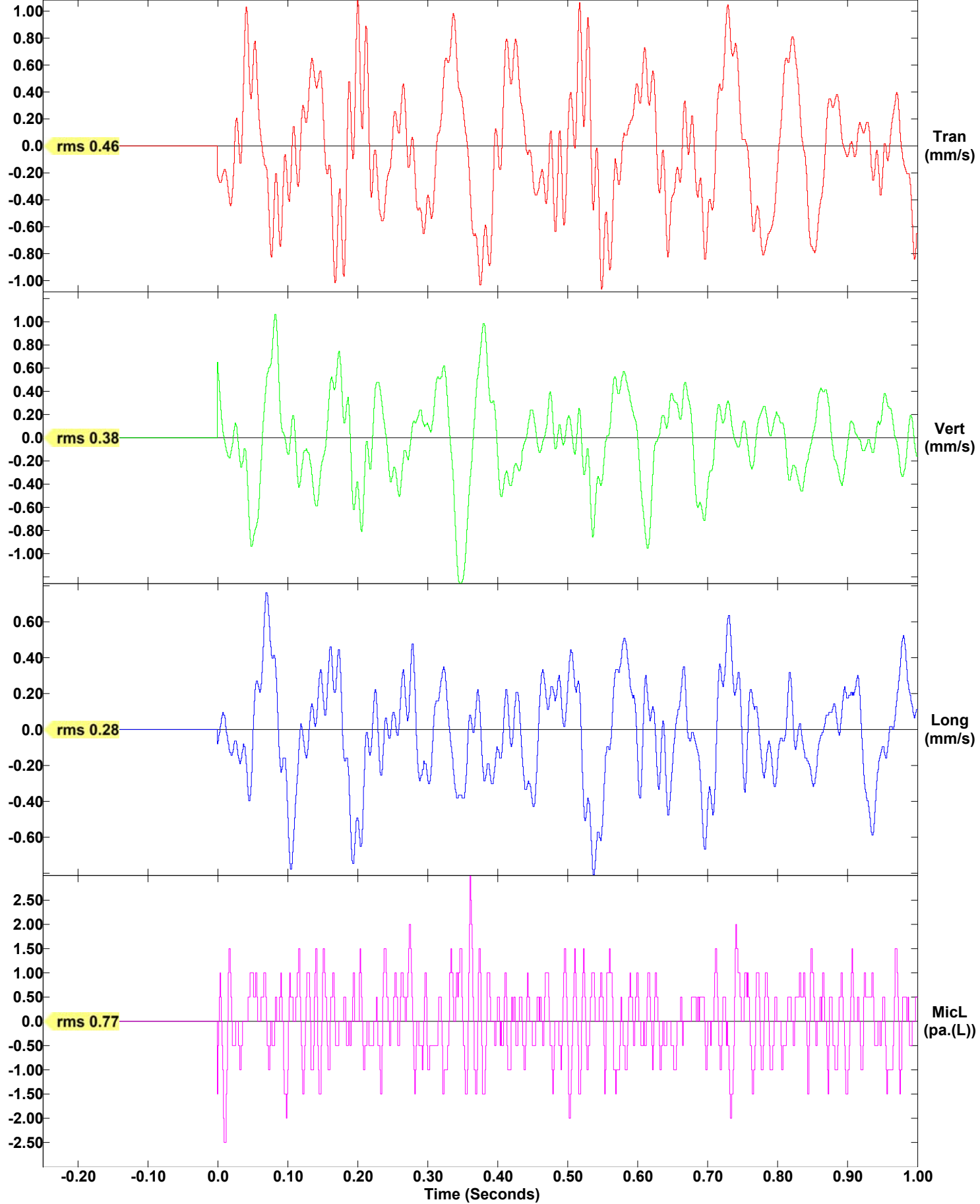
Peak Vector Sum 1.365 mm/s at 0.346 sec

USBM RI8507 And OSMRE



2585, Sep 10 /18 10:00:22 (d585hl1n.sm0)

0.0 sec 0.999 sec



Date/Time Tran at 10:00:28 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL1N.SS0

Notes

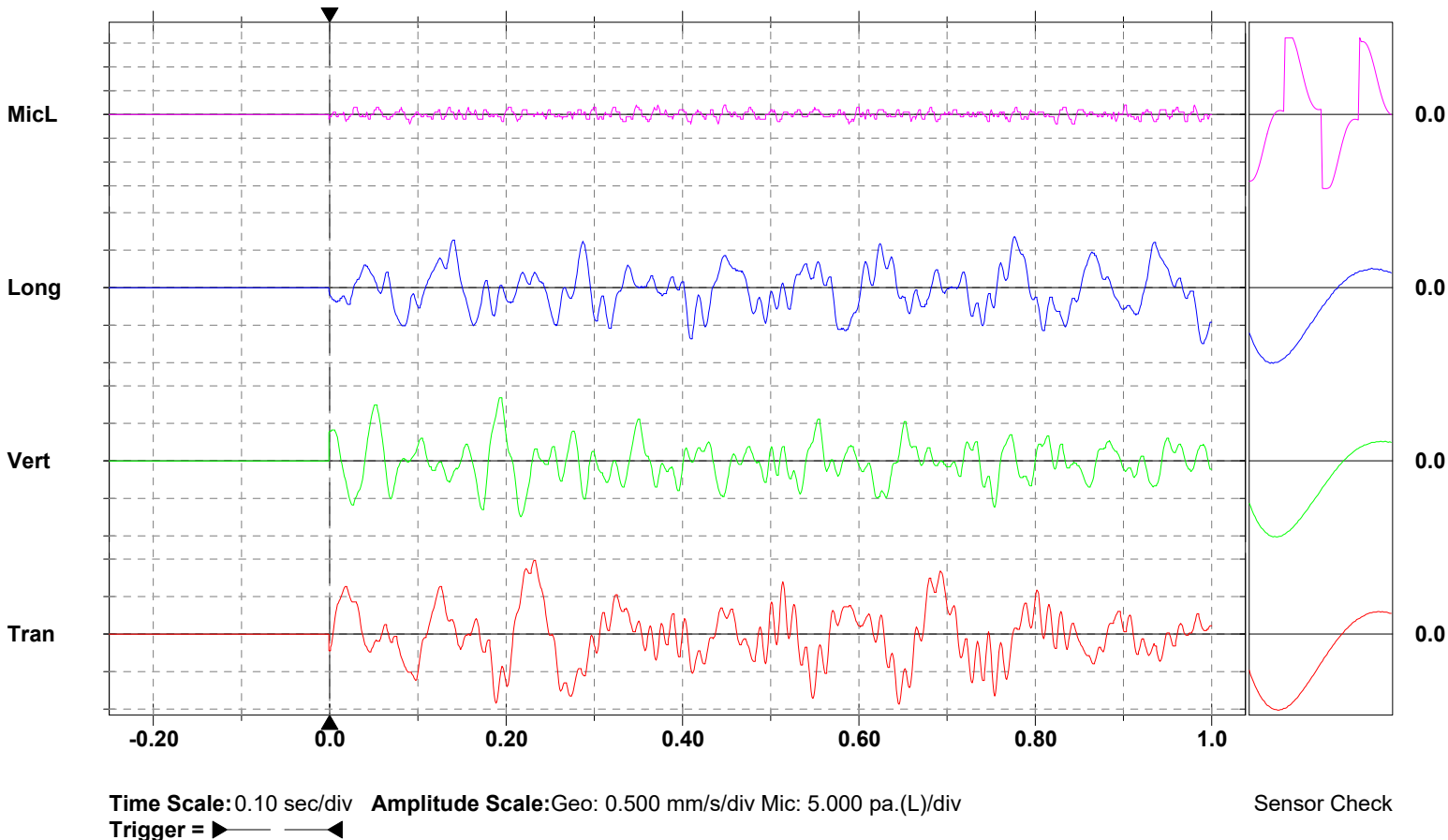
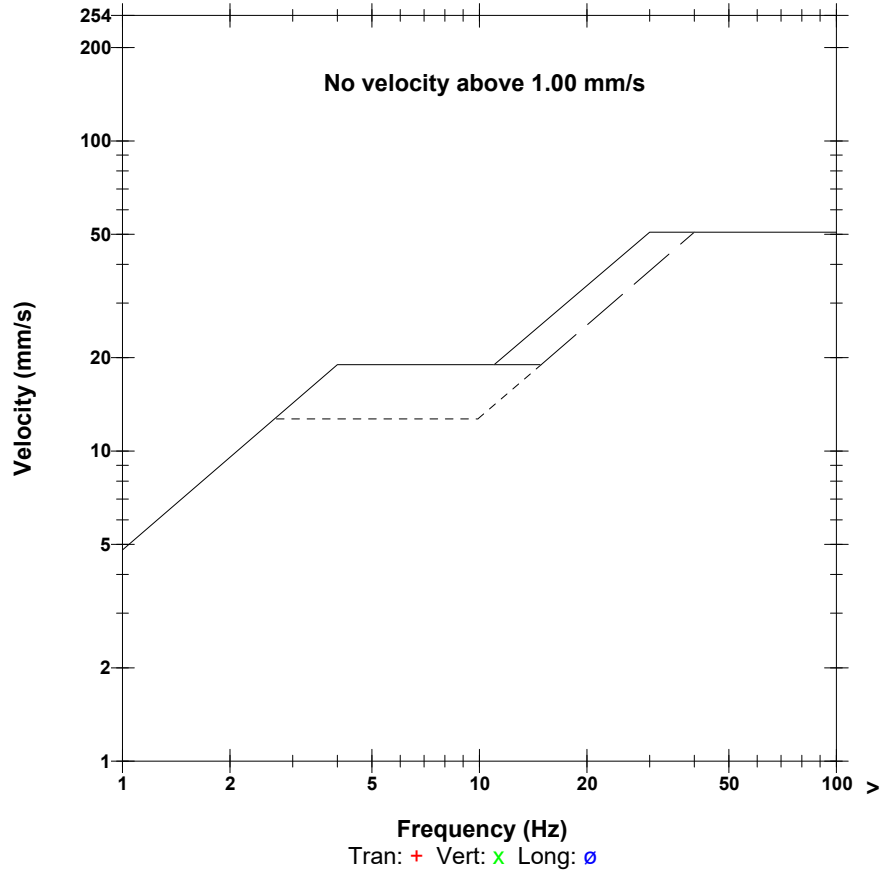
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:15 (V 10.74)

Microphone Linear Weighting
PSPL 100.0 dB(L) at 0.092 sec
ZC Freq 64 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 505 mv)

	Tran	Vert	Long	
PPV	0.984	0.841	0.746	mm/s
ZC Freq	12	19	16	Hz
Time (Rel. to Trig)	0.232	0.193	0.990	sec
Peak Acceleration	0.023	0.017	0.013	g
Peak Displacement	0.012	0.006	0.008	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.3	3.8	3.6	

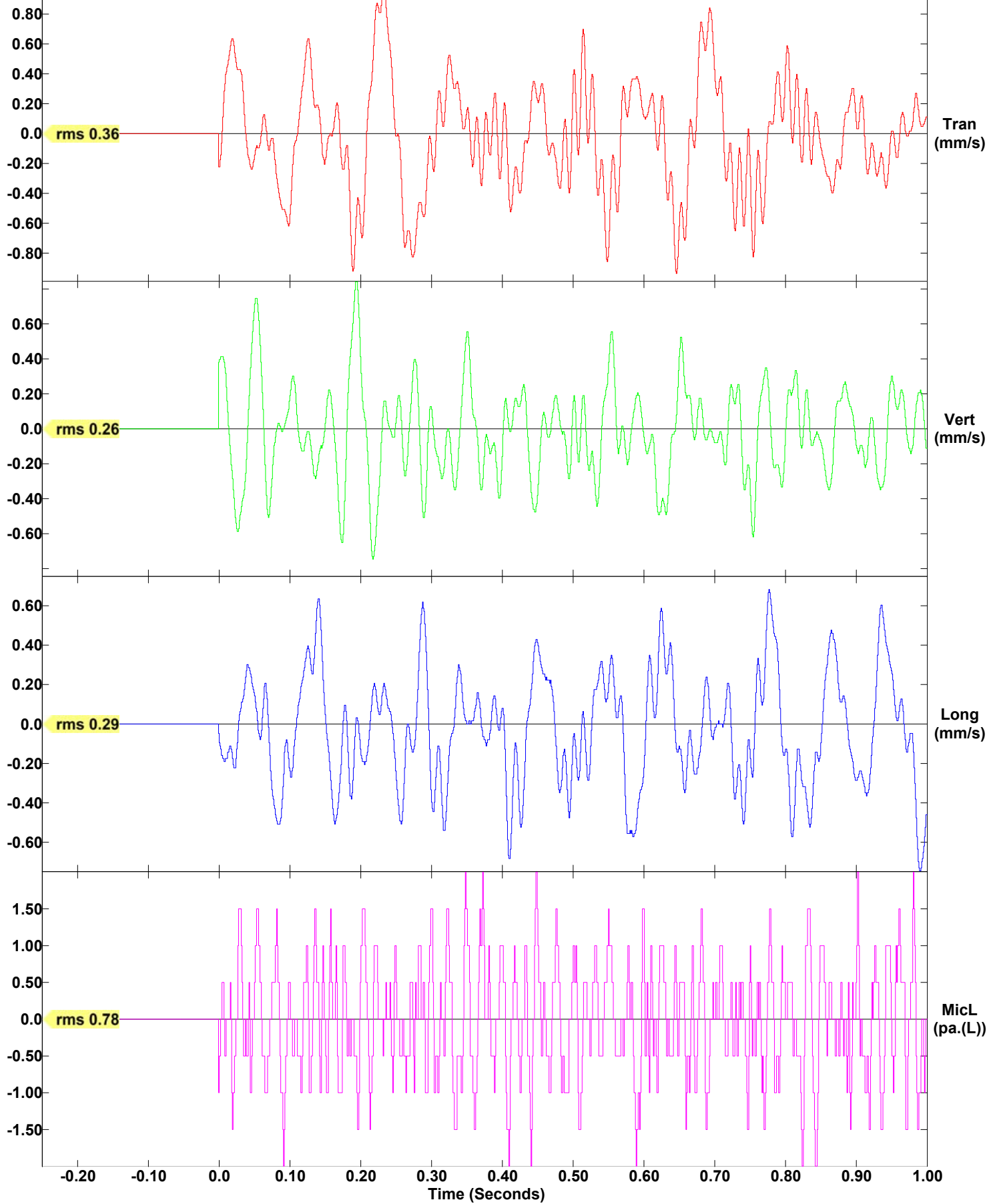
Peak Vector Sum 1.143 mm/s at 0.190 sec

USBM RI8507 And OSMRE



0.0 sec

0.999 sec



Date/Time Tran at 10:00:34 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL1N.SY0

Notes

Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:15 (V 10.74)

Microphone Linear Weighting

PSPL 97.5 dB(L) at 0.172 sec

ZC Freq N/A

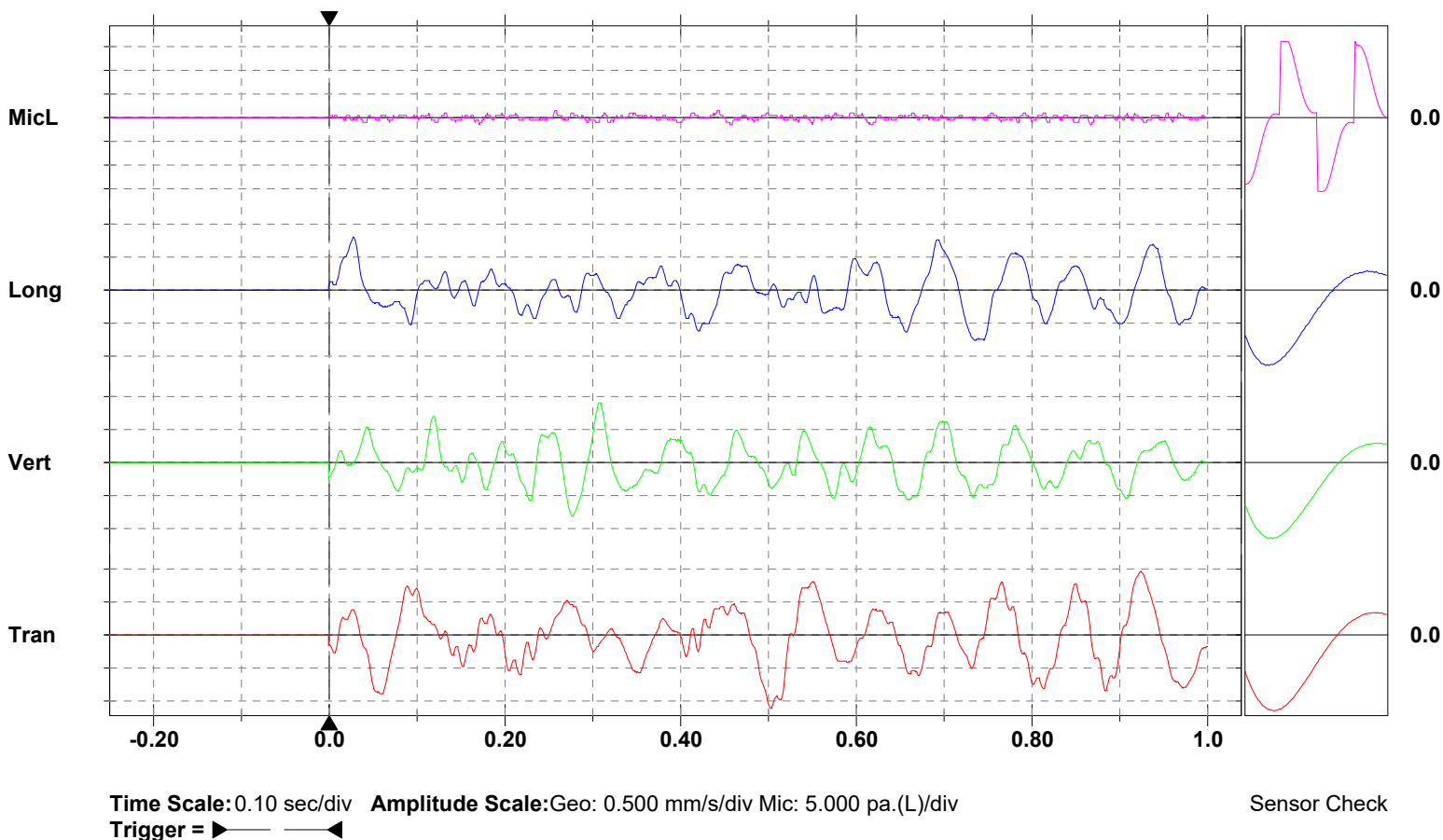
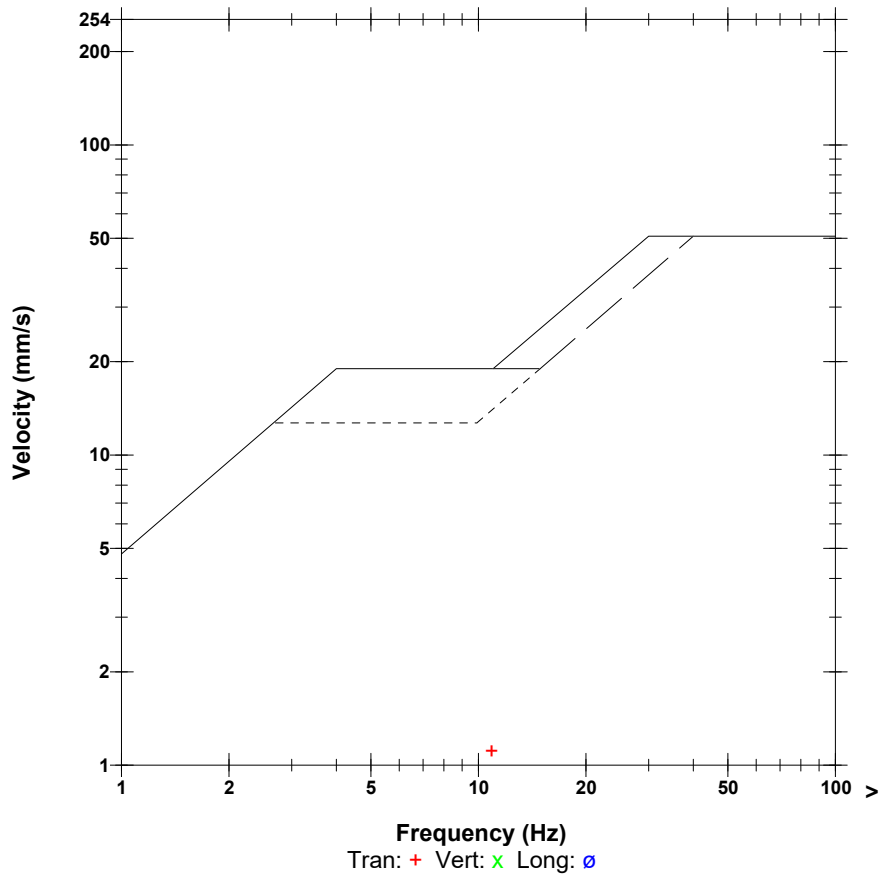
Channel Test Passed (Freq = 20.0 Hz Amp = 505 mv)

	Tran	Vert	Long	
PPV	1.111	0.905	0.810	mm/s
ZC Freq	11	18	12	Hz
Time (Rel. to Trig)	0.503	0.308	0.028	sec
Peak Acceleration	0.015	0.013	0.010	g
Peak Displacement	0.015	0.007	0.011	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.3	3.8	3.6	

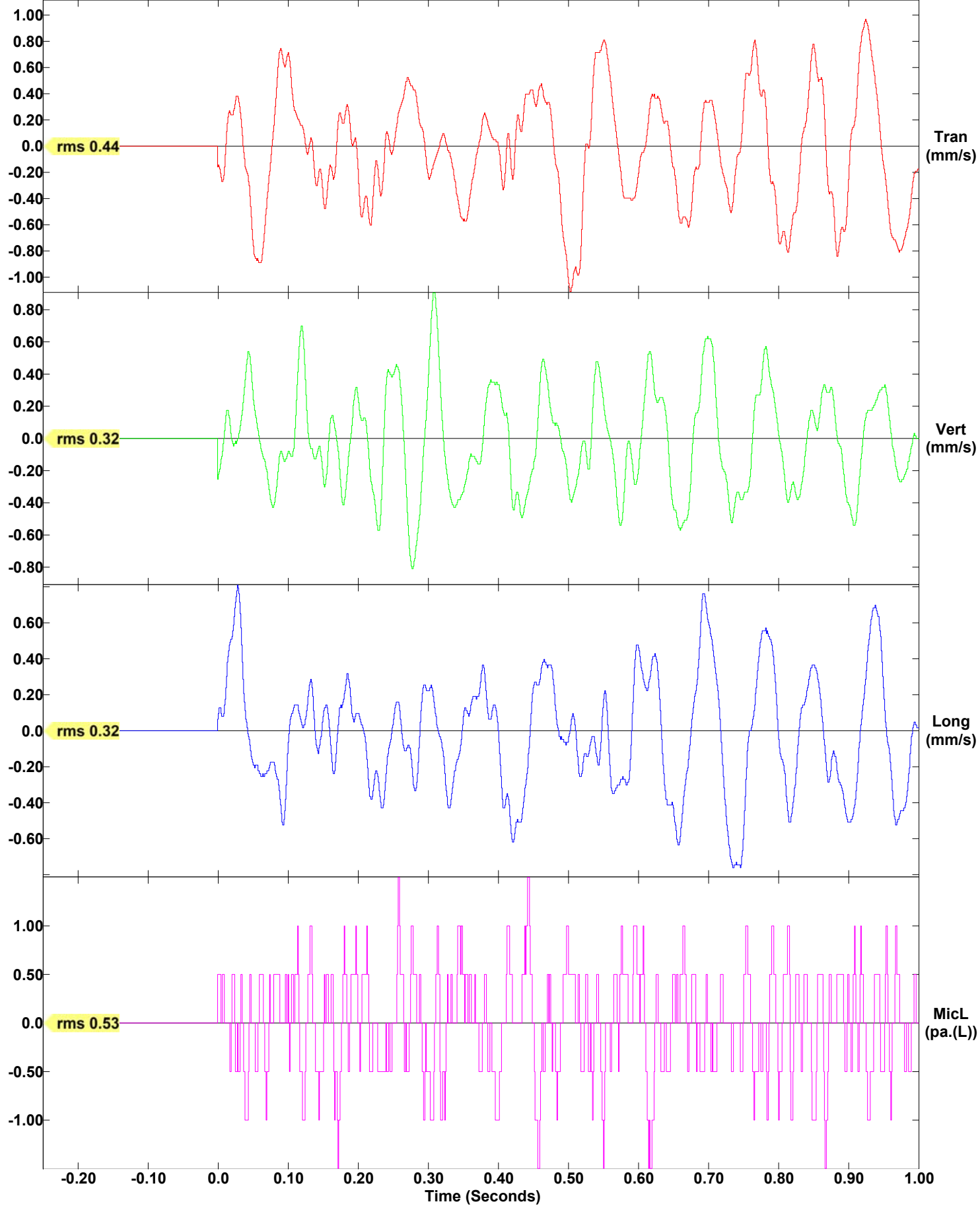
Peak Vector Sum 1.175 mm/s at 0.504 sec

N/A: Not Applicable

USBM RI8507 And OSMRE



0.0 sec 0.999 sec



Date/Time Tran at 10:00:41 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL1N.T50

Notes

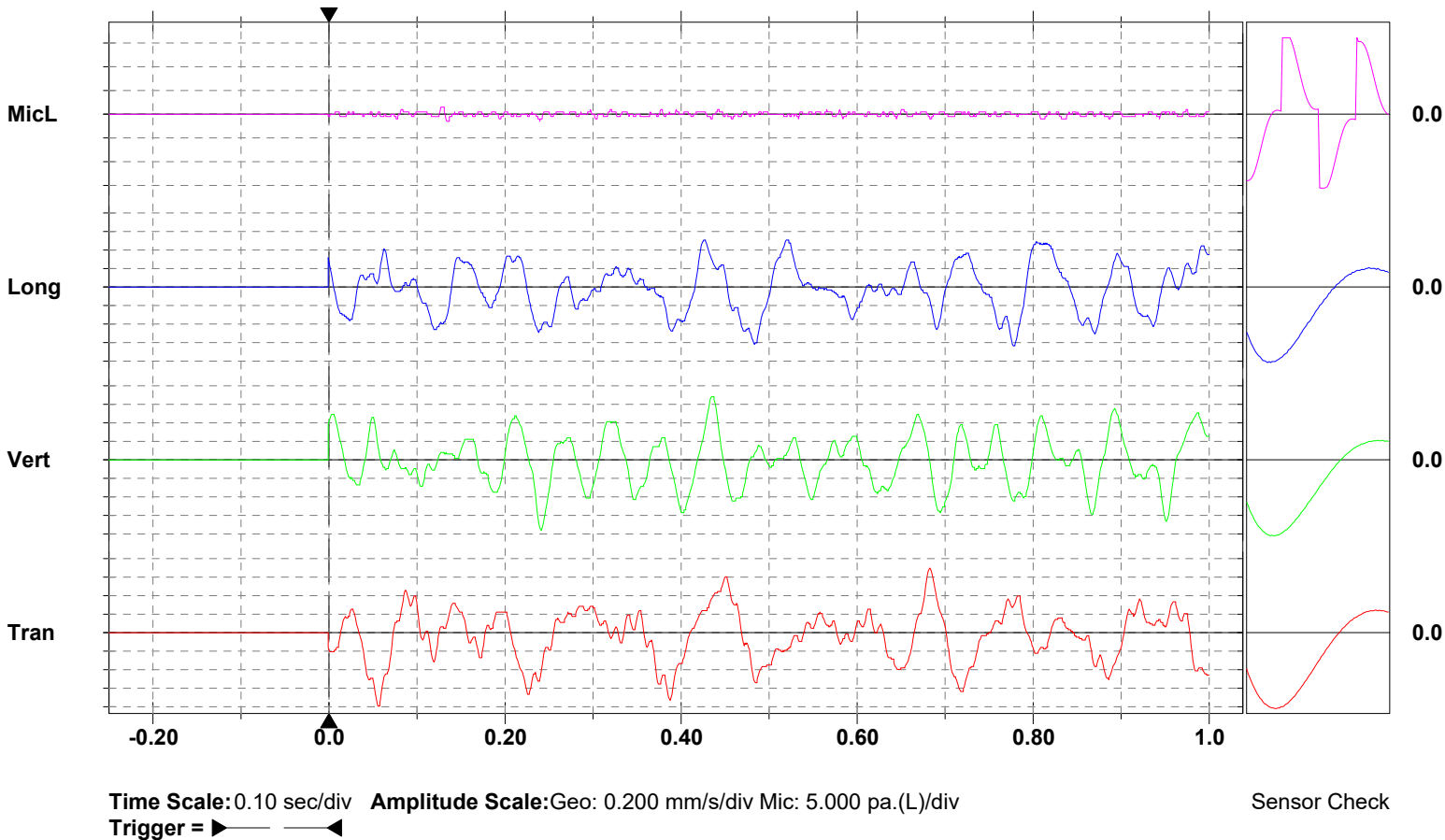
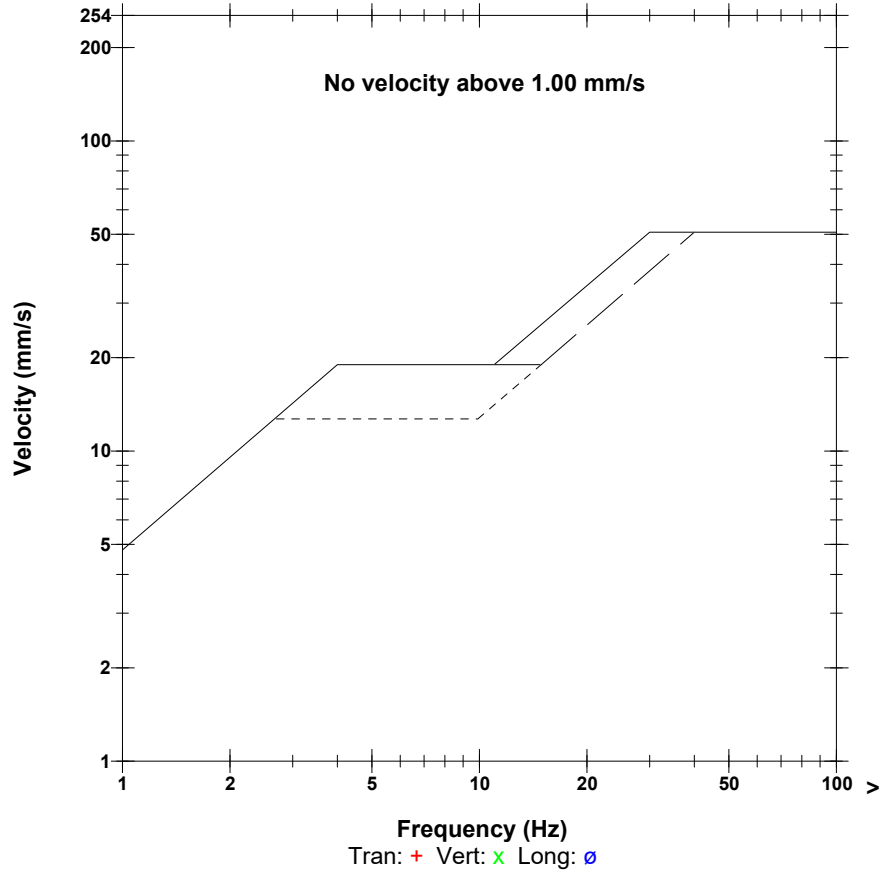
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:15 (V 10.74)

Microphone Linear Weighting
PSPL 97.5 dB(L) at 0.128 sec
ZC Freq N/A
Channel Test Passed (Freq = 20.0 Hz Amp = 505 mv)

	Tran	Vert	Long	
PPV	0.794	0.762	0.635	mm/s
ZC Freq	13	18	10	Hz
Time (Rel. to Trig)	0.057	0.242	0.778	sec
Peak Acceleration	0.012	0.012	0.010	g
Peak Displacement	0.009	0.006	0.009	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.3	3.8	3.6	

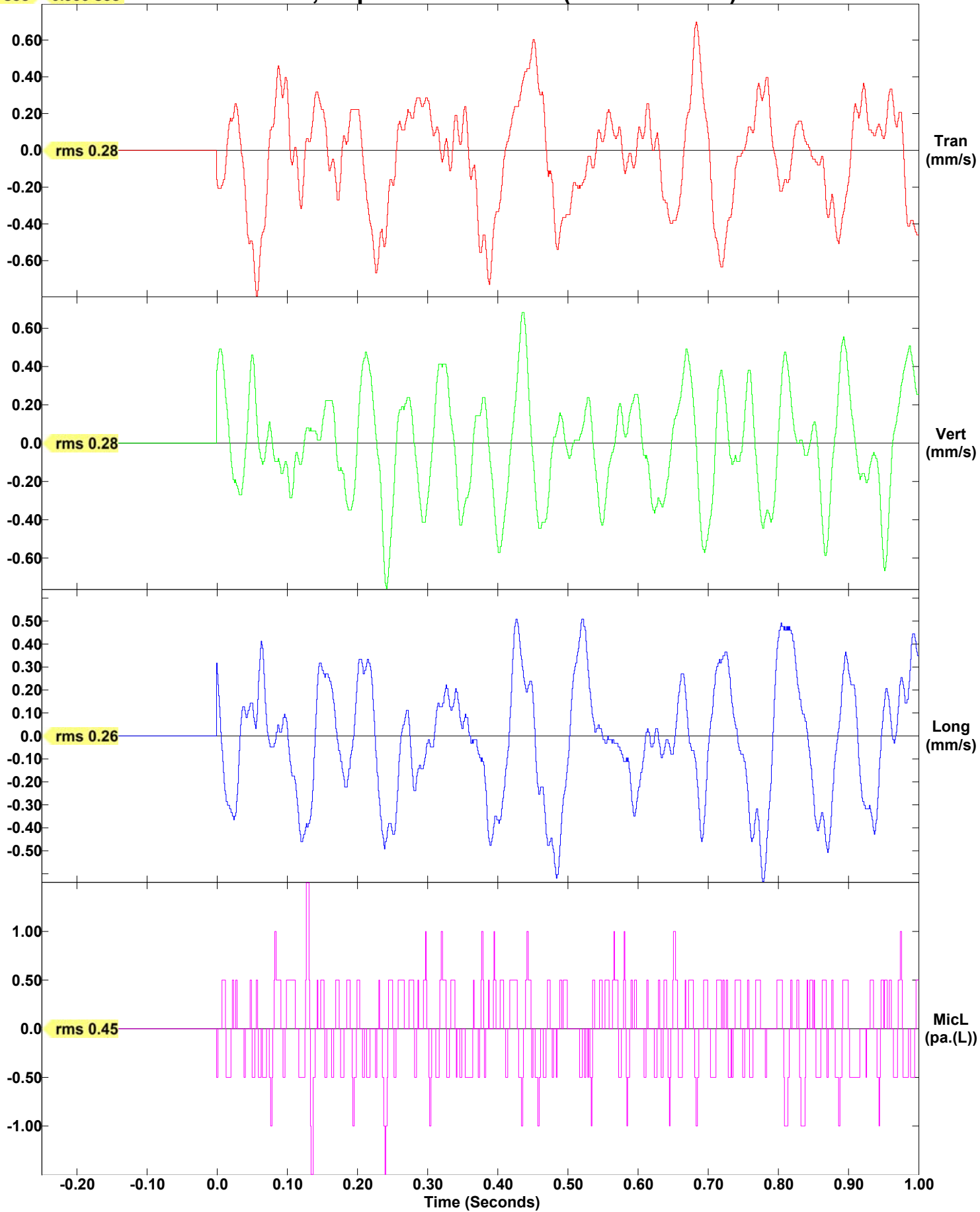
Peak Vector Sum 1.000 mm/s at 0.240 sec
N/A: Not Applicable

USBM RI8507 And OSMRE



0.0 sec

0.999 sec



Date/Time Tran at 10:00:47 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL1N.TB0

Notes

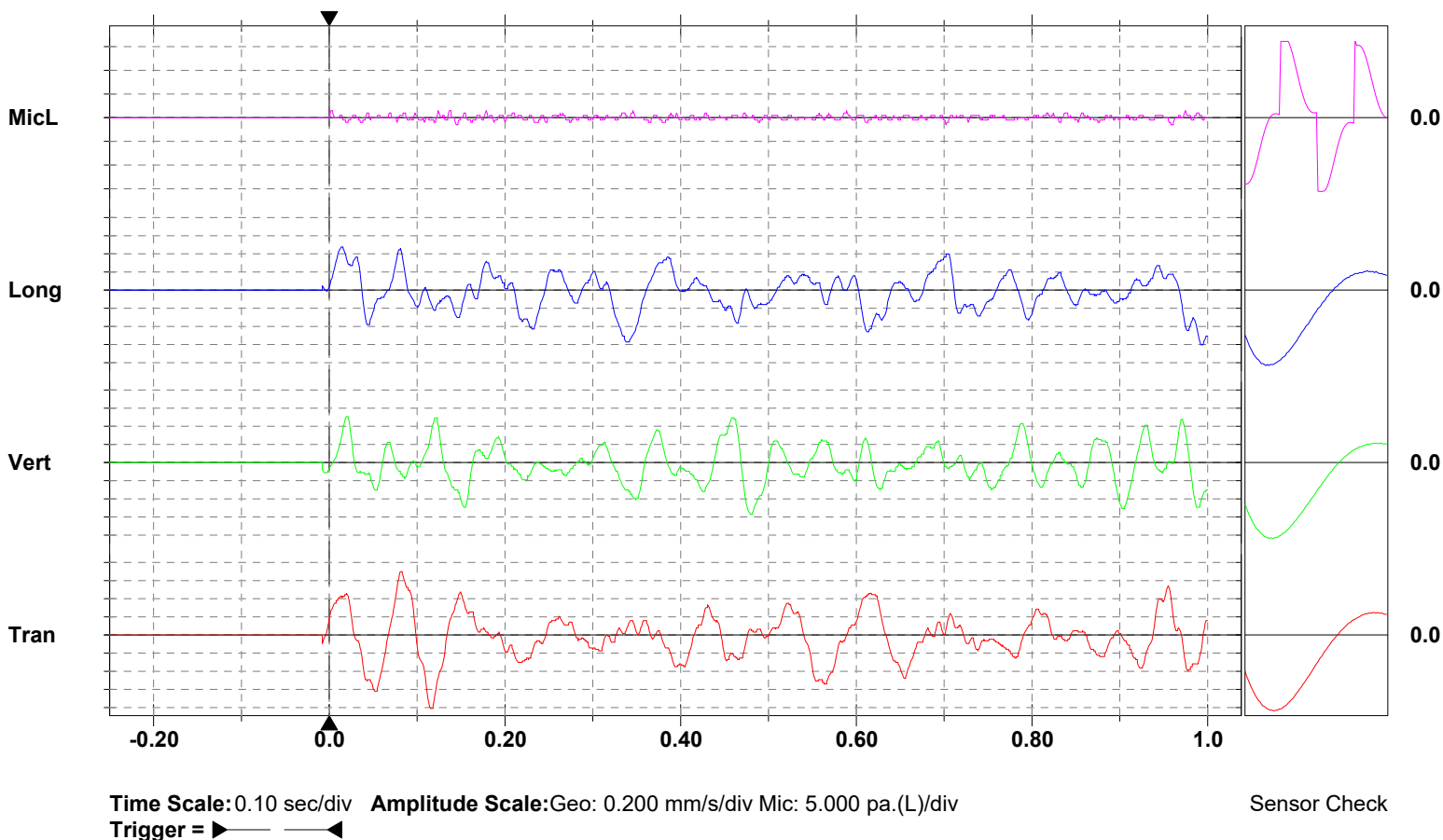
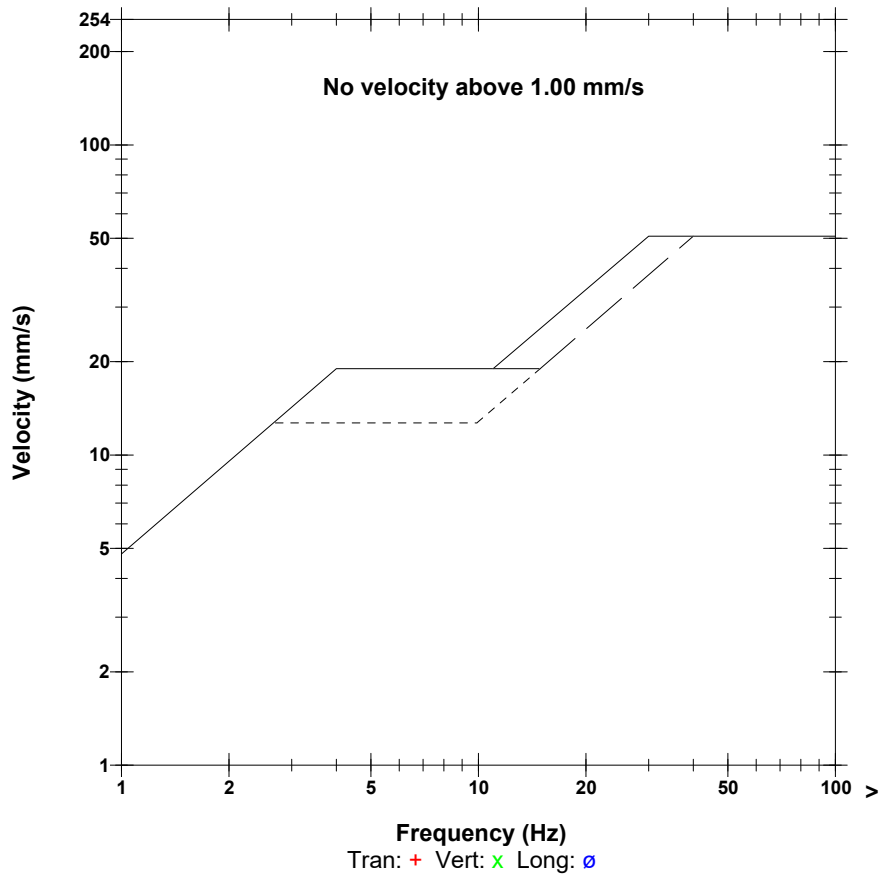
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:15 (V 10.74)

Microphone Linear Weighting
PSPL 97.5 dB(L) at 0.004 sec
ZC Freq N/A
Channel Test Passed (Freq = 20.0 Hz Amp = 505 mv)

	Tran	Vert	Long	
PPV	0.810	0.572	0.603	mm/s
ZC Freq	15	17	16	Hz
Time (Rel. to Trig)	0.116	0.480	0.993	sec
Peak Acceleration	0.012	0.010	0.010	g
Peak Displacement	0.008	0.006	0.007	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.3	3.8	3.6	

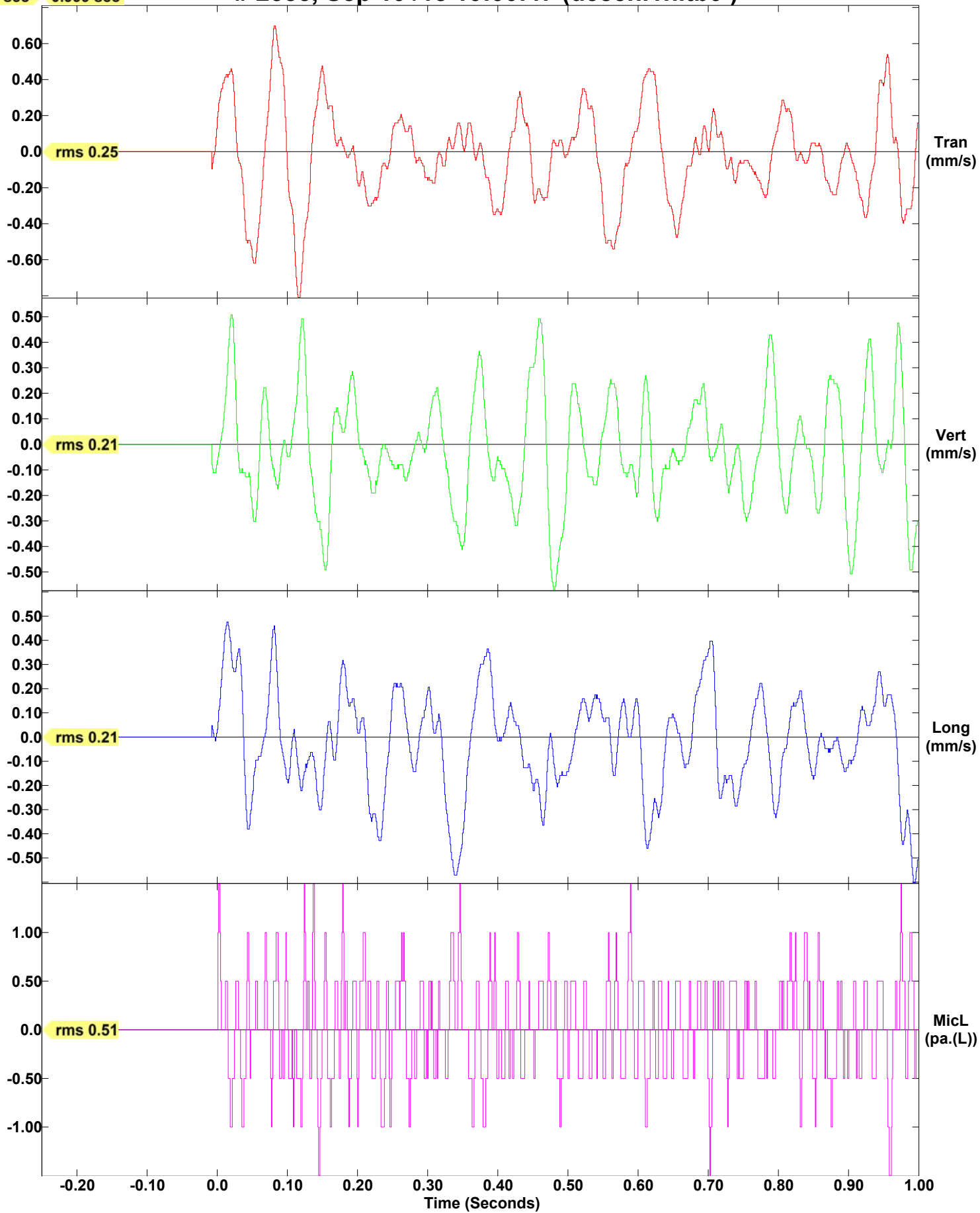
Peak Vector Sum 0.921 mm/s at 0.118 sec
N/A: Not Applicable

USBM RI8507 And OSMRE



0.0 sec

0.999 sec



Date/Time Tran at 10:00:53 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL1N.TH0

Notes

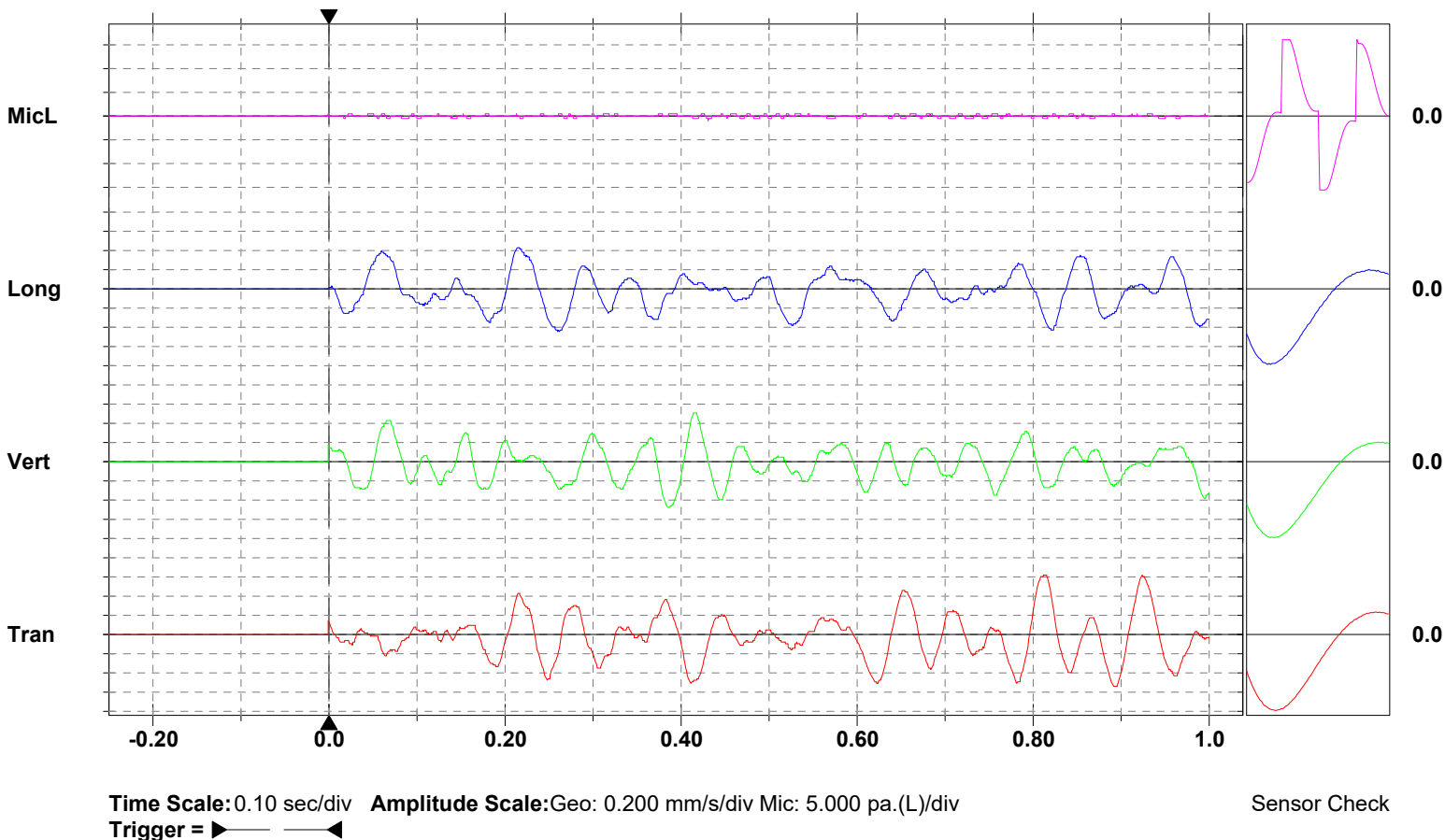
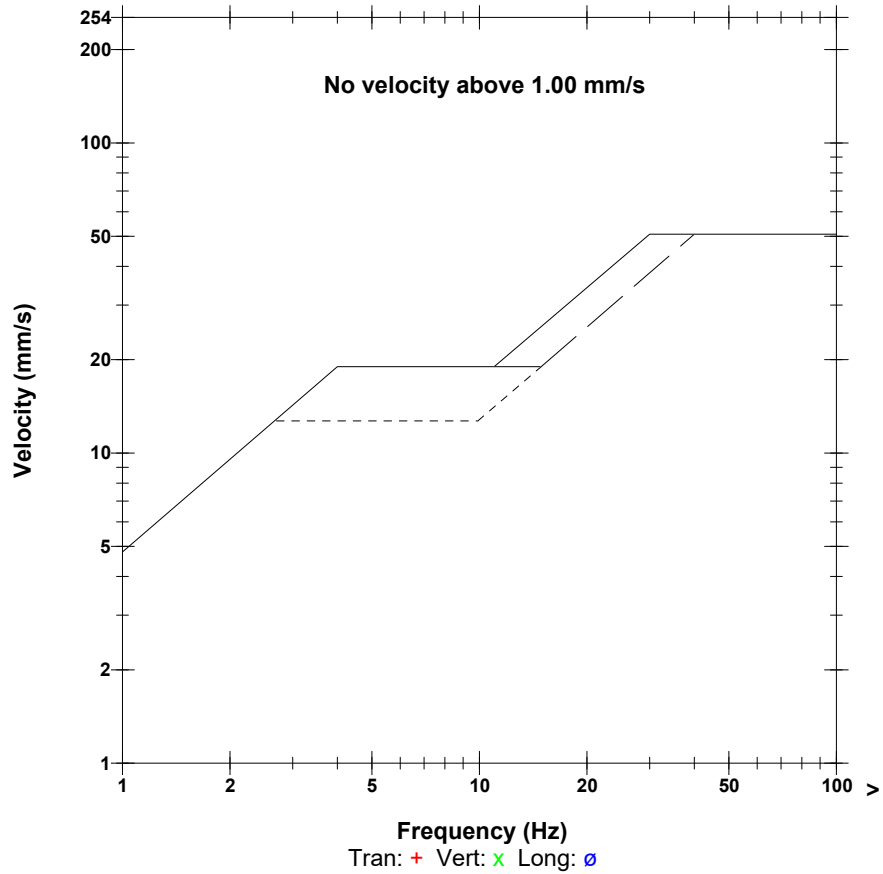
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:15 (V 10.74)

Microphone Linear Weighting
PSPL 94.0 dB(L) at 0.432 sec
ZC Freq N/A
Channel Test Passed (Freq = 20.0 Hz Amp = 505 mv)

	Tran	Vert	Long	
PPV	0.619	0.508	0.445	mm/s
ZC Freq	16	18	13	Hz
Time (Rel. to Trig)	0.813	0.415	0.261	sec
Peak Acceleration	0.010	0.008	0.007	g
Peak Displacement	0.006	0.005	0.006	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.3	3.8	3.6	

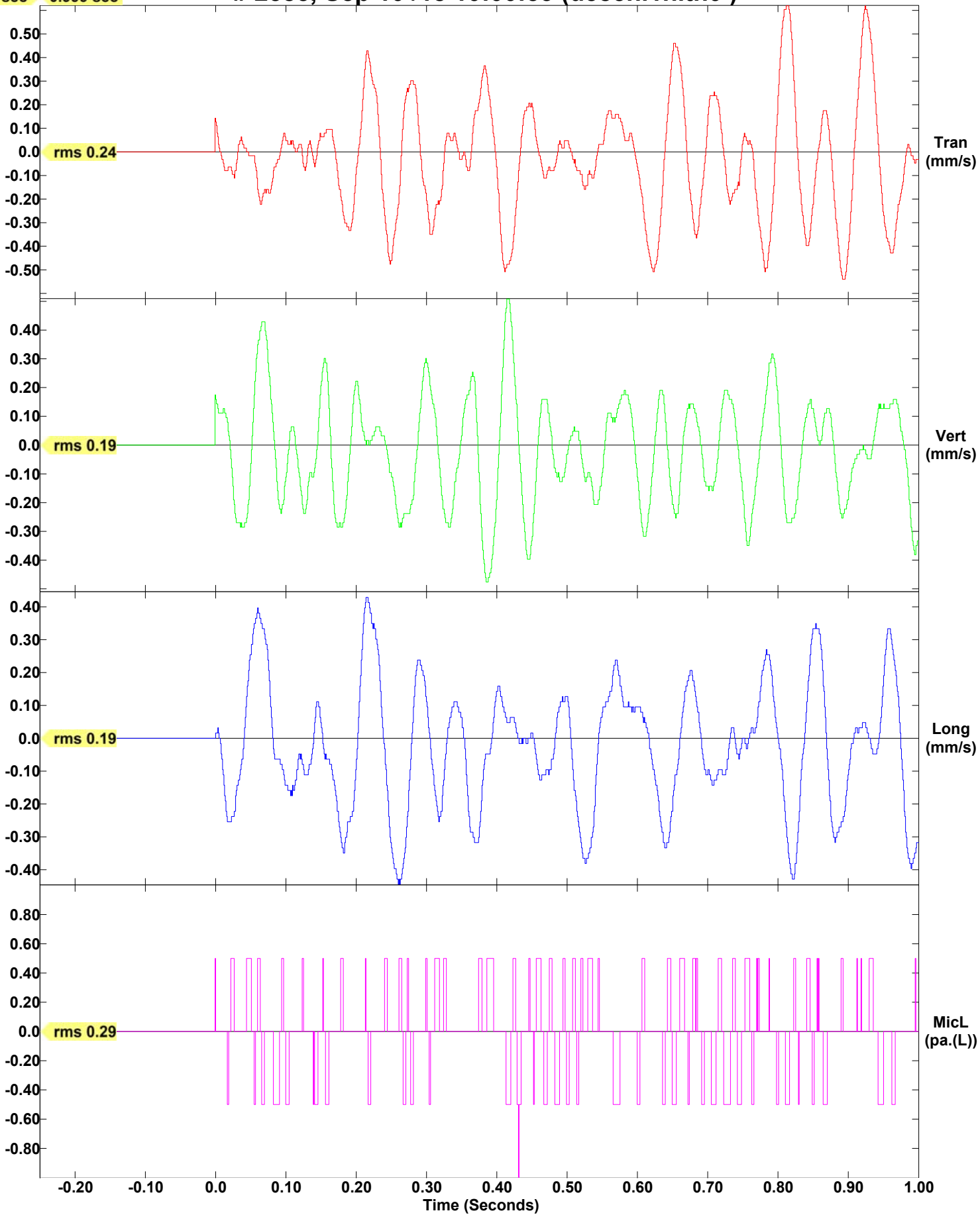
Peak Vector Sum 0.762 mm/s at 0.815 sec
N/A: Not Applicable

USBM RI8507 And OSMRE



0.0 sec

0.999 sec



Date/Time Long at 10:00:59 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL1N.TN0

Notes

Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:15 (V 10.74)

Microphone Linear Weighting

PSPL <88 dB(L)

ZC Freq N/A

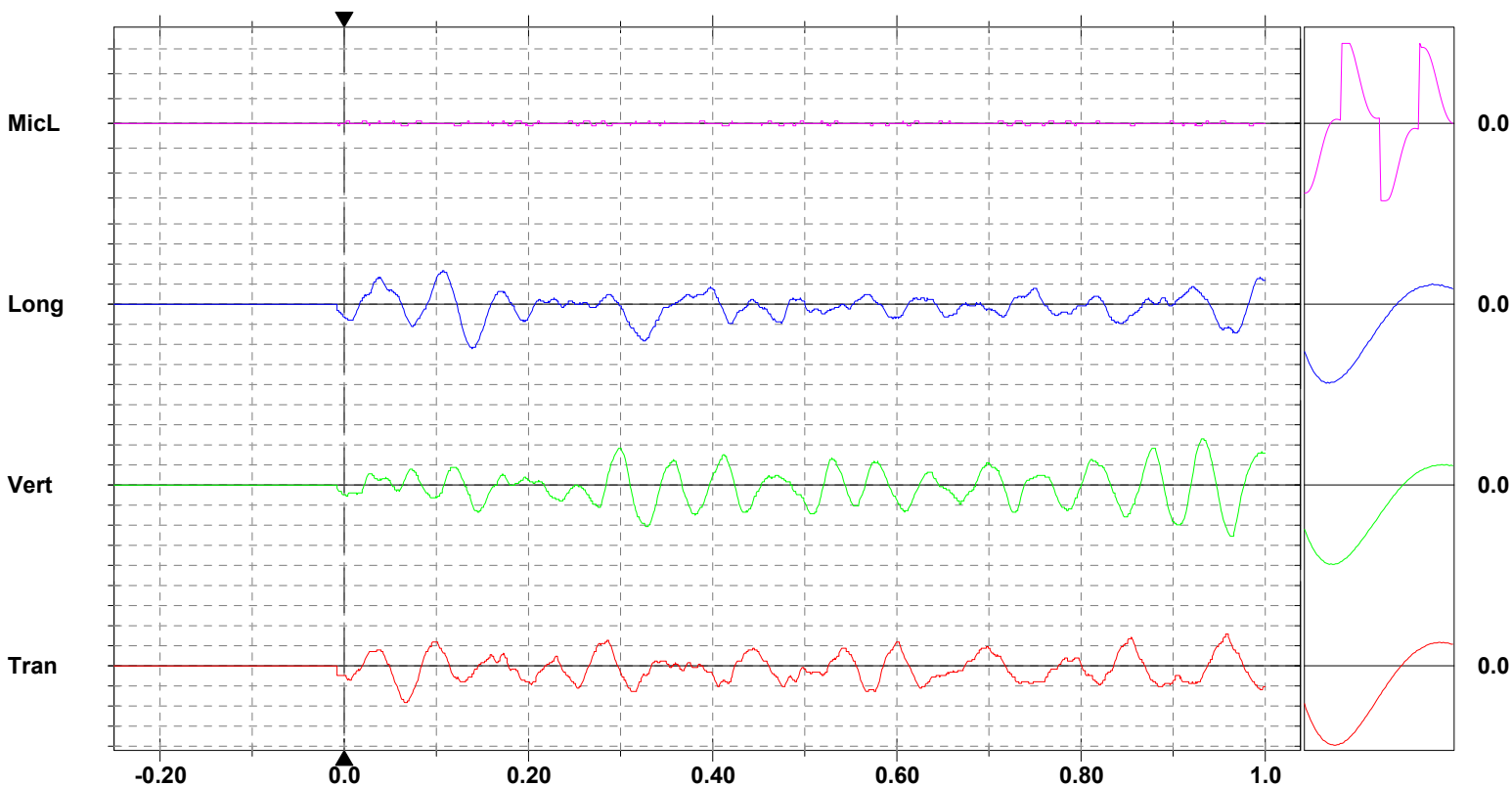
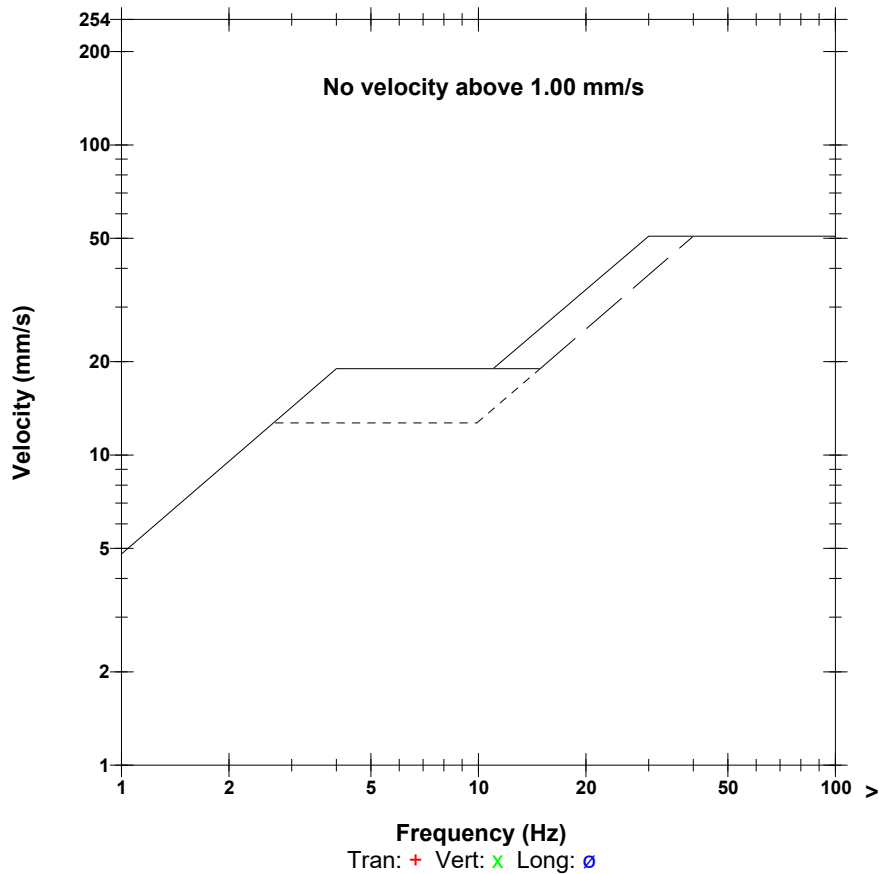
Channel Test Passed (Freq = 20.0 Hz Amp = 505 mv)

	Tran	Vert	Long	
PPV	0.365	0.508	0.445	mm/s
ZC Freq	15	17	14	Hz
Time (Rel. to Trig)	0.066	0.963	0.140	sec
Peak Acceleration	0.005	0.007	0.005	g
Peak Displacement	0.005	0.005	0.005	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.3	3.8	3.6	

Peak Vector Sum 0.603 mm/s at 0.964 sec

N/A: Not Applicable

USBM RI8507 And OSMRE

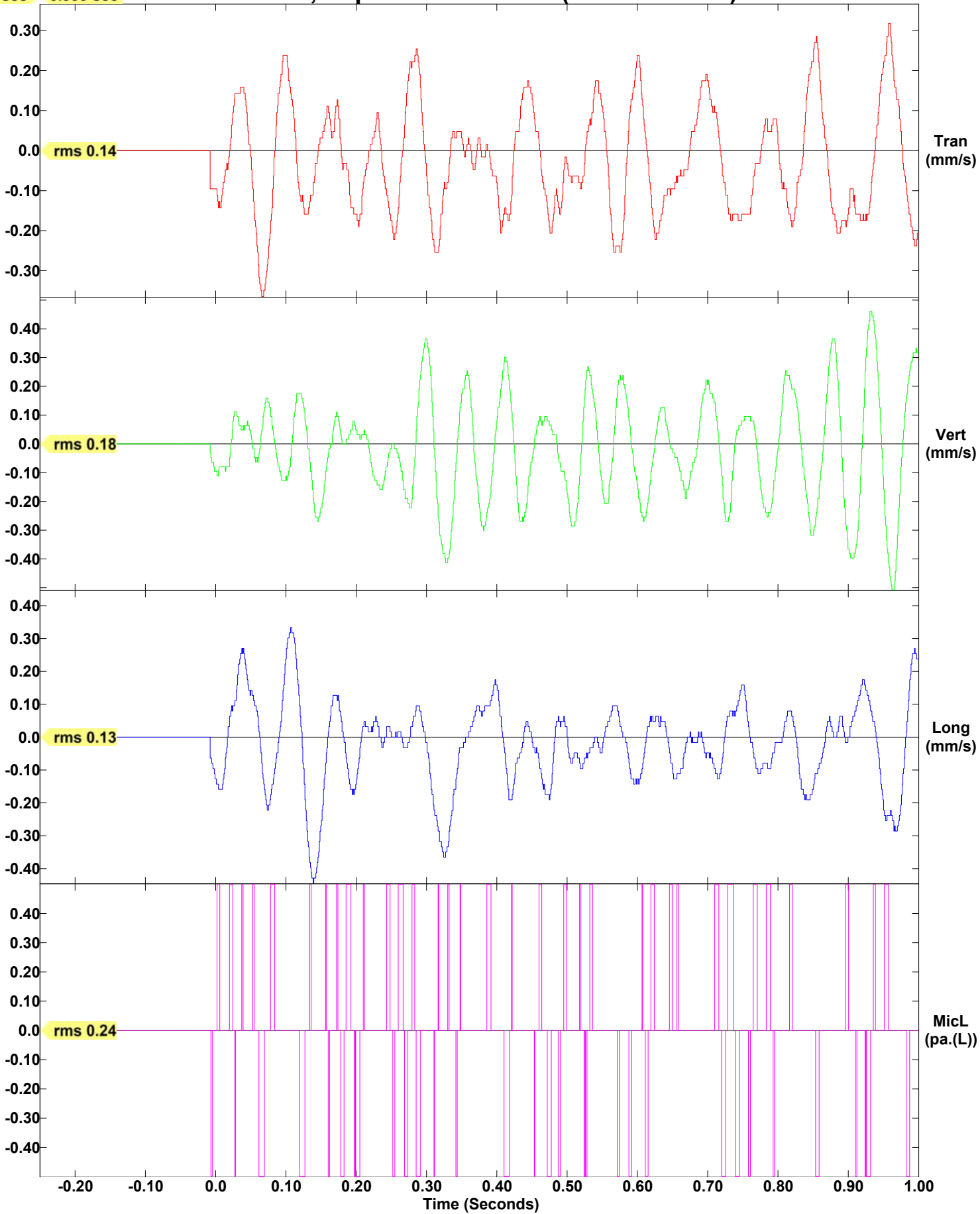


Time Scale: 0.10 sec/div **Amplitude Scale:** Geo: 0.200 mm/s/div Mic: 5.000 pa.(L)/div
Trigger =

Sensor Check

0.0 sec

0.999 sec



Date/Time Tran at 10:01:05 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL1N.TT0

Notes

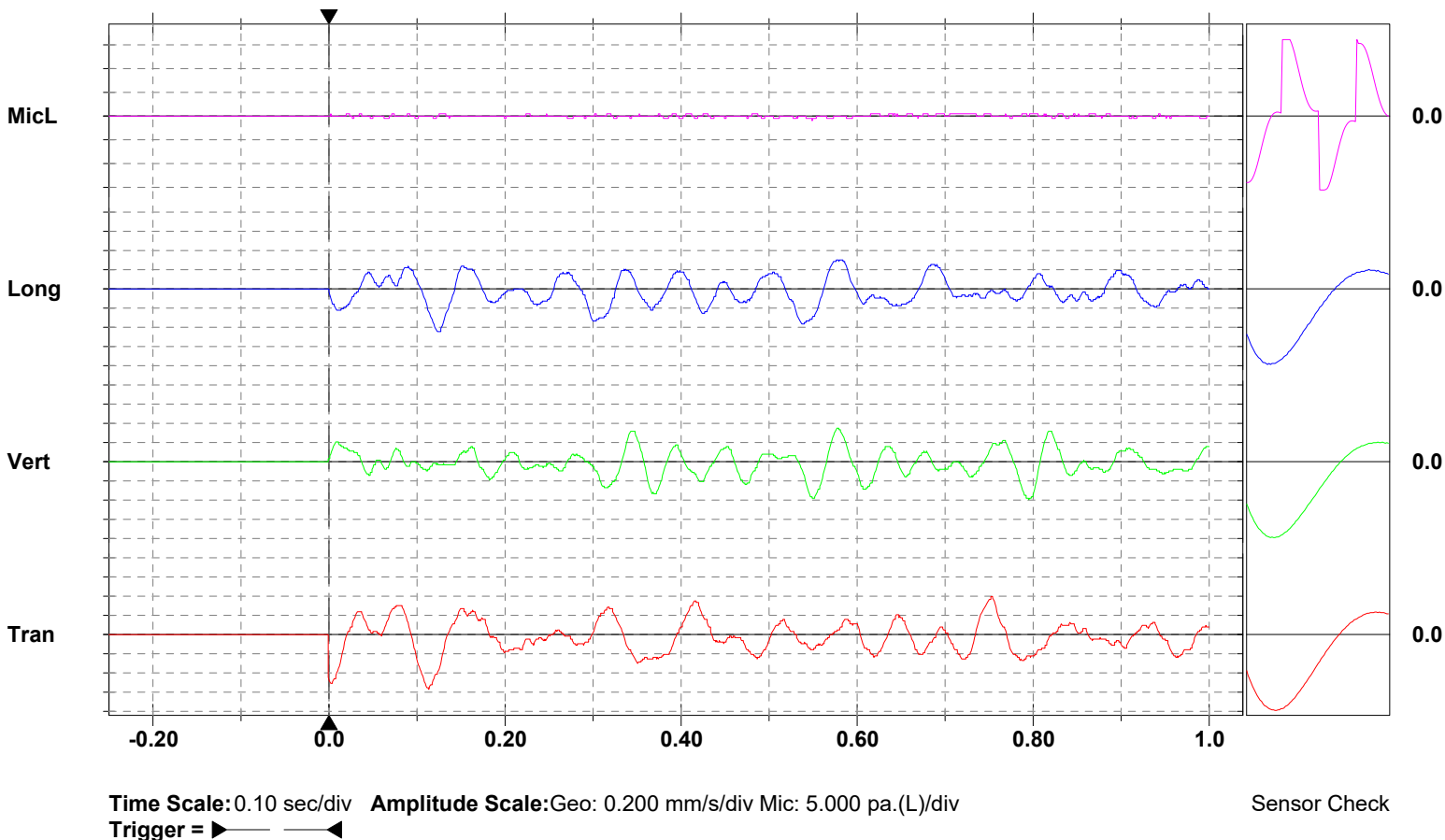
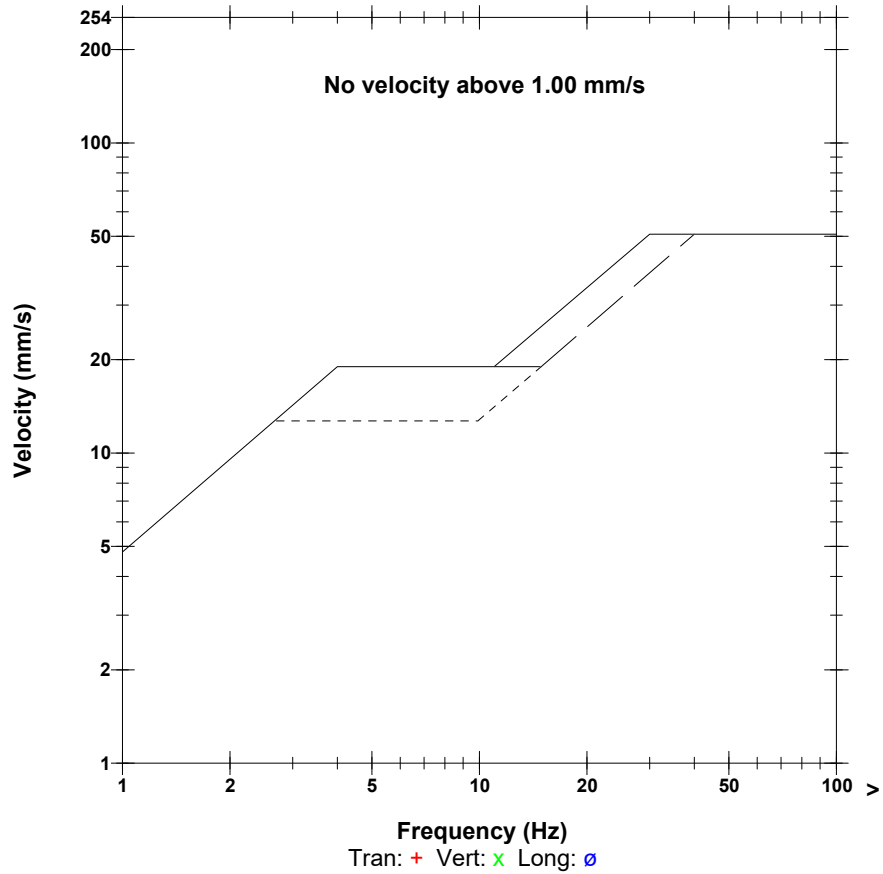
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting
PSPL 94.0 dB(L) at 0.550 sec
ZC Freq N/A
Channel Test Passed (Freq = 20.0 Hz Amp = 505 mv)

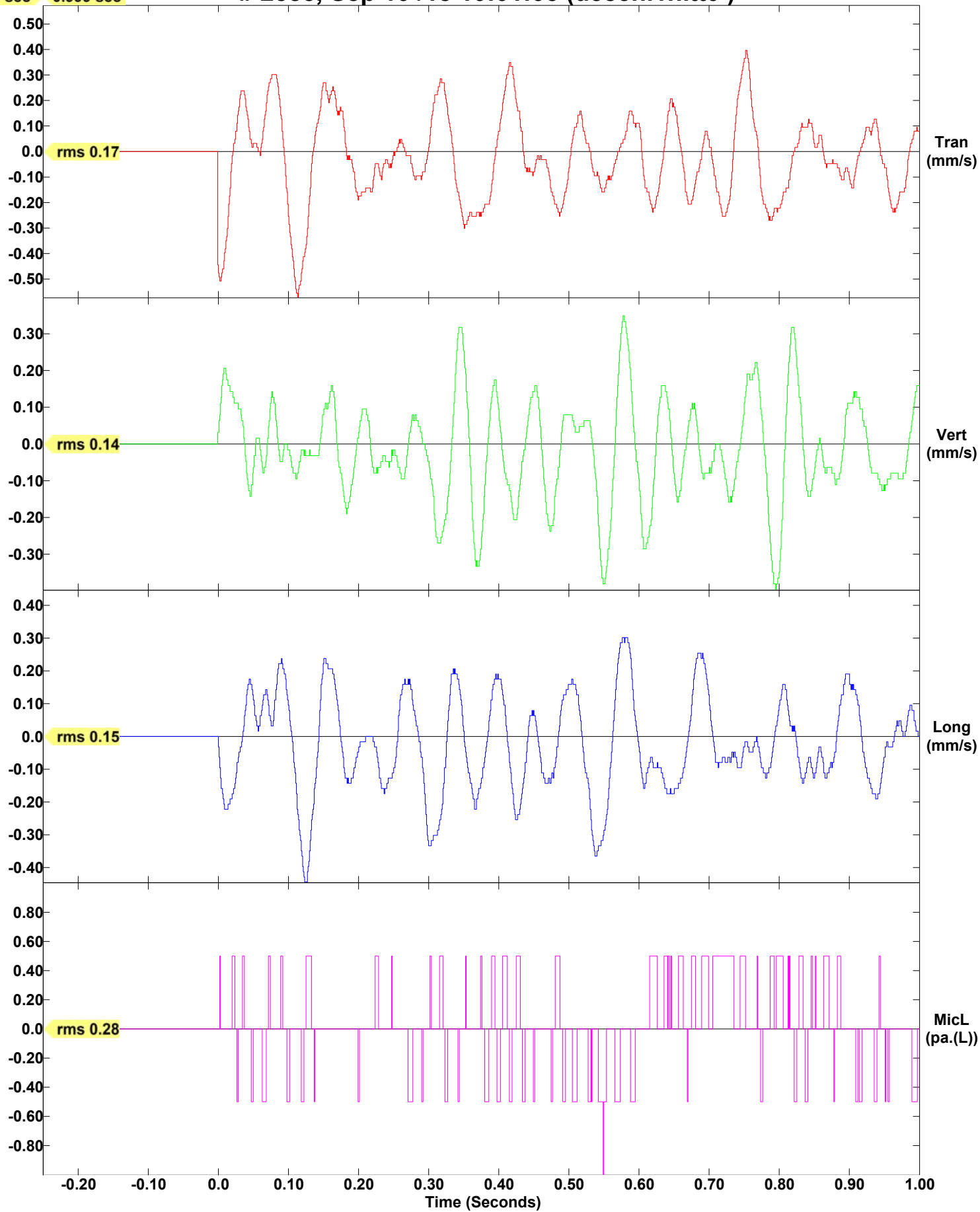
	Tran	Vert	Long	
PPV	0.572	0.397	0.445	mm/s
ZC Freq	12	17	13	Hz
Time (Rel. to Trig)	0.114	0.796	0.124	sec
Peak Acceleration	0.007	0.007	0.005	g
Peak Displacement	0.007	0.004	0.005	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.3	3.8	3.6	

Peak Vector Sum 0.619 mm/s at 0.114 sec
N/A: Not Applicable

USBM RI8507 And OSMRE



0.0 sec 0.999 sec



Date/Time Tran at 10:01:11 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL1N.TZ0

Notes

Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting

PSPL <88 dB(L)

ZC Freq N/A

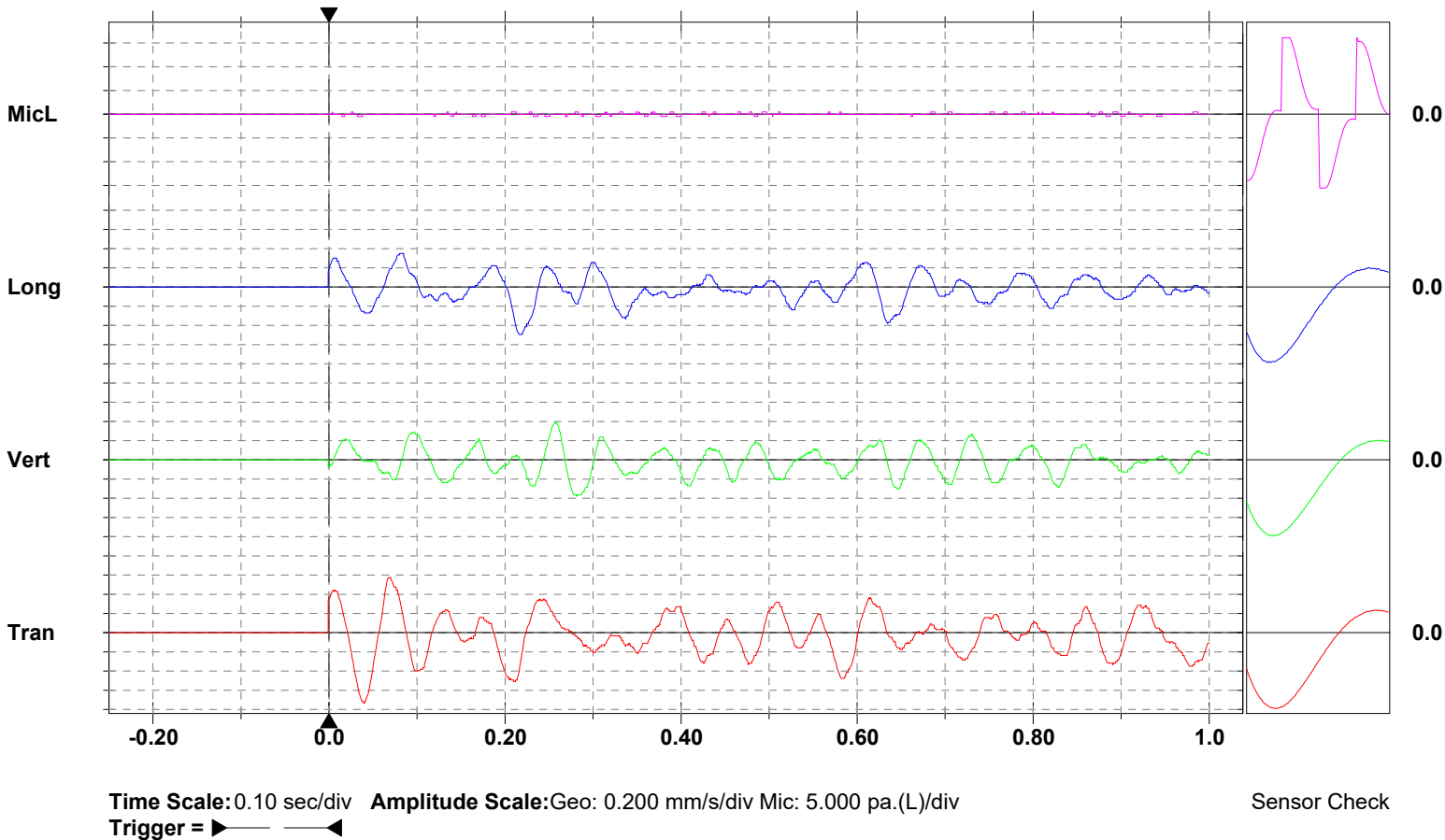
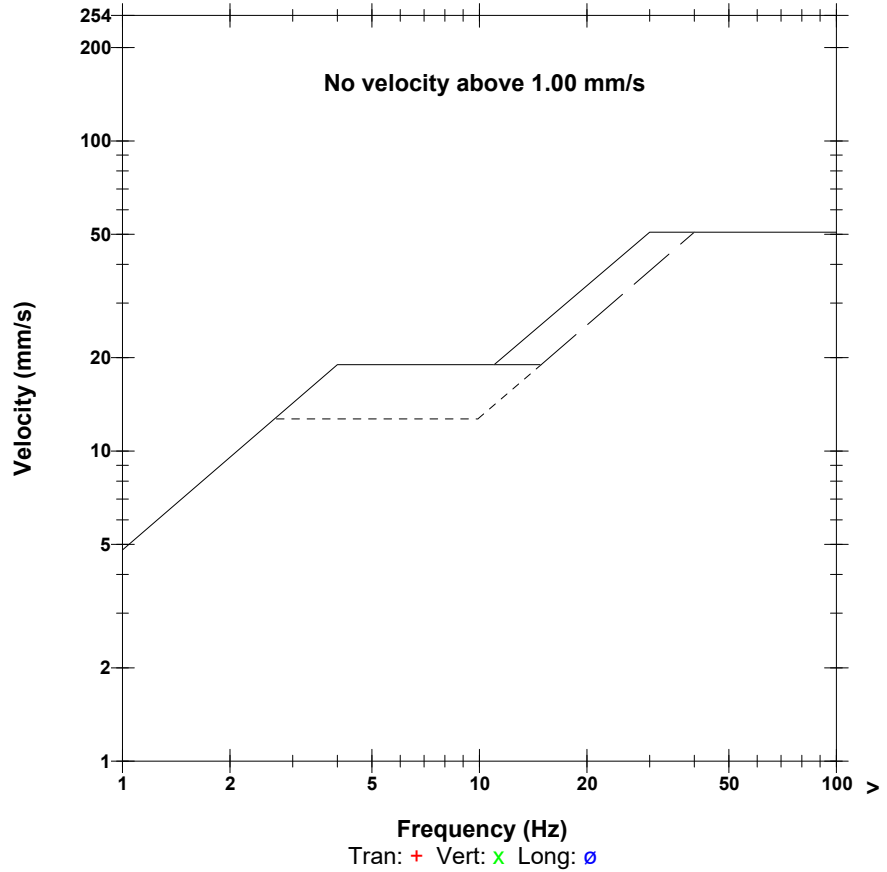
Channel Test Passed (Freq = 20.0 Hz Amp = 505 mv)

	Tran	Vert	Long	
PPV	0.730	0.397	0.492	mm/s
ZC Freq	14	20	14	Hz
Time (Rel. to Trig)	0.040	0.259	0.217	sec
Peak Acceleration	0.008	0.007	0.007	g
Peak Displacement	0.008	0.004	0.005	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.3	3.8	3.6	

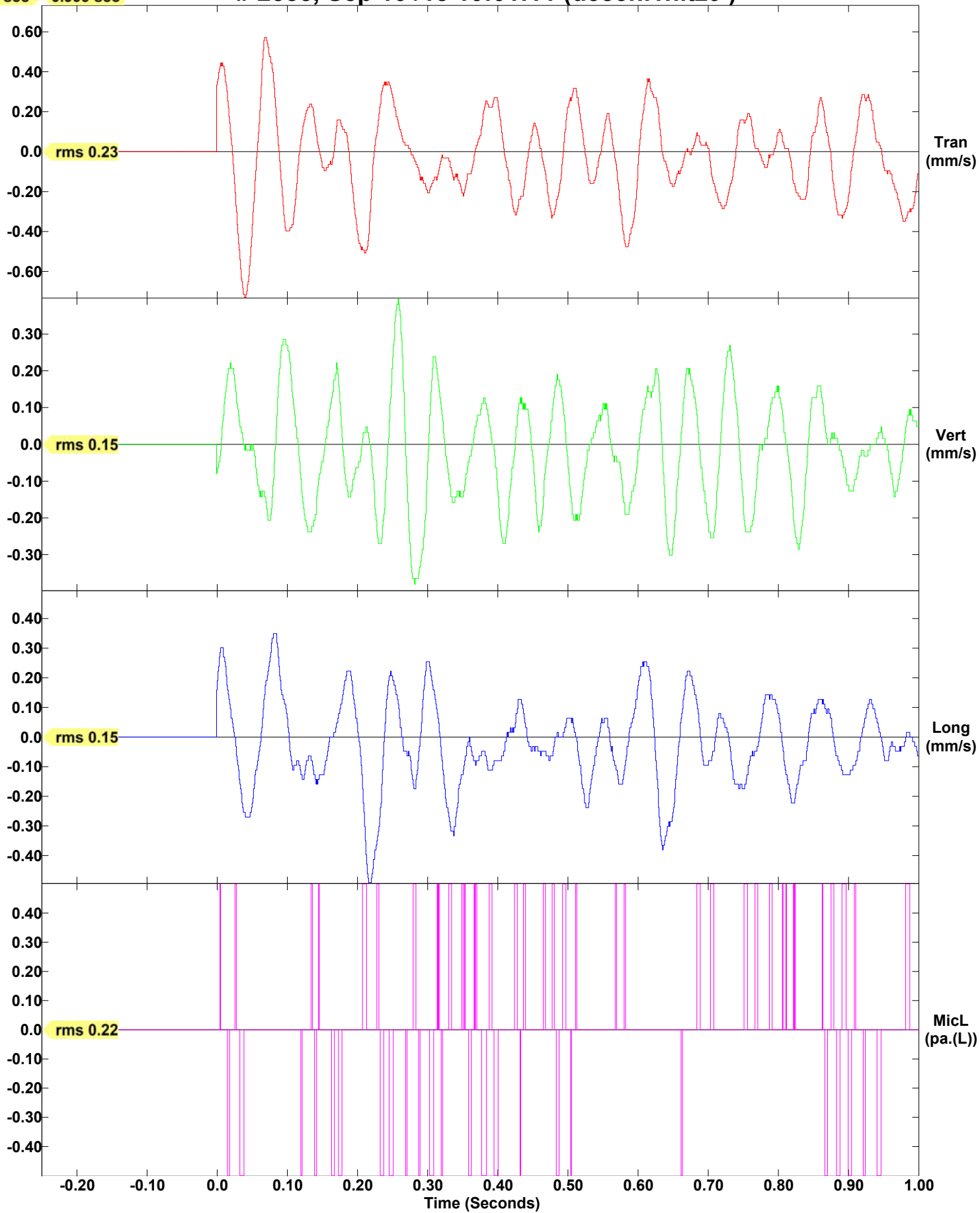
Peak Vector Sum 0.778 mm/s at 0.041 sec

N/A: Not Applicable

USBM RI8507 And OSMRE



0.0 sec 0.999 sec



Date/Time Tran at 10:01:17 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL1N.U50

Notes

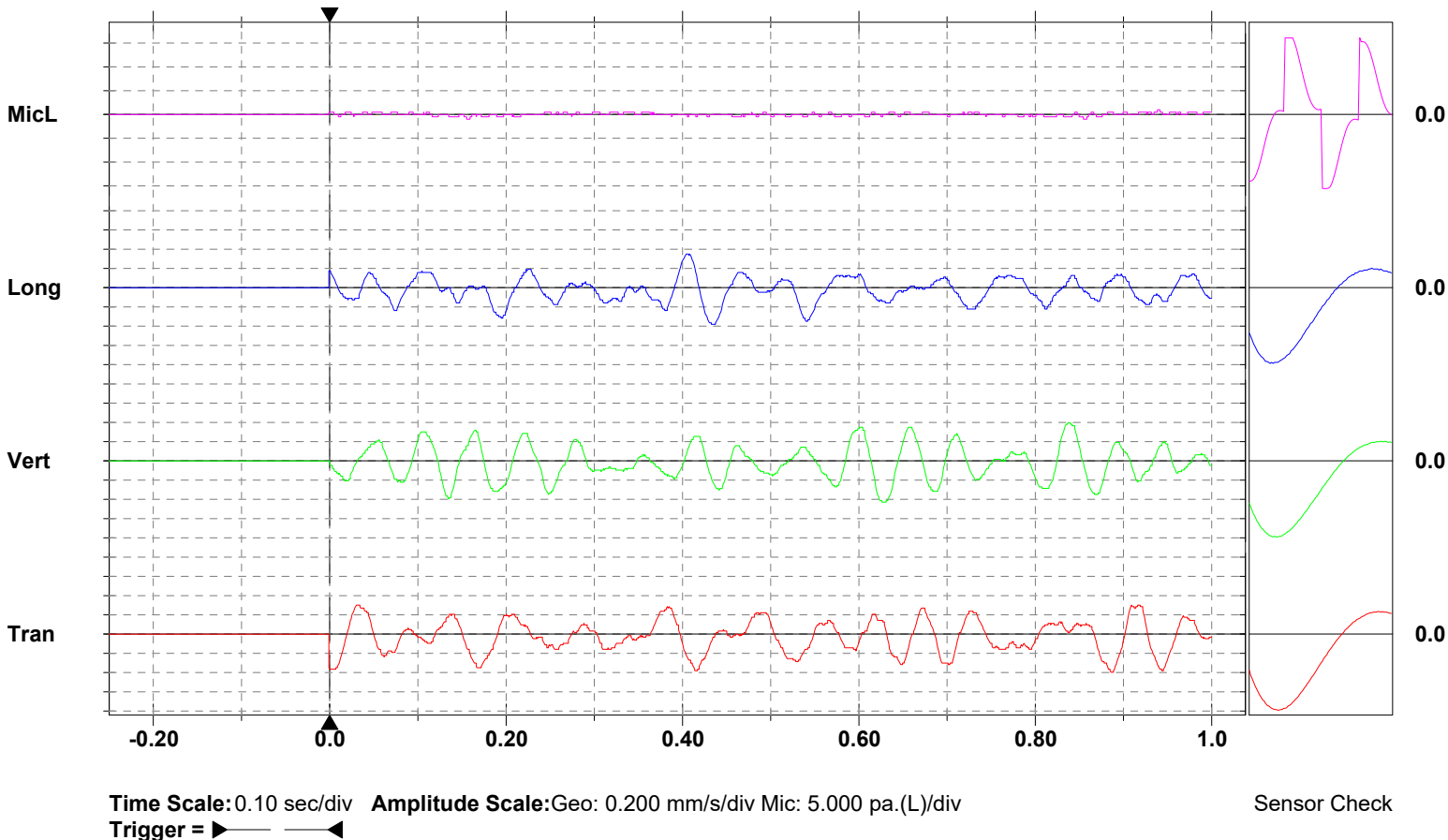
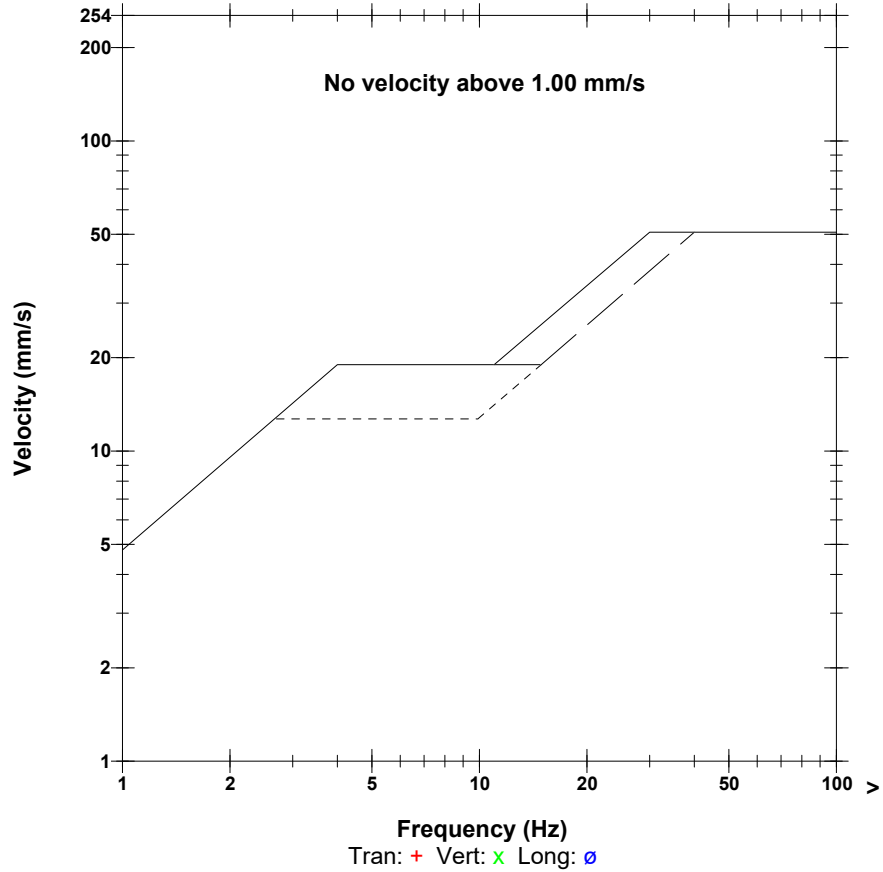
Location: Oxbow
 Client: Development ENG
 User Name: development eng
 Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting
PSPL 94.0 dB(L) at 0.156 sec
ZC Freq N/A
Channel Test Passed (Freq = 20.0 Hz Amp = 505 mv)

	Tran	Vert	Long	
PPV	0.397	0.429	0.381	mm/s
ZC Freq	15	17	16	Hz
Time (Rel. to Trig)	0.887	0.627	0.434	sec
Peak Acceleration	0.007	0.008	0.007	g
Peak Displacement	0.004	0.004	0.004	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.3	3.8	3.6	

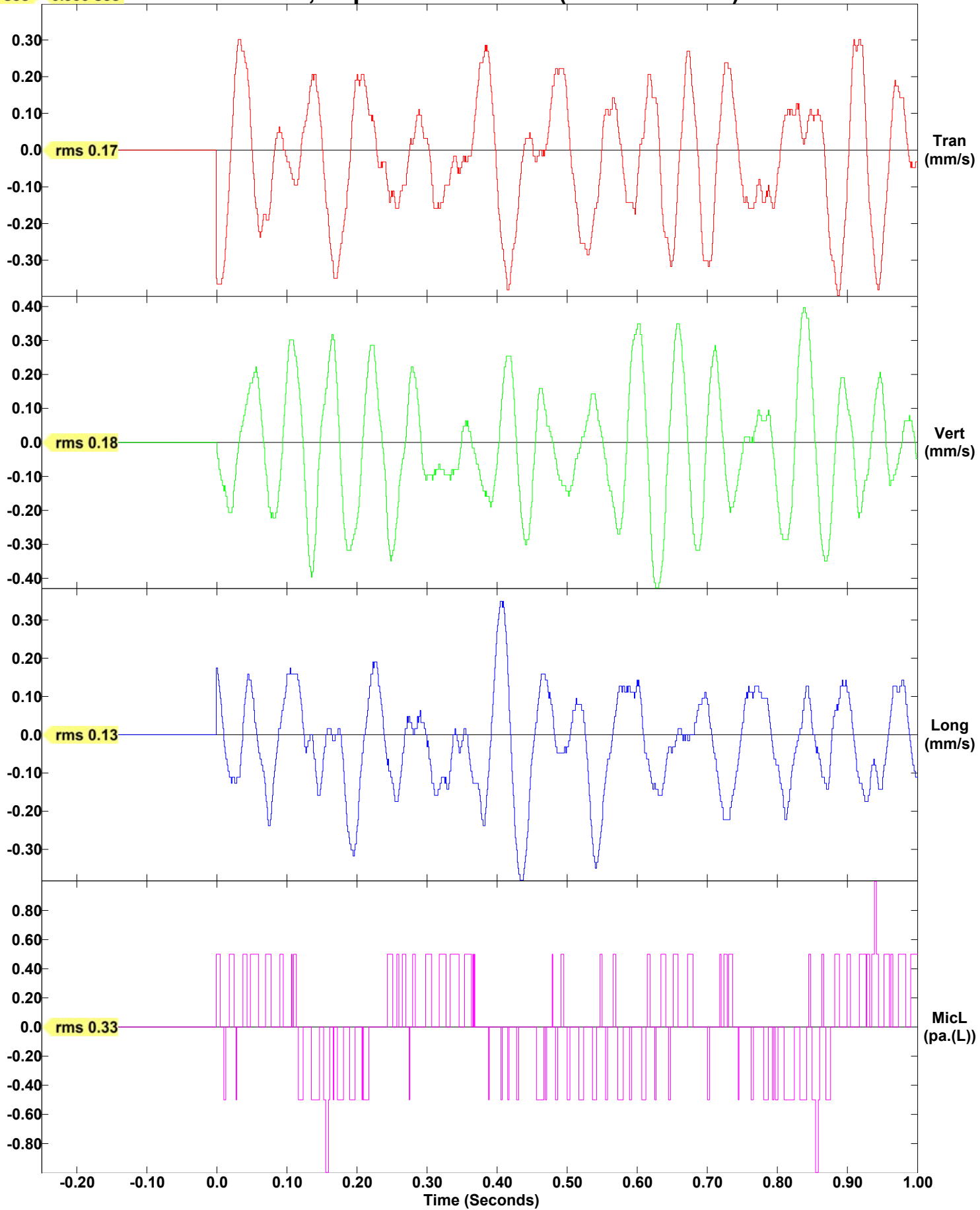
Peak Vector Sum 0.508 mm/s at 0.415 sec
 N/A: Not Applicable

USBM RI8507 And OSMRE



0.0 sec 0.999 sec

2585, Sep 10 /18 10:01:17 (d585hl1n.u50)



Date/Time Tran at 10:01:23 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL1N.UB0

Notes

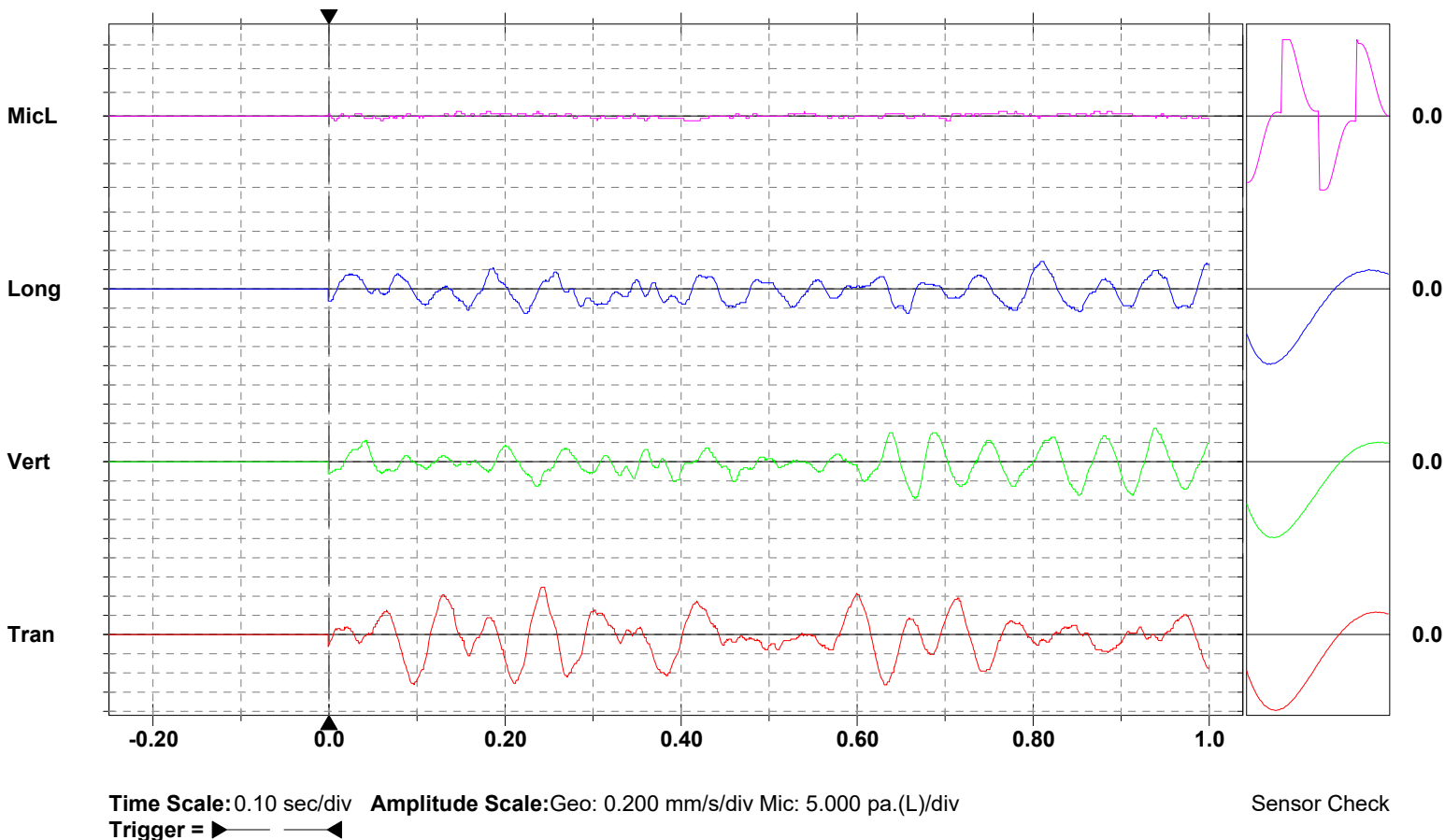
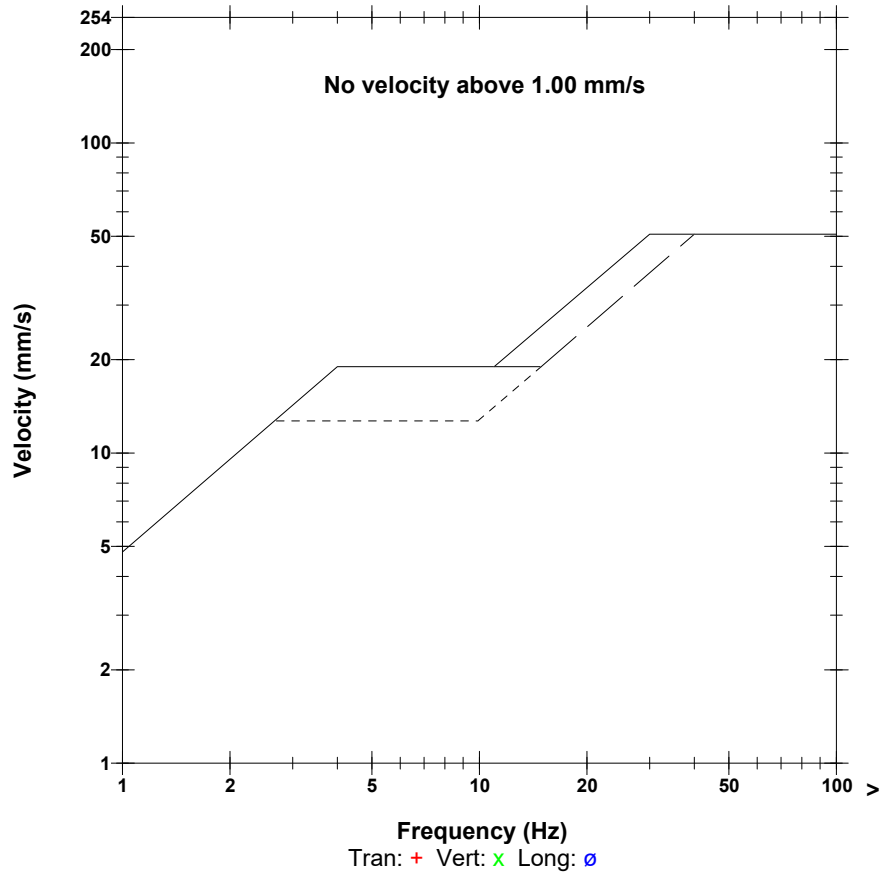
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting
PSPL 94.0 dB(L) at 0.007 sec
ZC Freq N/A
Channel Test Passed (Freq = 20.0 Hz Amp = 505 mv)

	Tran	Vert	Long	
PPV	0.524	0.381	0.286	mm/s
ZC Freq	13	18	15	Hz
Time (Rel. to Trig)	0.098	0.666	0.810	sec
Peak Acceleration	0.008	0.008	0.007	g
Peak Displacement	0.006	0.003	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.3	3.8	3.6	

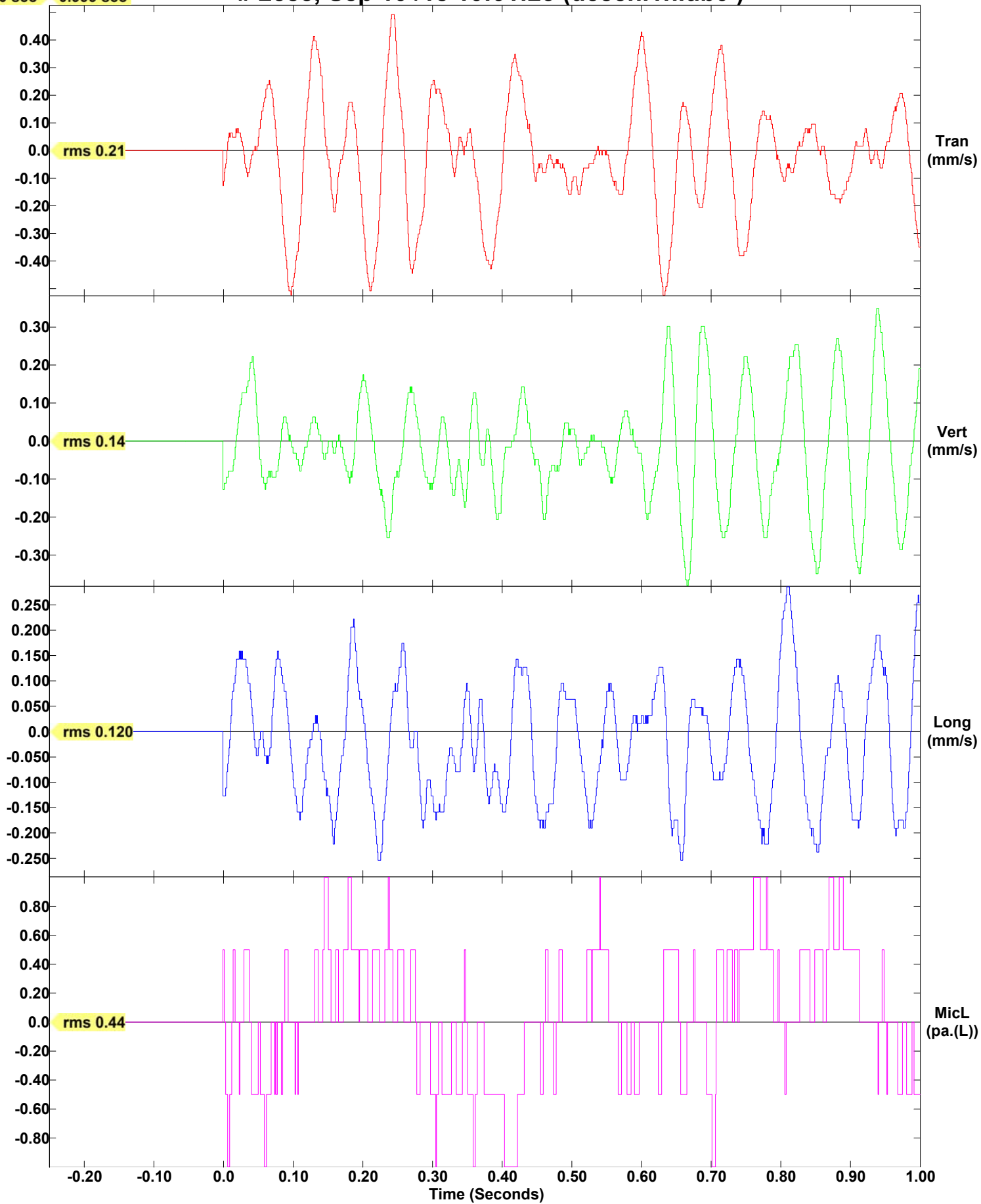
Peak Vector Sum 0.572 mm/s at 0.638 sec
N/A: Not Applicable

USBM RI8507 And OSMRE



0.0 sec 0.999 sec

2585, Sep 10 /18 10:01:23 (d585hl1n.ub0)



Date/Time Tran at 10:01:30 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL1N.UI0

Notes

Location: Oxbow
 Client: Development ENG
 User Name: development eng
 Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting

PSPL <88 dB(L)

ZC Freq N/A

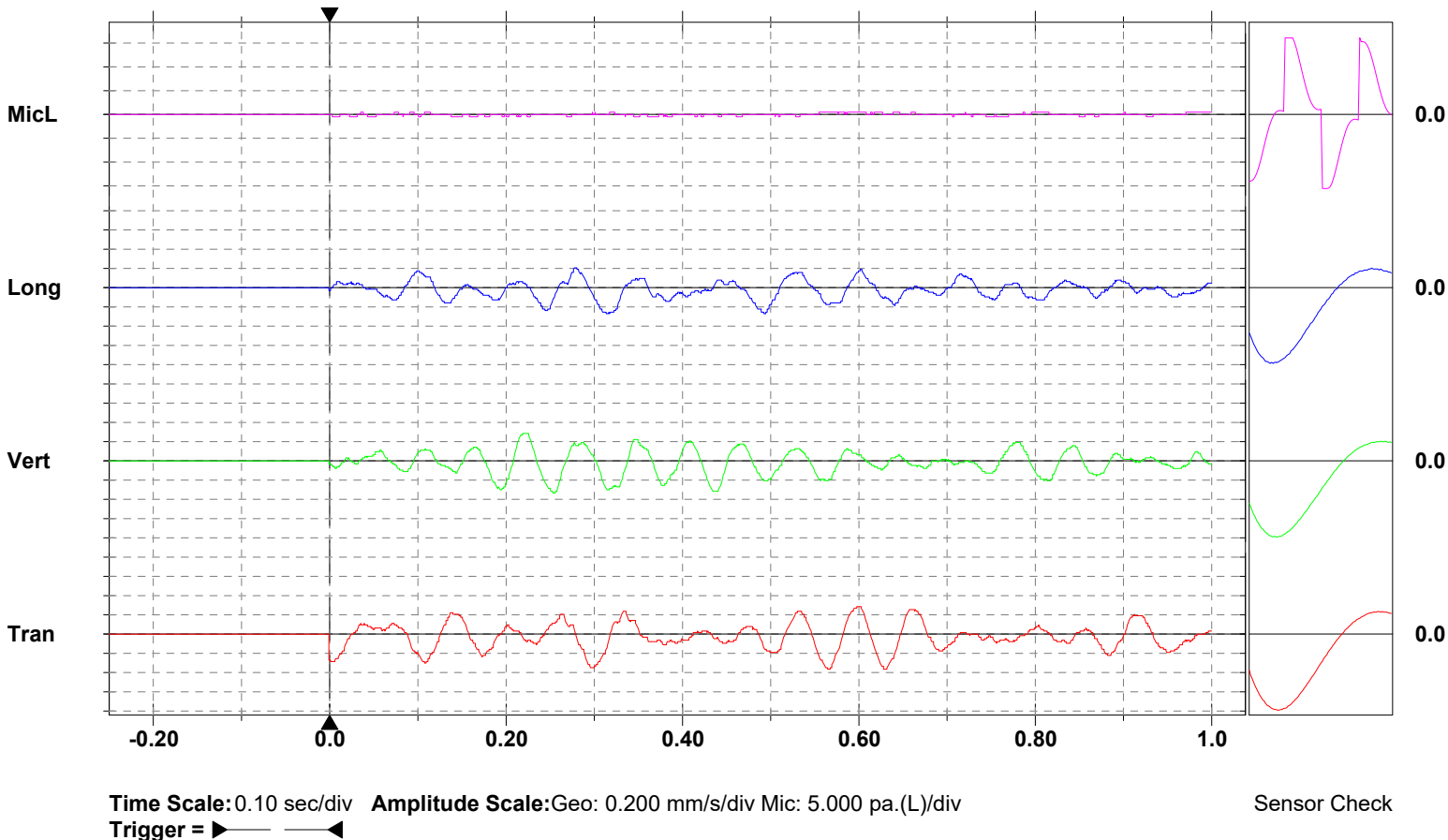
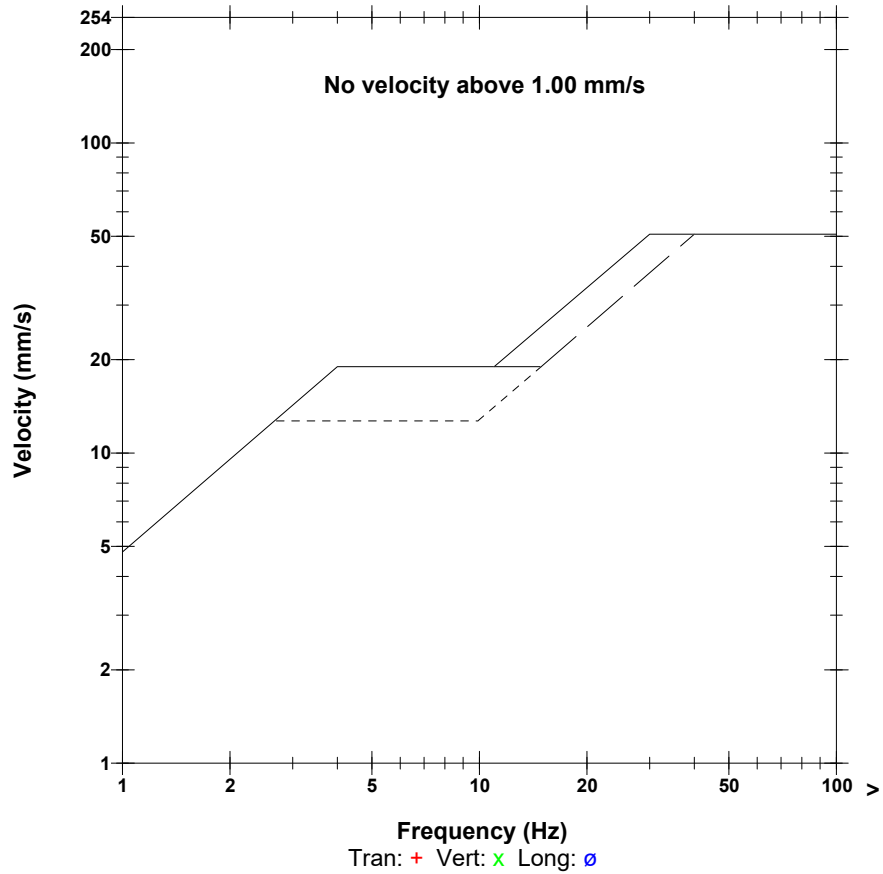
Channel Test Passed (Freq = 20.0 Hz Amp = 505 mv)

	Tran	Vert	Long	
PPV	0.365	0.333	0.270	mm/s
ZC Freq	14	16	13	Hz
Time (Rel. to Trig)	0.565	0.254	0.314	sec
Peak Acceleration	0.005	0.007	0.005	g
Peak Displacement	0.004	0.004	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.3	3.8	3.6	

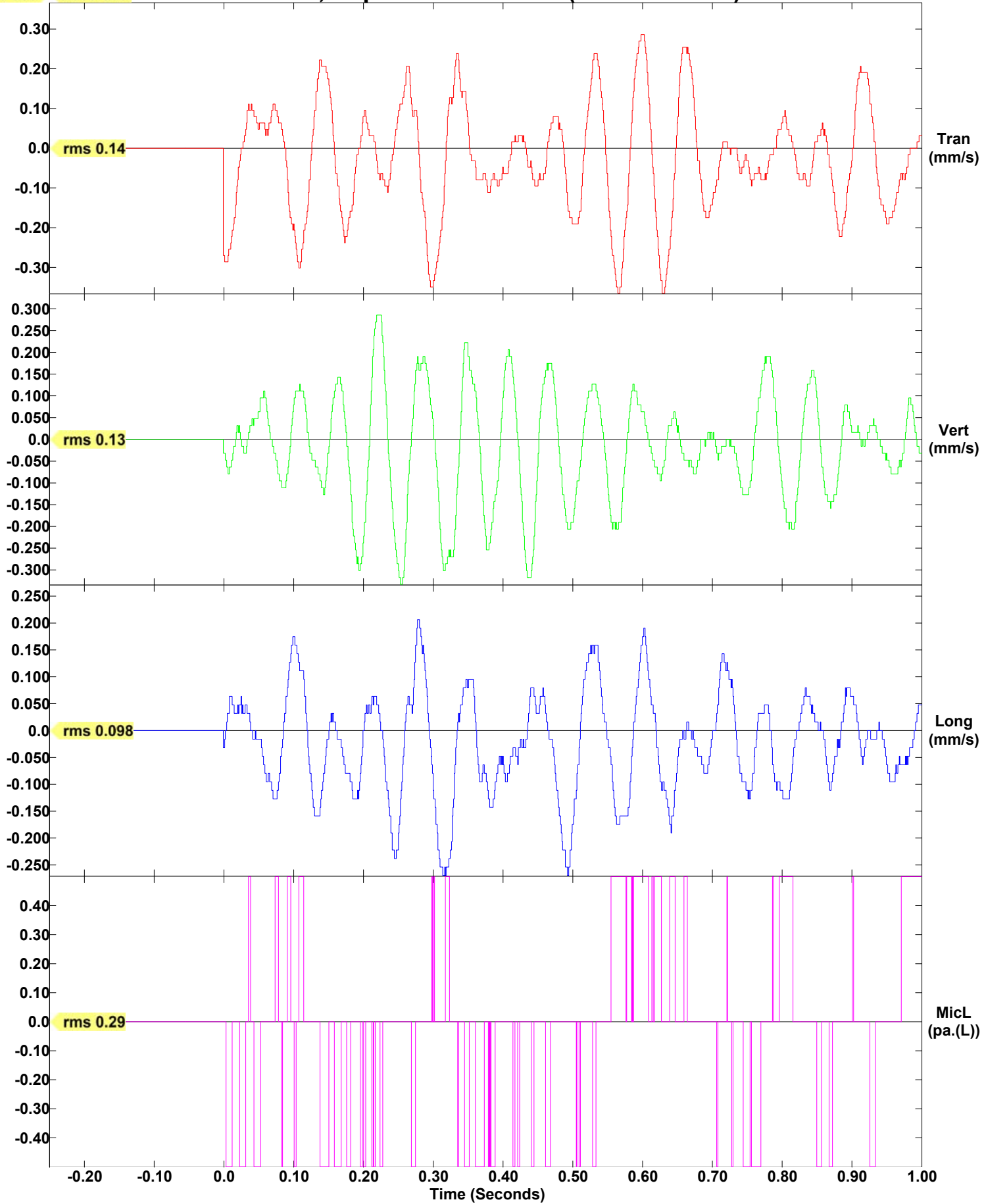
Peak Vector Sum 0.460 mm/s at 0.565 sec

N/A: Not Applicable

USBM RI8507 And OSMRE



0.0 sec 0.999 sec



Date/Time Tran at 10:01:36 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL1N.UO0

Notes

Location: Oxbow
 Client: Development ENG
 User Name: development eng
 Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting

PSPL <88 dB(L)

ZC Freq N/A

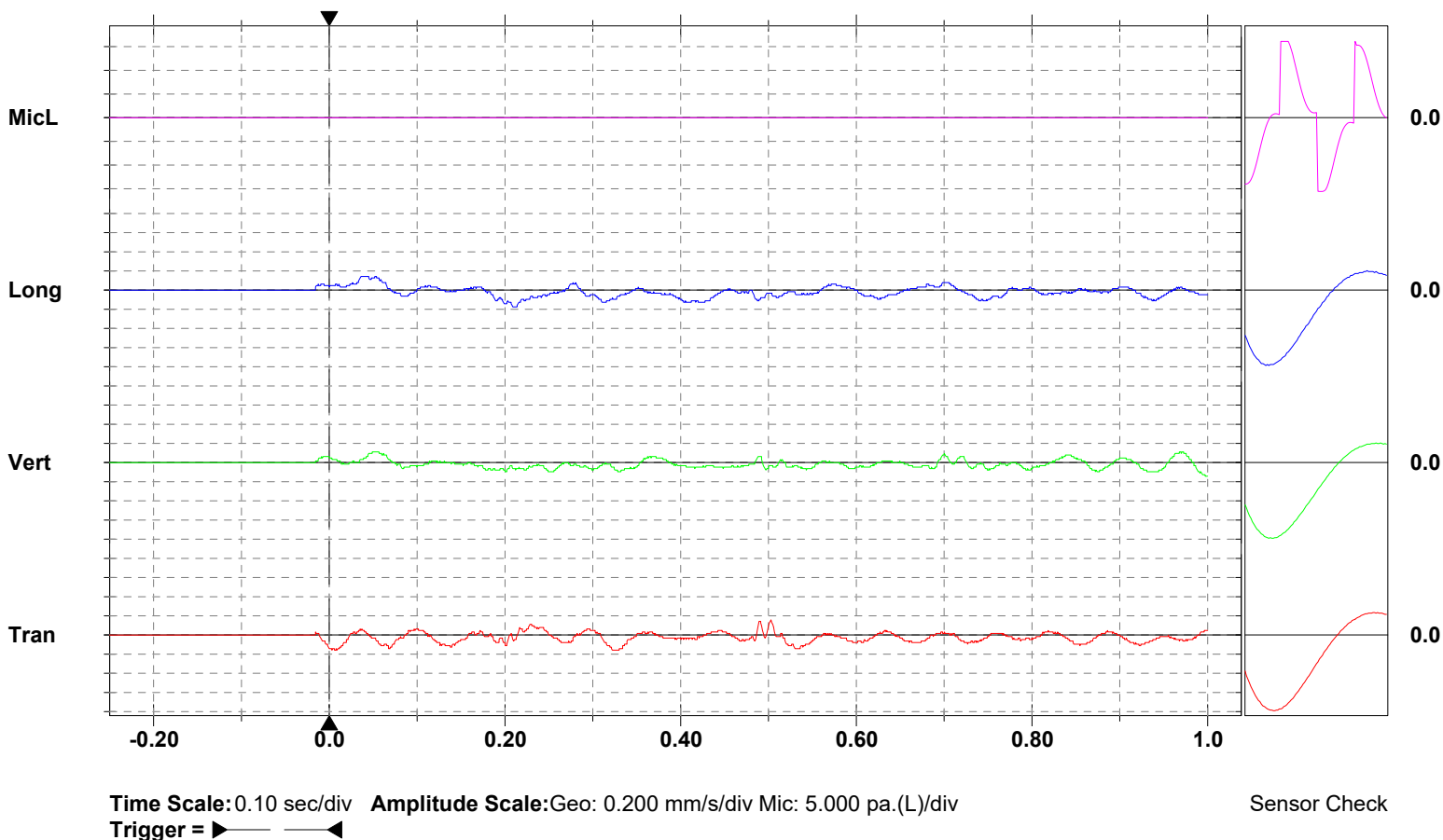
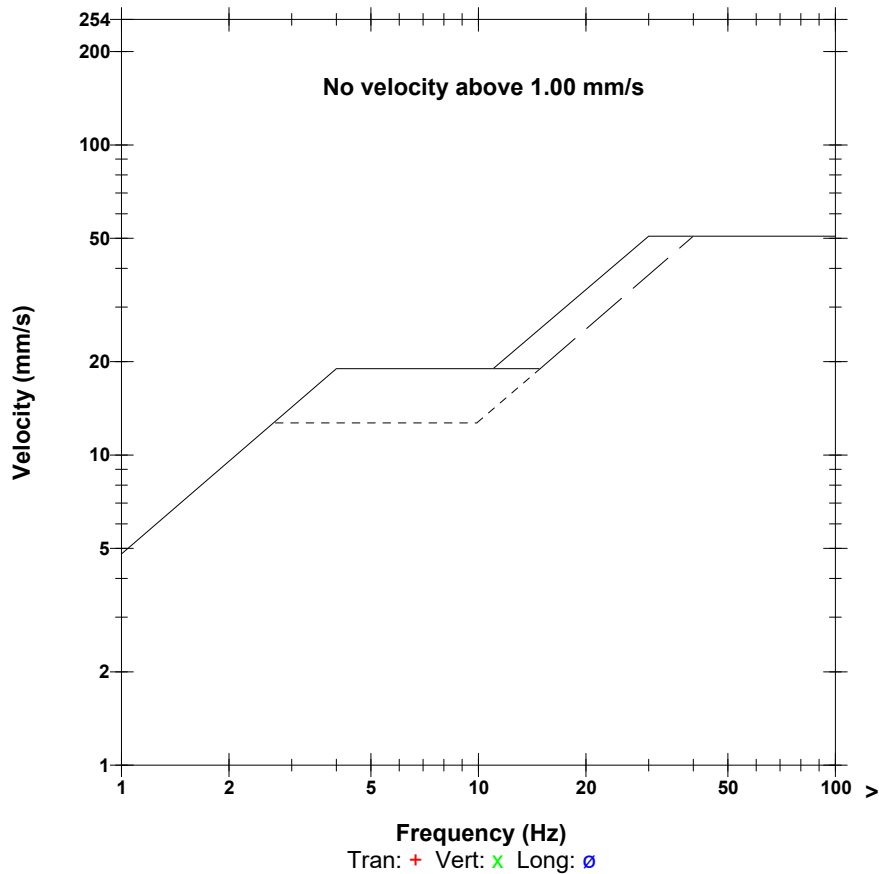
Channel Test Passed (Freq = 20.0 Hz Amp = 505 mv)

	Tran	Vert	Long	
PPV	0.159	0.143	0.175	mm/s
ZC Freq	15	32	7.0	Hz
Time (Rel. to Trig)	0.010	0.998	0.210	sec
Peak Acceleration	0.005	0.003	0.003	g
Peak Displacement	0.002	0.002	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.3	3.8	3.6	

Peak Vector Sum 0.206 mm/s at 0.201 sec

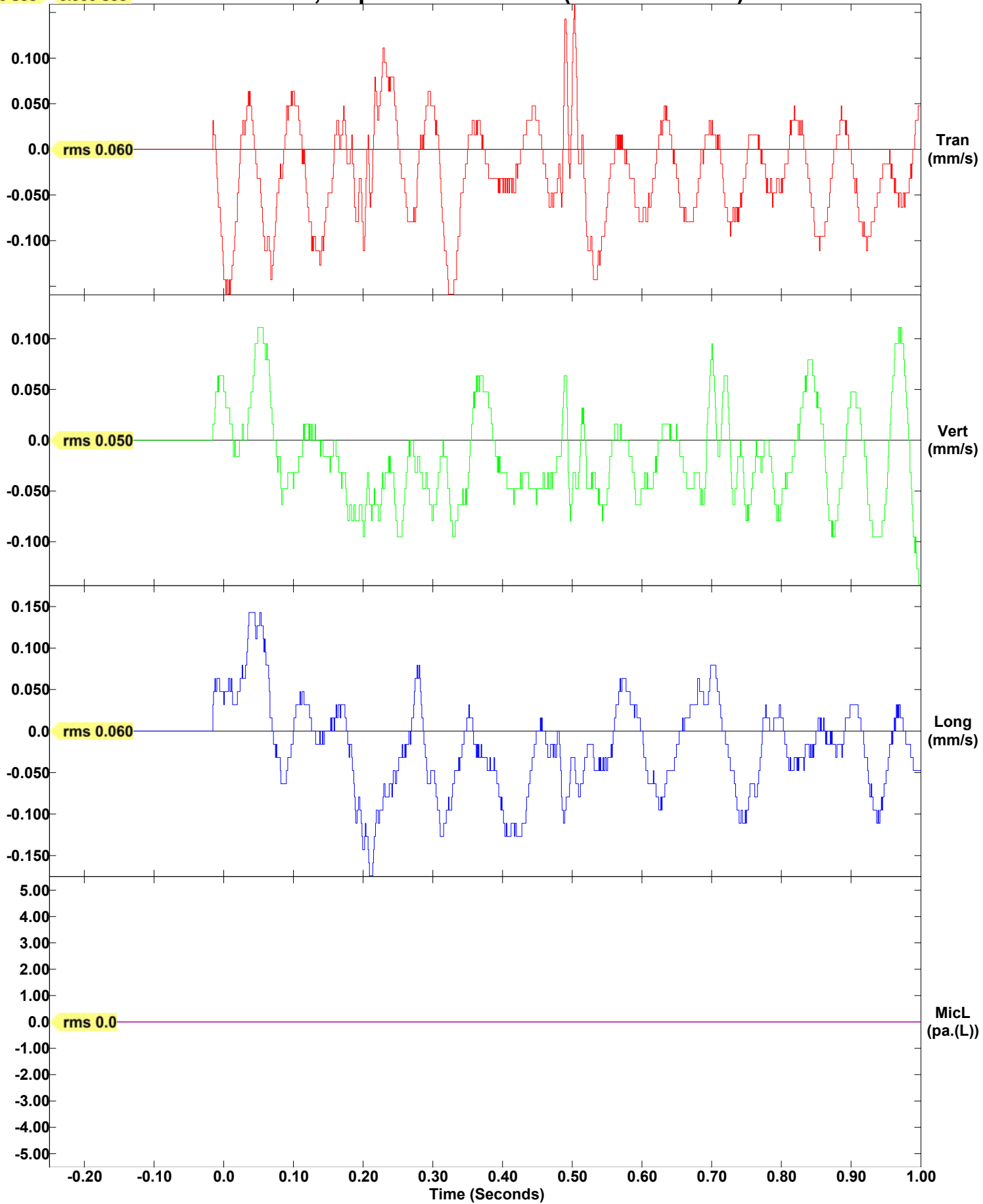
N/A: Not Applicable

USBM RI8507 And OSMRE



0.0 sec 0.999 sec

2585, Sep 10 /18 10:01:36 (d585hl1n.uo0)



Date/Time Tran at 14:25:04 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL20.1S0

Notes

Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting

PSPL <88 dB(L)

ZC Freq N/A

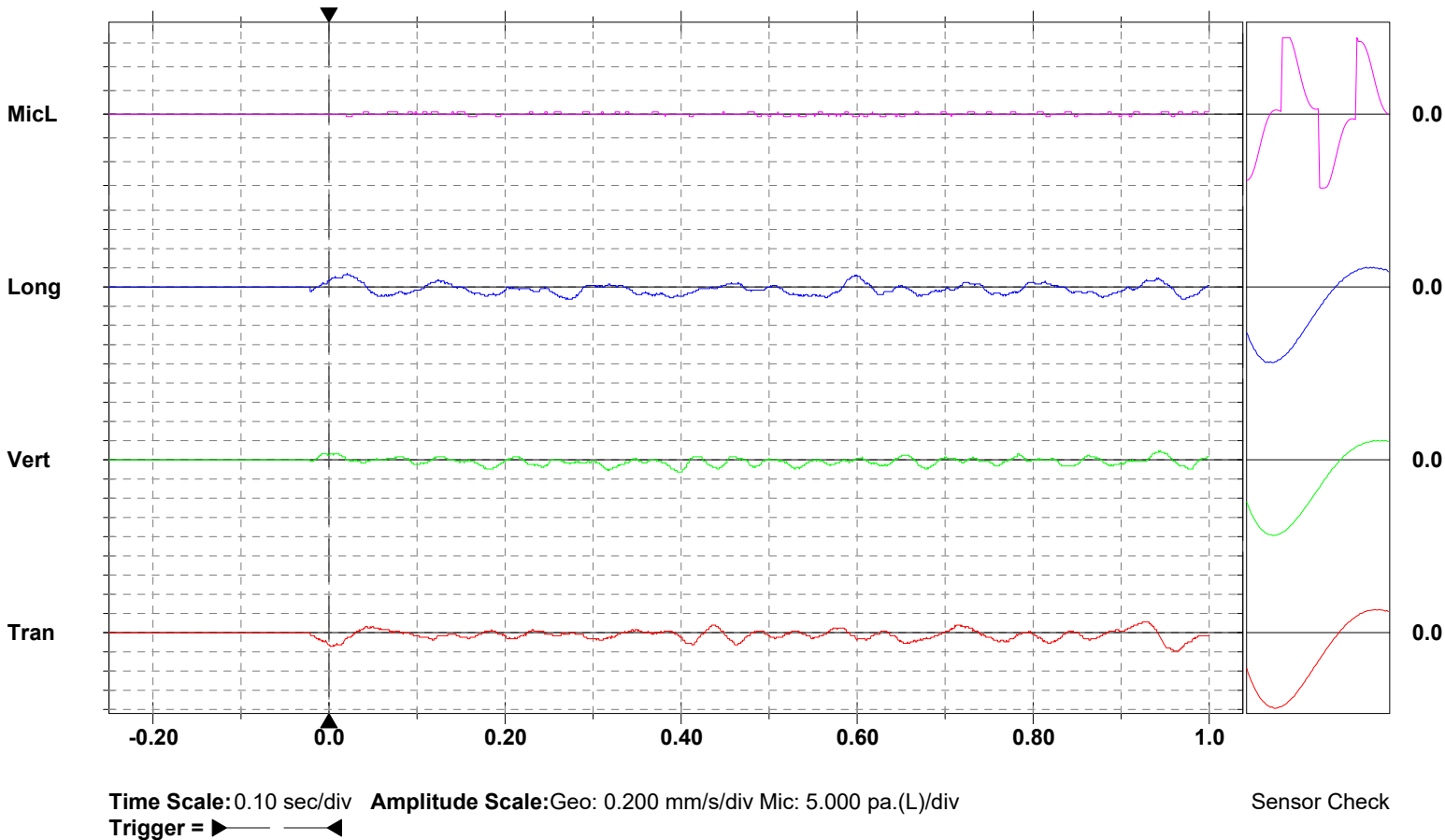
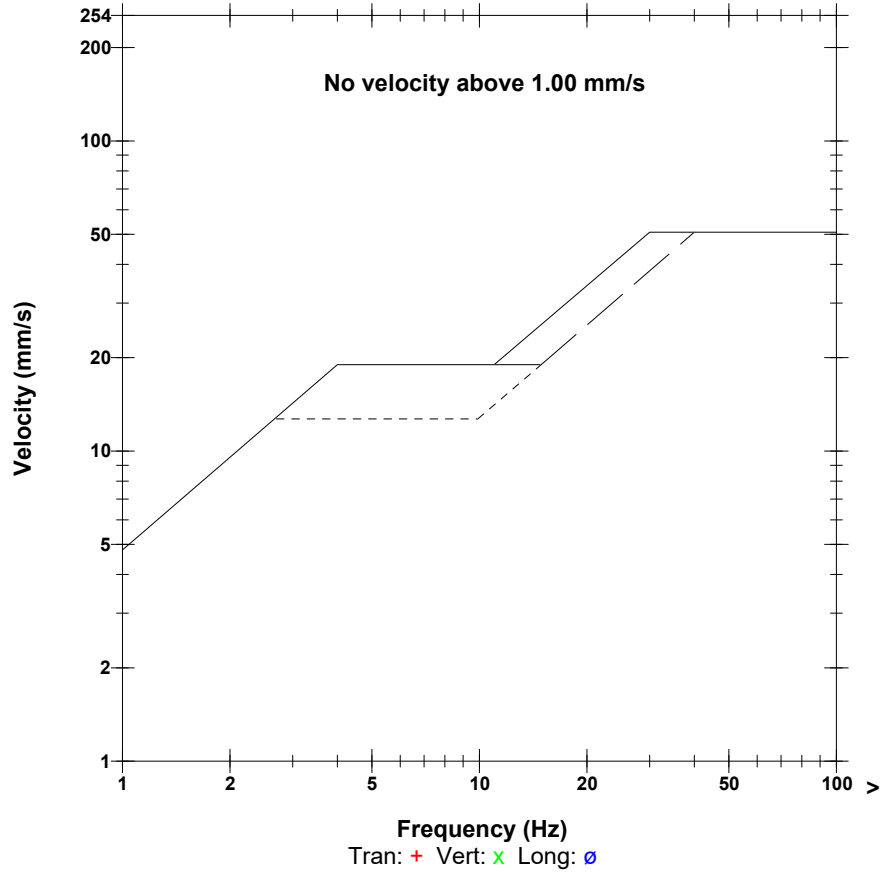
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

	Tran	Vert	Long	
PPV	0.191	0.127	0.143	mm/s
ZC Freq	9.0	16	10	Hz
Time (Rel. to Trig)	0.960	0.396	0.021	sec
Peak Acceleration	0.003	0.003	0.003	g
Peak Displacement	0.003	0.001	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.2	3.9	3.5	

Peak Vector Sum 0.222 mm/s at 0.966 sec

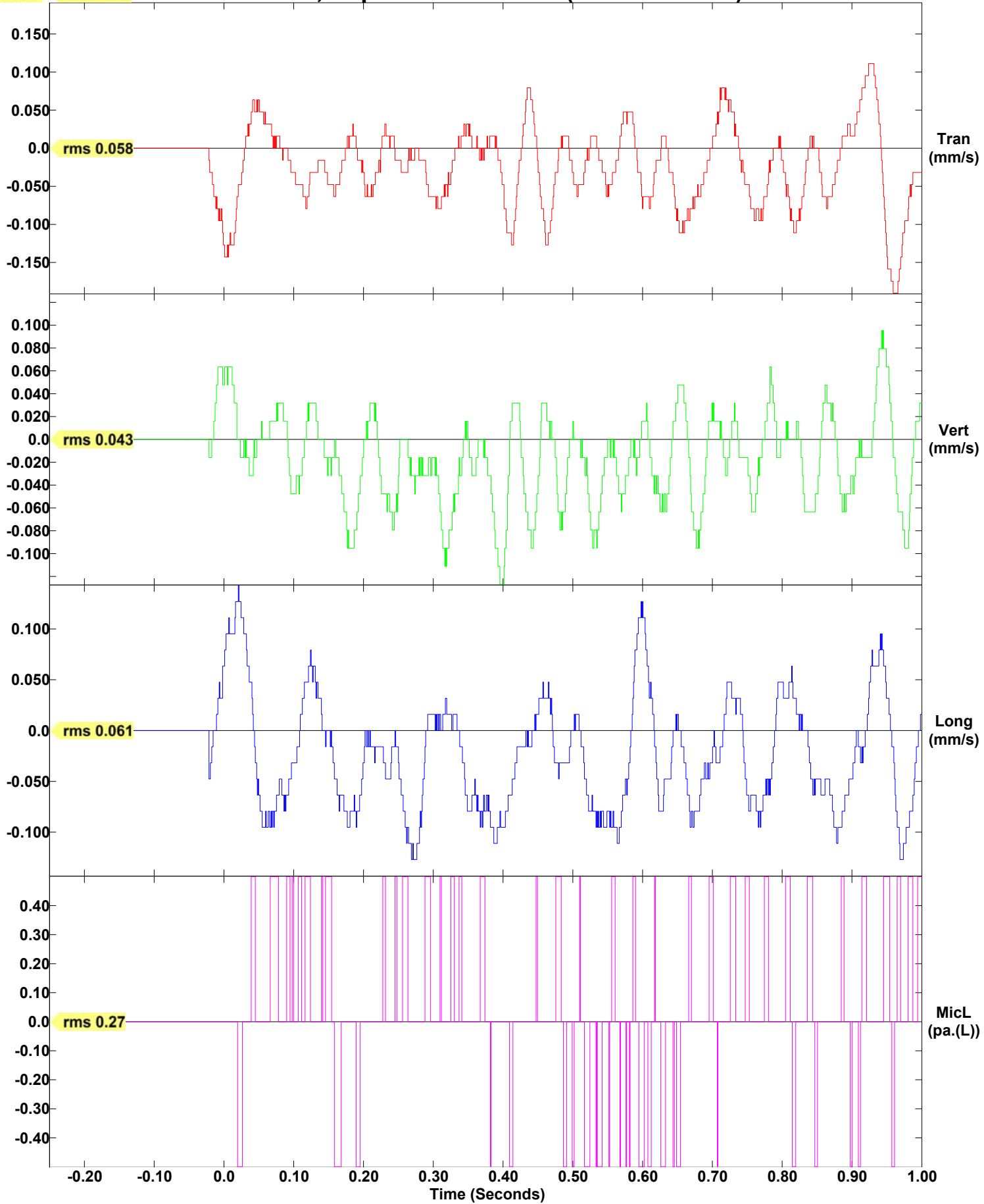
N/A: Not Applicable

USBM RI8507 And OSMRE



0.0 sec

0.999 sec



Date/Time Vert at 14:25:10 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL20.1Y0

Notes

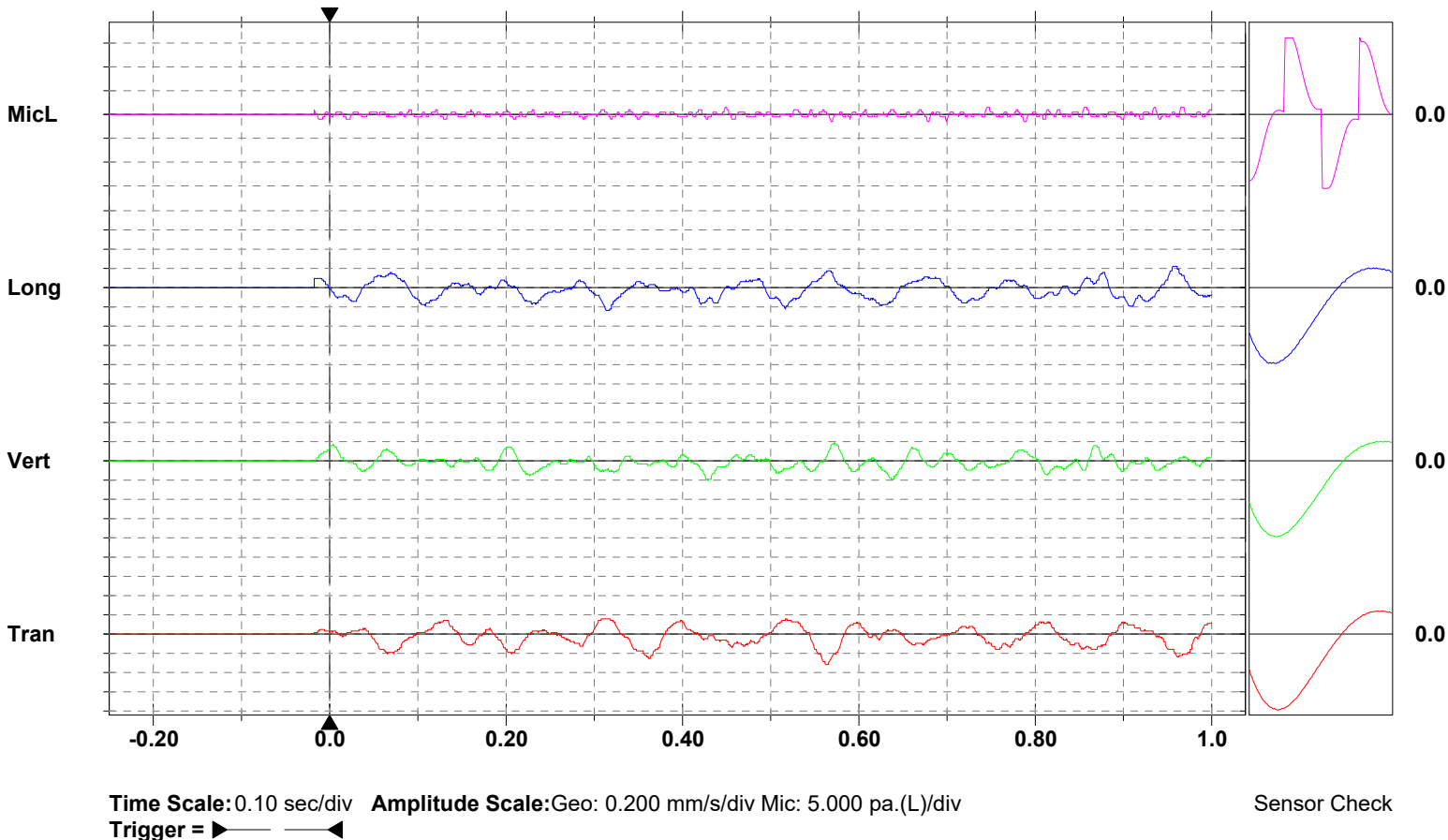
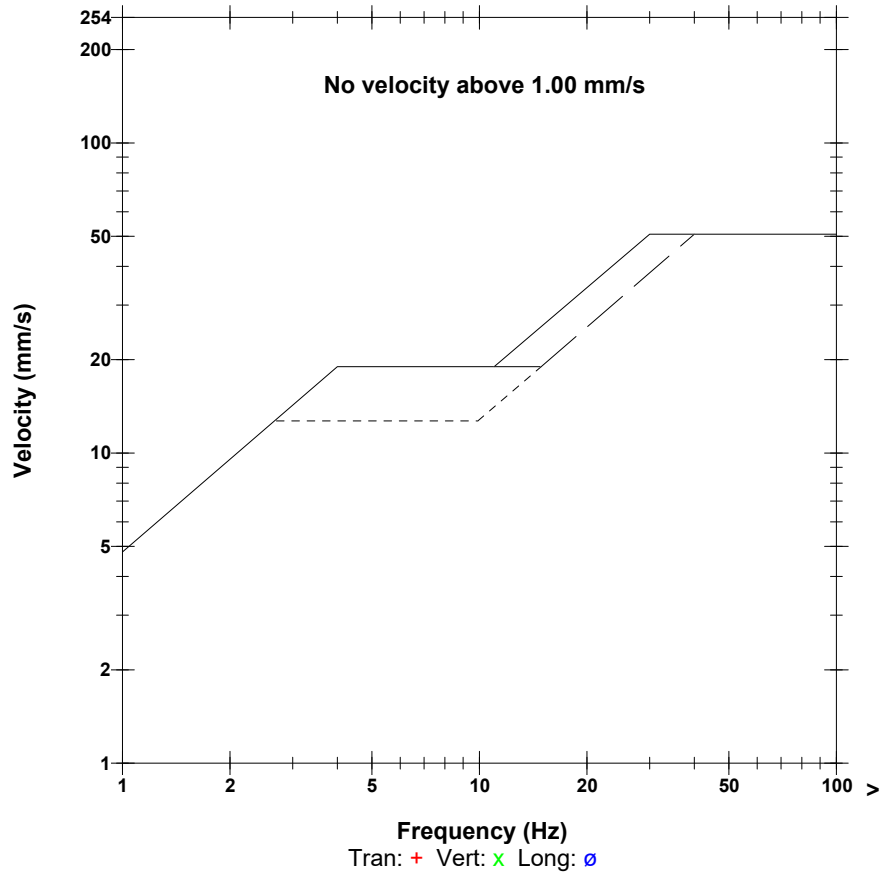
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting
PSPL 97.5 dB(L) at 0.449 sec
ZC Freq 85 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

	Tran	Vert	Long	
PPV	0.318	0.206	0.238	mm/s
ZC Freq	13	12	12	Hz
Time (Rel. to Trig)	0.563	0.430	0.314	sec
Peak Acceleration	0.005	0.003	0.005	g
Peak Displacement	0.004	0.002	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.2	3.9	3.5	

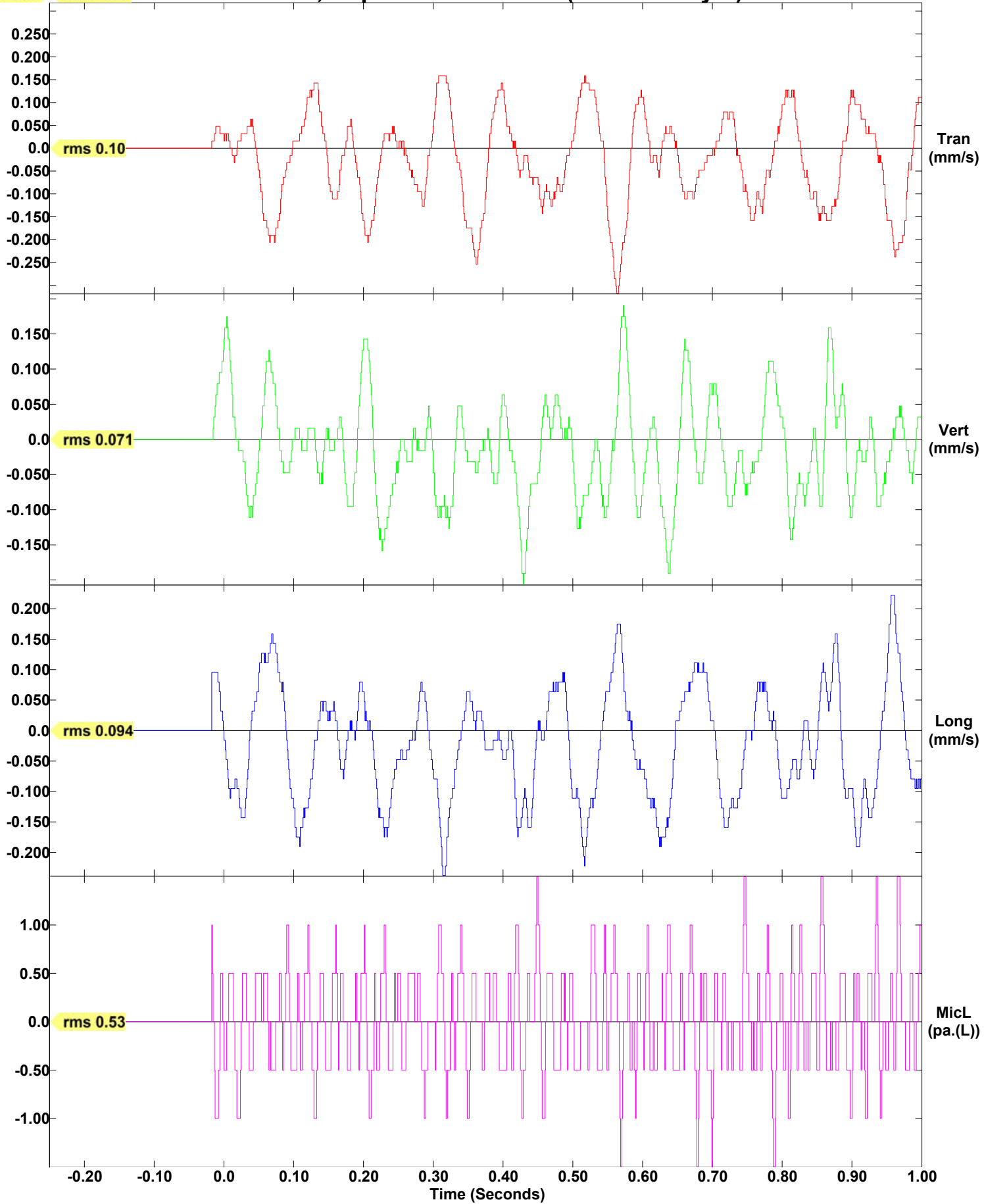
Peak Vector Sum 0.365 mm/s at 0.565 sec

USBM RI8507 And OSMRE



0.0 sec 0.999 sec

2585, Sep 10 /18 14:25:10 (d585hl20.1y0)



Date/Time Vert at 14:25:16 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL20.240

Notes

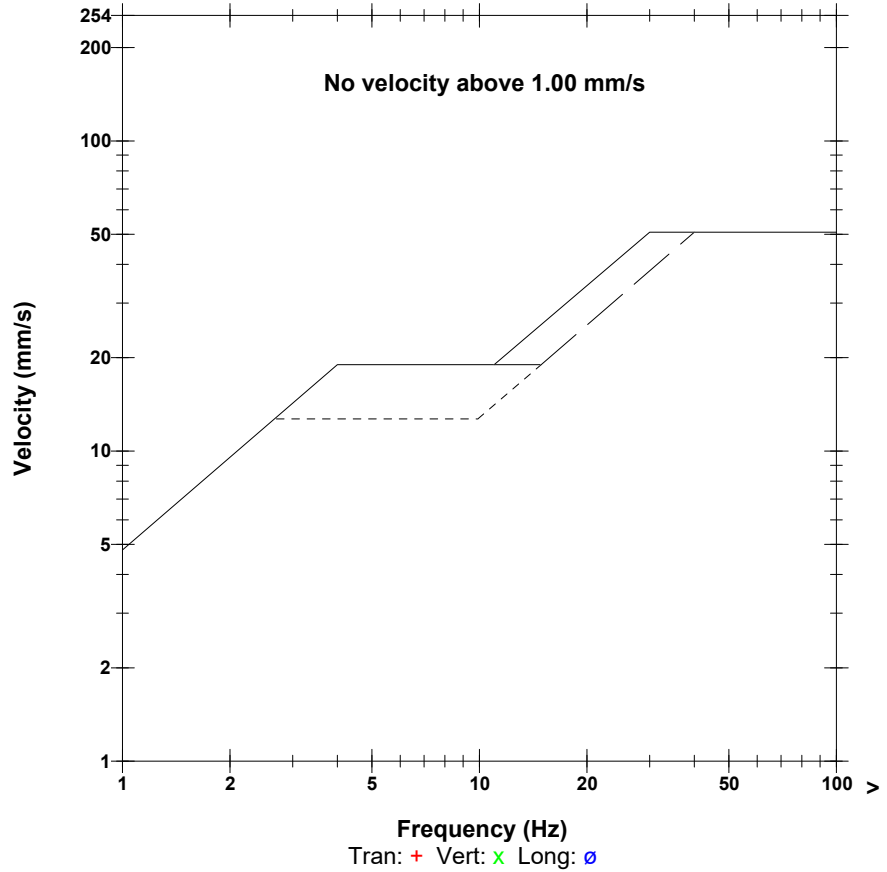
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting
PSPL 108.8 dB(L) at 0.229 sec
ZC Freq 85 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

	Tran	Vert	Long	
PPV	0.540	0.540	0.587	mm/s
ZC Freq	15	24	11	Hz
Time (Rel. to Trig)	0.925	0.751	0.084	sec
Peak Acceleration	0.015	0.013	0.010	g
Peak Displacement	0.006	0.005	0.007	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.2	3.9	3.5	

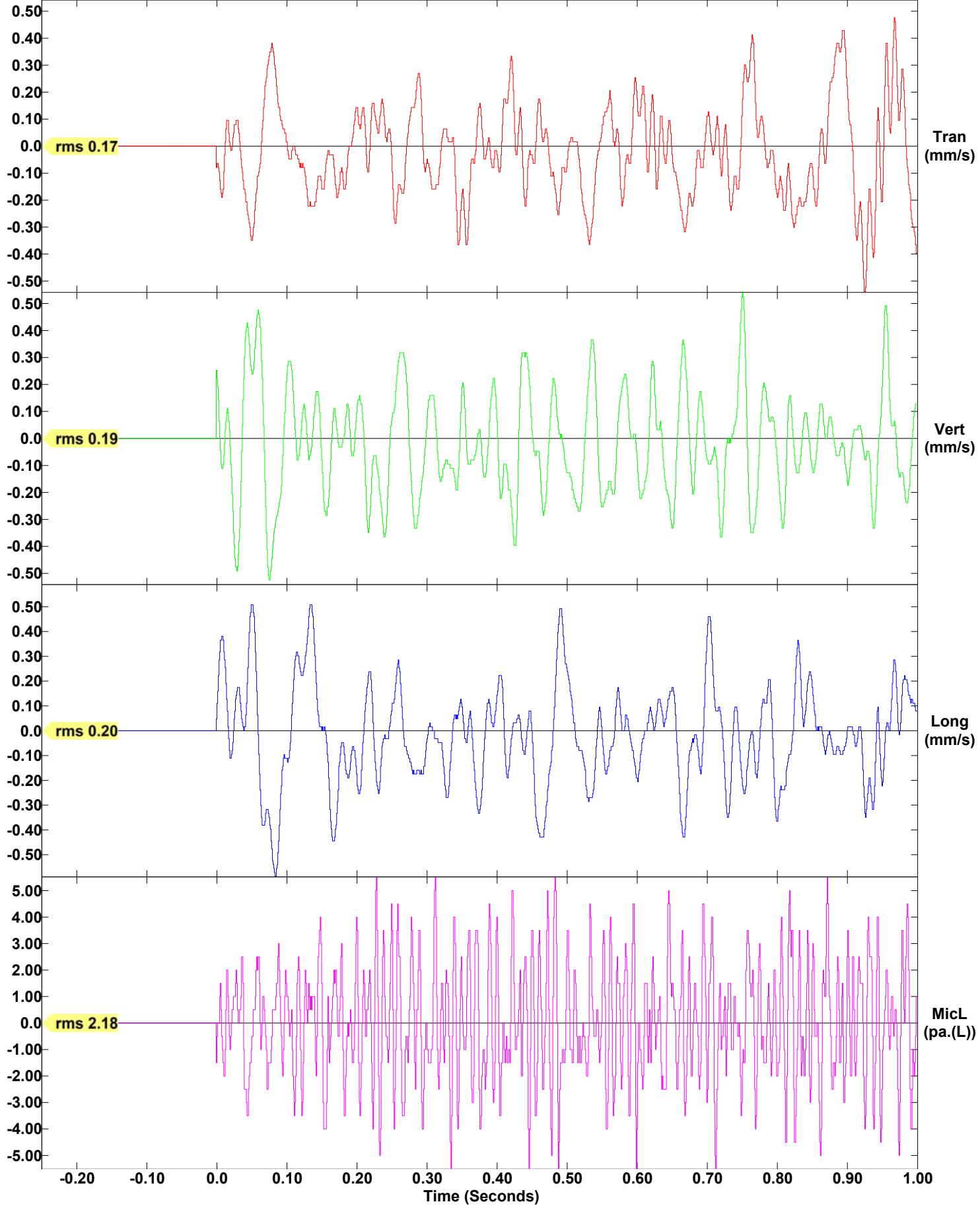
Peak Vector Sum 0.762 mm/s at 0.080 sec

USBM RI8507 And OSMRE



Sensor Check

0.0 sec 0.999 sec



Date/Time Tran at 14:25:22 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL20.2A0

Notes

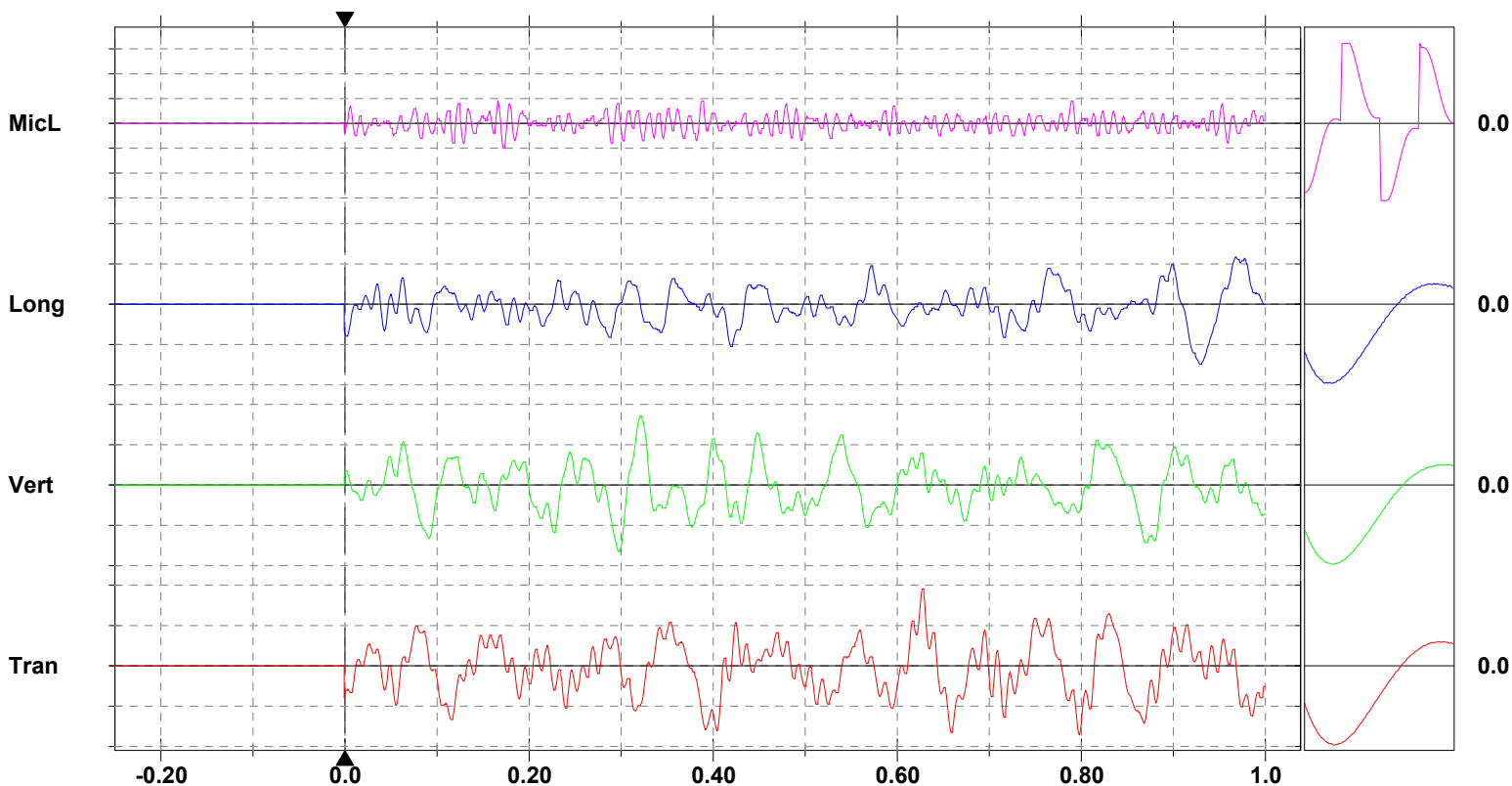
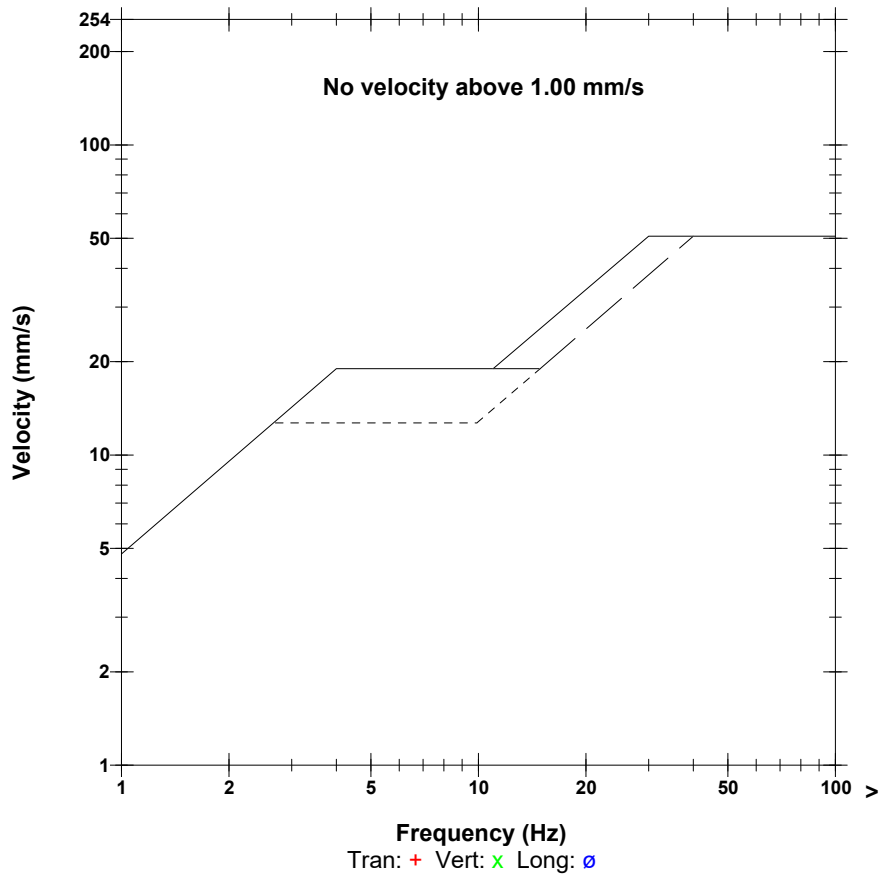
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

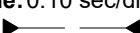
Microphone Linear Weighting
PSPL 108.0 dB(L) at 0.173 sec
ZC Freq 85 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

	Tran	Vert	Long	
PPV	0.953	0.857	0.746	mm/s
ZC Freq	16	20	12	Hz
Time (Rel. to Trig)	0.628	0.321	0.930	sec
Peak Acceleration	0.023	0.017	0.013	g
Peak Displacement	0.008	0.008	0.009	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.2	3.9	3.5	

Peak Vector Sum 1.032 mm/s at 0.628 sec

USBM RI8507 And OSMRE

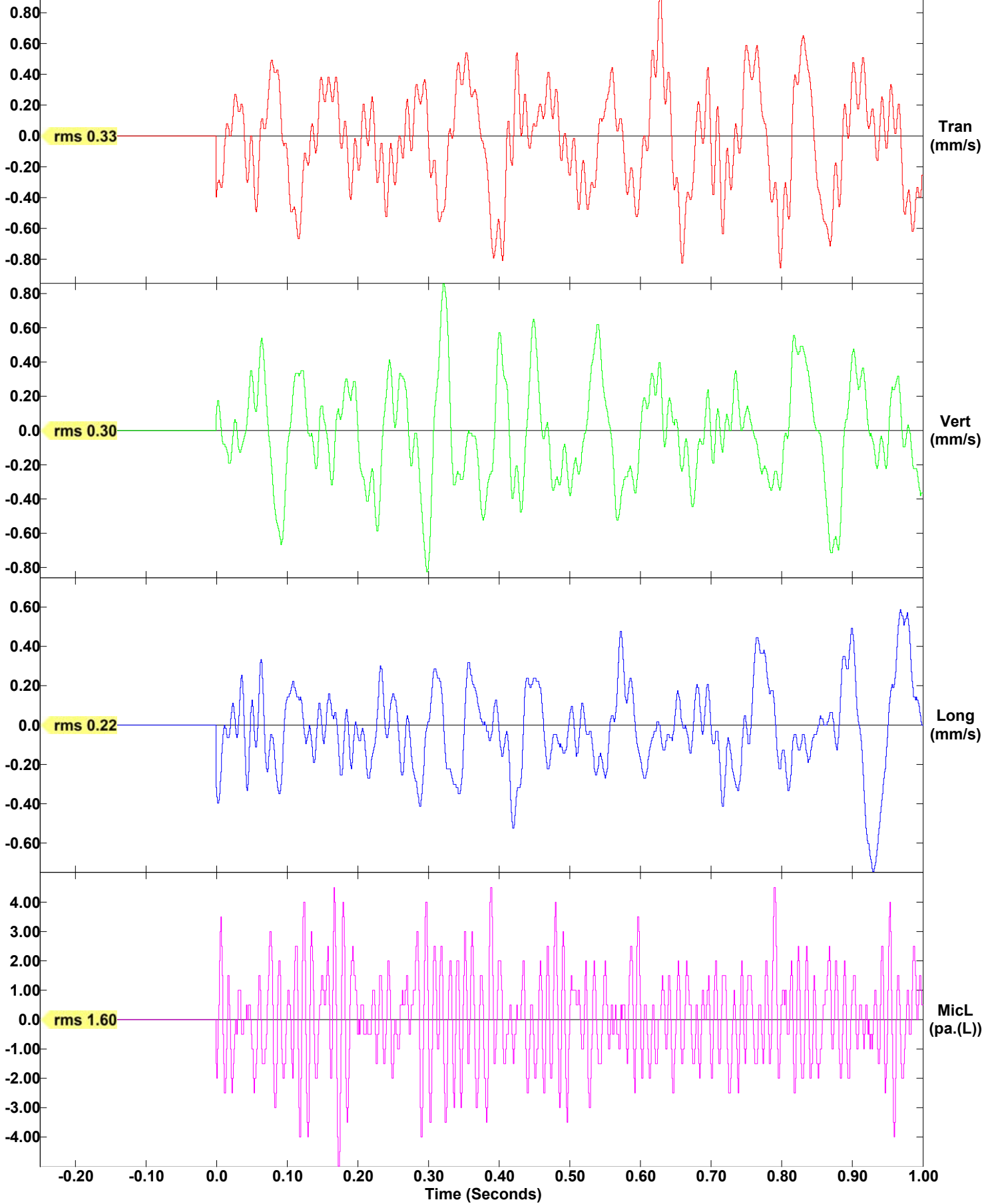


Time Scale: 0.10 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 5.000 pa.(L)/div
Trigger = 

Sensor Check

0.0 sec

0.999 sec



Date/Time Tran at 14:25:29 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL20.2H0

Notes

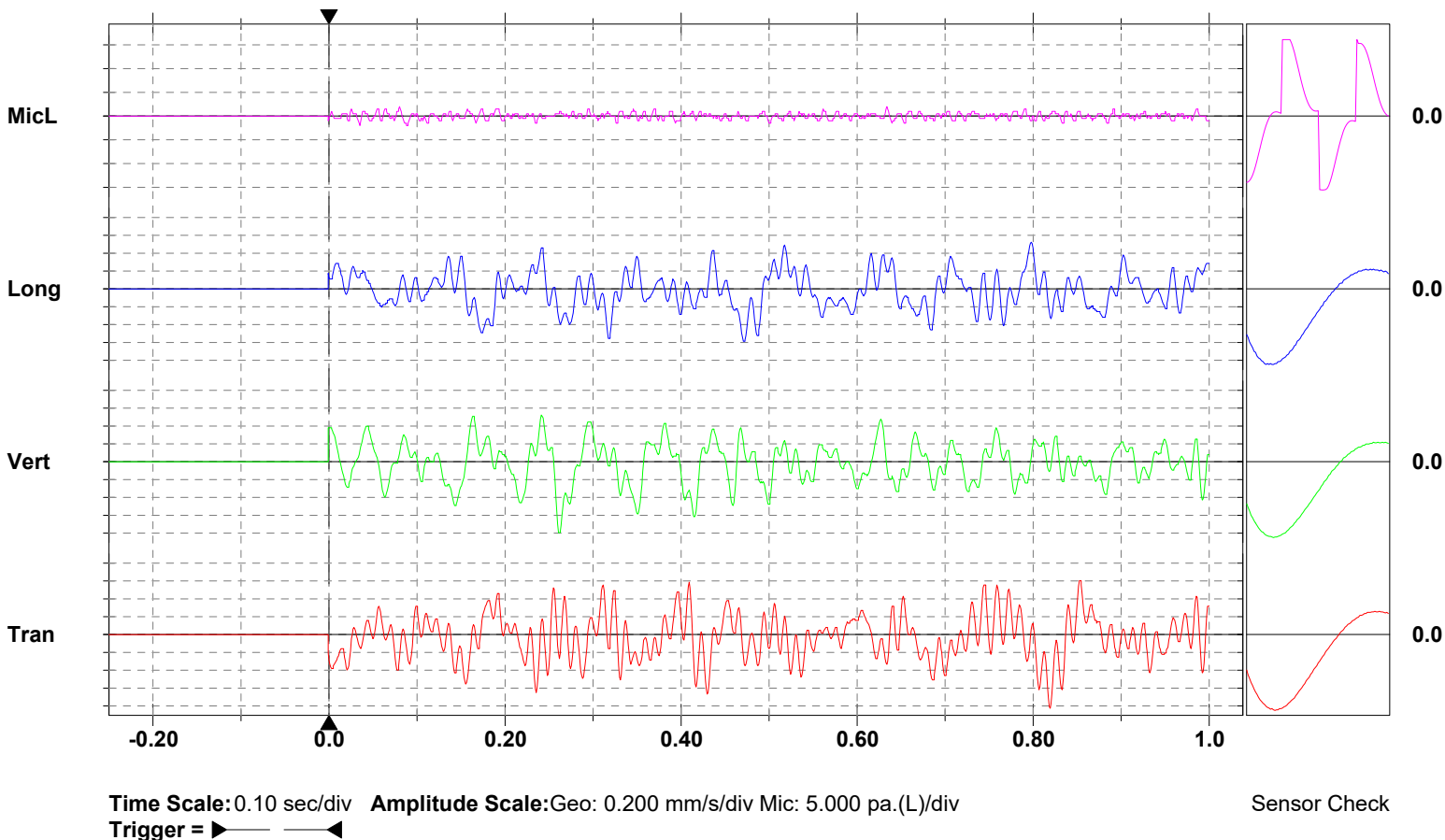
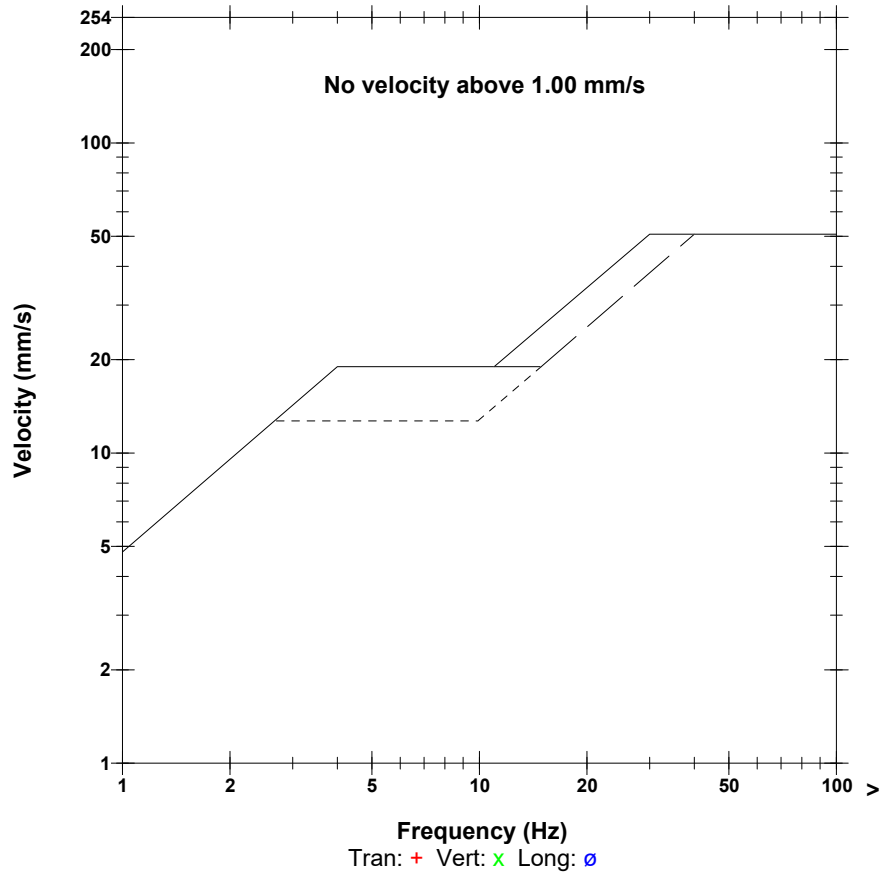
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting
PSPL 100.0 dB(L) at 0.036 sec
ZC Freq N/A
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

	Tran	Vert	Long	
PPV	0.826	0.794	0.587	mm/s
ZC Freq	14	17	13	Hz
Time (Rel. to Trig)	0.820	0.262	0.472	sec
Peak Acceleration	0.027	0.020	0.017	g
Peak Displacement	0.007	0.005	0.006	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.2	3.9	3.5	

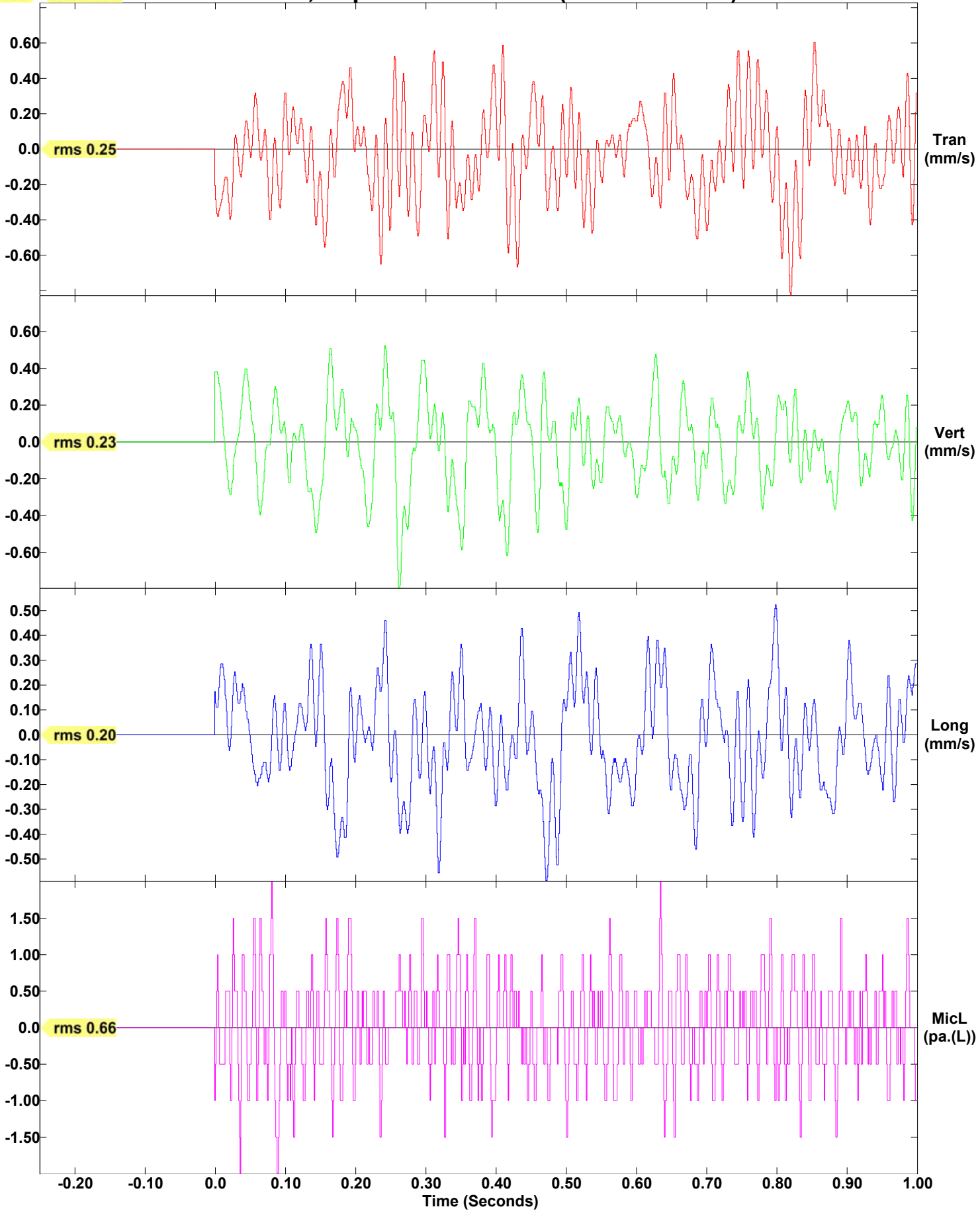
Peak Vector Sum 0.921 mm/s at 0.263 sec
N/A: Not Applicable

USBM RI8507 And OSMRE



0.0 sec 0.999 sec

2585, Sep 10 /18 14:25:29 (d585hl20.2h0)



Date/Time Tran at 14:25:35 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL20.2N0

Notes

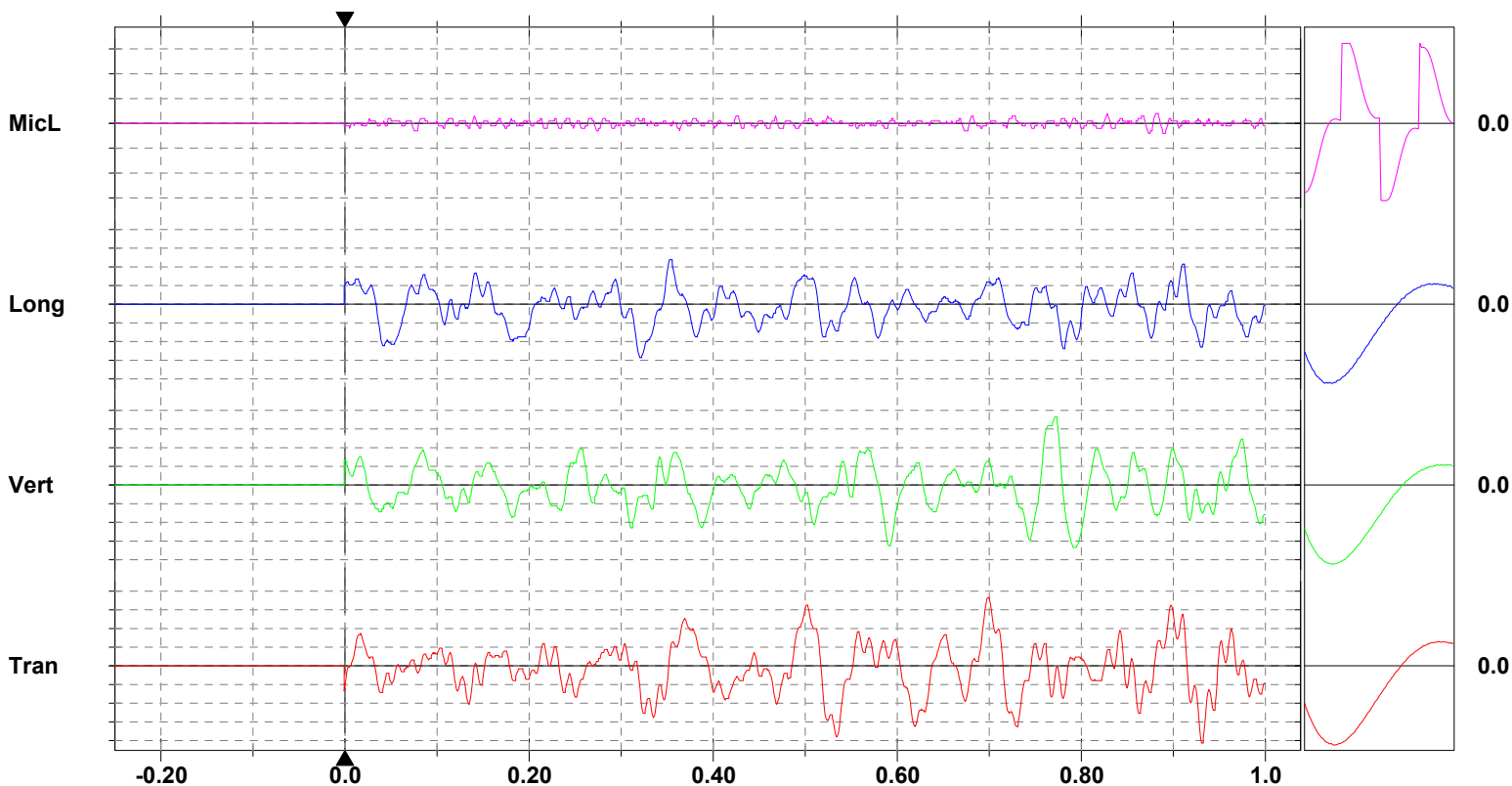
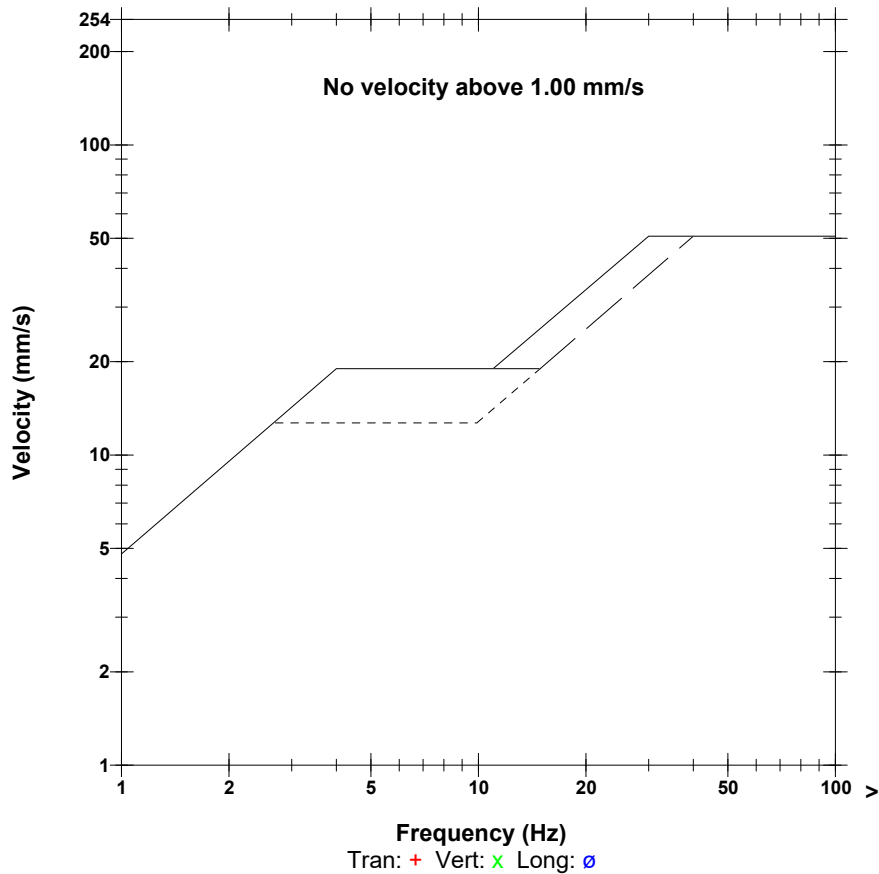
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting
PSPL 100.0 dB(L) at 0.829 sec
ZC Freq 85 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

	Tran	Vert	Long	
PPV	0.826	0.730	0.572	mm/s
ZC Freq	15	21	11	Hz
Time (Rel. to Trig)	0.932	0.772	0.321	sec
Peak Acceleration	0.020	0.015	0.010	g
Peak Displacement	0.007	0.006	0.006	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.2	3.9	3.5	

Peak Vector Sum 0.984 mm/s at 0.932 sec

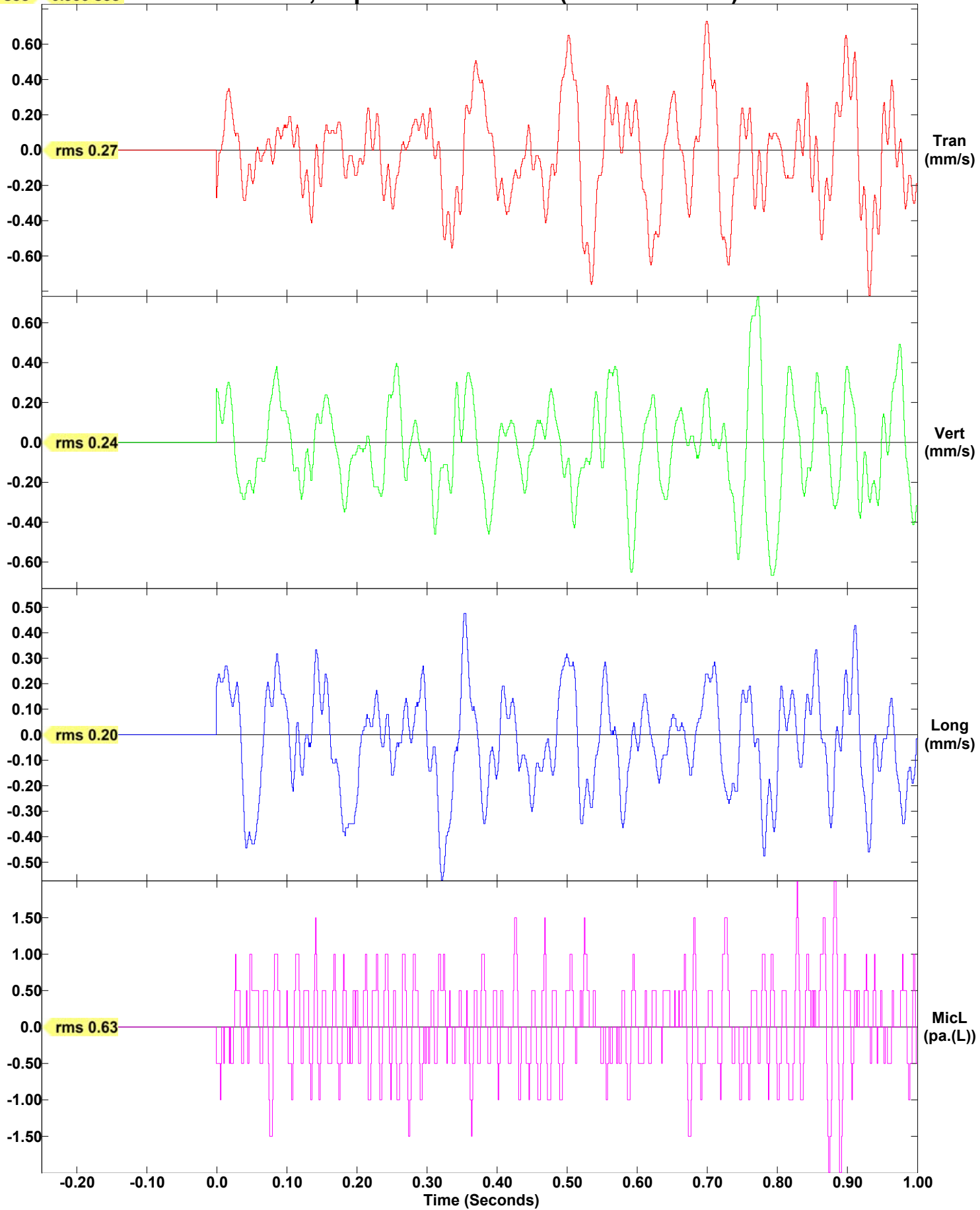
USBM RI8507 And OSMRE



Sensor Check

0.0 sec 0.999 sec

2585, Sep 10 /18 14:25:35 (d585hl20.2n0)



Date/Time Tran at 14:25:41 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL20.2T0

Notes

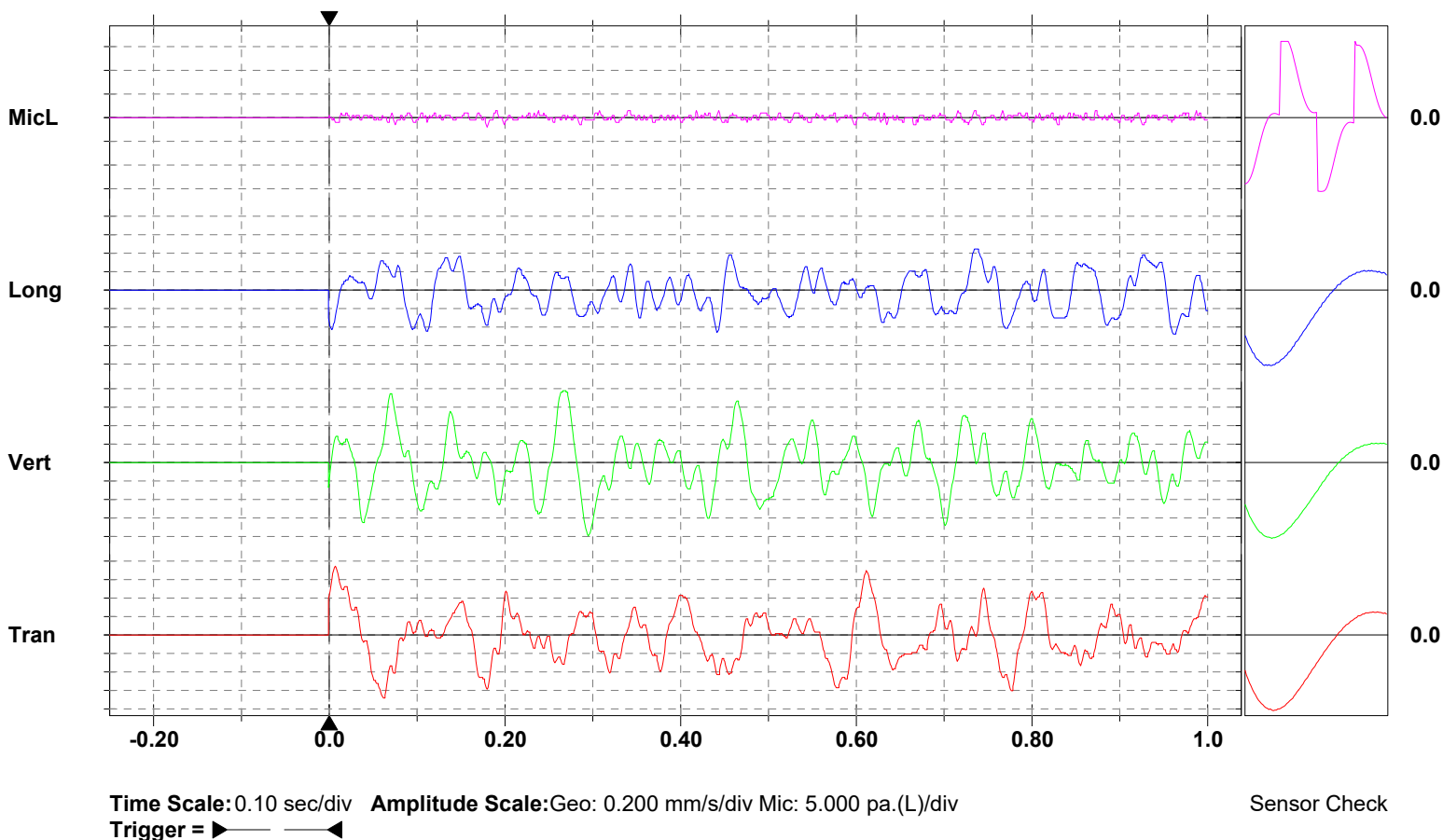
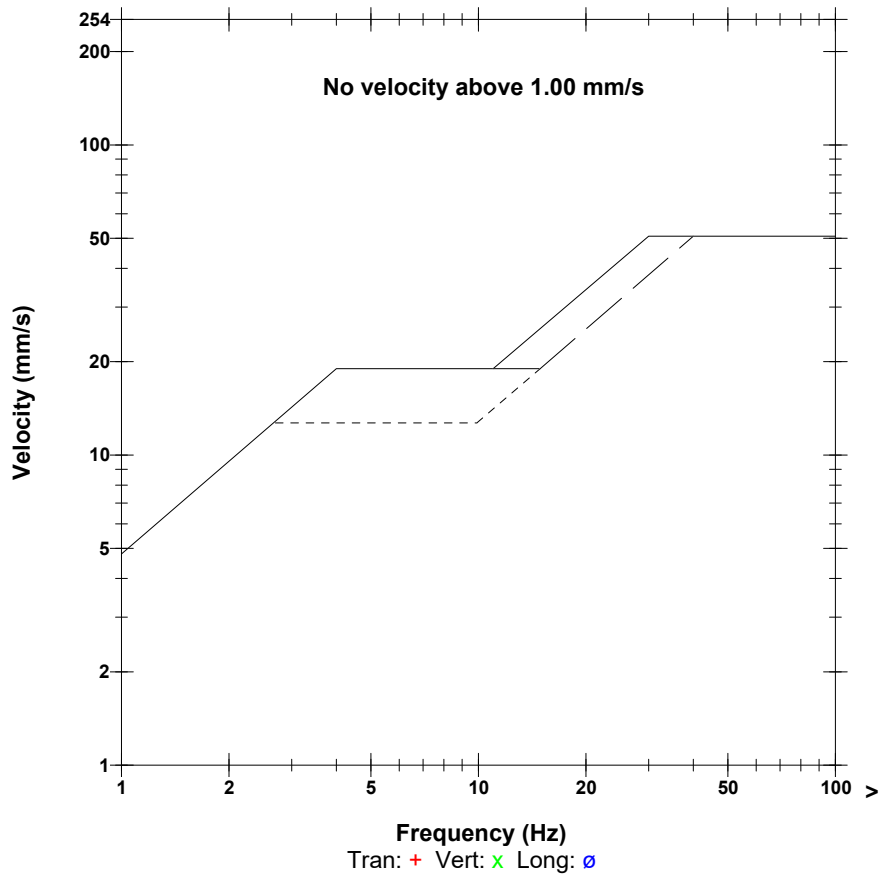
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting
PSPL 100.0 dB(L) at 0.181 sec
ZC Freq N/A
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

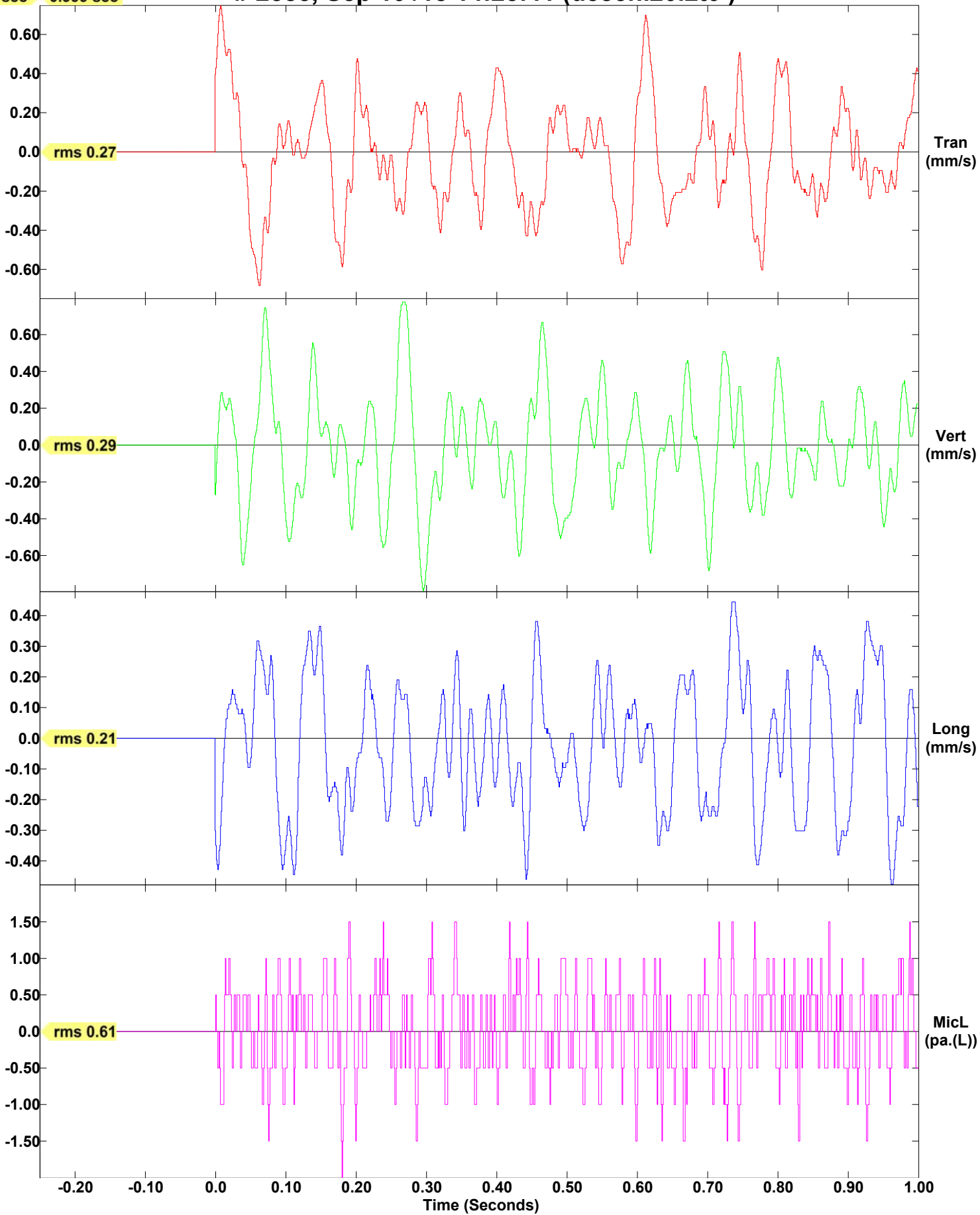
	Tran	Vert	Long	
PPV	0.746	0.794	0.476	mm/s
ZC Freq	13	12	17	Hz
Time (Rel. to Trig)	0.008	0.296	0.962	sec
Peak Acceleration	0.013	0.012	0.012	g
Peak Displacement	0.008	0.008	0.005	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.2	3.9	3.5	

Peak Vector Sum 0.857 mm/s at 0.267 sec
N/A: Not Applicable

USBM RI8507 And OSMRE



0.0 sec 0.999 sec



Date/Time Tran at 14:25:47 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL20.2Z0

Notes

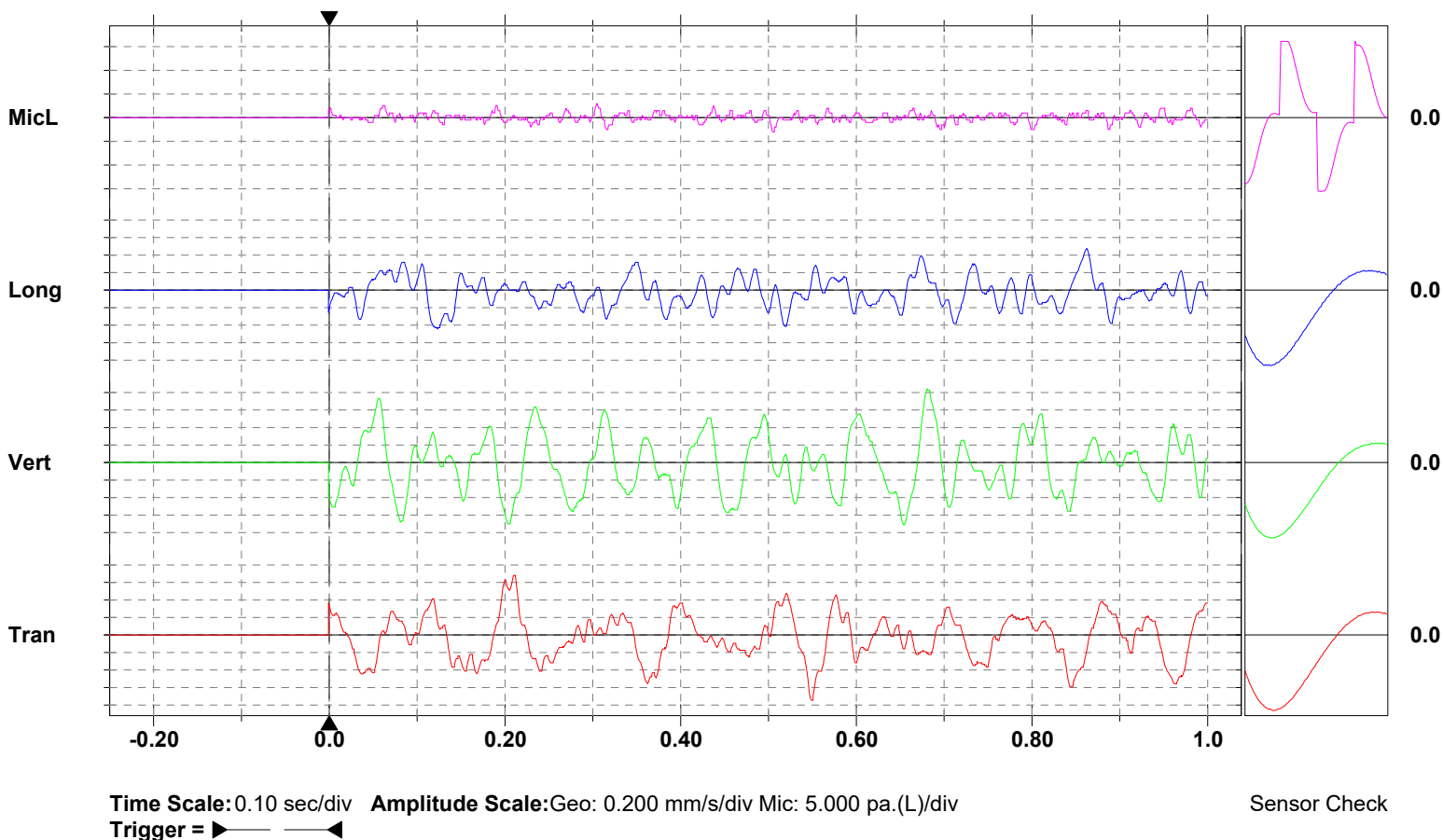
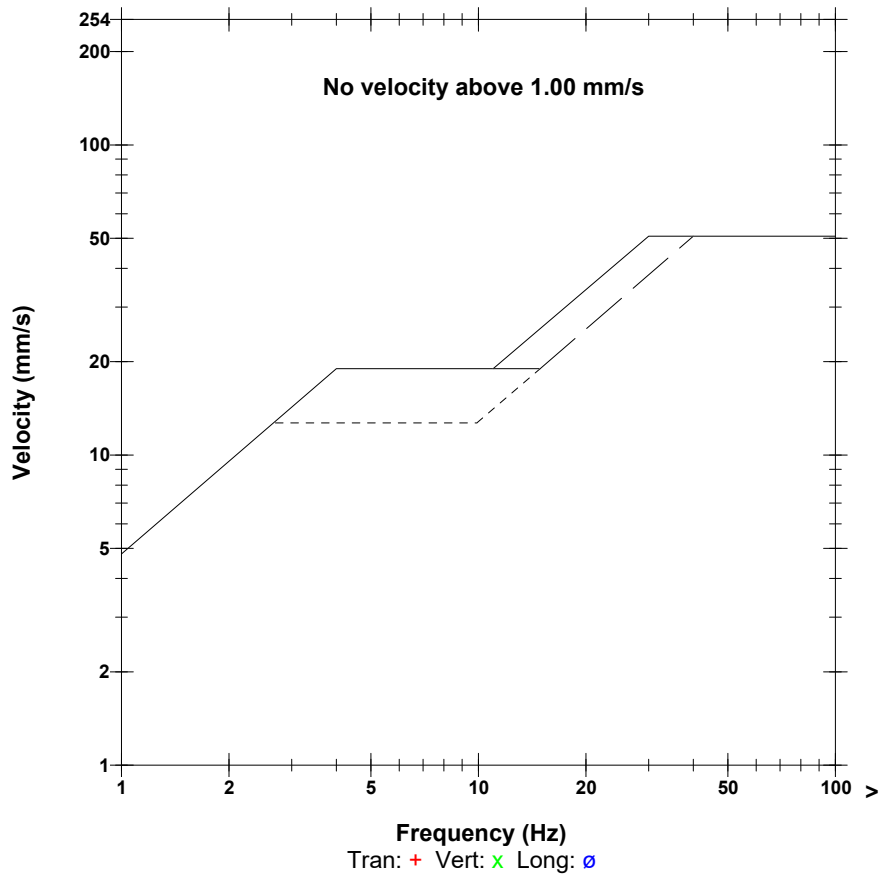
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting
PSPL 103.5 dB(L) at 0.306 sec
ZC Freq 64 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

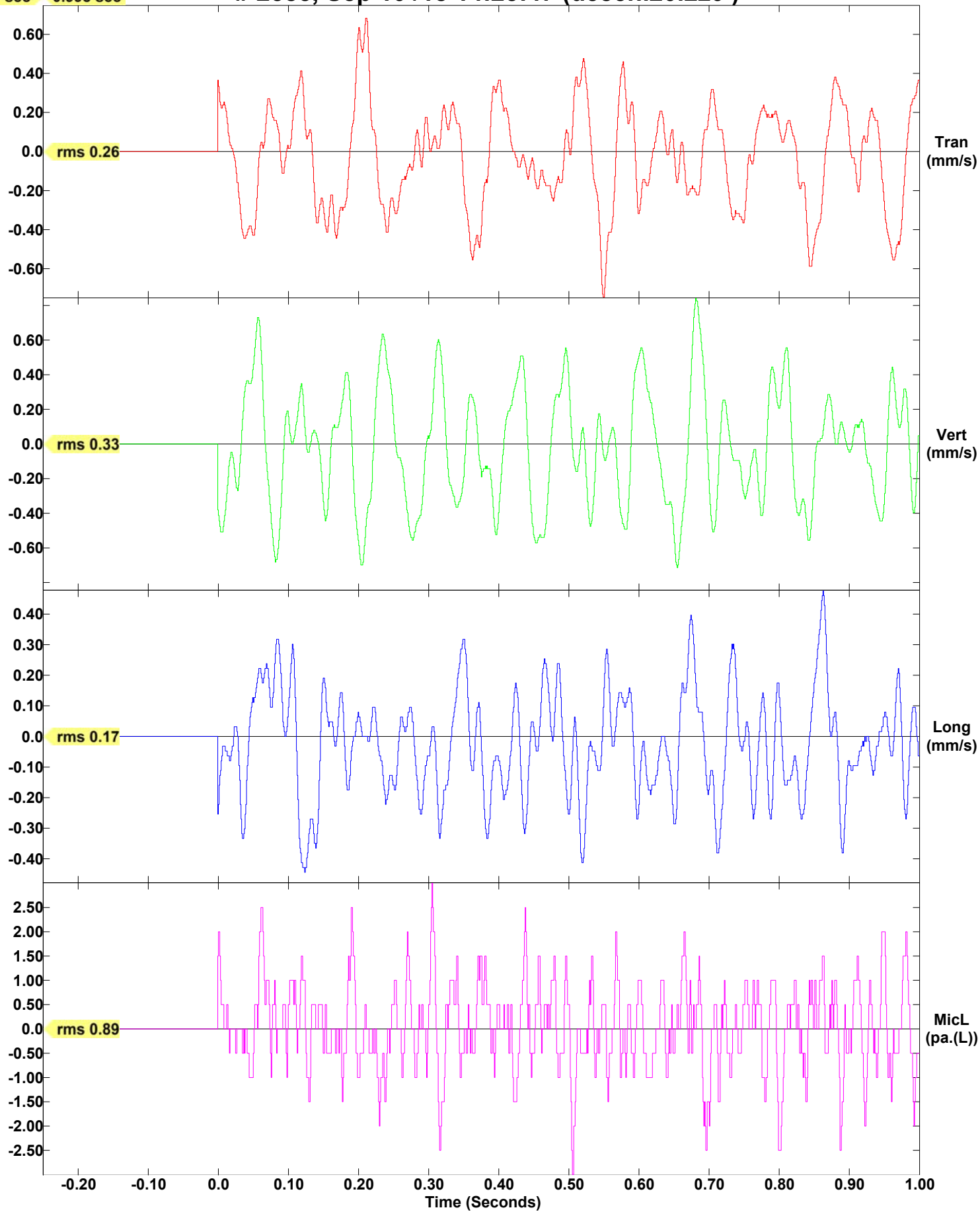
	Tran	Vert	Long	
PPV	0.746	0.841	0.476	mm/s
ZC Freq	14	18	18	Hz
Time (Rel. to Trig)	0.550	0.682	0.863	sec
Peak Acceleration	0.012	0.015	0.010	g
Peak Displacement	0.008	0.008	0.005	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.2	3.9	3.5	

Peak Vector Sum 0.889 mm/s at 0.202 sec

USBM RI8507 And OSMRE



0.0 sec 0.998 sec



Date/Time Tran at 14:25:53 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL20.350

Notes

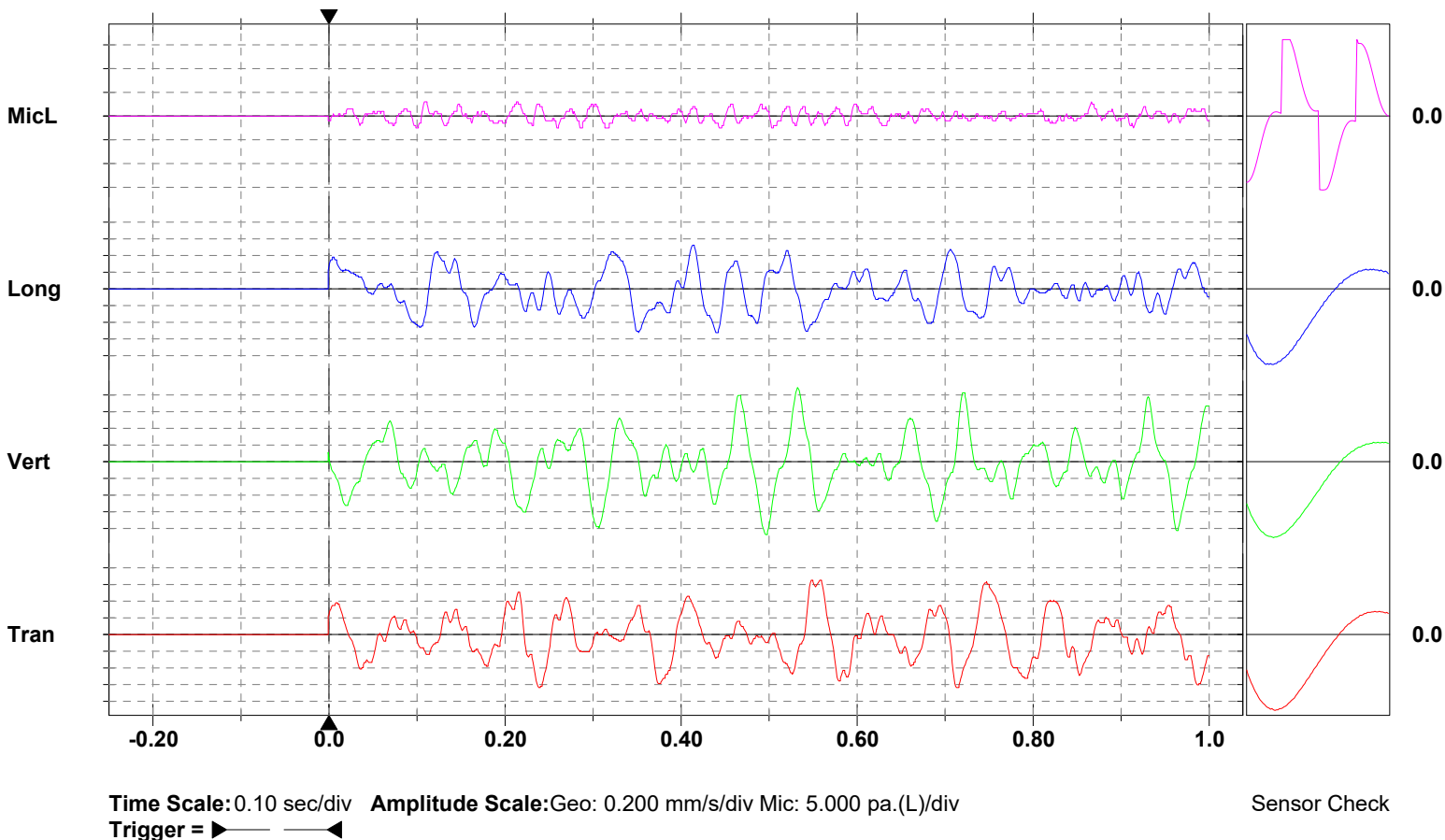
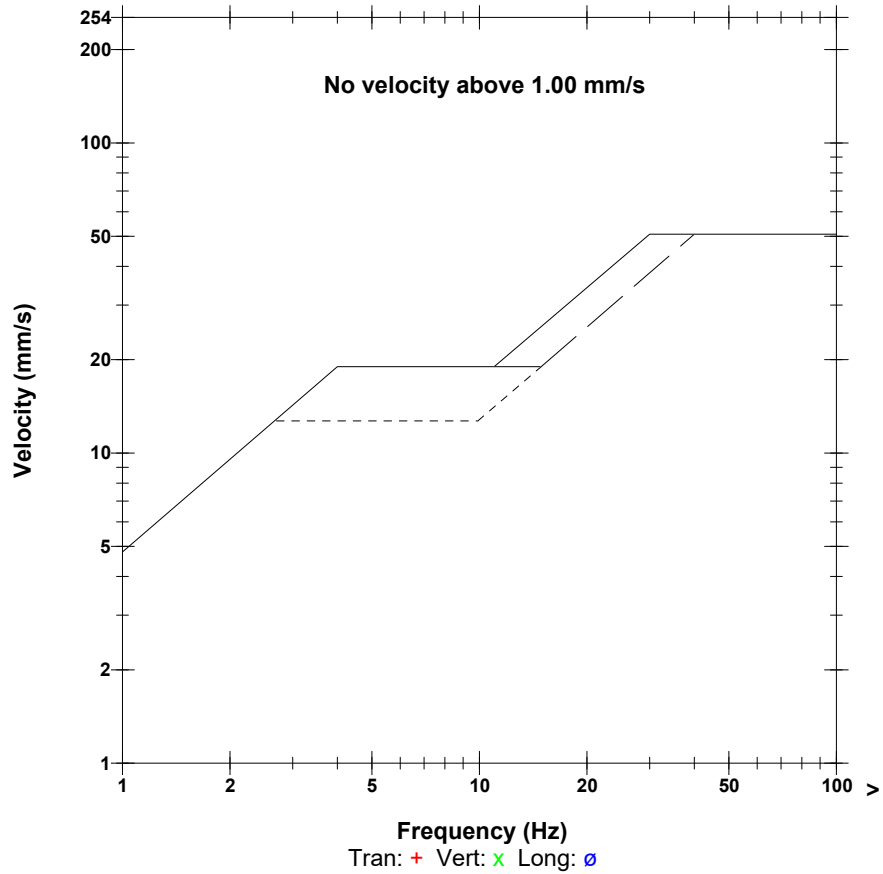
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting
PSPL 103.5 dB(L) at 0.109 sec
ZC Freq 64 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

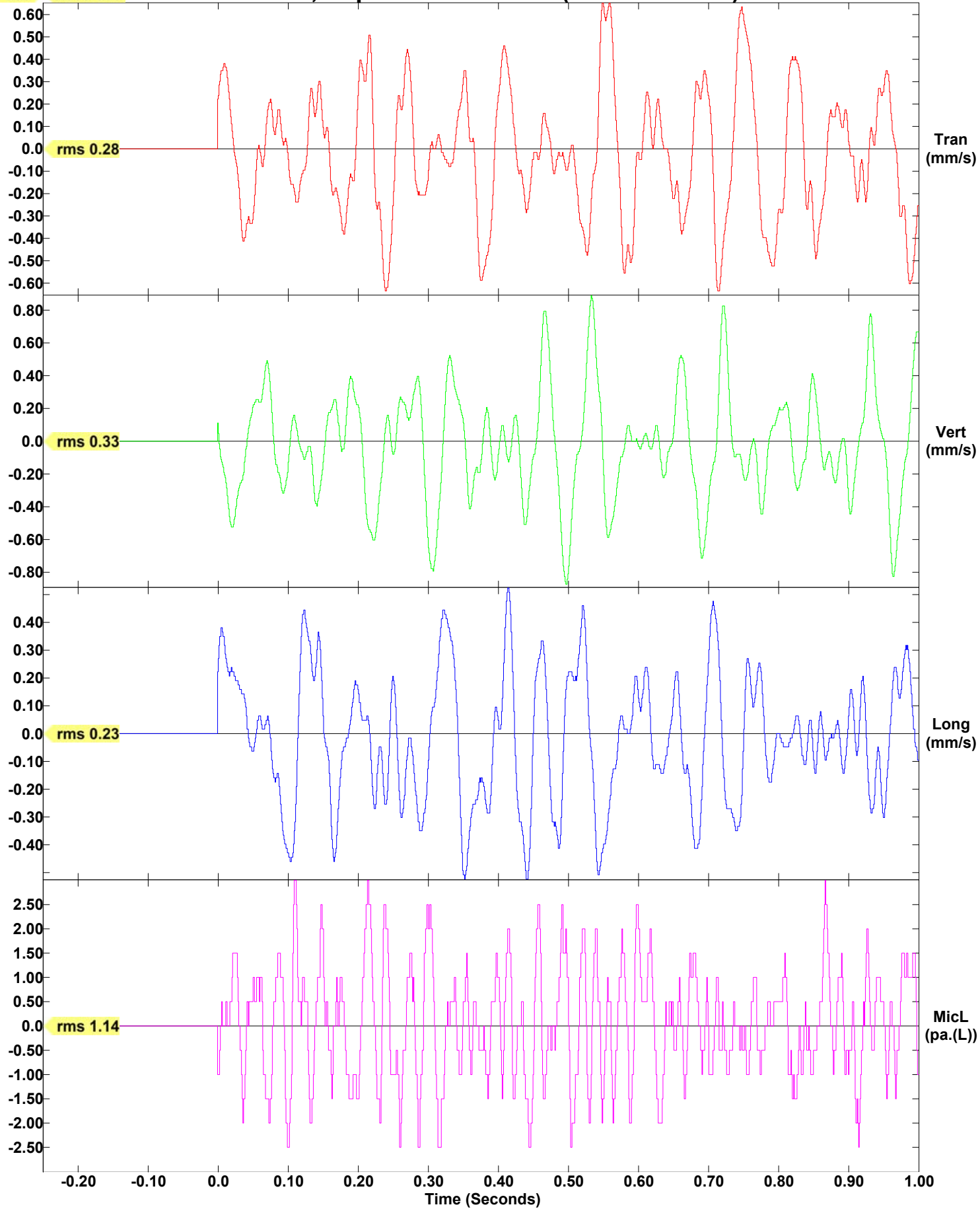
	Tran	Vert	Long	
PPV	0.651	0.889	0.524	mm/s
ZC Freq	17	17	10	Hz
Time (Rel. to Trig)	0.549	0.533	0.353	sec
Peak Acceleration	0.015	0.013	0.012	g
Peak Displacement	0.007	0.008	0.007	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.2	3.9	3.5	

Peak Vector Sum 0.937 mm/s at 0.721 sec

USBM RI8507 And OSMRE



0.0 sec 0.999 sec



Date/Time Tran at 14:25:59 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL20.3B0

Notes

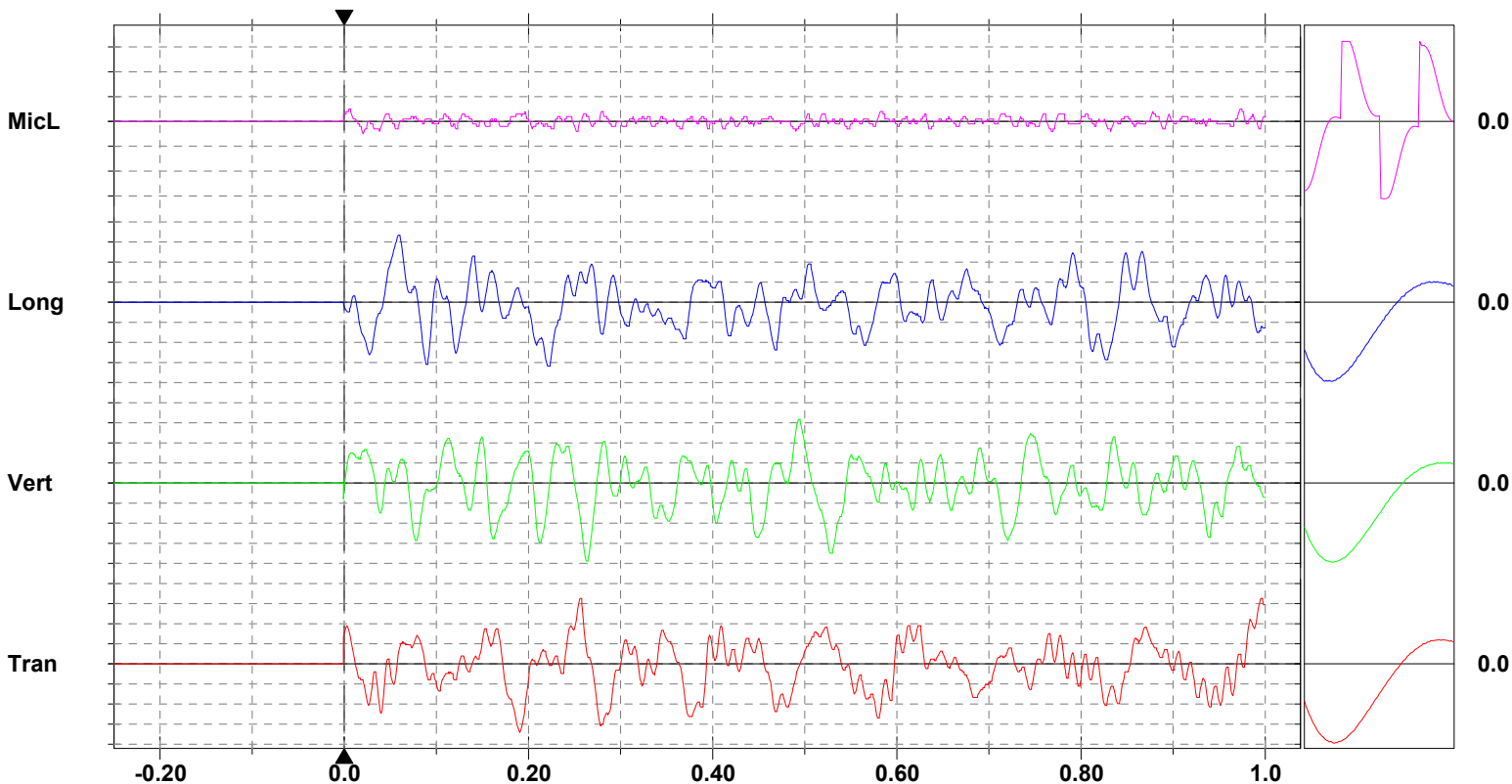
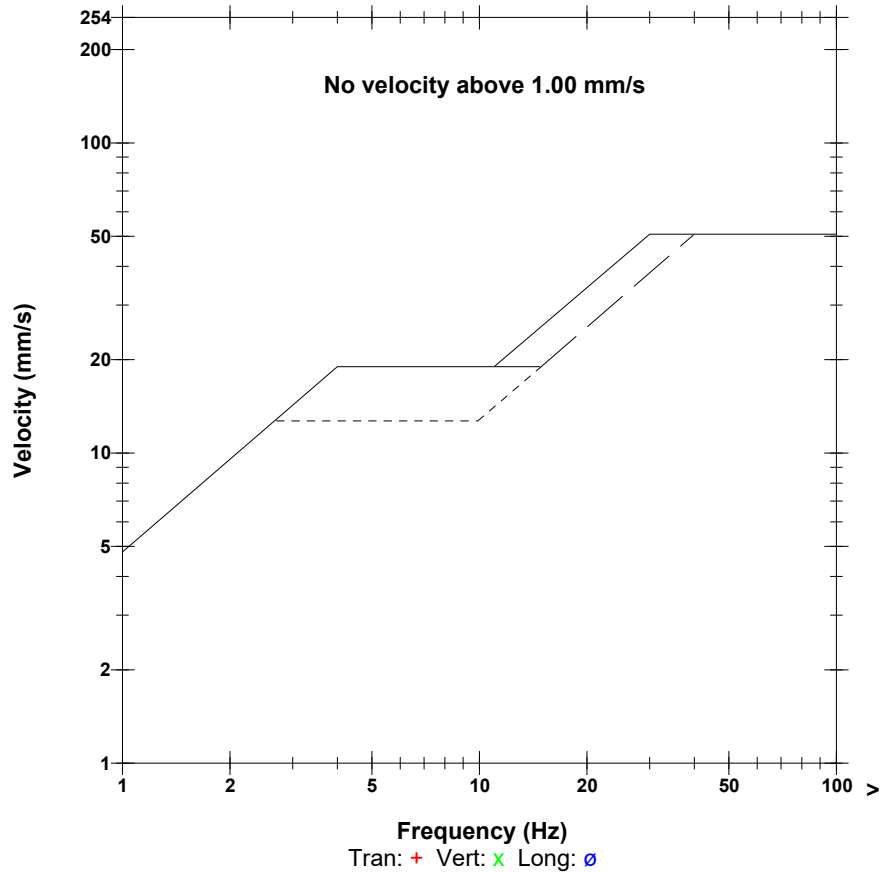
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting
PSPL 101.9 dB(L) at 0.007 sec
ZC Freq 47 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

	Tran	Vert	Long	
PPV	0.683	0.778	0.667	mm/s
ZC Freq	17	21	13	Hz
Time (Rel. to Trig)	0.191	0.264	0.060	sec
Peak Acceleration	0.018	0.015	0.015	g
Peak Displacement	0.007	0.007	0.007	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.2	3.9	3.5	

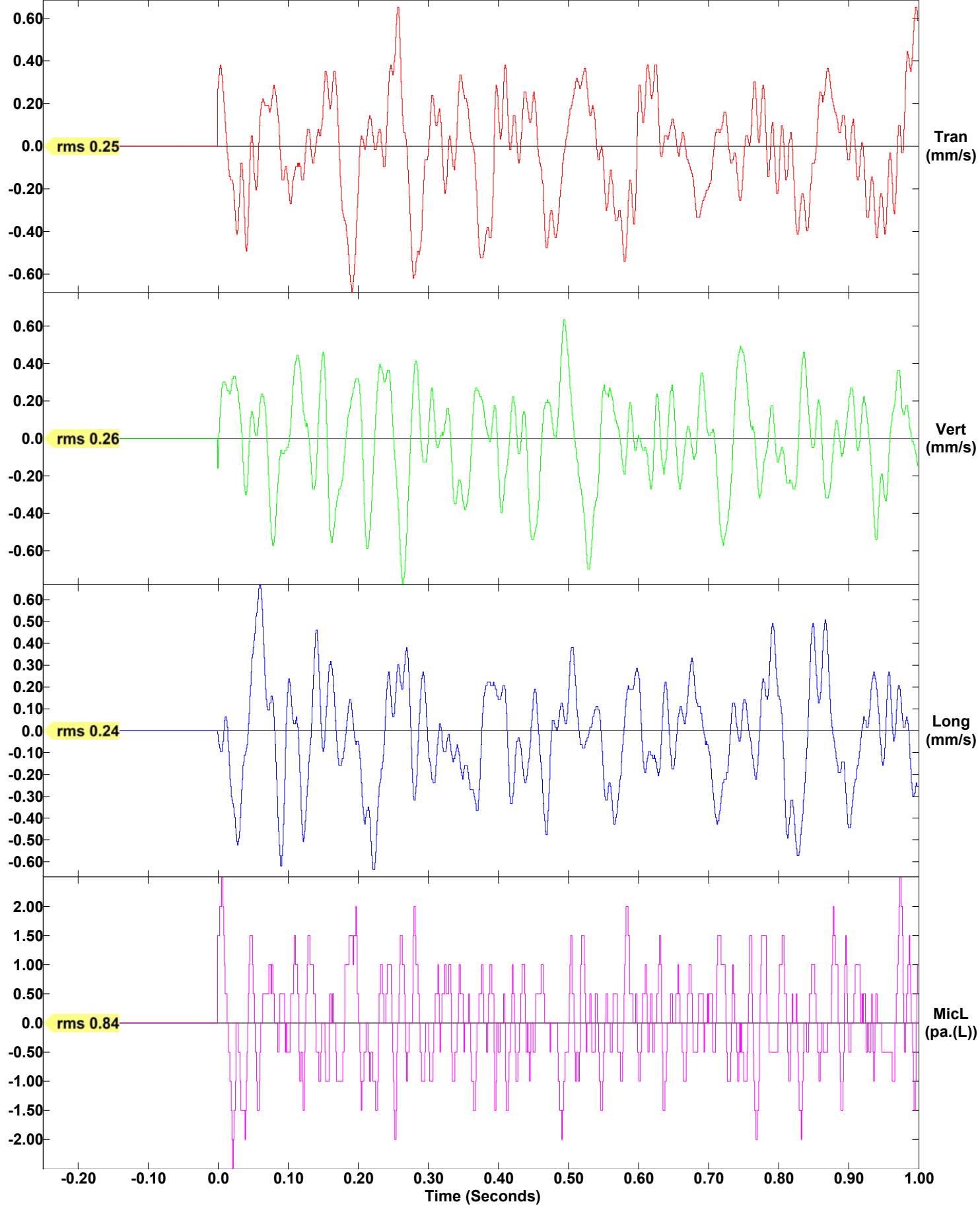
Peak Vector Sum 0.810 mm/s at 0.265 sec

USBM RI8507 And OSMRE



Sensor Check

0.0 sec 0.999 sec



Date/Time Vert at 14:26:05 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL20.3H0

Notes

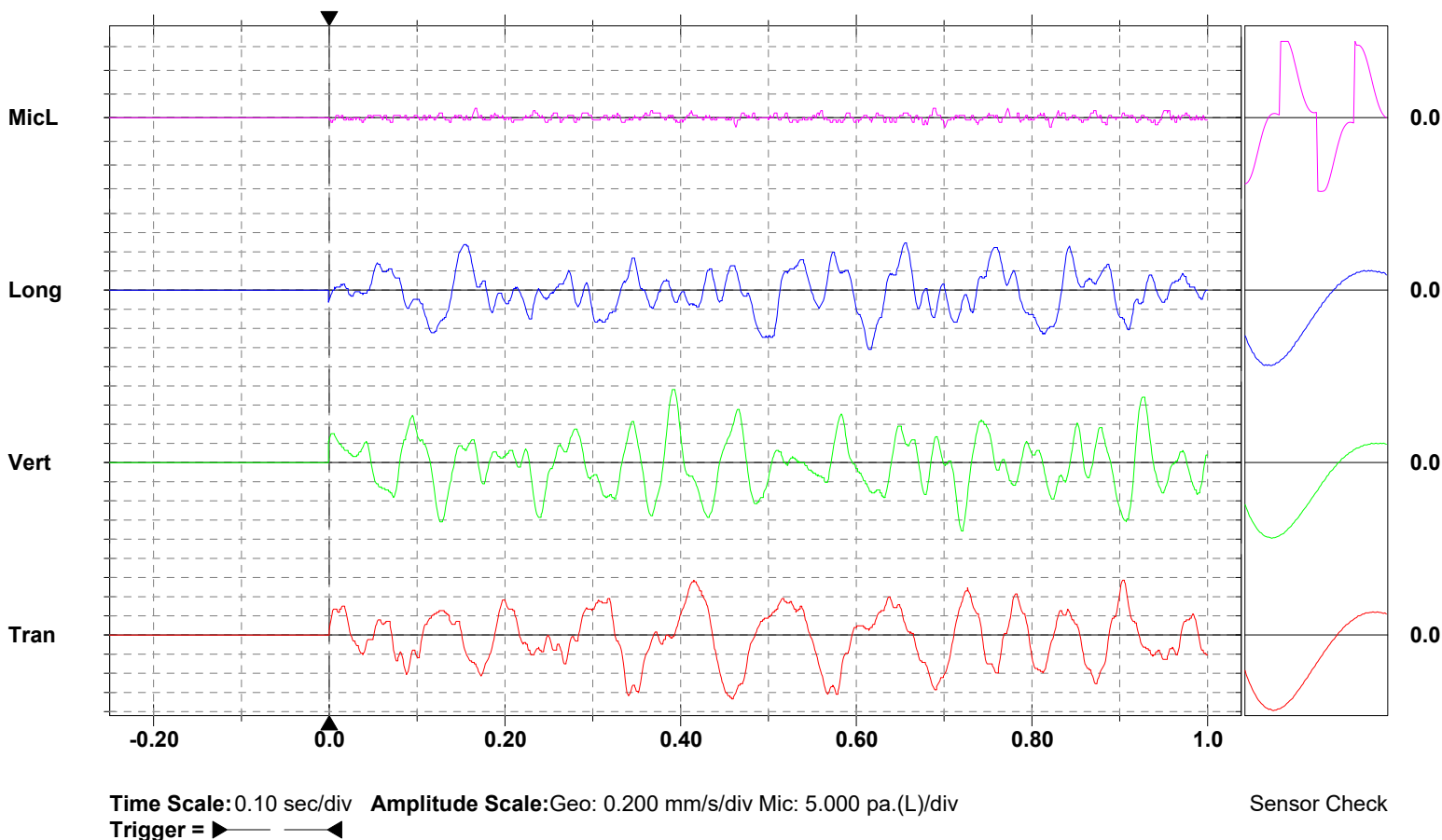
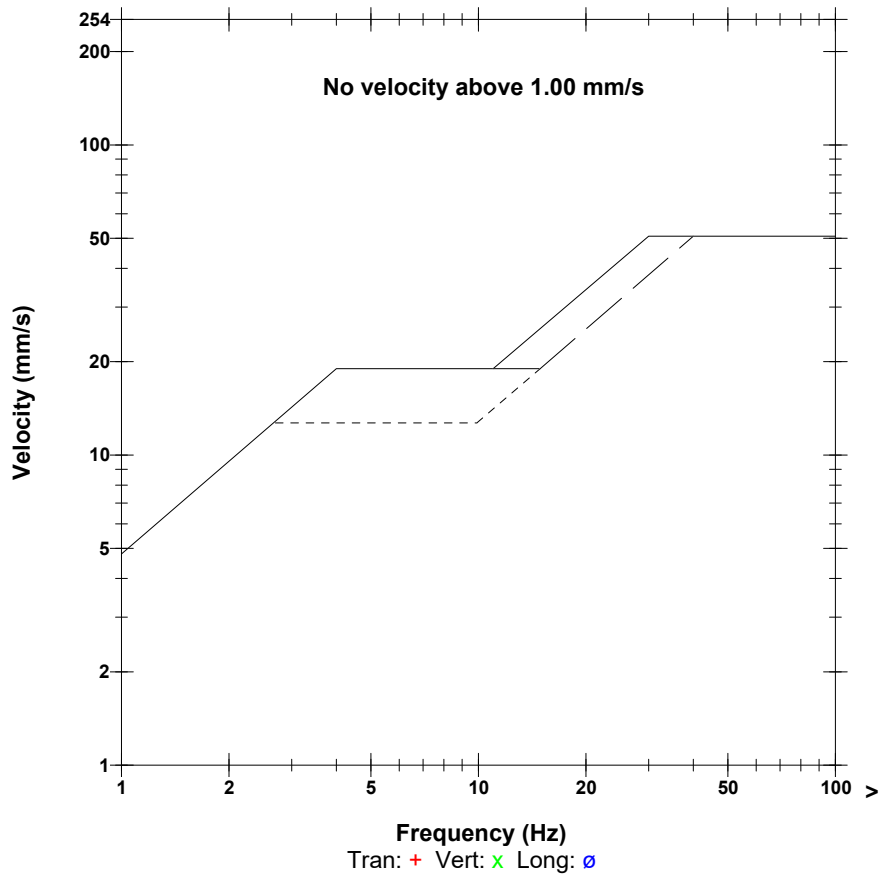
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting
PSPL 100.0 dB(L) at 0.167 sec
ZC Freq 73 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

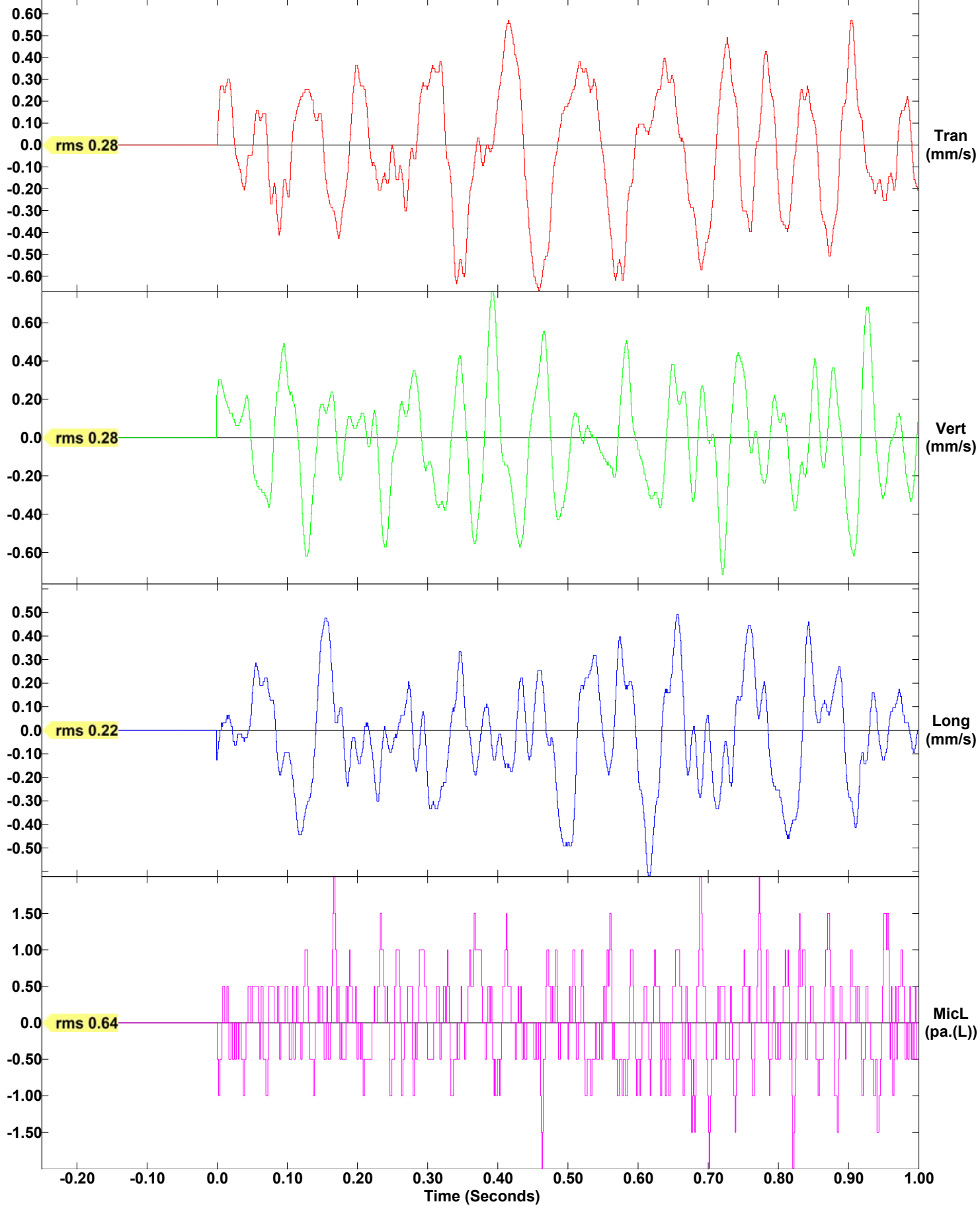
	Tran	Vert	Long	
PPV	0.667	0.762	0.619	mm/s
ZC Freq	10	21	13	Hz
Time (Rel. to Trig)	0.459	0.392	0.615	sec
Peak Acceleration	0.008	0.013	0.010	g
Peak Displacement	0.010	0.006	0.007	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.2	3.9	3.5	

Peak Vector Sum 0.889 mm/s at 0.906 sec

USBM RI8507 And OSMRE



0.0 sec 0.999 sec



Date/Time Tran at 14:26:11 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL20.3N0

Notes

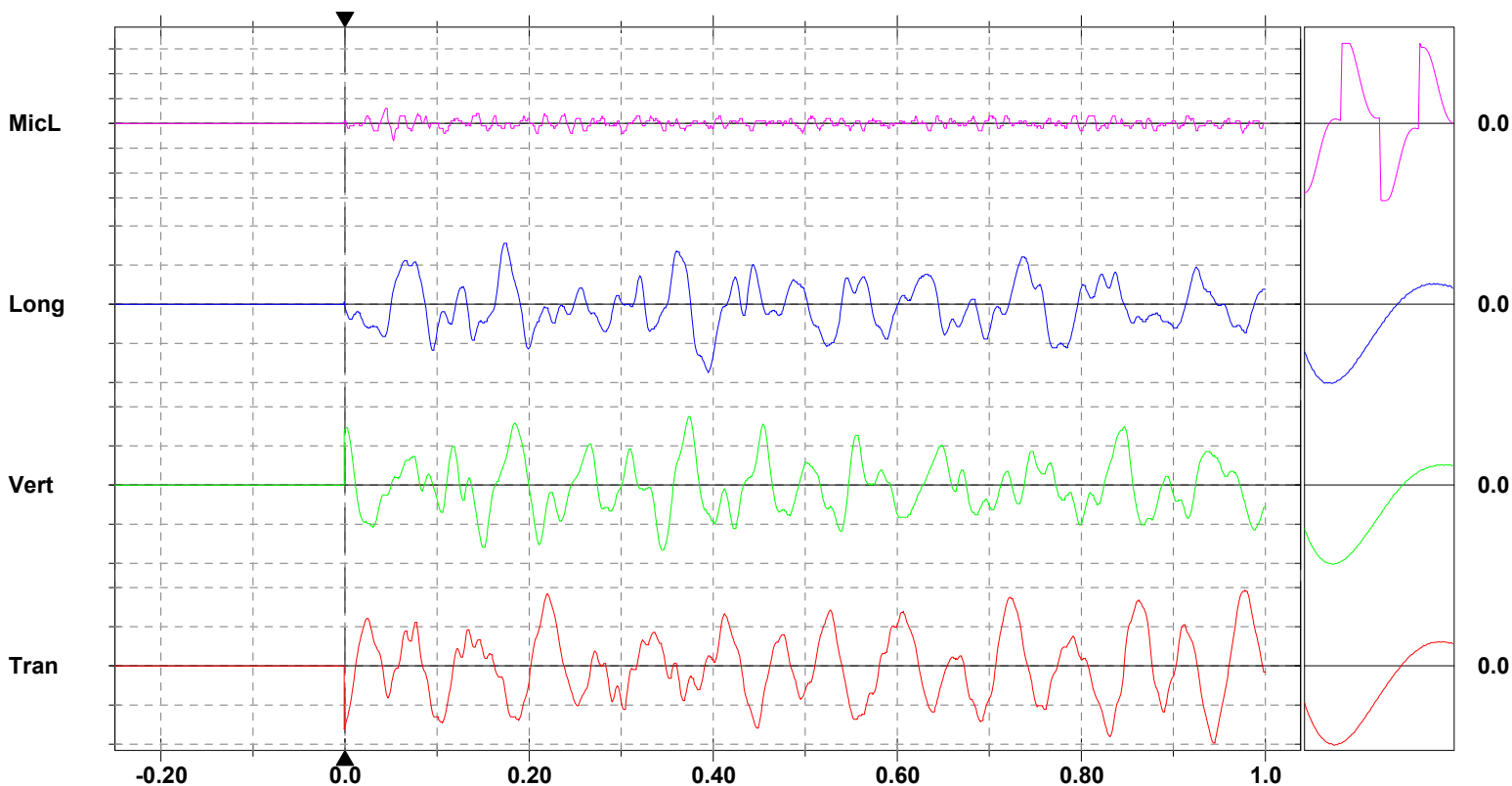
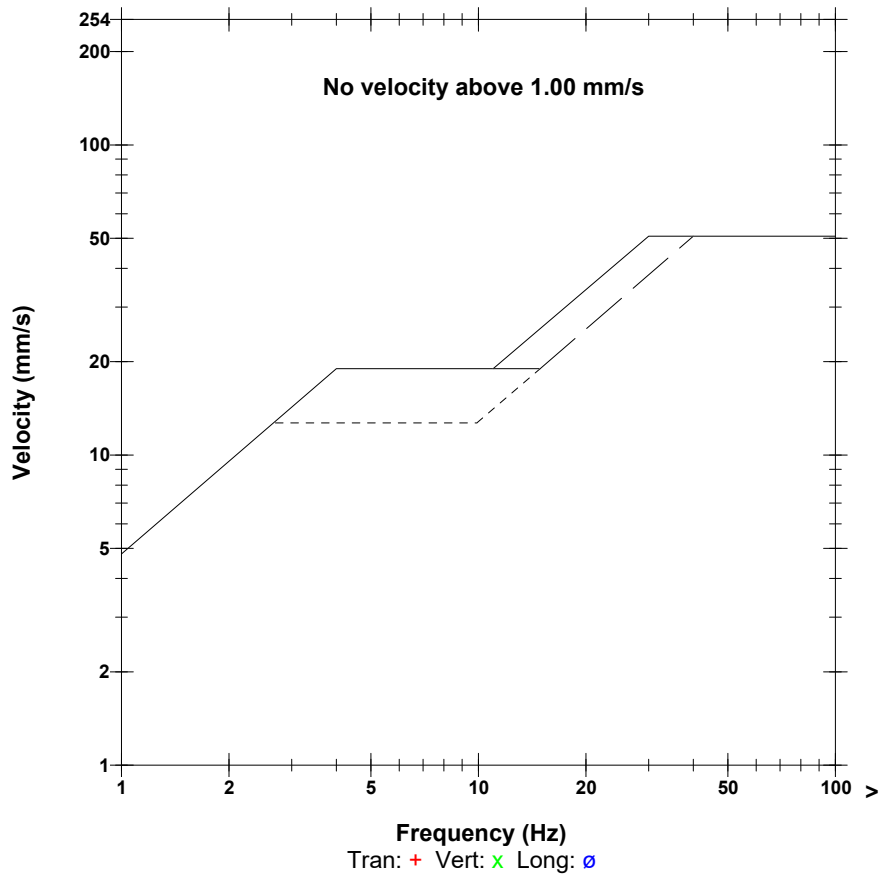
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting
PSPL 104.9 dB(L) at 0.054 sec
ZC Freq 64 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

	Tran	Vert	Long	
PPV	0.984	0.873	0.873	mm/s
ZC Freq	15	18	13	Hz
Time (Rel. to Trig)	0.944	0.374	0.396	sec
Peak Acceleration	0.018	0.015	0.013	g
Peak Displacement	0.010	0.008	0.009	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.2	3.9	3.5	

Peak Vector Sum 1.064 mm/s at 0.184 sec

USBM RI8507 And OSMRE

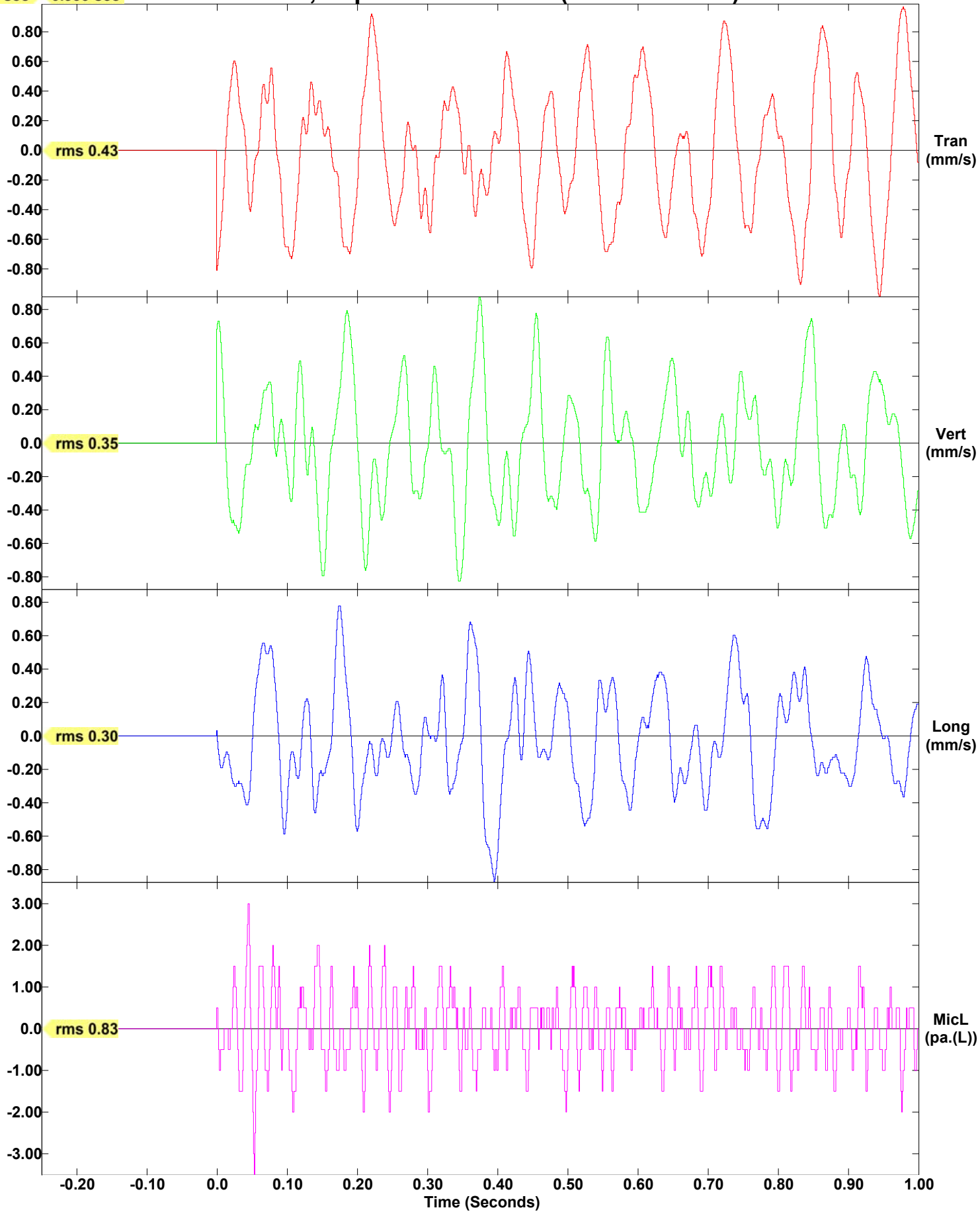


Time Scale: 0.10 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 5.000 pa.(L)/div
Trigger =

Sensor Check

0.0 sec

0.999 sec



Date/Time Vert at 14:26:17 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL20.3T0

Notes

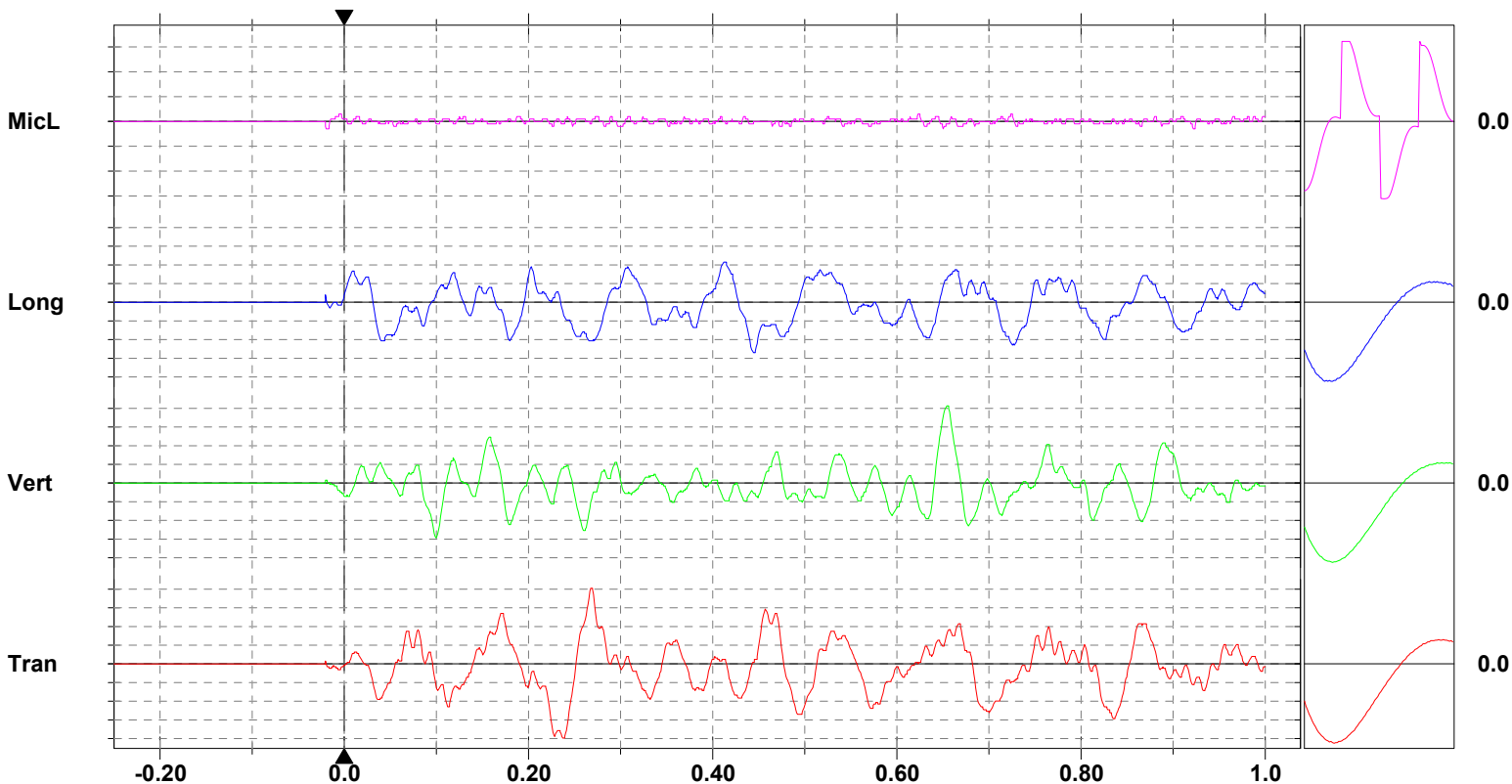
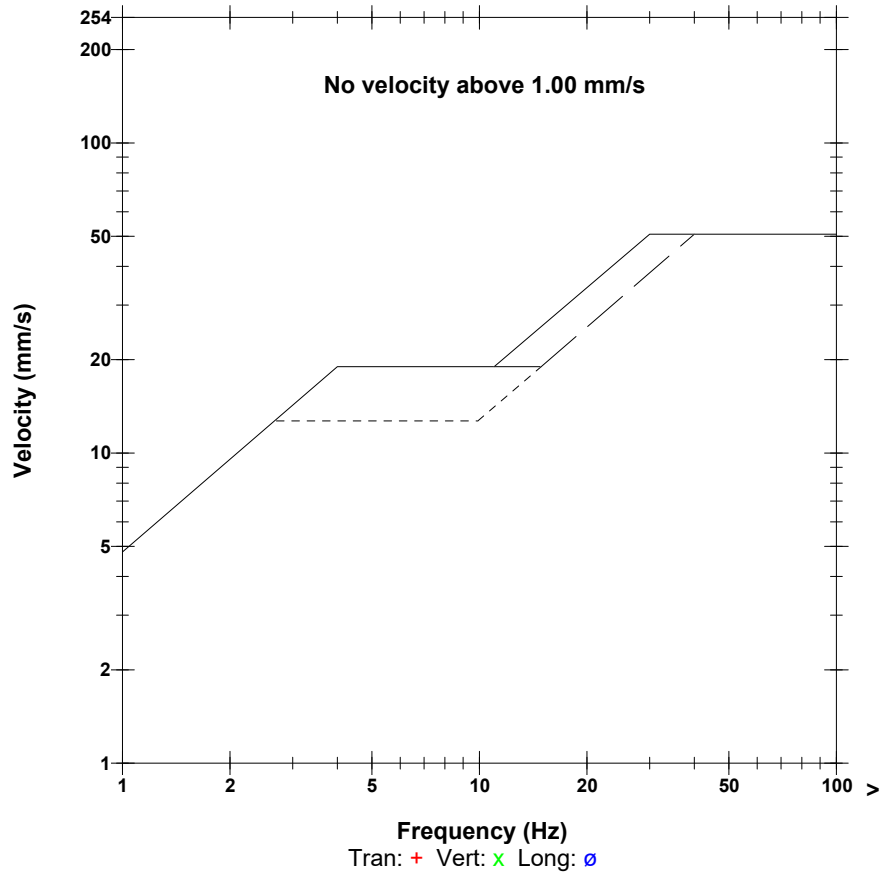
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting
PSPL 97.5 dB(L) at -0.003 sec
ZC Freq 64 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

	Tran	Vert	Long	
PPV	0.810	0.826	0.540	mm/s
ZC Freq	14	17	8.0	Hz
Time (Rel. to Trig)	0.269	0.655	0.445	sec
Peak Acceleration	0.010	0.012	0.008	g
Peak Displacement	0.012	0.007	0.009	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.2	3.9	3.5	

Peak Vector Sum 0.937 mm/s at 0.656 sec

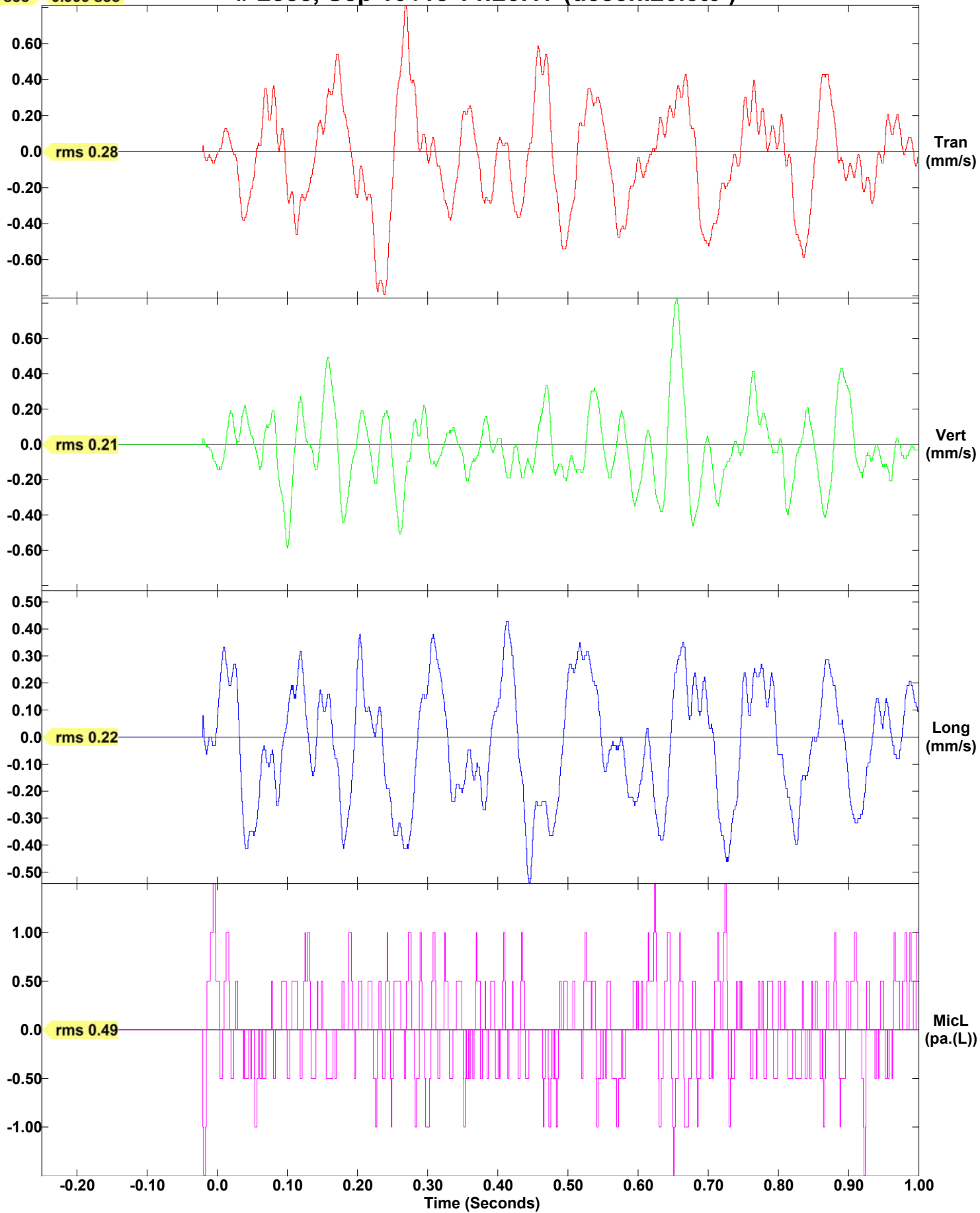
USBM RI8507 And OSMRE



Sensor Check

0.0 sec

0.999 sec



Date/Time Tran at 14:26:24 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL20.400

Notes

Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting

PSPL 97.5 dB(L) at 0.010 sec

ZC Freq N/A

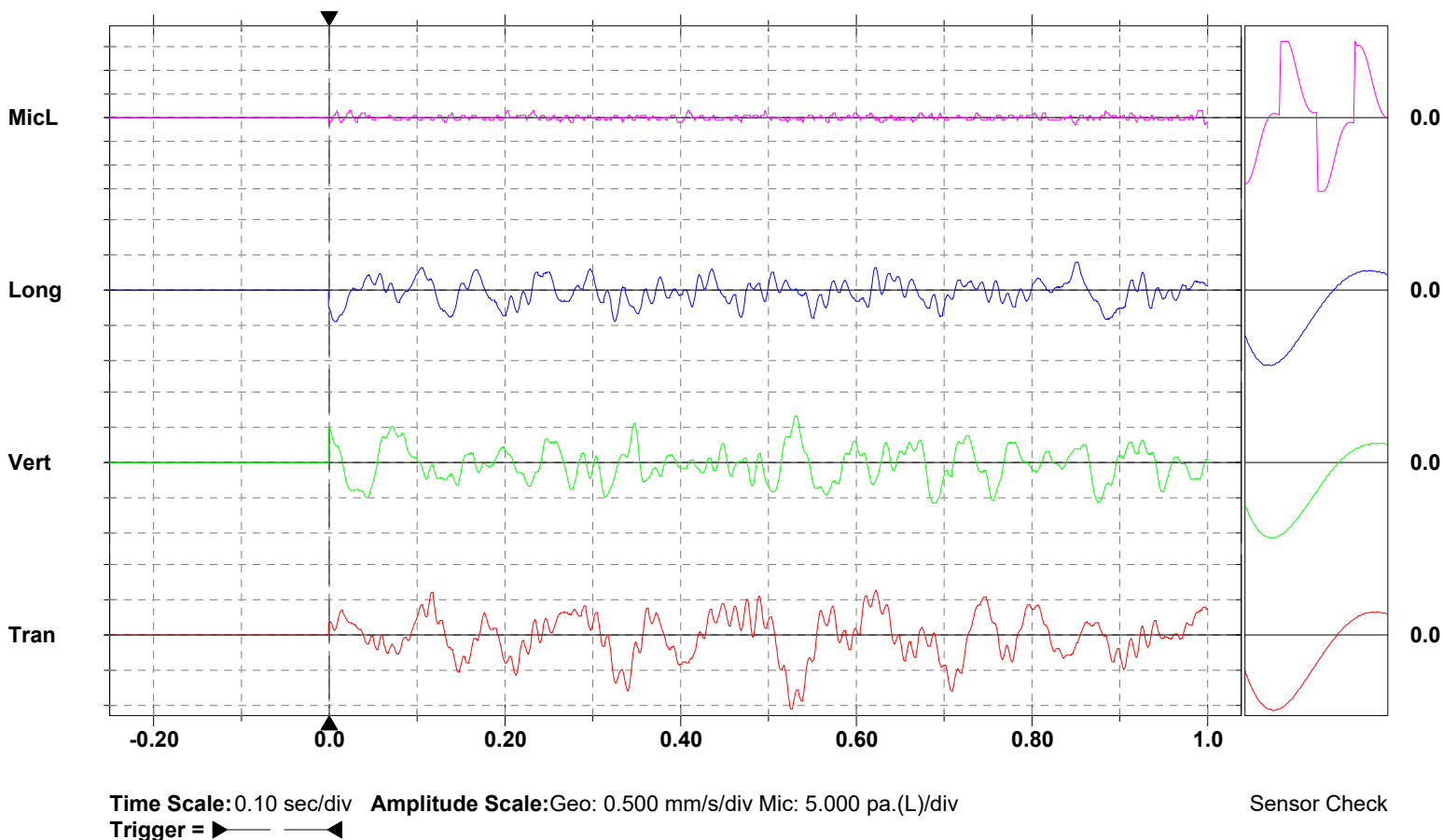
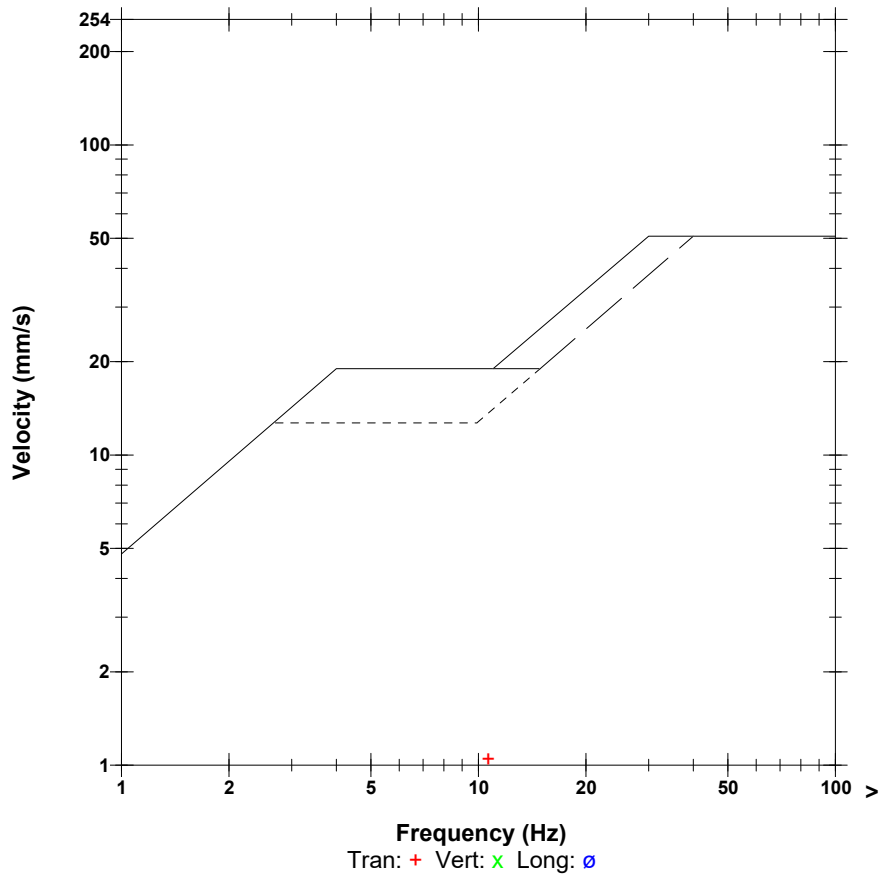
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

	Tran	Vert	Long	
PPV	1.048	0.667	0.445	mm/s
ZC Freq	11	16	19	Hz
Time (Rel. to Trig)	0.526	0.532	0.009	sec
Peak Acceleration	0.015	0.013	0.012	g
Peak Displacement	0.014	0.007	0.006	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.2	3.9	3.5	

Peak Vector Sum 1.143 mm/s at 0.528 sec

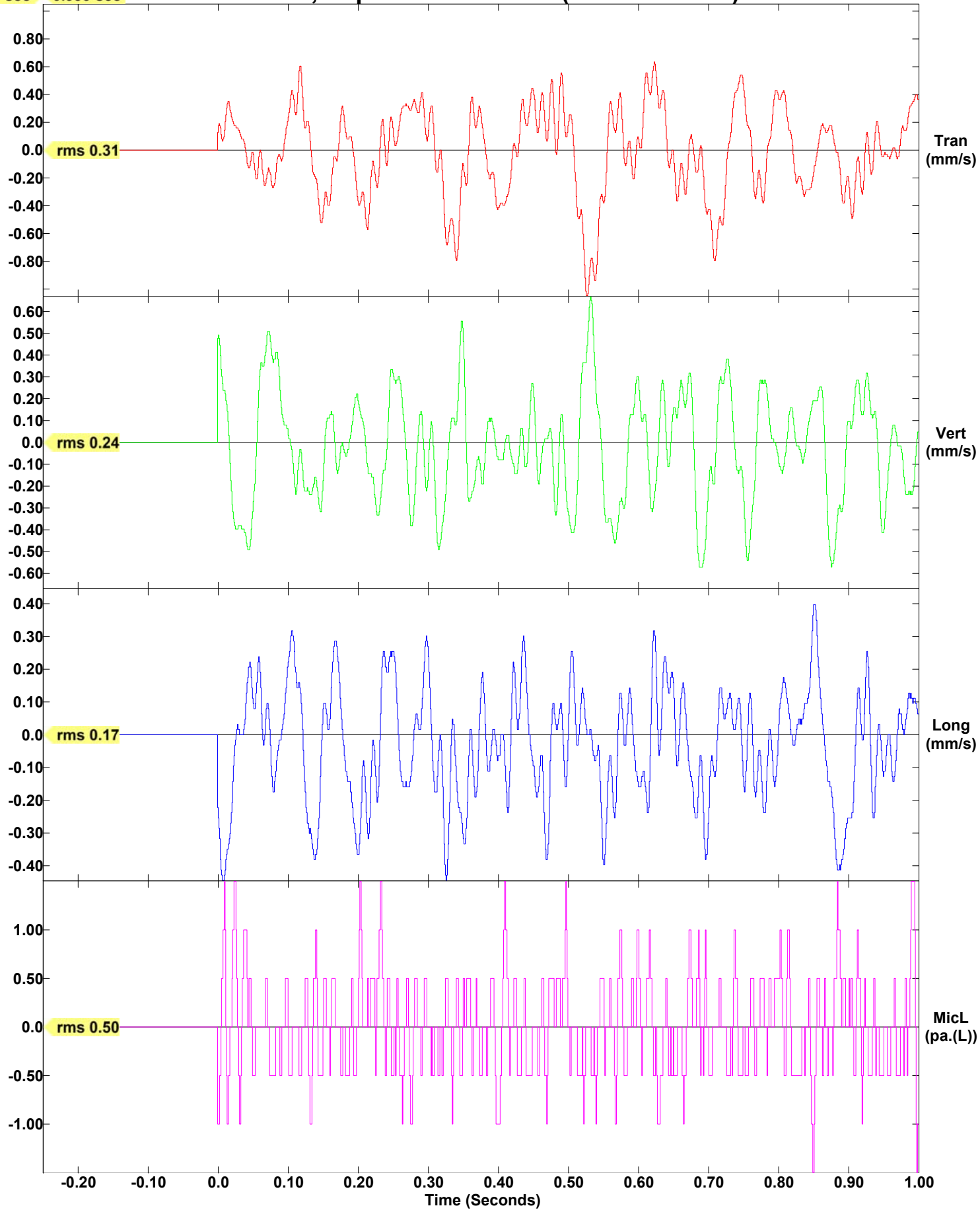
N/A: Not Applicable

USBM RI8507 And OSMRE



0.0 sec

0.999 sec



Date/Time Tran at 14:26:30 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL20.460

Notes

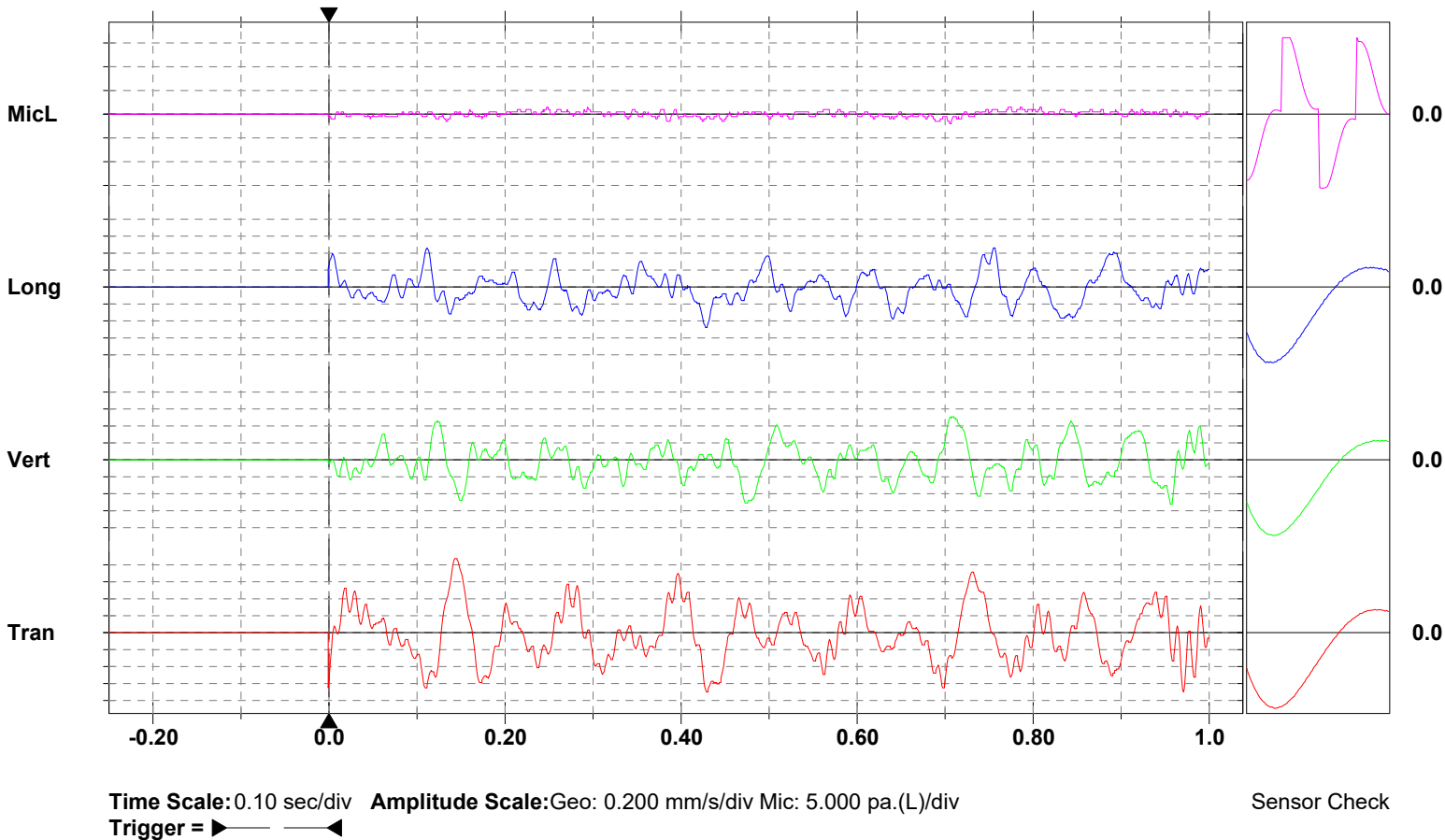
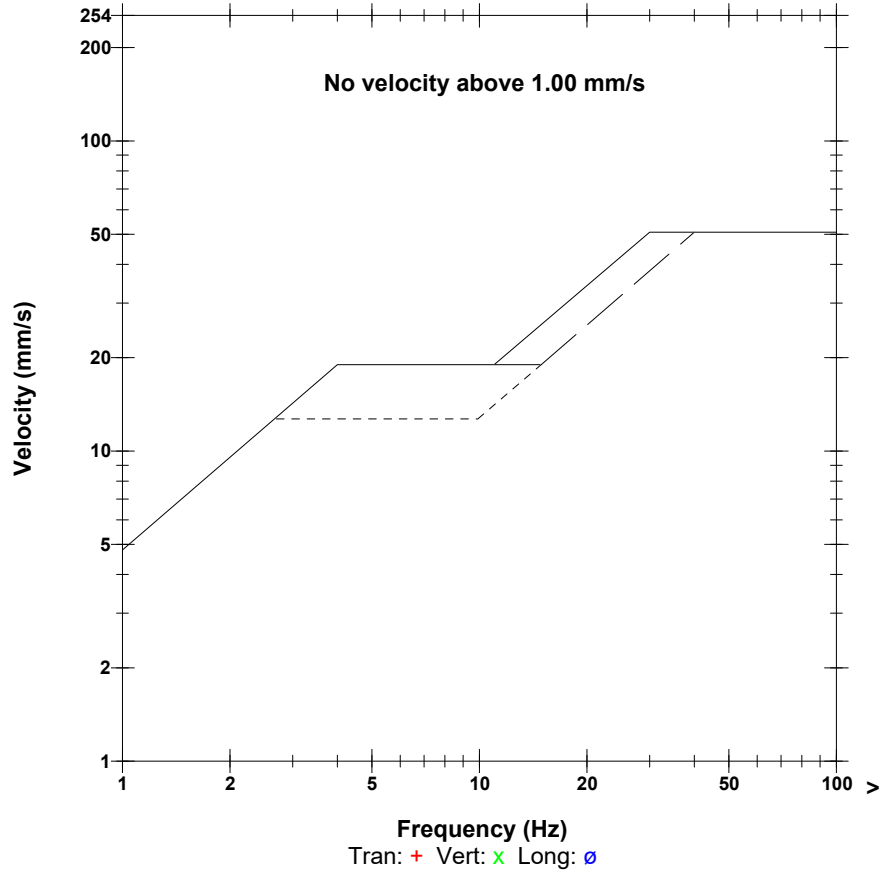
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting
PSPL 100.0 dB(L) at 0.706 sec
ZC Freq 64 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

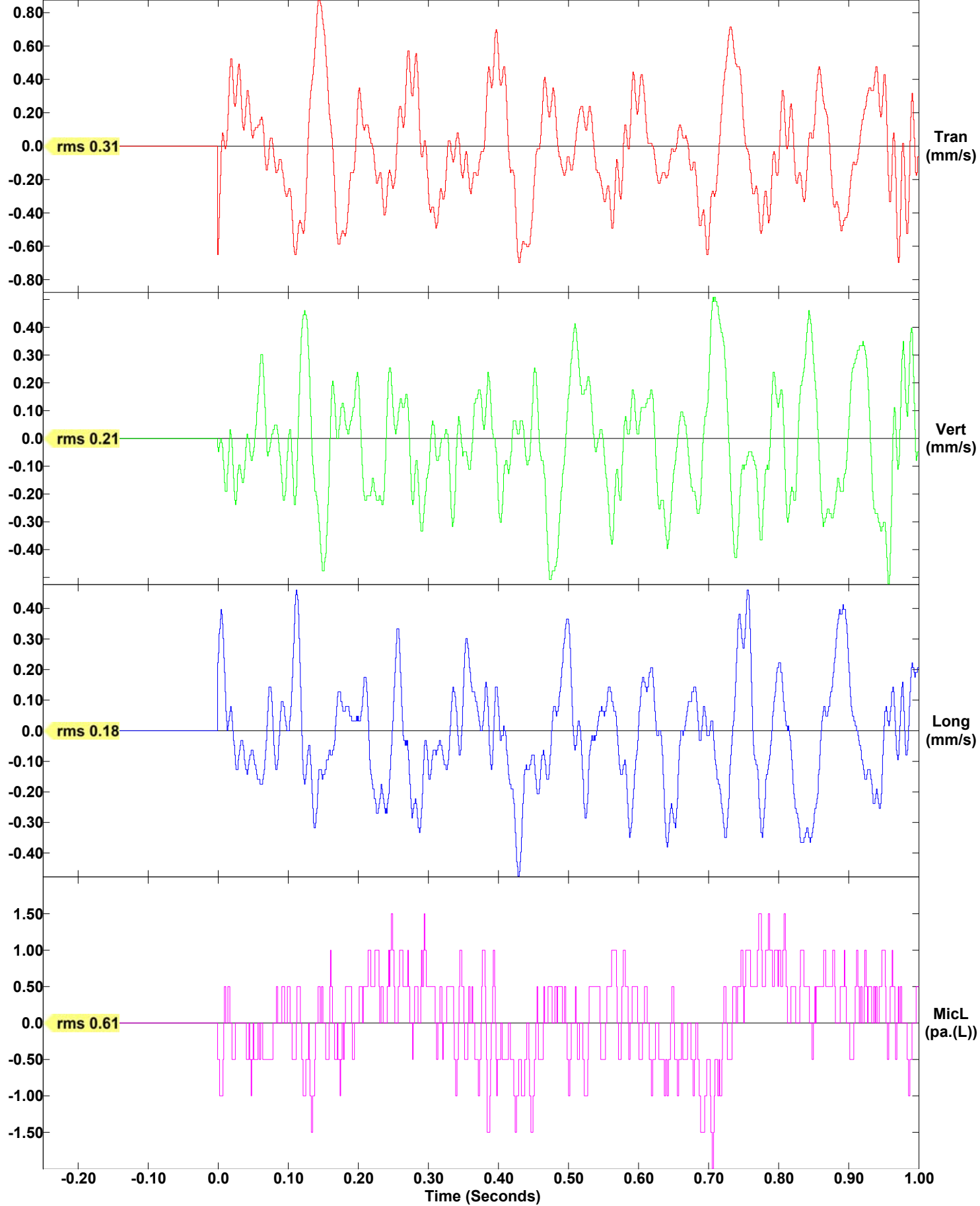
	Tran	Vert	Long	
PPV	0.873	0.524	0.476	mm/s
ZC Freq	14	16	8.0	Hz
Time (Rel. to Trig)	0.144	0.957	0.429	sec
Peak Acceleration	0.022	0.013	0.010	g
Peak Displacement	0.009	0.006	0.006	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.2	3.9	3.5	

Peak Vector Sum 0.953 mm/s at 0.146 sec

USBM RI8507 And OSMRE



0.0 sec 0.999 sec



Date/Time Tran at 14:26:36 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL20.4C0

Notes

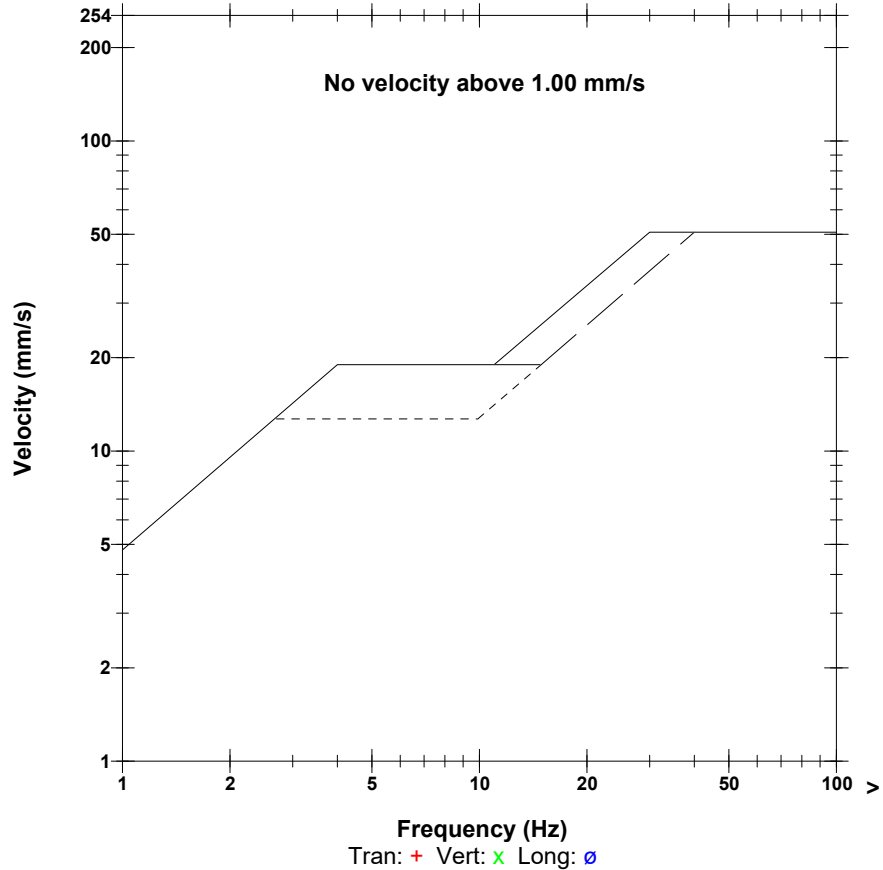
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting
PSPL 100.0 dB(L) at 0.367 sec
ZC Freq 51 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

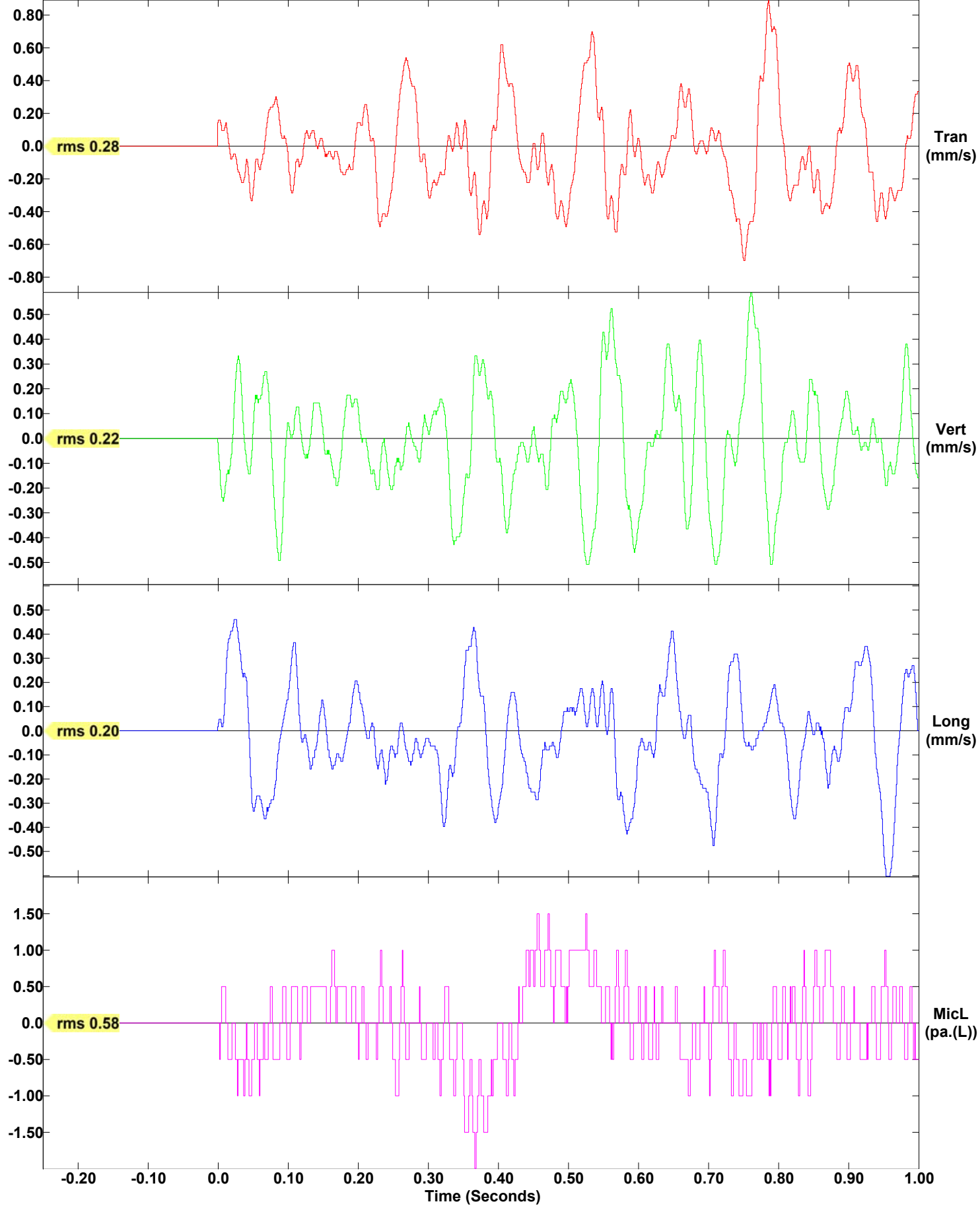
	Tran	Vert	Long	
PPV	0.889	0.587	0.603	mm/s
ZC Freq	13	14	14	Hz
Time (Rel. to Trig)	0.786	0.761	0.954	sec
Peak Acceleration	0.017	0.013	0.008	g
Peak Displacement	0.010	0.006	0.006	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.2	3.9	3.5	

Peak Vector Sum 0.968 mm/s at 0.786 sec

USBM RI8507 And OSMRE



0.0 sec 0.999 sec



Date/Time Tran at 14:26:42 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL20.410

Notes

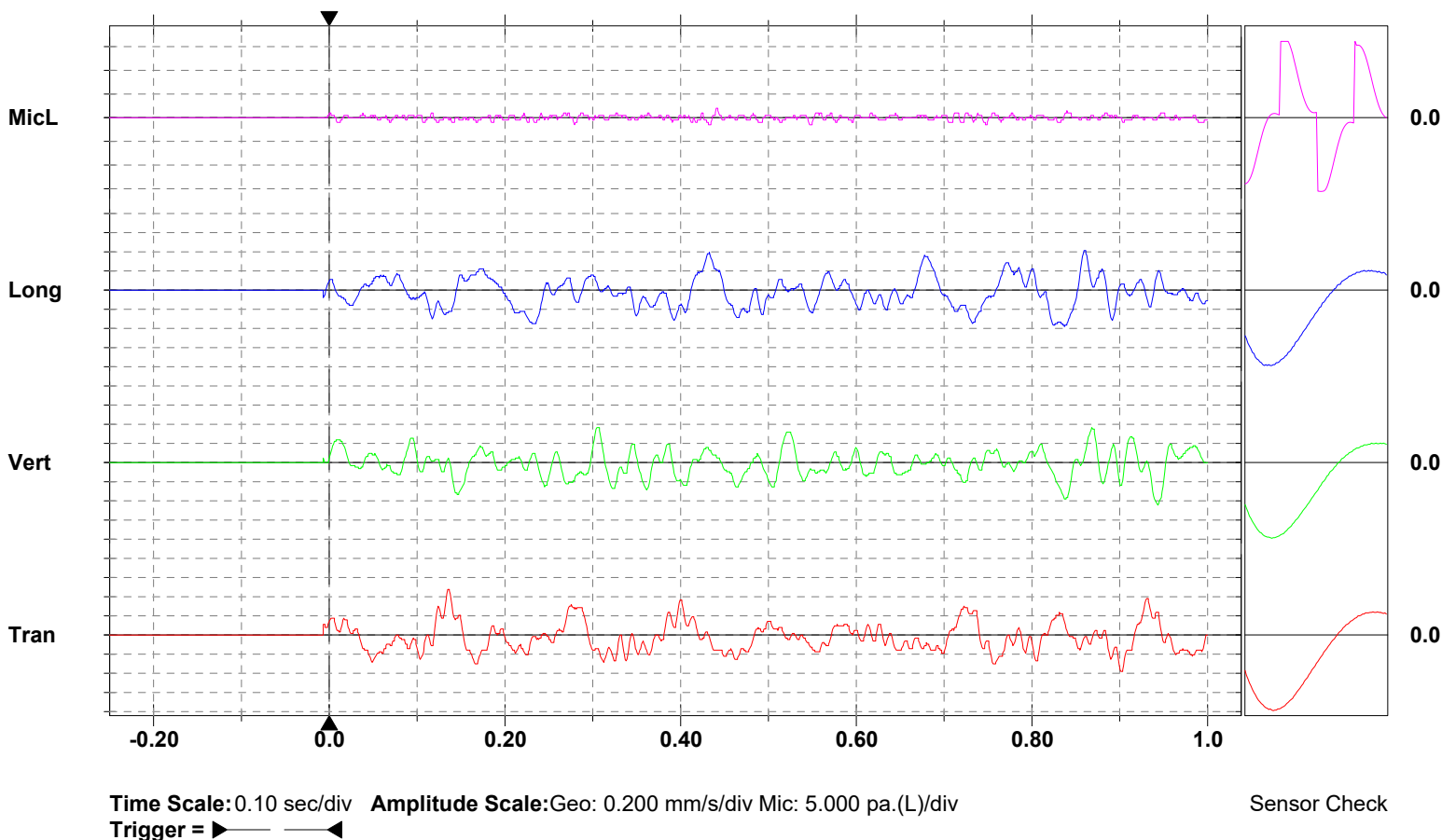
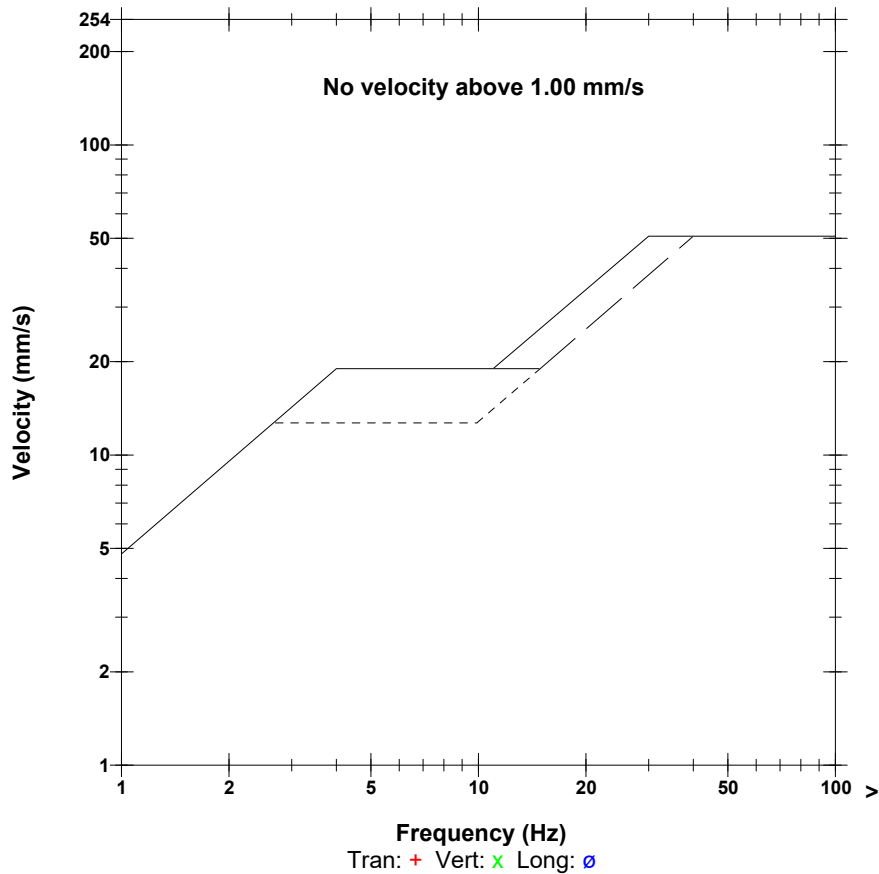
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting
PSPL 100.0 dB(L) at 0.441 sec
ZC Freq 85 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

	Tran	Vert	Long	
PPV	0.476	0.445	0.413	mm/s
ZC Freq	16	26	15	Hz
Time (Rel. to Trig)	0.136	0.944	0.860	sec
Peak Acceleration	0.010	0.008	0.008	g
Peak Displacement	0.004	0.003	0.005	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.2	3.9	3.5	

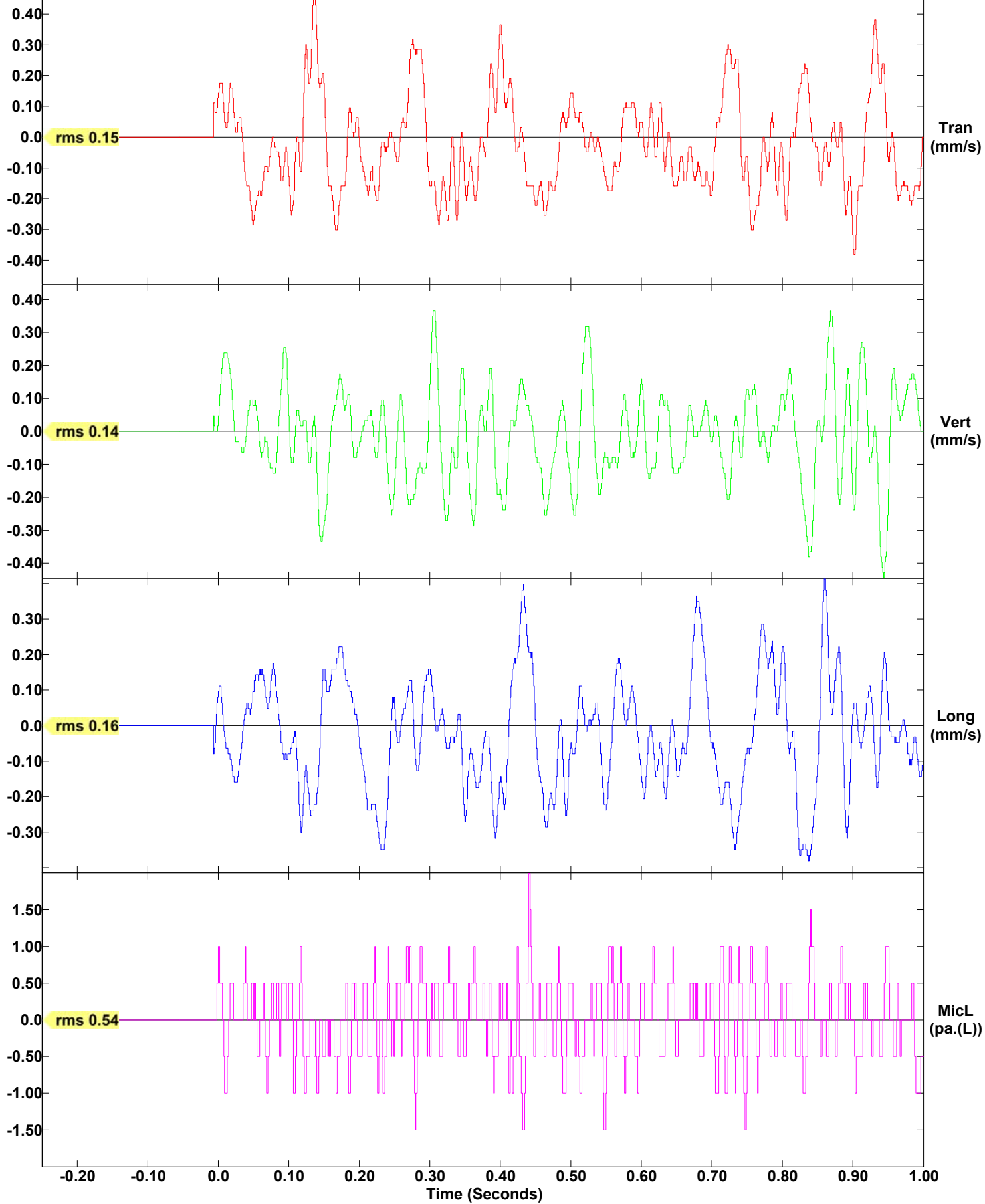
Peak Vector Sum 0.556 mm/s at 0.838 sec

USBM RI8507 And OSMRE



0.0 sec

0.999 sec



Date/Time Vert at 14:26:48 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL20.400

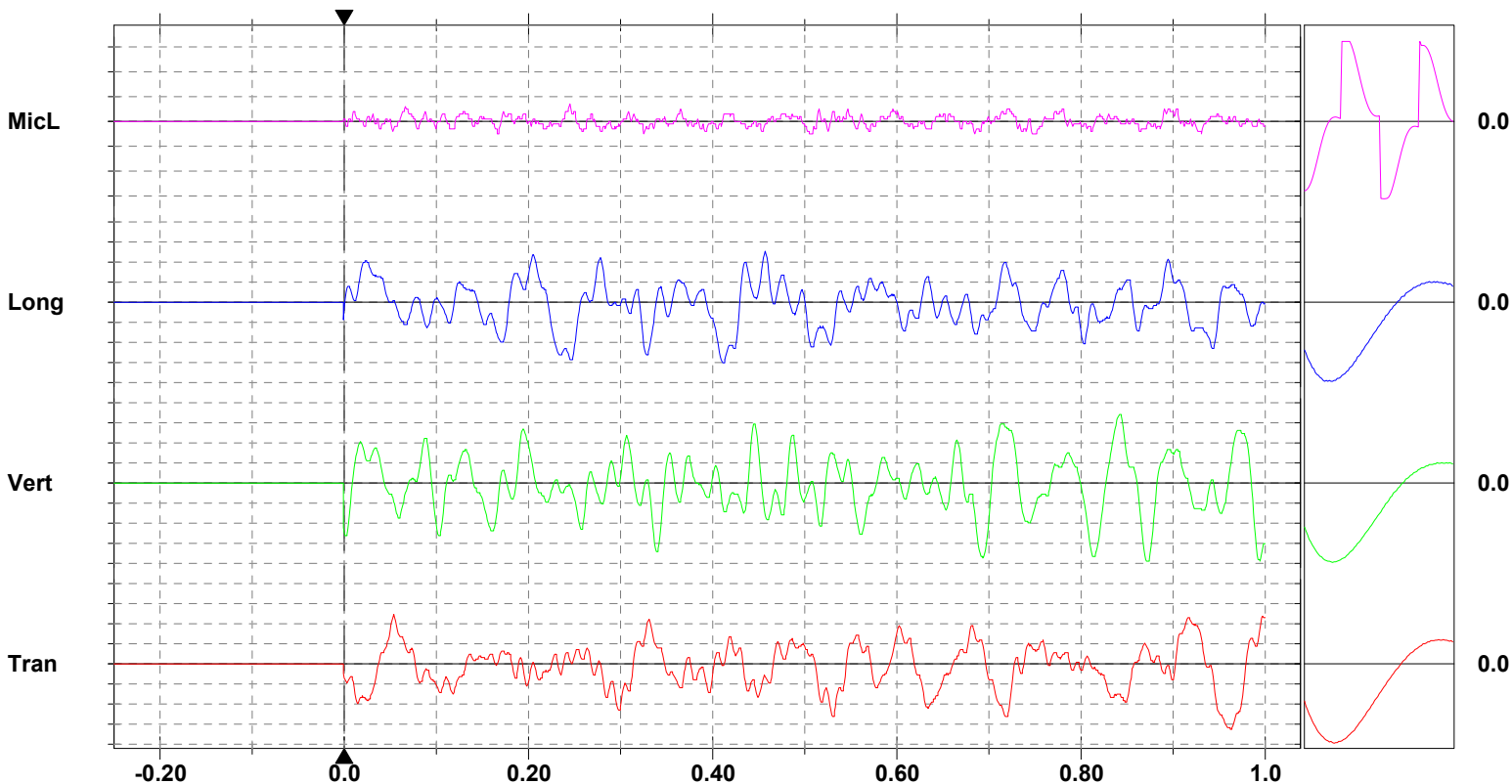
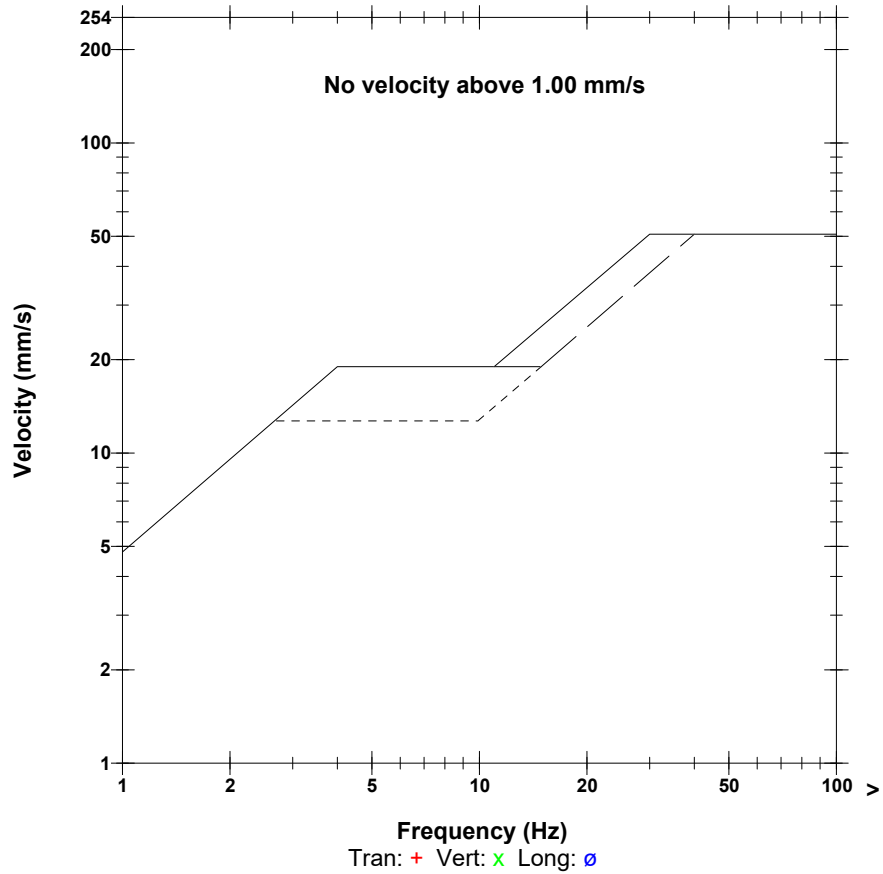
Notes
 Location: Oxbow
 Client: Development ENG
 User Name: development eng
 Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting
PSPL 104.9 dB(L) at 0.246 sec
ZC Freq 39 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

	Tran	Vert	Long	
PPV	0.651	0.778	0.603	mm/s
ZC Freq	13	23	14	Hz
Time (Rel. to Trig)	0.963	0.872	0.412	sec
Peak Acceleration	0.013	0.015	0.013	g
Peak Displacement	0.008	0.006	0.007	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.2	3.9	3.5	

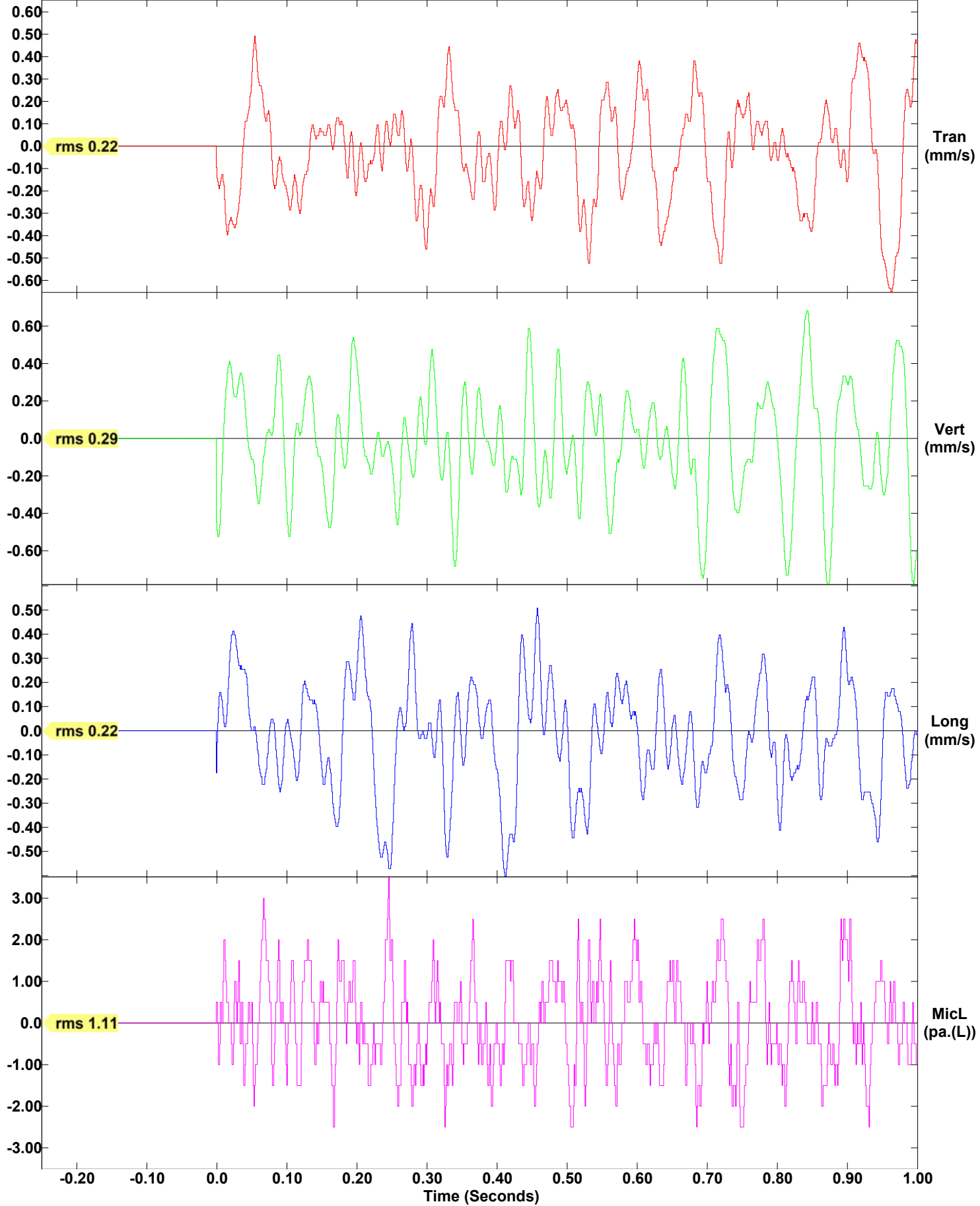
Peak Vector Sum 0.857 mm/s at 0.718 sec

USBM RI8507 And OSMRE



Sensor Check

0.0 sec 0.999 sec



Date/Time Vert at 14:26:54 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL20.4U0

Notes

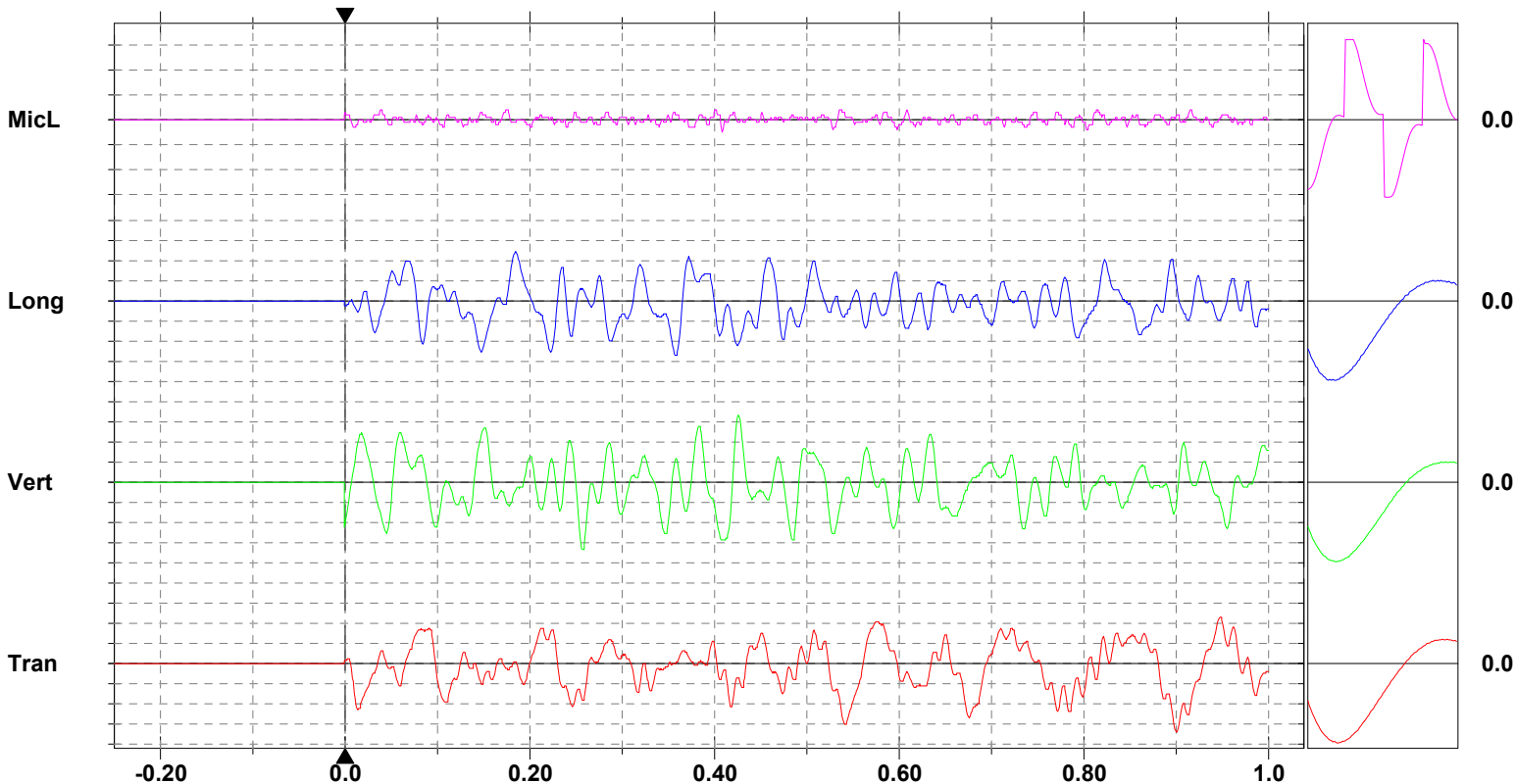
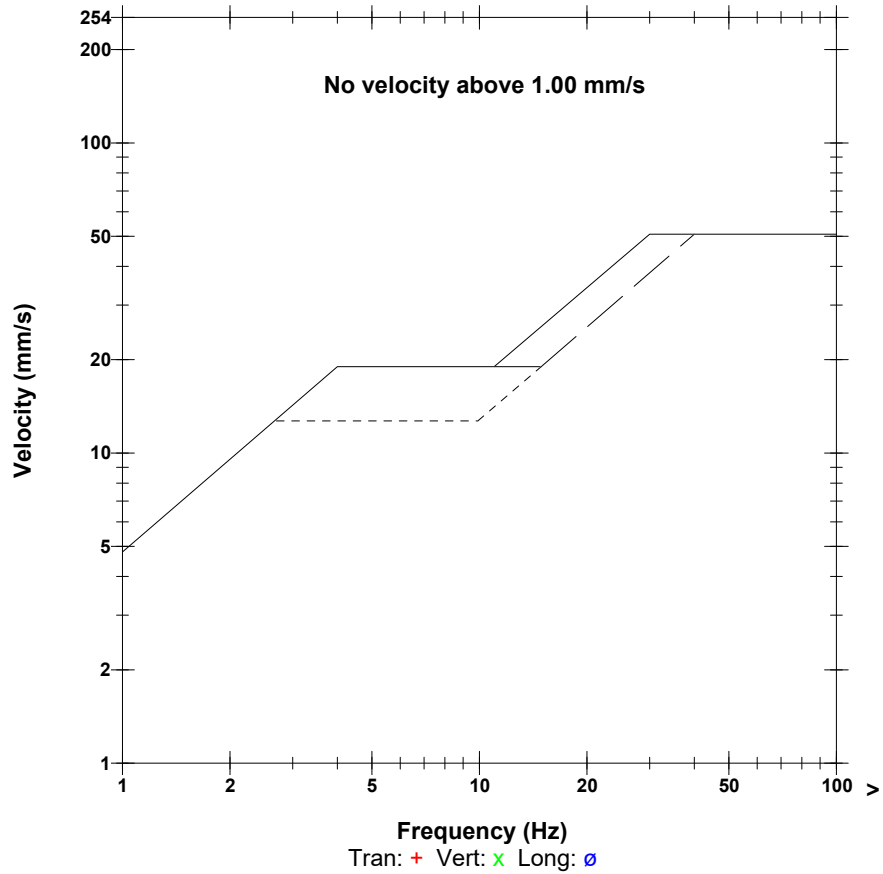
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting
PSPL 101.9 dB(L) at 0.409 sec
ZC Freq N/A
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

	Tran	Vert	Long	
PPV	0.683	0.667	0.540	mm/s
ZC Freq	10	32	14	Hz
Time (Rel. to Trig)	0.901	0.258	0.358	sec
Peak Acceleration	0.012	0.017	0.013	g
Peak Displacement	0.009	0.005	0.006	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.2	3.9	3.5	

Peak Vector Sum 0.810 mm/s at 0.427 sec
N/A: Not Applicable

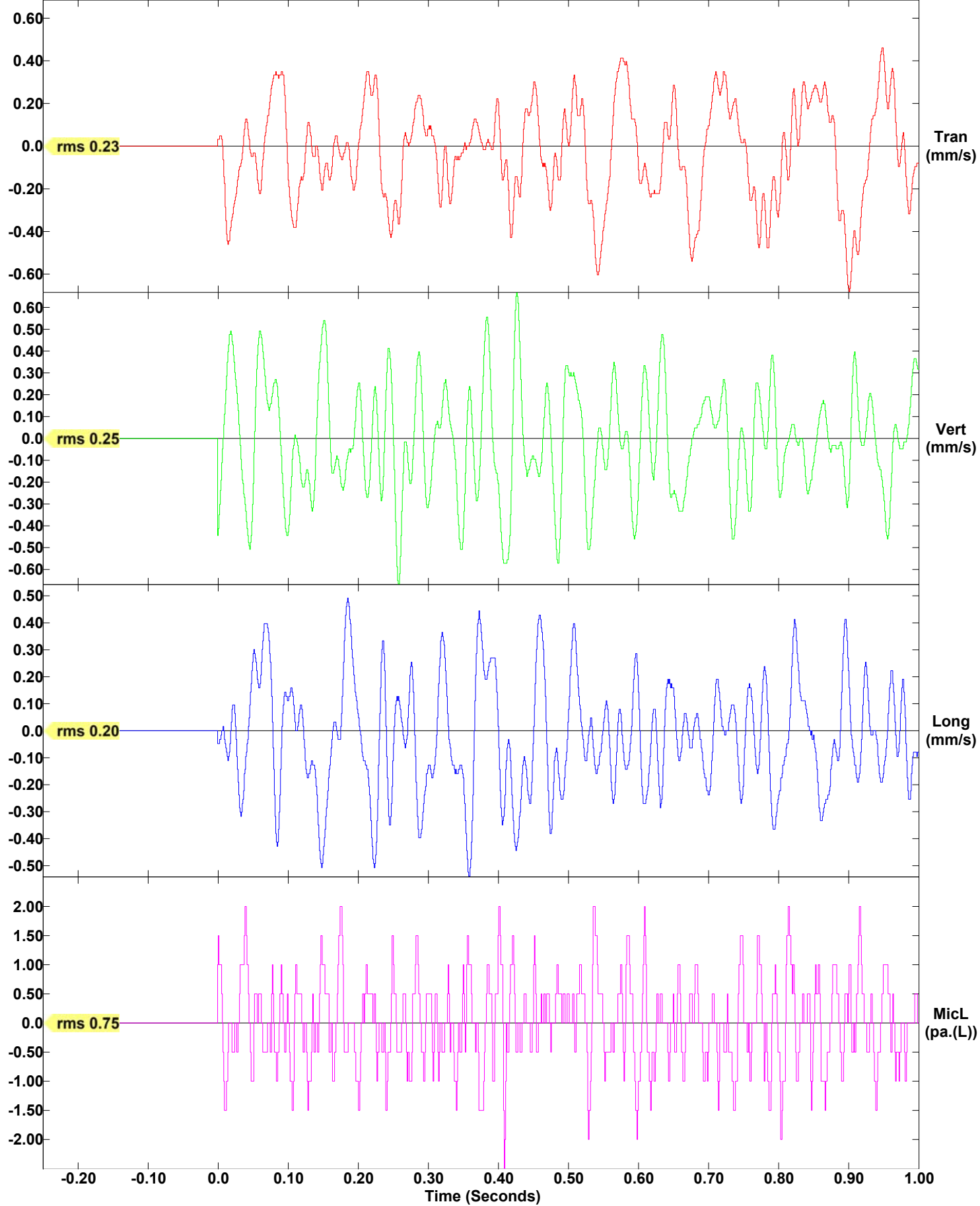
USBM RI8507 And OSMRE



Sensor Check

0.0 sec

0.999 sec



Date/Time Vert at 14:27:00 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL20.500

Notes

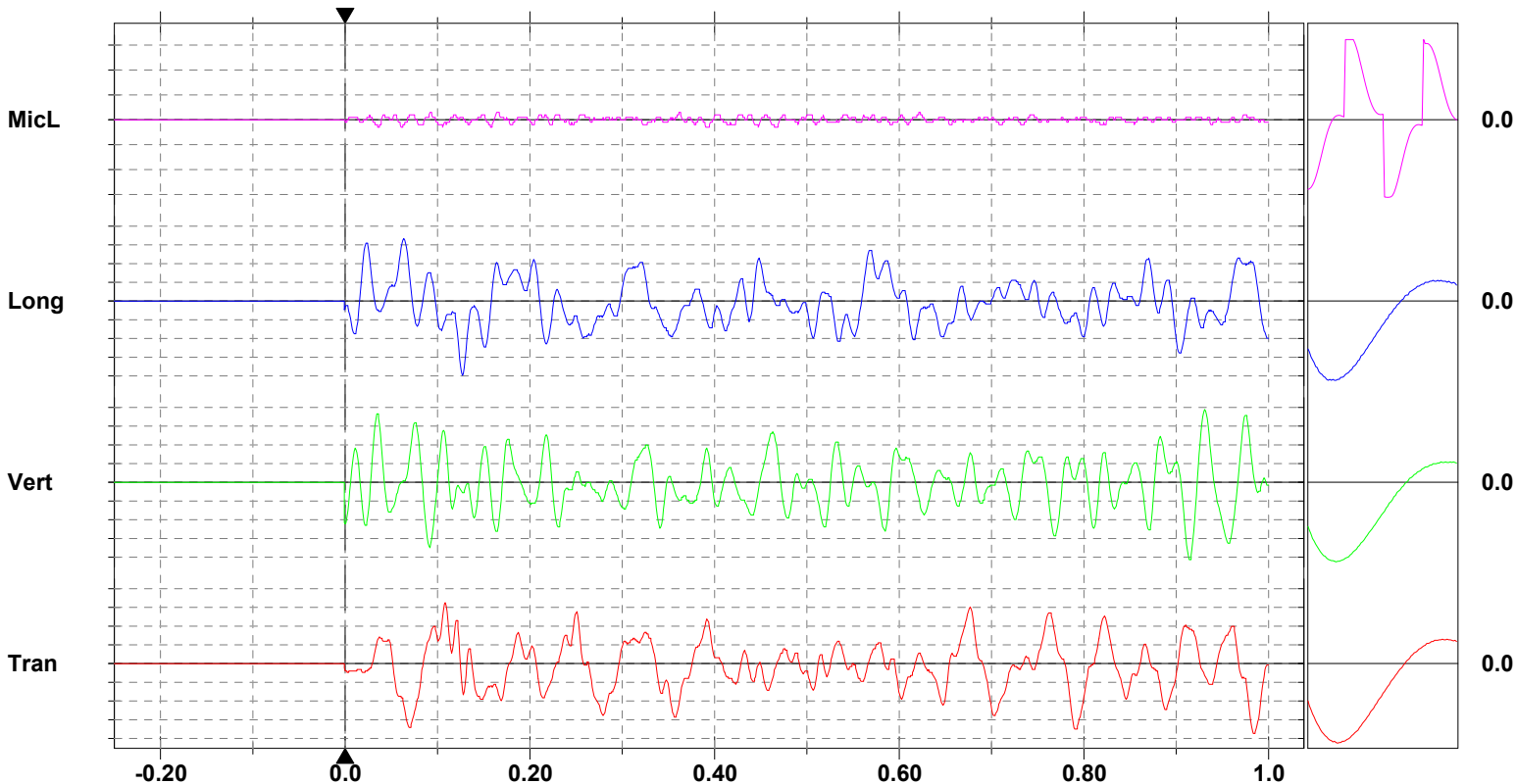
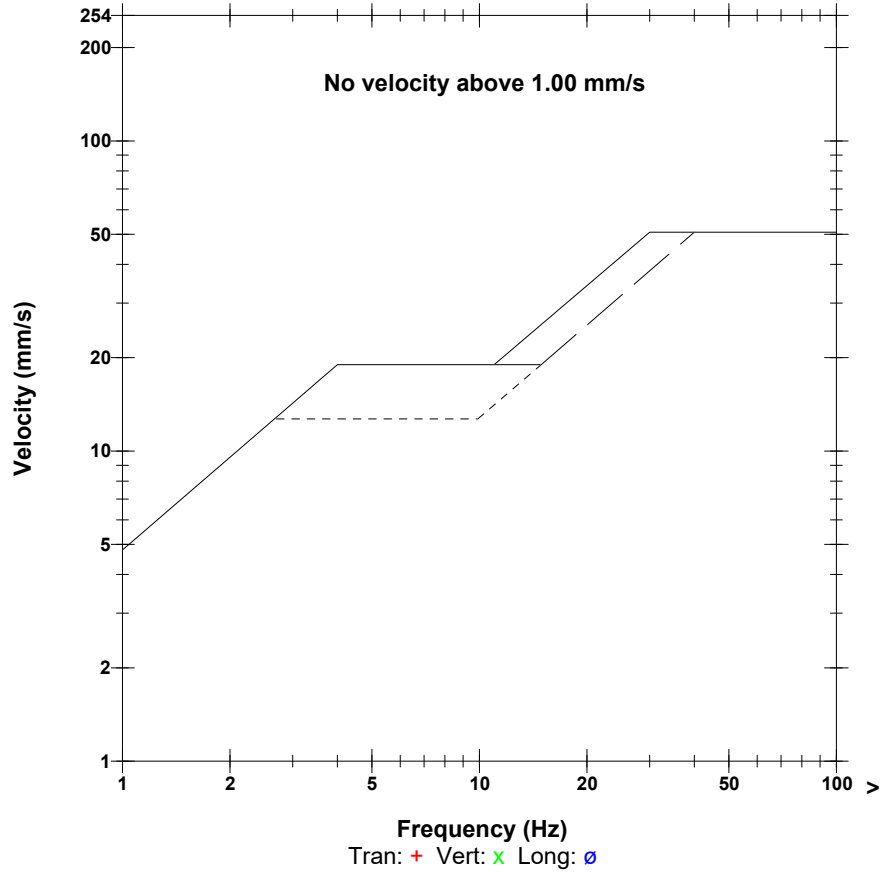
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting
PSPL 97.5 dB(L) at 0.036 sec
ZC Freq 64 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

	Tran	Vert	Long	
PPV	0.746	0.826	0.794	mm/s
ZC Freq	17	28	8.0	Hz
Time (Rel. to Trig)	0.984	0.915	0.128	sec
Peak Acceleration	0.017	0.018	0.013	g
Peak Displacement	0.007	0.005	0.009	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.2	3.9	3.5	

Peak Vector Sum 0.905 mm/s at 0.915 sec

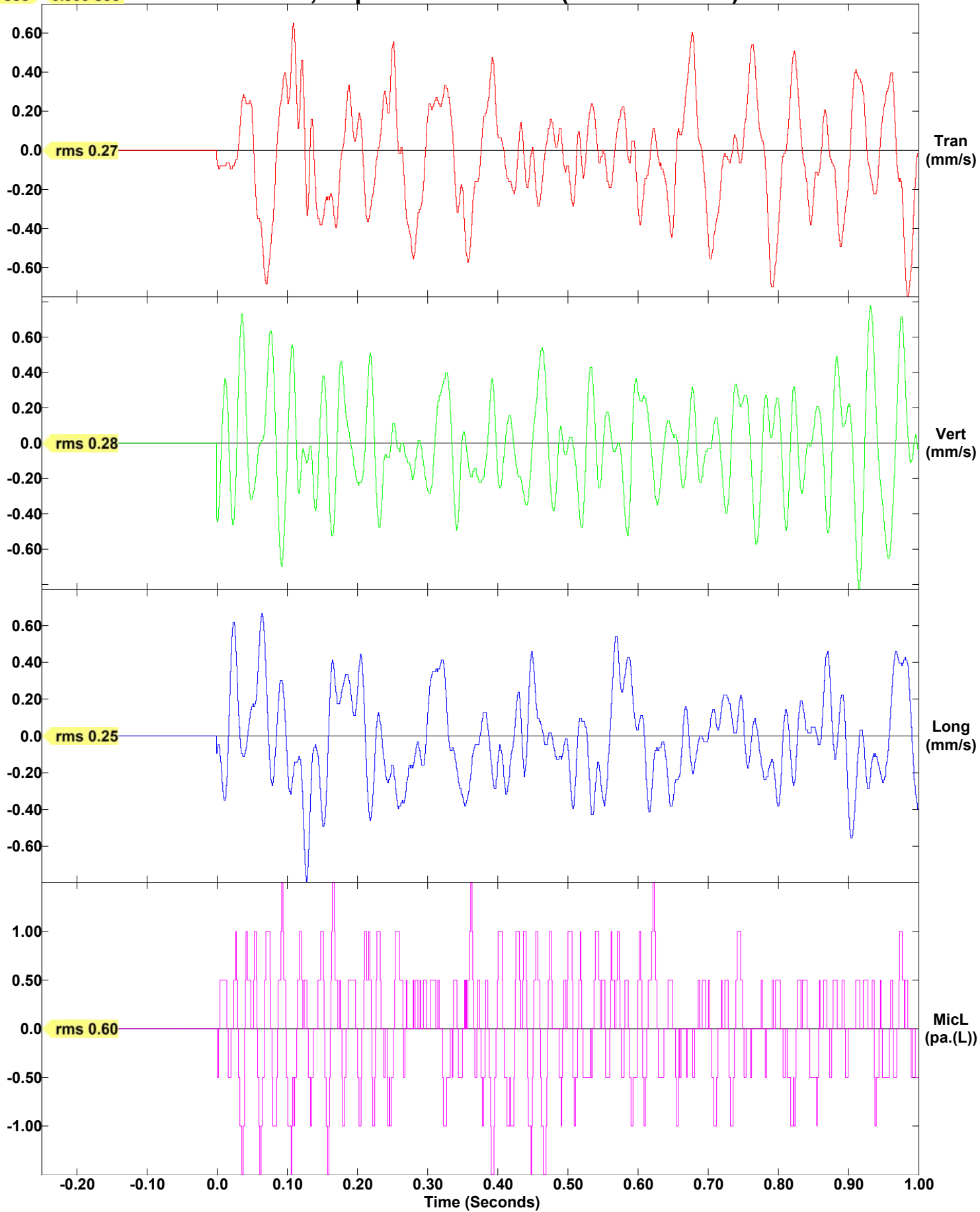
USBM RI8507 And OSMRE



Sensor Check

0.0 sec 0.999 sec

2585, Sep 10 /18 14:27:00 (d585hl20.500)



Date/Time Vert at 14:27:06 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL20.560

Notes

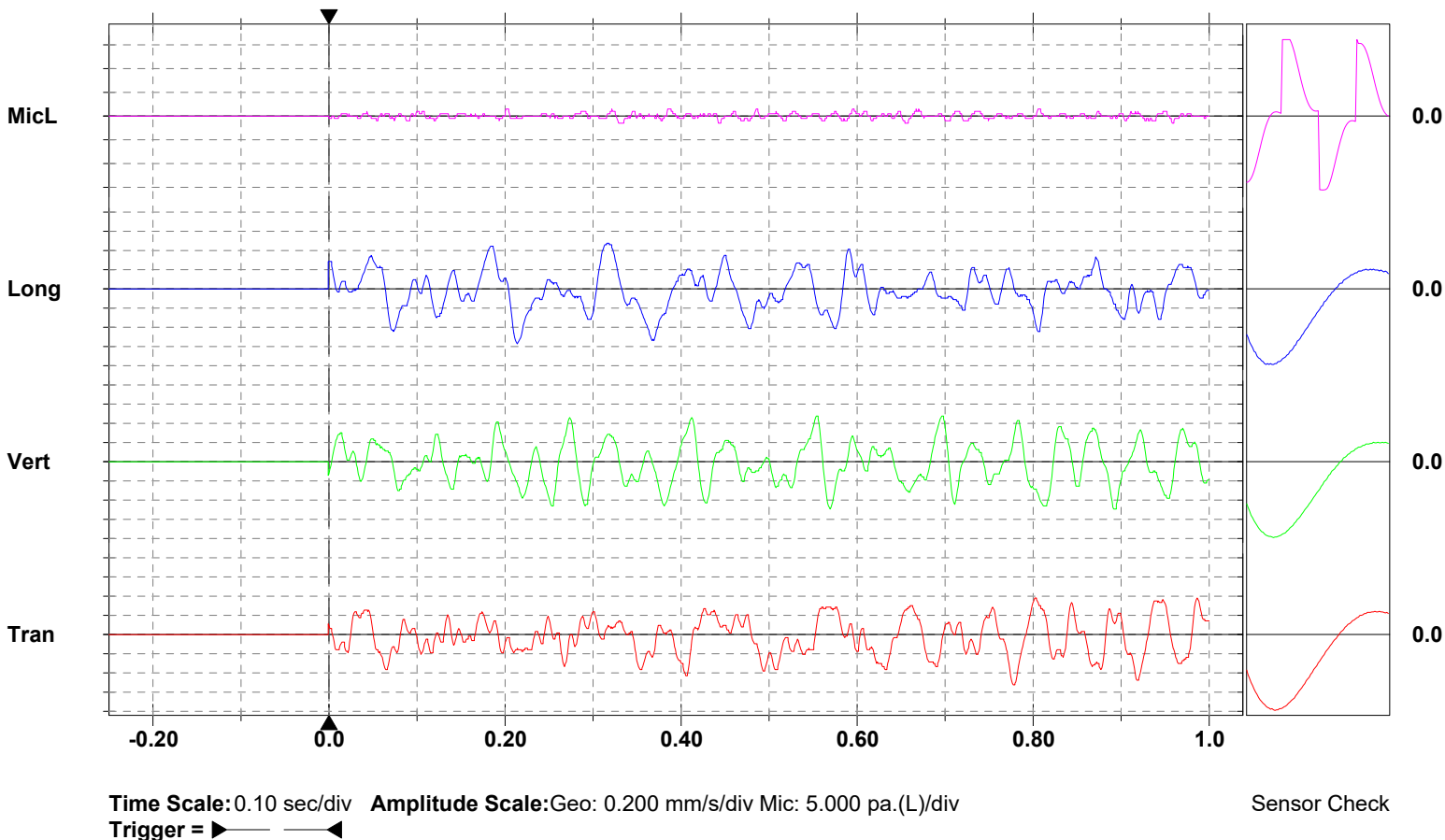
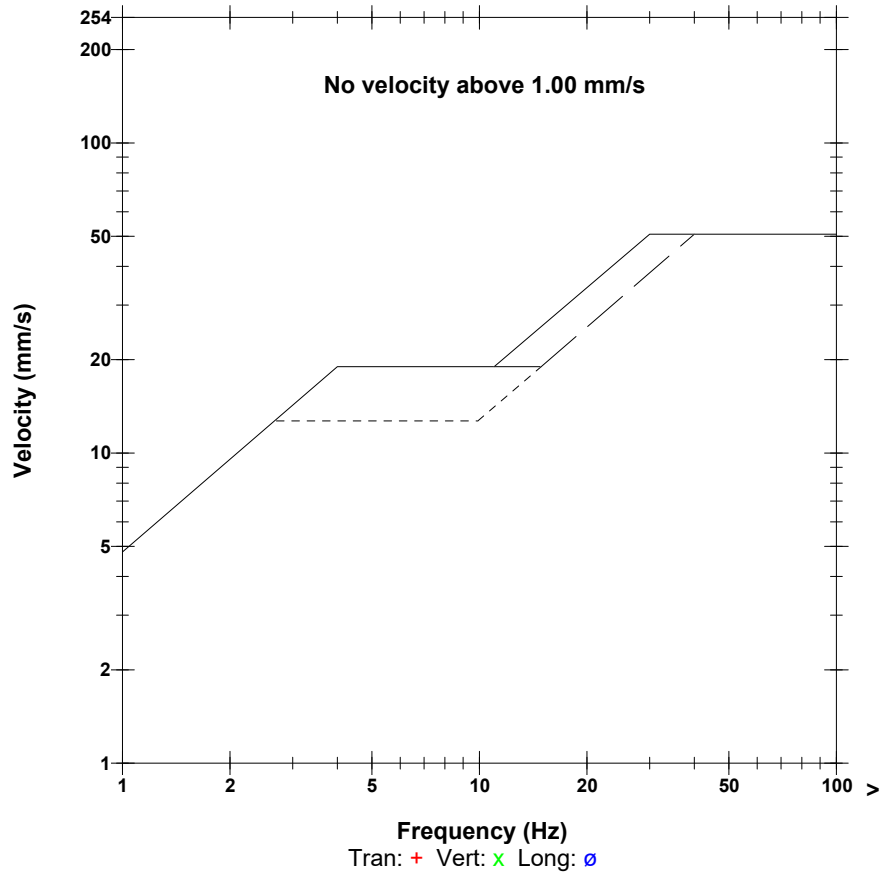
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting
PSPL 97.5 dB(L) at 0.202 sec
ZC Freq 85 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

	Tran	Vert	Long	
PPV	0.524	0.492	0.572	mm/s
ZC Freq	17	18	12	Hz
Time (Rel. to Trig)	0.778	0.570	0.215	sec
Peak Acceleration	0.012	0.012	0.010	g
Peak Displacement	0.006	0.005	0.007	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.2	3.9	3.5	

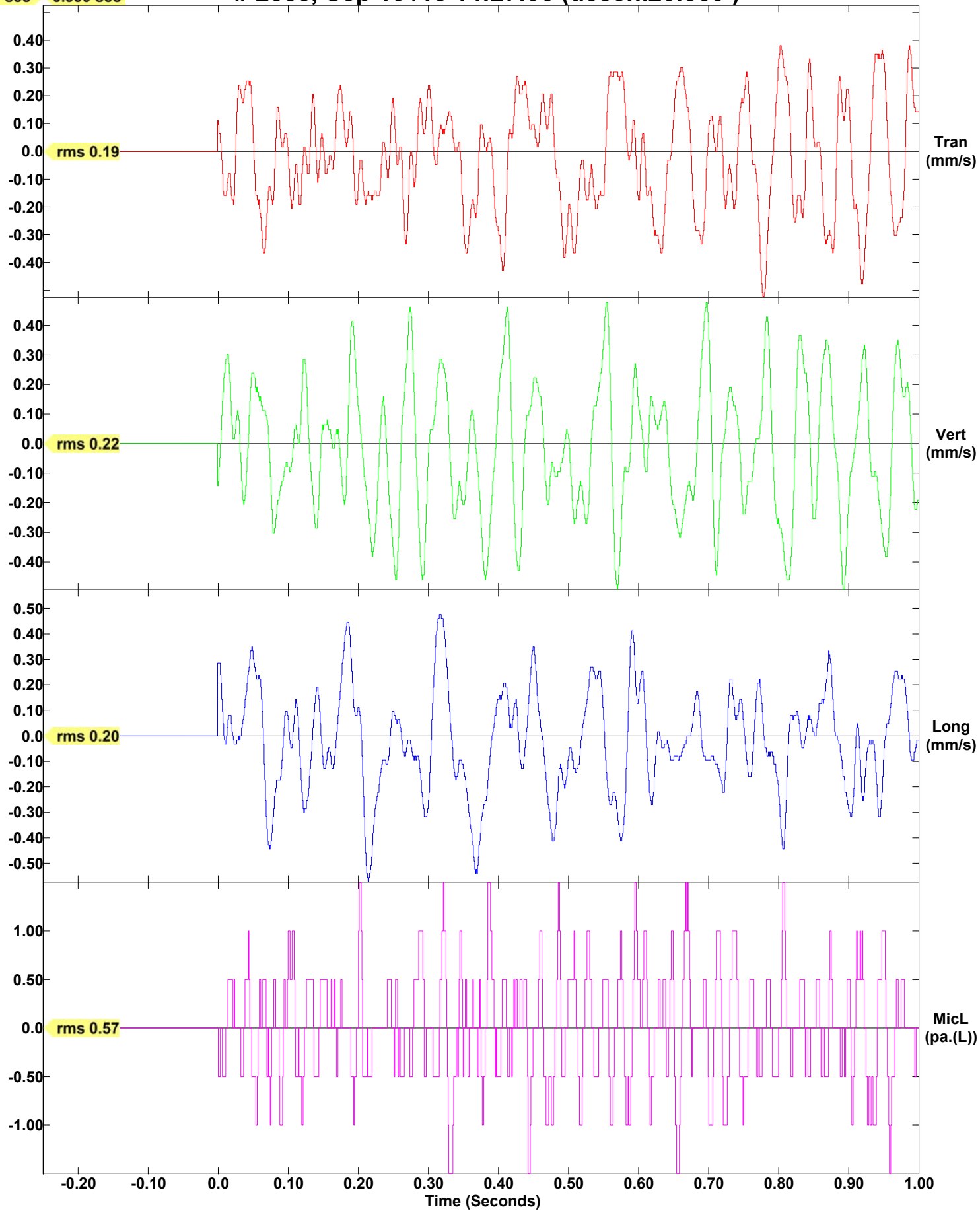
Peak Vector Sum 0.651 mm/s at 0.808 sec

USBM RI8507 And OSMRE



0.0 sec

0.999 sec



Date/Time Tran at 14:27:12 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL20.5C0

Notes

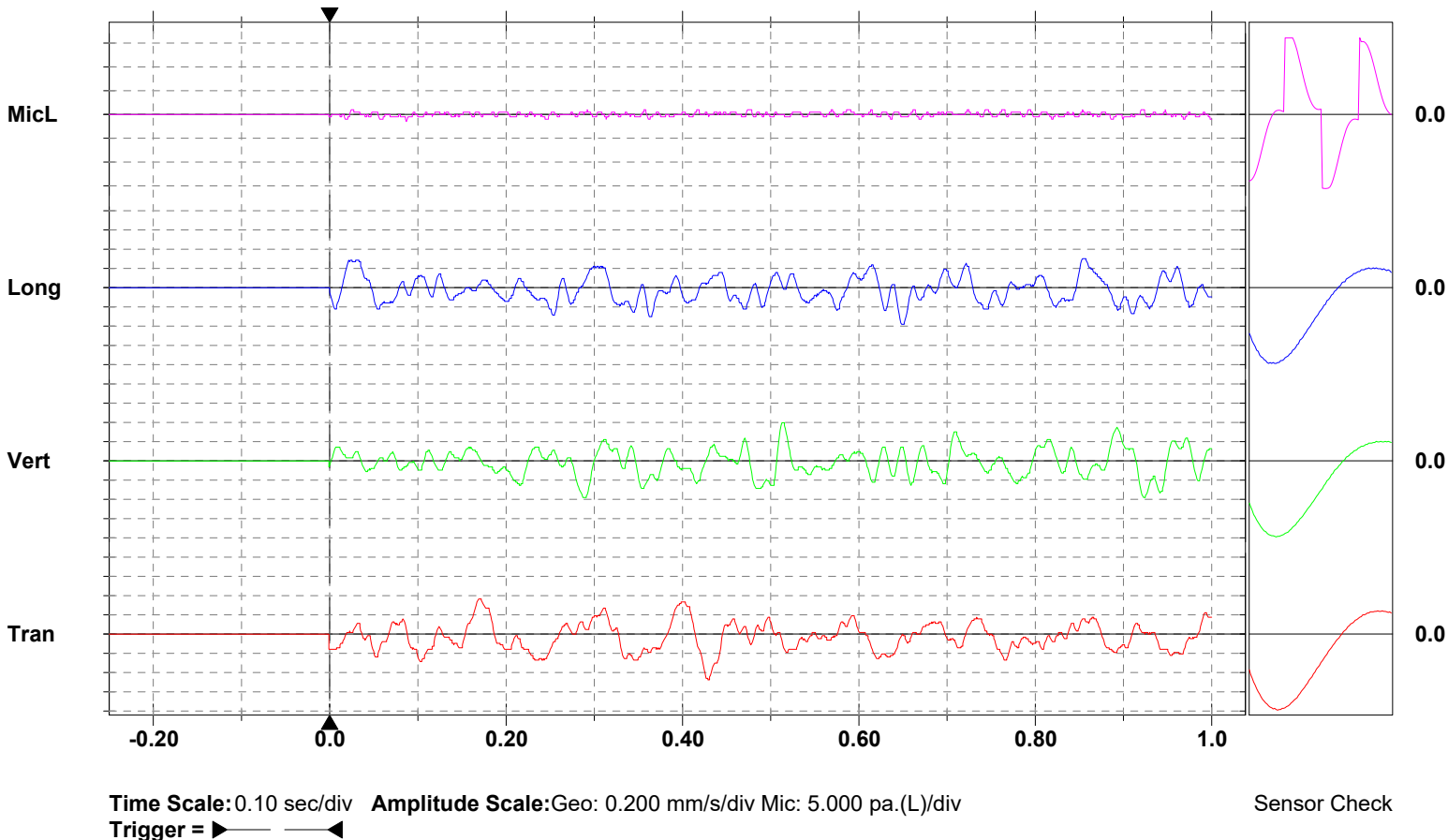
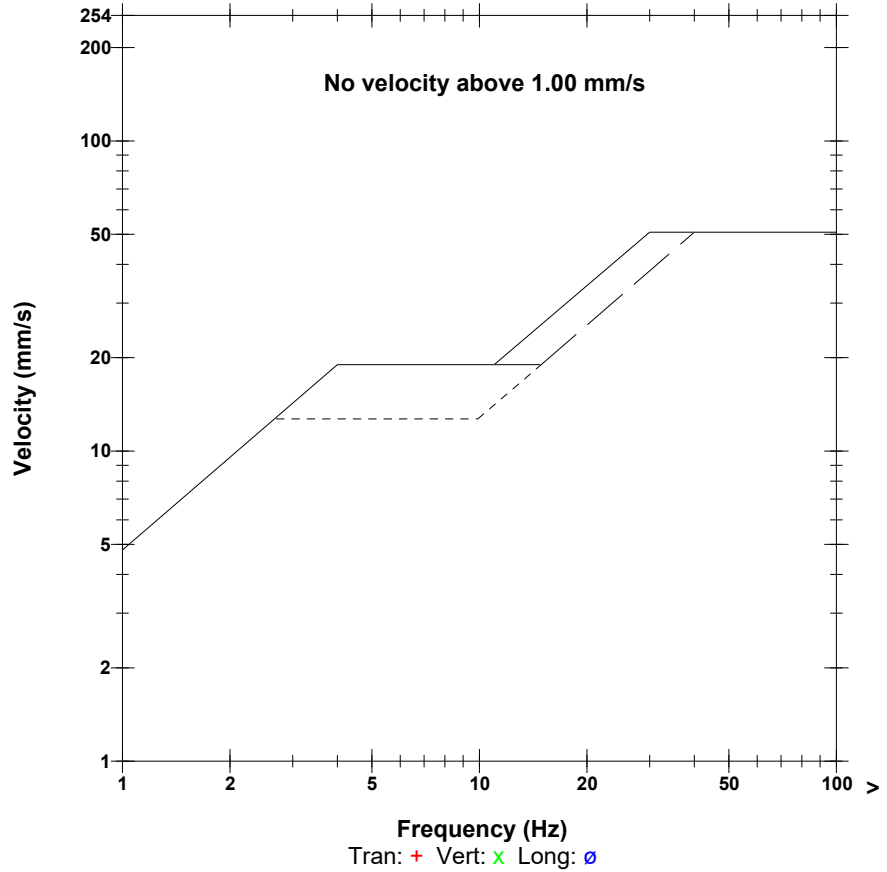
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User Name: development eng
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ZC Freq N/A
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

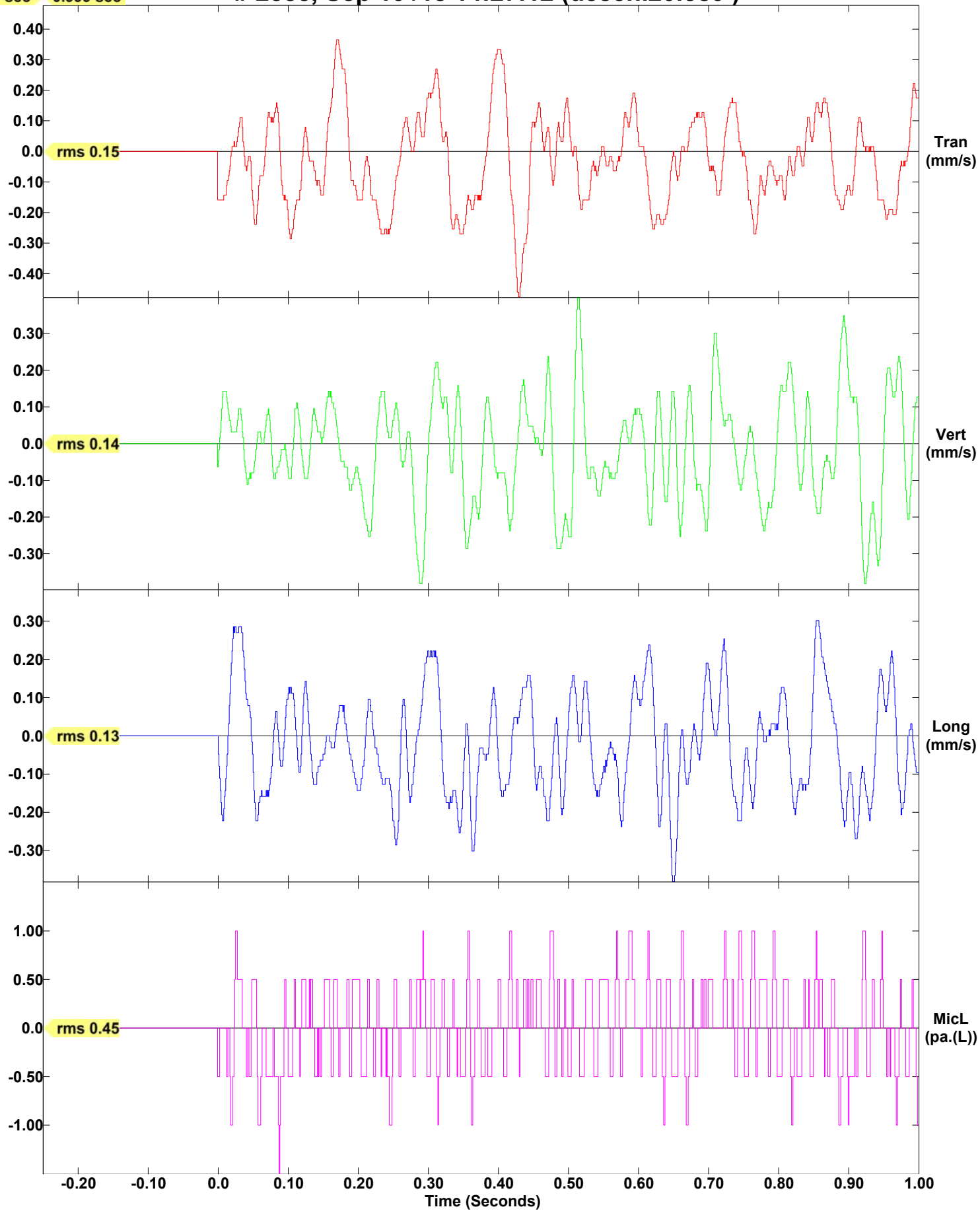
	Tran	Vert	Long	
PPV	0.476	0.397	0.381	mm/s
ZC Freq	17	30	27	Hz
Time (Rel. to Trig)	0.430	0.514	0.649	sec
Peak Acceleration	0.010	0.010	0.008	g
Peak Displacement	0.005	0.004	0.004	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.2	3.9	3.5	

Peak Vector Sum 0.492 mm/s at 0.431 sec
N/A: Not Applicable

USBM RI8507 And OSMRE



0.0 sec 0.999 sec



Date/Time Tran at 14:27:19 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL20.5J0

Notes

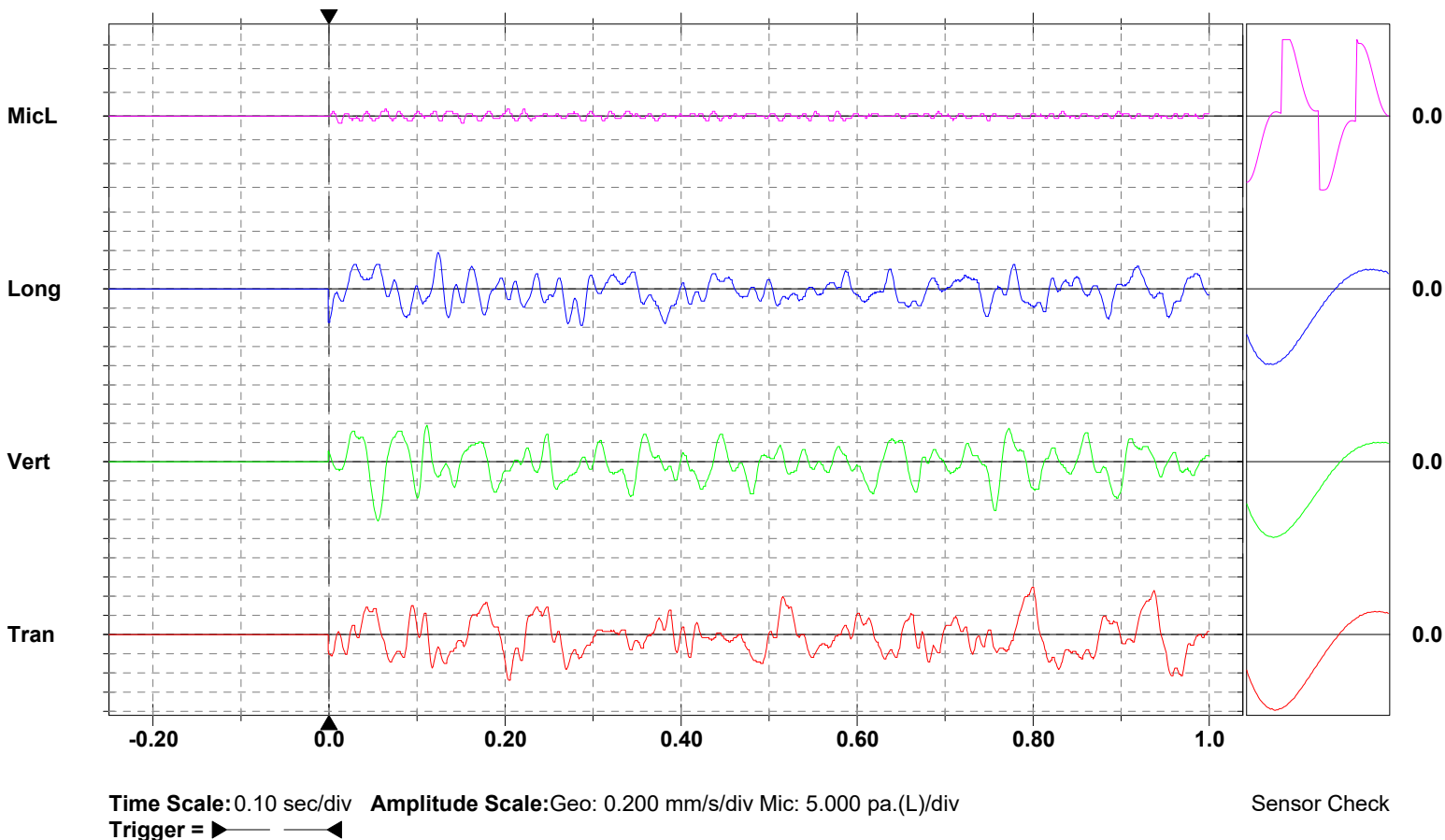
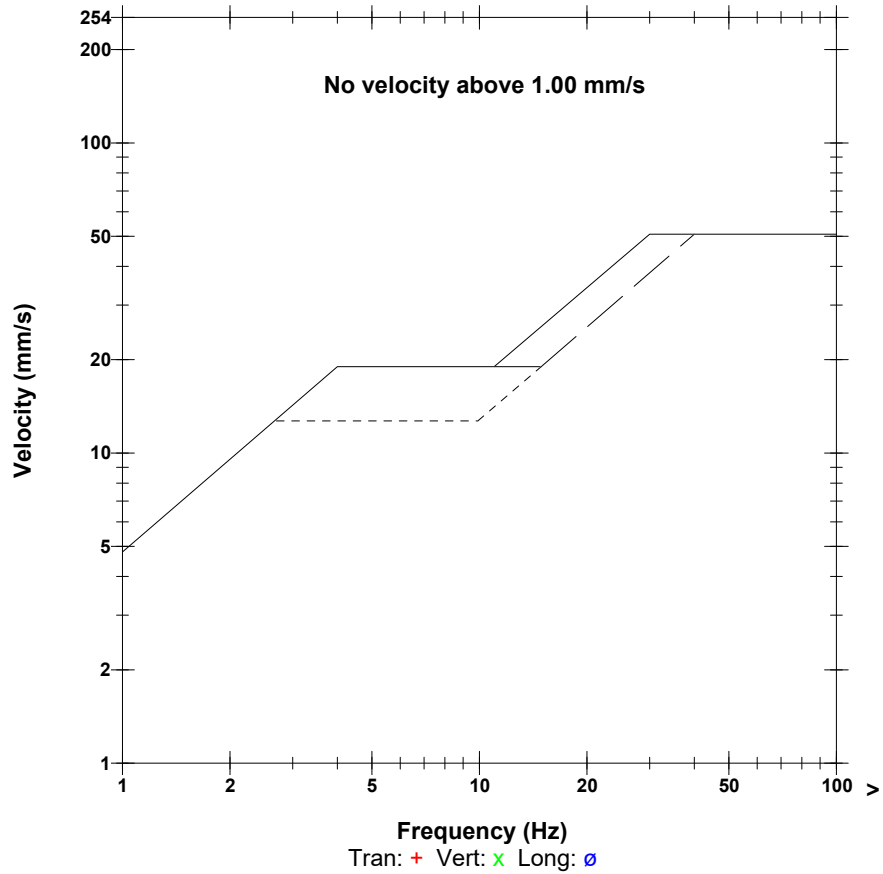
Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting
PSPL 97.5 dB(L) at 0.012 sec
ZC Freq 73 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

	Tran	Vert	Long	
PPV	0.492	0.619	0.381	mm/s
ZC Freq	17	24	39	Hz
Time (Rel. to Trig)	0.800	0.057	0.125	sec
Peak Acceleration	0.012	0.013	0.010	g
Peak Displacement	0.007	0.004	0.004	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.2	3.9	3.5	

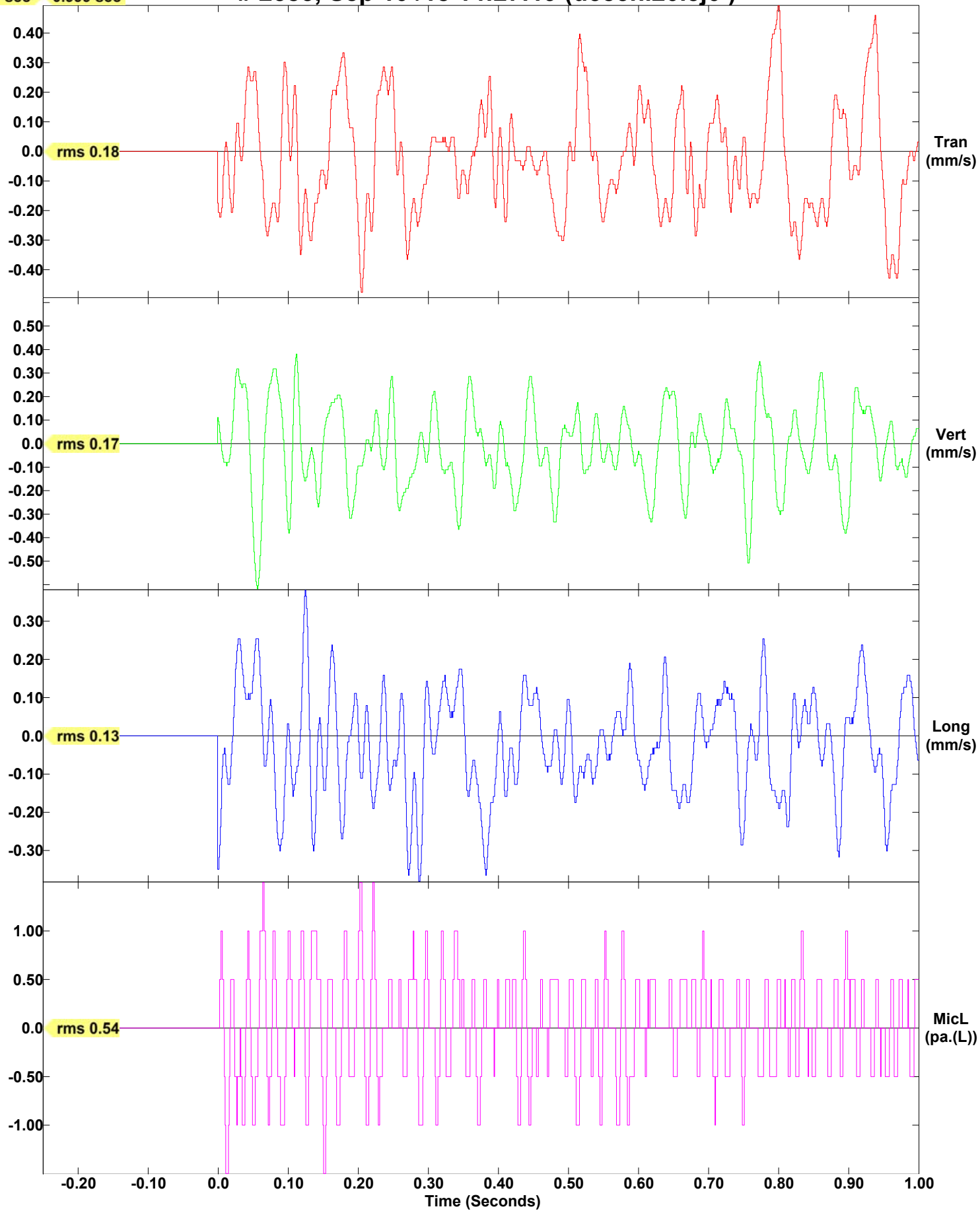
Peak Vector Sum 0.683 mm/s at 0.057 sec

USBM RI8507 And OSMRE



0.0 sec 0.999 sec

2585, Sep 10 /18 14:27:19 (d585hl20.5j0)



Date/Time Tran at 14:27:26 September 10, 2018
Trigger Source Geo: 0.127 mm/s
Range Geo: 254.0 mm/s
Record Time 1.0 sec at 1024 sps

Serial Number 2585 V 5.52 BlastMate II/677
Battery Level 6.3 Volts
Unit Calibration June 6, 2017 by InstanTel
File Name D585HL20.5Q0

Notes

Location: Oxbow
Client: Development ENG
User Name: development eng
Converted: September 13, 2018 10:31:16 (V 10.74)

Microphone Linear Weighting

PSPL <88 dB(L)

ZC Freq N/A

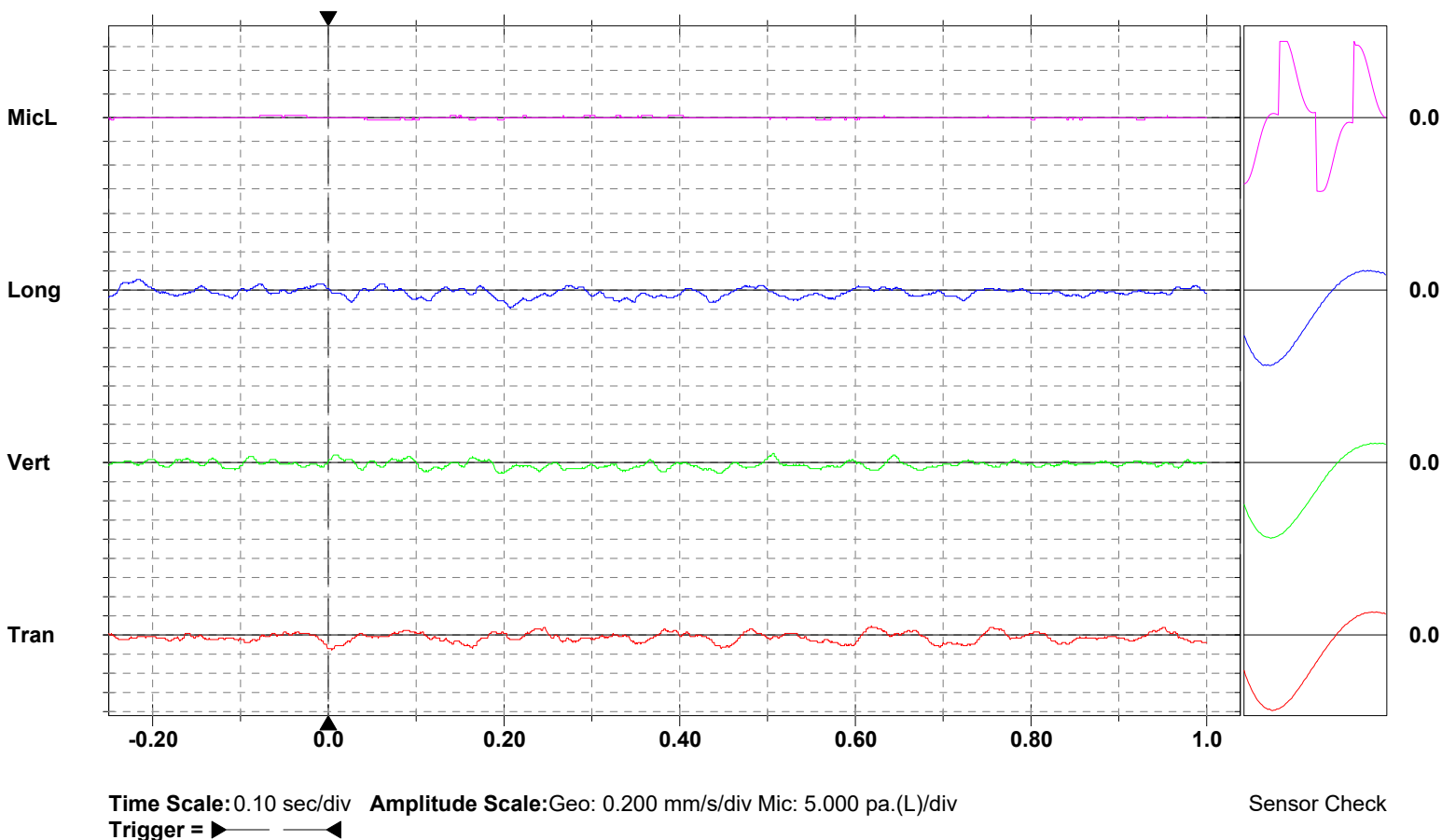
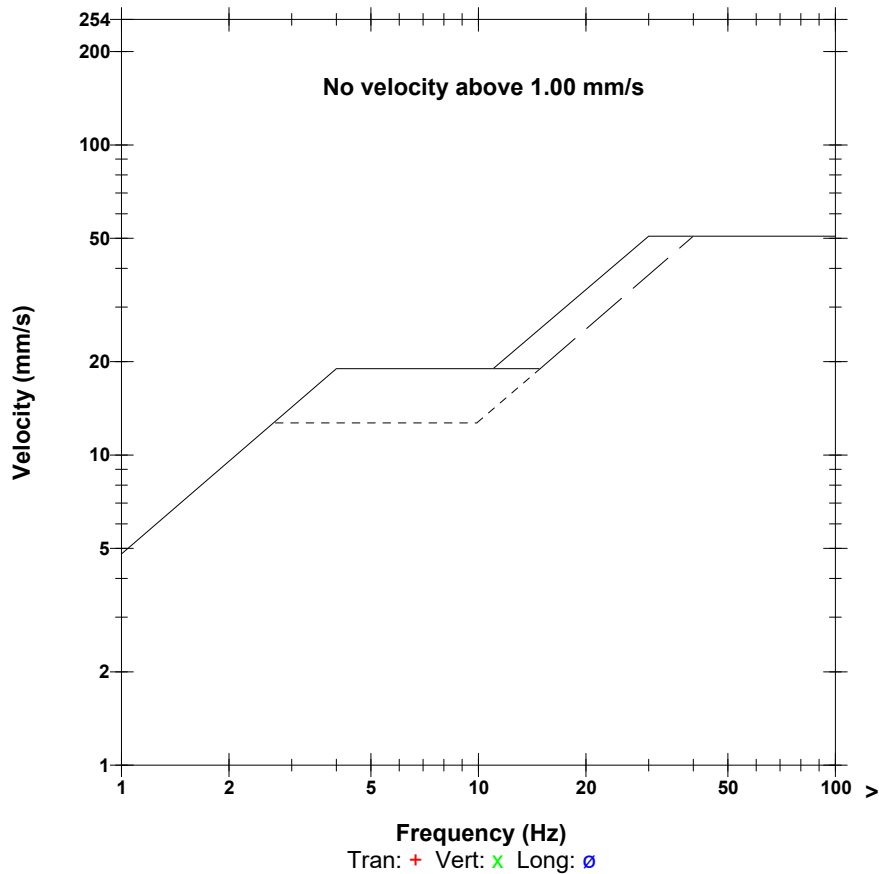
Channel Test Passed (Freq = 20.0 Hz Amp = 506 mv)

	Tran	Vert	Long	
PPV	0.159	0.111	0.191	mm/s
ZC Freq	12	19	6.0	Hz
Time (Rel. to Trig)	0.005	0.194	0.208	sec
Peak Acceleration	0.003	0.003	0.003	g
Peak Displacement	0.003	0.001	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.2	Hz
Overswing Ratio	3.2	3.9	3.5	

Peak Vector Sum 0.206 mm/s at 0.208 sec

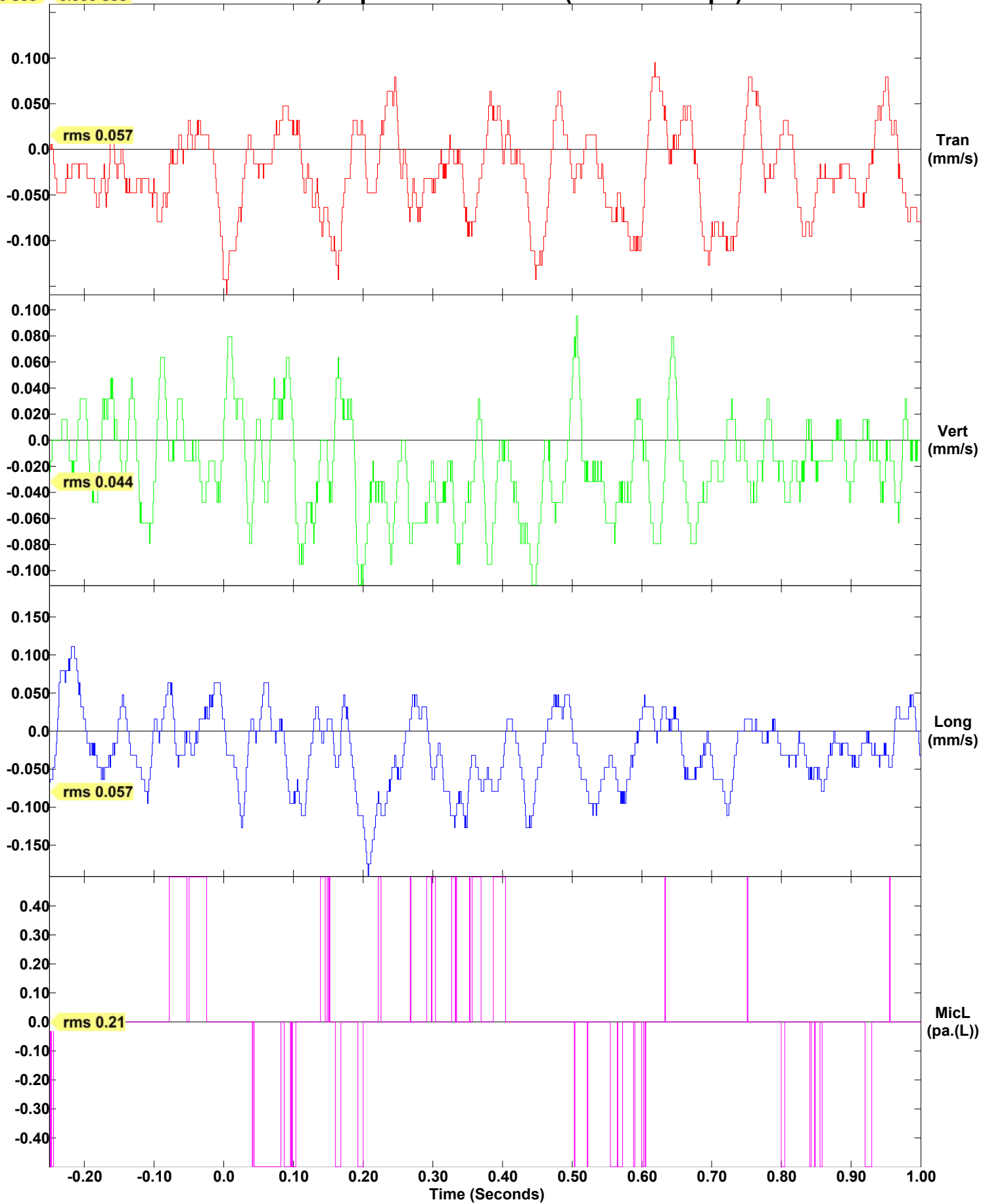
N/A: Not Applicable

USBM RI8507 And OSMRE



0.0 sec 0.999 sec

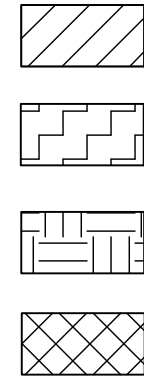
2585, Sep 10 /18 14:27:26 (d585hl20.5q0)



NOISE LEGEND & WARNING CLAUSES:

- | | |
|---|--|
| <p>A – "Purchasers/Tenants are advised that sound levels due to increasing road traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of Environment."</p> <p>B – "Purchasers/Tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of Environment."</p> <p>C – "This dwelling unit has been fitted with a forced air heating system and the ducting, etc. was sized to accommodate central air conditioning. Installation of central air conditioning by the occupant will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the noise level limits of the Municipality and the Ministry of the Environment. (Note: The location and installation of the outdoor air conditioning device should be done so as to comply with the sound criteria of MOE Publication NPC-216, Residential Air Conditioning Devices and thus minimize the noise impacts both on and in the immediate vicinity of the subject property)."</p> | <p>D – "This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of Environment." (Note: The location and installation of the outdoor air conditioning device should be done so as to comply with the noise criteria of MOE Publication NPC-216, Residential Air Conditioning Devices and thus minimize the noise impacts both on and in the immediate vicinity of the subject property)."</p> |
|---|--|

Note: Detailed Site Plans were not available for the proposed medium density blocks 177-181 as of the date of this report. Supplemental noise assessments of each block will be required at the Site Plan Approval stage for each block.



WARNING CLAUSE TYPE A



WARNING CLAUSE TYPE B



WARNING CLAUSE TYPE C



WARNING CLAUSE TYPE D



MANDATORY INSTALLATION OF CENTRAL AIR CONDITIONING



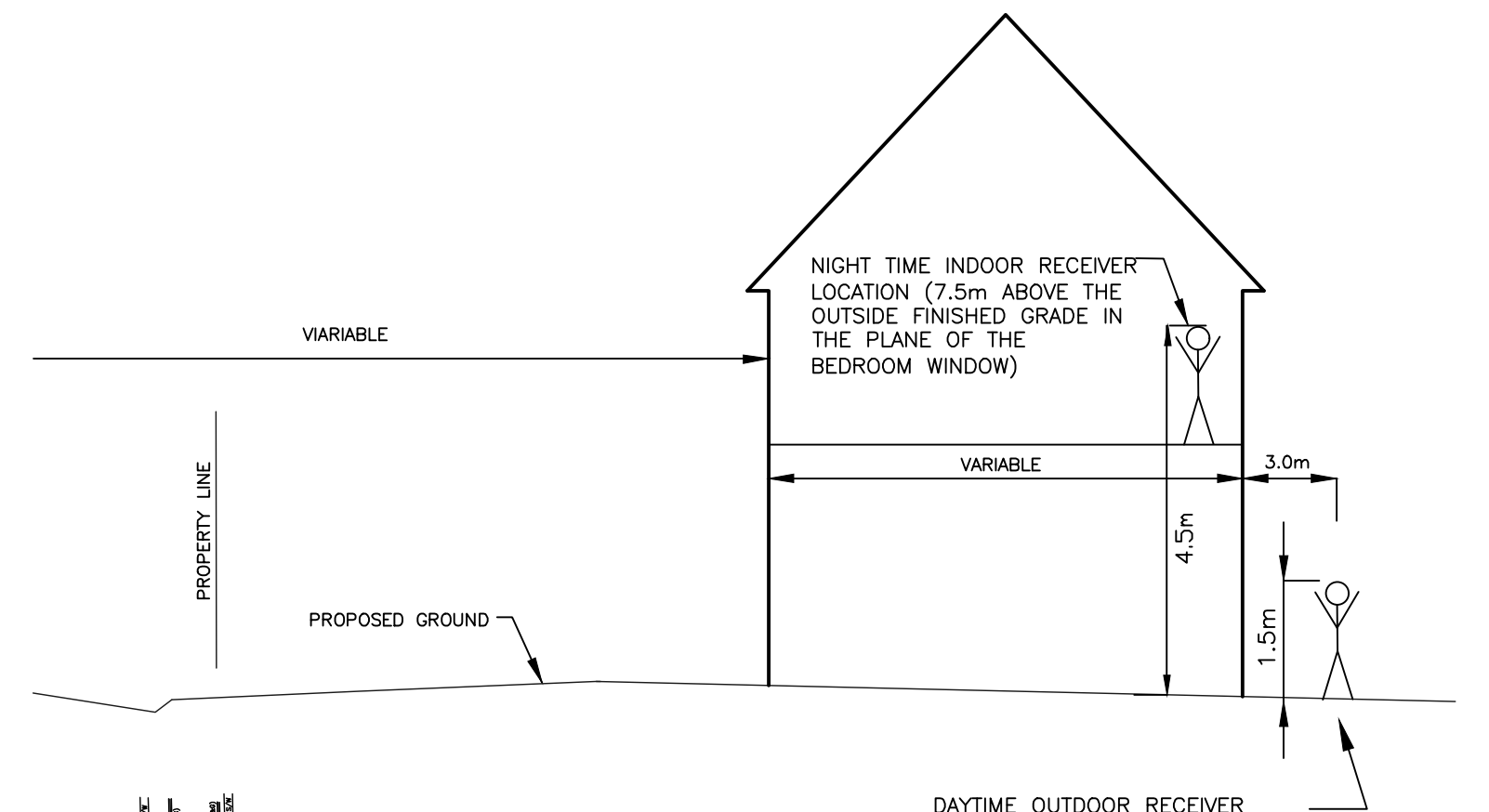
DENOTES STAMSON TEST LOCATION



MANDATORY INSTALLATION OF BUILDING COMPONENTS

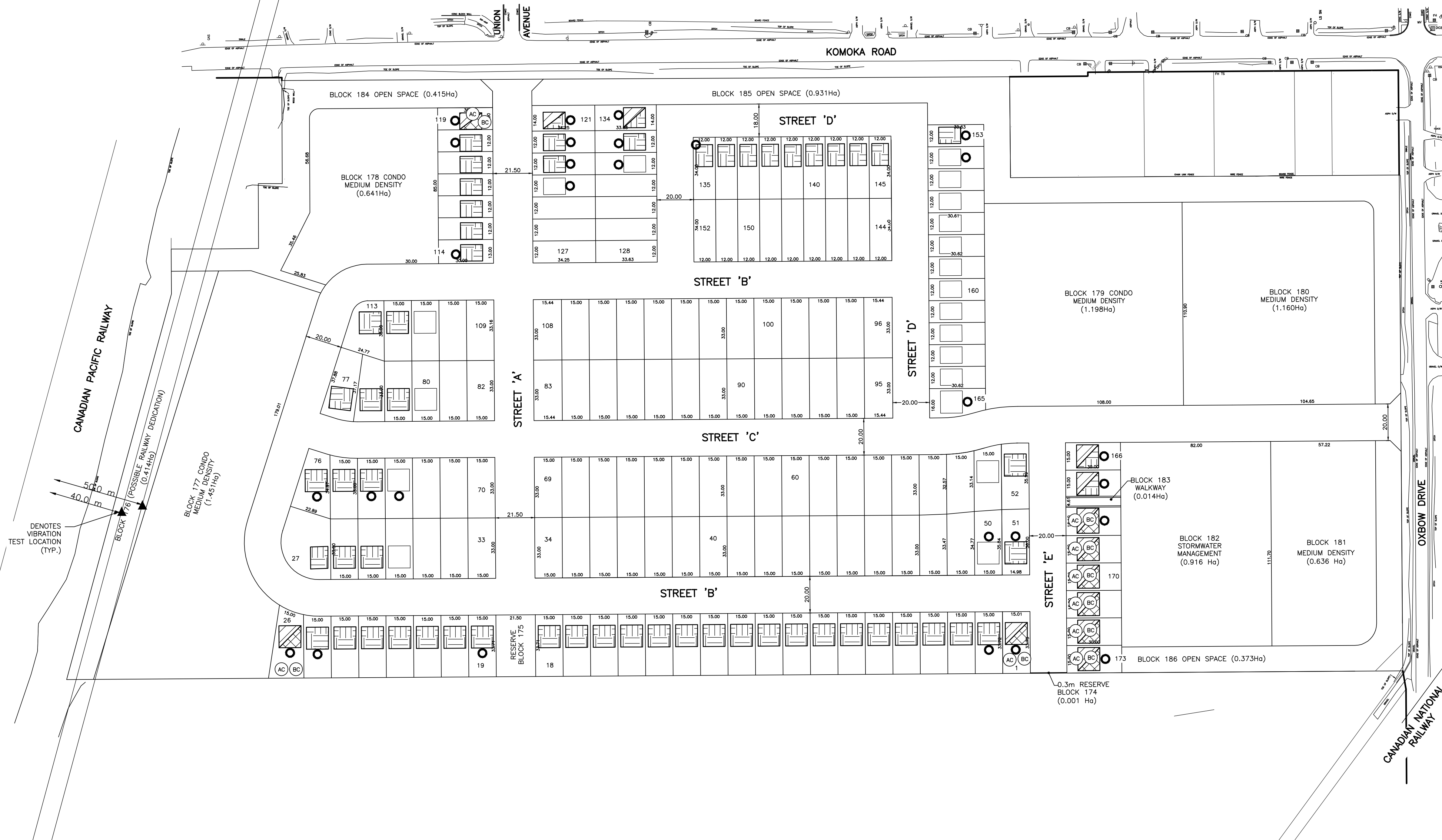


DENOTES VIBRATION TEST LOCATION



TYPICAL SECTION - SINGLE FAMILY

NTS

[illegible]



**9904 Oxbow Drive
Komoka, Ontario
Transportation Impact Study**

Paradigm Transportation Solutions Limited

April 2019



Project Summary



Project Number
180218

9904 Oxbow Drive, Komoka, Ontario
Transportation Impact Study

April 2019

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Brantam Developments Inc.
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Signatures and Seals

A handwritten signature in black ink that reads "Matthew Brouwer".

Signature



Engineer's Seal

Disclaimer

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Executive Summary

Content

Brantam Developments Inc. retained Paradigm Transportation Solutions Limited (Paradigm) to conduct this Transportation Impact Study for a proposed residential development located in the village of Komoka, Municipality of Middlesex Centre, County of Middlesex.

This Transportation Impact Study (TIS) includes an analysis of existing traffic conditions, a description of the proposed development, traffic forecasts for a five-year horizon from the date of TIS submission (2023), and any recommendations required to improve future traffic conditions.

Development Concept

The subject site is located on the north side of Oxbow Drive (#9904) in the village of Komoka, Municipality of Middlesex Centre, County of Middlesex. The site is bounded by the Canadian Pacific Railway to the north and southwest, agricultural land to the west, Oxbow Drive to the south, and Komoka Road to the east.

The proposed site re-development consists of:

- ▶ One-hundred seventy-three (173) single family dwellings;
- ▶ One-hundred twenty-nine (129) townhouse units; and
- ▶ Forty (40) apartment units in a four to five storey building.

Access will be provided via two all-moves connections; one on Oxbow Drive and one on Komoka Road opposite Union Avenue.

Conclusions

Based on the investigations carried out, it is concluded that:

- ▶ under existing 2018 traffic conditions, all turning movements at all study area intersections operate within acceptable levels;
- ▶ the development is forecast to generate 203 and 264 new trips during the AM and PM peak hours, respectively;
- ▶ under 2023 background traffic conditions, all turning movements at all study area intersections operate within acceptable levels;
- ▶ under 2023 total traffic conditions, all turning movements at all study area intersections operate within acceptable levels; and



- ▶ left-turn lanes are not forecast to be warranted on study area roads under 2023 total volumes during the AM or PM peak hour.

Recommendations

Based on the findings of this study, it is recommended that the subject development be approved with:

- ▶ no additional improvements to the road network within the study area.



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1 Introduction

1.1 Overview

Brantam Developments Inc. retained Paradigm Transportation Solutions Limited (Paradigm) to conduct this Transportation Impact Study for a proposed residential development located in the Village of Komoka, Municipality of Middlesex Centre, County of Middlesex. **Figure 1.1** details the subject development location.

1.2 Purpose and Scope

The purpose of the study is to:

- ▶ determine and assess the current study area traffic conditions;
- ▶ forecast the additional traffic generated by the proposed development;
- ▶ analyze the impacts of this additional traffic on the study area street network; and
- ▶ recommend any necessary remedial measures required to mitigate these impacts.

The study scope developed in consultation with the Municipality of Middlesex Centre and the County of Middlesex via e-mail in August 2018 is aimed at evaluating the anticipated traffic impact of the proposed development and includes:

- ▶ AM and PM peak hour traffic conditions analyses for existing (2018), 2023 background (without development) and 2023 total (with development) planning horizons;
- ▶ Adjacent street network assessments at the intersections of:
 - Melrose Drive and Komoka Road;
 - Street 'A'/Union Avenue and Komoka Road;
 - Street 'C' and Oxbow Drive;
 - Oxbow Drive and Komoka Road; and
 - Glendon Drive and Komoka Road.
- ▶ Recommendations to mitigate anticipated traffic impacts, if required, at the above locations and the site accesses.



This study has been prepared in accordance with the requirements detailed by the City of London in its Transportation Impact Assessment Guidelines¹.

¹ Transportation Impact Assessment Guidelines, City of London, April 2012.





2 Existing Conditions

This section documents current traffic conditions, operational deficiencies, and constraints experienced by the public travelling at the intersections within the study area. The operational deficiencies and constraints identified at this stage will be fundamental to the process of defining the required remedial measures.

2.1 Road Network

Figure 1.1 illustrates the subject site location.

The study area is primarily composed of single family detached dwellings with agricultural land uses located to the north and west. All roads within in the study area have two-lane rural cross-sections except for Komoka Road between Simcoe Avenue and Glendon Drive, which has a two-lane urban cross-section. Melrose Drive has a gravel driving surface while all other study area roads have asphalt surfaces. Komoka Road has a posted speed limit of 50 km/h from Glendon Drive to the Canadian Pacific Railway line located north of Union Avenue, where the posted limit increases to 70 km/h. Oxbow Drive has a posted speed limit of 60 km/h. Sidewalks are present on the east side of Komoka Road from Oxbow Drive to Glendon Drive.

Figure 2.1 displays the traffic control and lane configuration at the study area intersections.

2.2 Transit Service

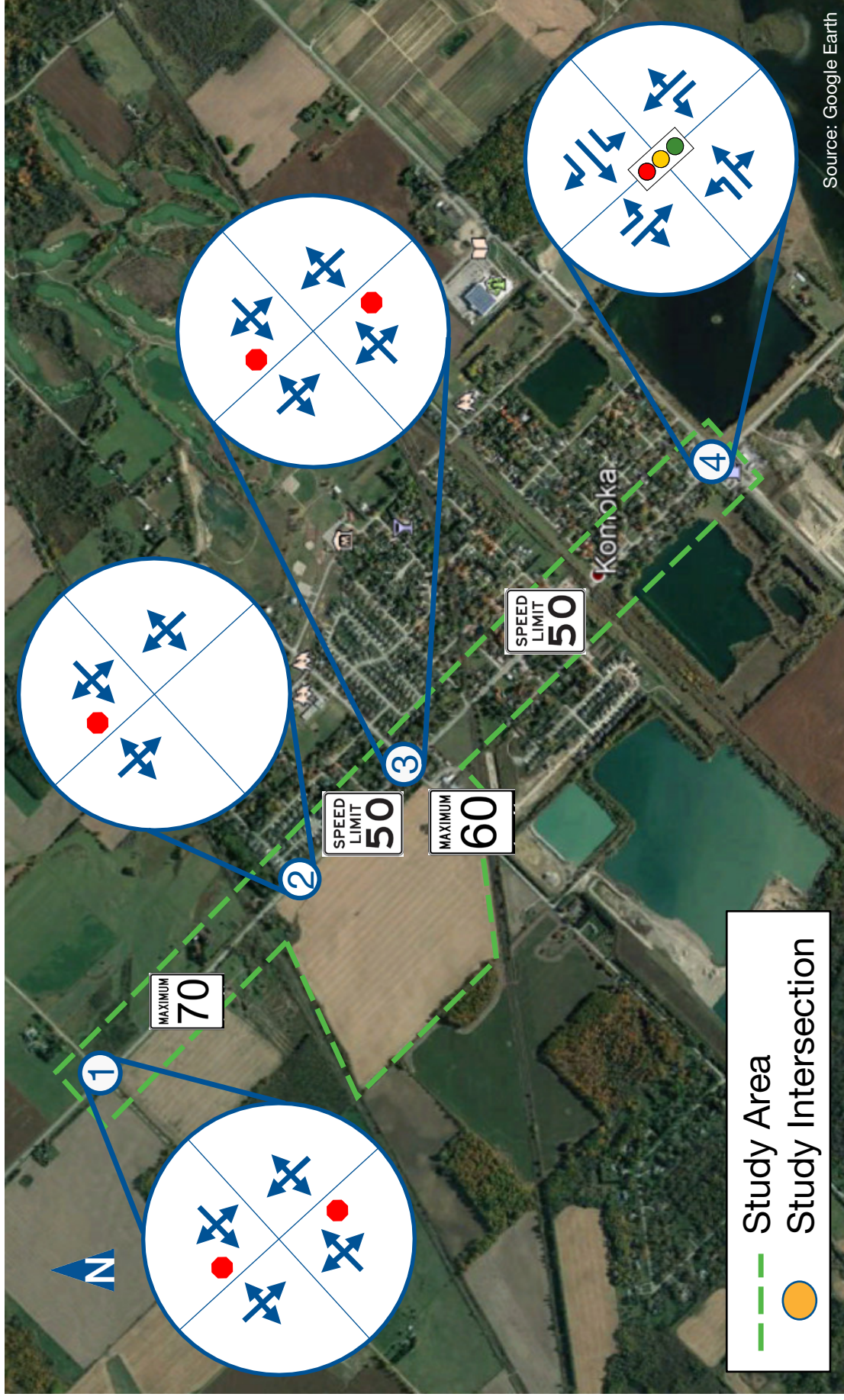
There is currently no transit service available within the study area.

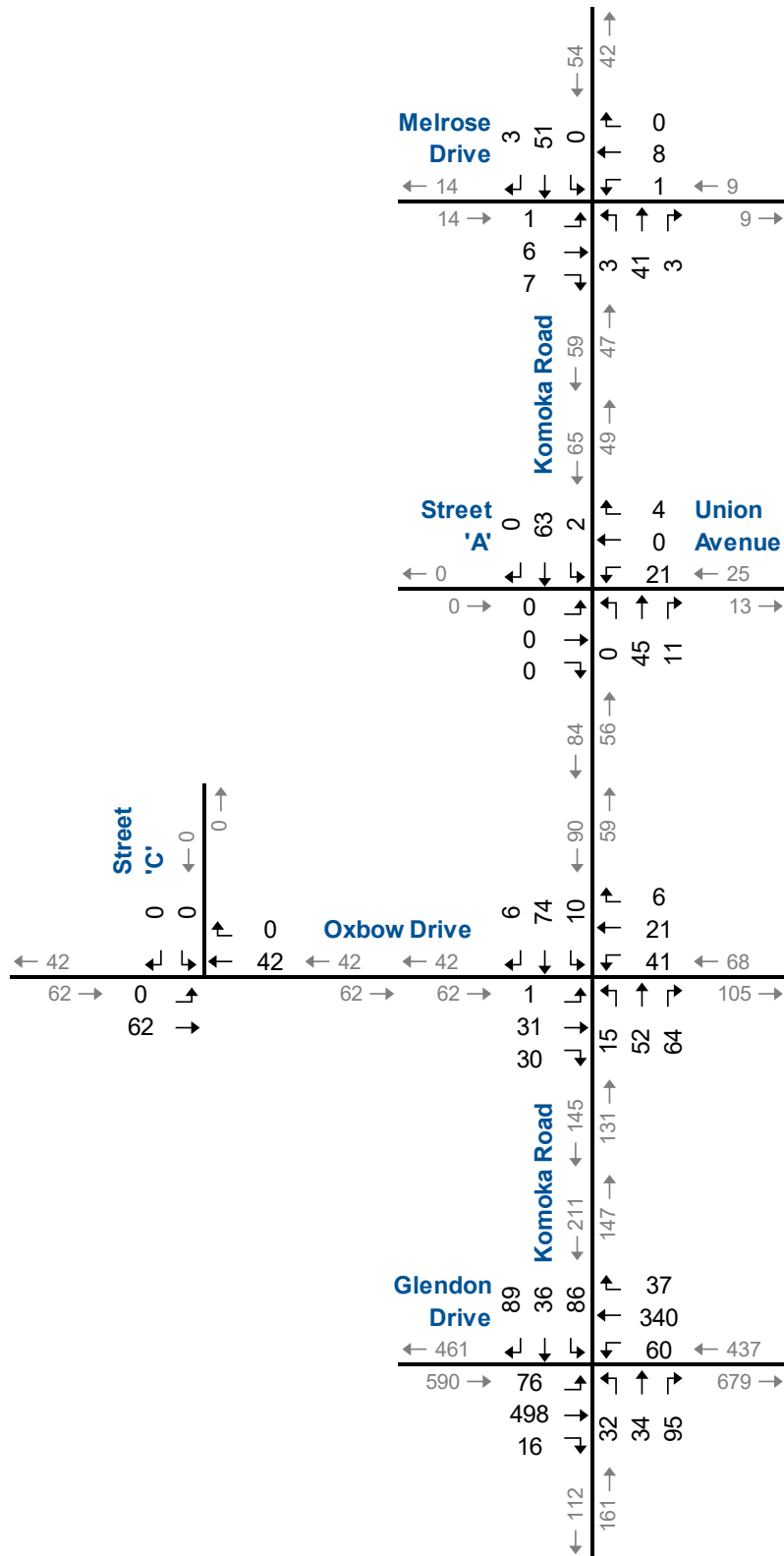
2.3 Traffic Volumes

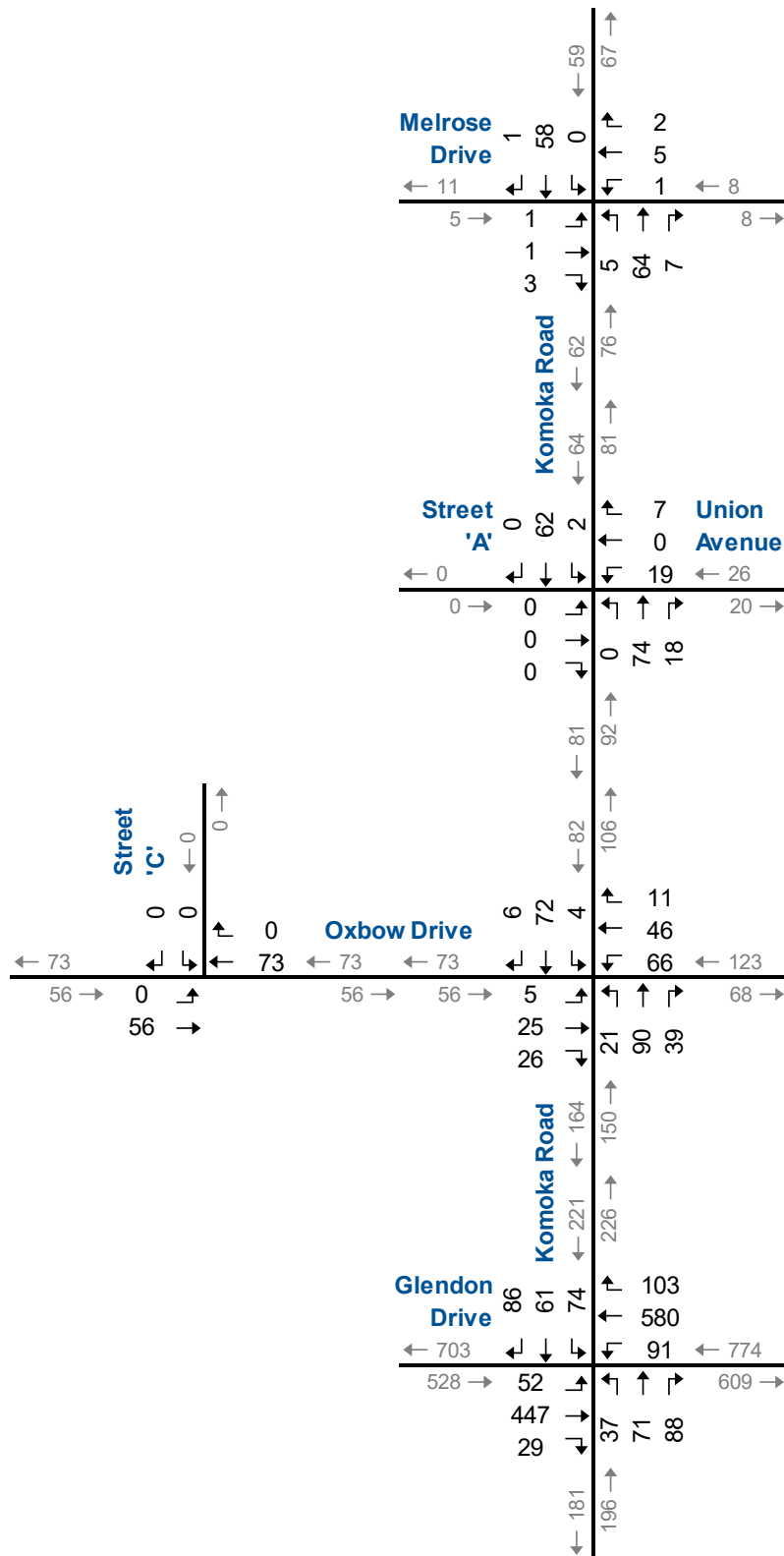
Figure 2.2a and **Figure 2.2b** display the existing AM and PM weekday peak hour turning movement traffic volumes collected in September 2018.

Appendix A contains the detailed traffic counts for study area intersections.









2.4 Traffic Operations

Intersection level of service (LOS) is a recognized method of quantifying the average delay experienced by drivers at intersections. It is based on the delay experienced by individual vehicles executing the various movements. The delay is related to the number of vehicles intending to make a particular movement, compared to the estimated capacity for that movement. The capacity is based on a number of criteria related to the opposing traffic flows and intersection geometry.

The highest possible rating is LOS A, under which the average total delay is equal or less than 10.0 seconds per vehicle. When the average delay exceeds 80 seconds for signalized intersections, 50 seconds for unsignalized intersections or when the volume to capacity ratio is greater than 1.0, the movement is classed as LOS F and remedial measures are usually implemented, if they are feasible. LOS E is usually used as a guideline for the determination of road improvement needs on through lanes, while LOS F may be acceptable for left-turn movements at peak times, depending on delays.

The operations of intersections in the study area were evaluated with the existing turning movement volumes using Synchro 9.

The intersection analysis considered two separate measures of performance:

- ▶ the volume to capacity ratio for each intersection; and
- ▶ the LOS for each turning movement (LOS is based on the average control delay per vehicle).

Table 2.1 summarizes the existing intersection operations. The entries in the table indicating the AM and PM peak hour level of service (LOS), volume to capacity ratios (V/C), and 95th percentile queues experienced.

All intersections are forecast to operate within acceptable levels, with no specific problem movements under existing traffic conditions.

Appendix B contains the detailed Synchro 9 reports.



TABLE 2.1: 2018 EXISTING PEAK HOUR TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
Existing AM Peak Hour	Melrose Drive & Komoka Road	TWSC	LOS Delay V/C Q	A 10 0.02 1	A 10 0.02 1	A 10 0.02 1	A 10 0.01 0	A 10 0.01 0	A 10 0.01 0	A 10 0.01 0	A 1 0.00 0	A 1 0.00 0	A 1 0.00 0	A 1 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	2	
	Union Avenue & Komoka Road	TWSC	LOS Delay V/C Q				A 9 0.03 1		A 9 0.03 1	A 9 0.03 1	A 0 0.04 0	A 0 0.04 0	A 0 0.04 0	A 0 0.00 0	A 0 0.00 0			A 0 0.00 0	2	
	Oxbow Drive & Komoka Road	TWSC	LOS Delay V/C Q	A 10 0.09 2	A 10 0.09 2	A 10 0.09 2	A 10 0.12 3	B 11 0.12 3	B 11 0.12 3	B 11 0.12 3	A 1 0.01 0	A 1 0.01 0	A 1 0.01 0	A 1 0.01 0	A 1 0.01 0	A 1 0.01 0	A 1 0.01 0	A 1 0.01 0	5	
	Glendon Drive & Komoka Road	TCS	LOS Delay V/C Q	A 8 0.16 10	A 10 0.51 58	A 10 0.51 58	A 10 0.17 9	A 8 0.34 35	A 3 0.05 3	A 8 0.05 3	B 13 0.09 8	A 6 0.23 13	A 6 0.23 13	A 8 0.23 13	B 14 0.22 17	A 7 0.21 13	A 7 0.21 13	A 10 0.21 13	A 10	
Existing PM Peak Hour	Melrose Drive & Komoka Road	TWSC	LOS Delay V/C Q	A 10 0.01 0	A 10 0.01 0	A 10 0.01 0	A 10 0.01 0	A 10 0.01 0	A 10 0.01 0	A 10 0.01 0	A 1 0.00 0	A 1 0.00 0	A 1 0.00 0	A 1 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	1	
	Union Avenue & Komoka Road	TWSC	LOS Delay V/C Q				A 9 0.03 1		A 9 0.03 1	A 9 0.03 1		A 0 0.06 0	A 0 0.06 0	A 0 0.06 0	A 0 0.00 0	A 0 0.00 0		A 0 0.00 0	2	
	Oxbow Drive & Komoka Road	TWSC	LOS Delay V/C Q	A 10 0.08 2	A 10 0.08 2	A 10 0.08 2	A 10 0.21 6	B 12 0.21 6	B 12 0.21 6	B 12 0.21 6	A 1 0.02 0	A 1 0.02 0	A 1 0.02 0	A 1 0.02 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	6	
	Glendon Drive & Komoka Road	TCS	LOS Delay V/C Q	A 9 0.21 8	A 10 0.53 50	A 10 0.53 50	A 9 0.27 12	B 12 0.64 67	A 2 0.12 5	B 11 0.12 5	B 15 0.10 10	A 10 0.29 21	A 10 0.29 21	B 11 0.29 21	B 16 0.20 17	A 9 0.27 18	A 9 0.27 18	B 11 0.27 18	B 11	

MOE - Measure of Effectiveness

Q - 95th Percentile Queue Length

TCS - Traffic Control Signal

RBT - Roundabout

LOS - Level of Service

TWSC - Two-Way Stop Control

Delay - Average Delay per Vehicle in Seconds

AWSC - All-Way Stop Control



3 Development Concept

3.1 Development Description

The subject site is located on the north side of Oxbow Drive (#9904) in the village of Komoka, Municipality of Middlesex Centre, County of Middlesex. The site is bounded by the Canadian Pacific Railway to the north and southwest, agricultural land to the west, Oxbow Drive to the south, and Komoka Road to the east.

The proposed site re-development consists of:

- ▶ One-hundred seventy-three (173) single family dwellings;
- ▶ One-hundred twenty-nine (129) townhouse units; and
- ▶ Forty (40) apartment units in a four to five storey building.

Access will be provided via two all-moves connections; one on Oxbow Drive and one on Komoka Road opposite Union Avenue.

Figure 3.1 shows the development concept.

3.2 Development Trip Generation

The Institute of Transportation Engineers (ITE) Trip Generation Manual² provides rates and equations used to estimate the peak hour traffic volumes generated by the Land Use Codes (LUC) of this development:

- ▶ LUC 210 (Single Family Housing);
- ▶ LUC 220 (Multifamily Housing, Low Rise); and
- ▶ LUC 221 (Multifamily Housing, Mid Rise).

Due to lack of public transit options and as the development only consists of residential dwellings, no trip reductions were applied.

Table 3.1 summarizes the forecast number of net new trips generated by the proposed development.

² Trip Generation Tenth Edition, Institute of Transportation Engineers, 2017



TABLE 3.1: TRIP GENERATION

Land Use Code	Units/GFA	Formula or Rate	AM Peak Hour				PM Peak Hour			
			Rate per Unit	In	Out	Total	Rate per Unit	In	Out	Total
210: Single Family Housing	173 Units	Formula	0.74	32	96	128	0.99	108	64	172
220: Multifamily Housing (Low Rise)	129 Units	Formula	0.47	14	47	61	0.57	47	27	74
221: Multifamily Housing (Mid Rise)	40 Units	Formula	0.35	4	10	14	0.46	11	7	18
Total Generalized Trips				50	153	203		166	98	264
Mode Split			0%	0	0	0	0%	0	0	0
Total Net Trips				50	153	203		166	98	264

3.3 Development Trip Distribution and Assignment

Given that the proposed development and the village of Komoka primarily consists of residential dwellings, the trip assignment and distribution was based on existing travel patterns of the study area. **Table 3.2** displays the breakdown of trip distributions used in this study.

TABLE 3.2: ESTIMATED PEAK HOUR TRIP DISTRIBUTION

Trip Distribution		
Origin/Destination	AM Peak Hour	PM Peak Hour
East via Glendon Drive	27%	31%
West via Glendon Drive & Oxbow Drive	37%	24%
North via Komoka Road	20%	21%
South via Komoka Road	16%	23%

Figure 3.2a and **Figure 3.2b** illustrate the site-generated traffic volumes for the AM and PM peak hours, respectively.

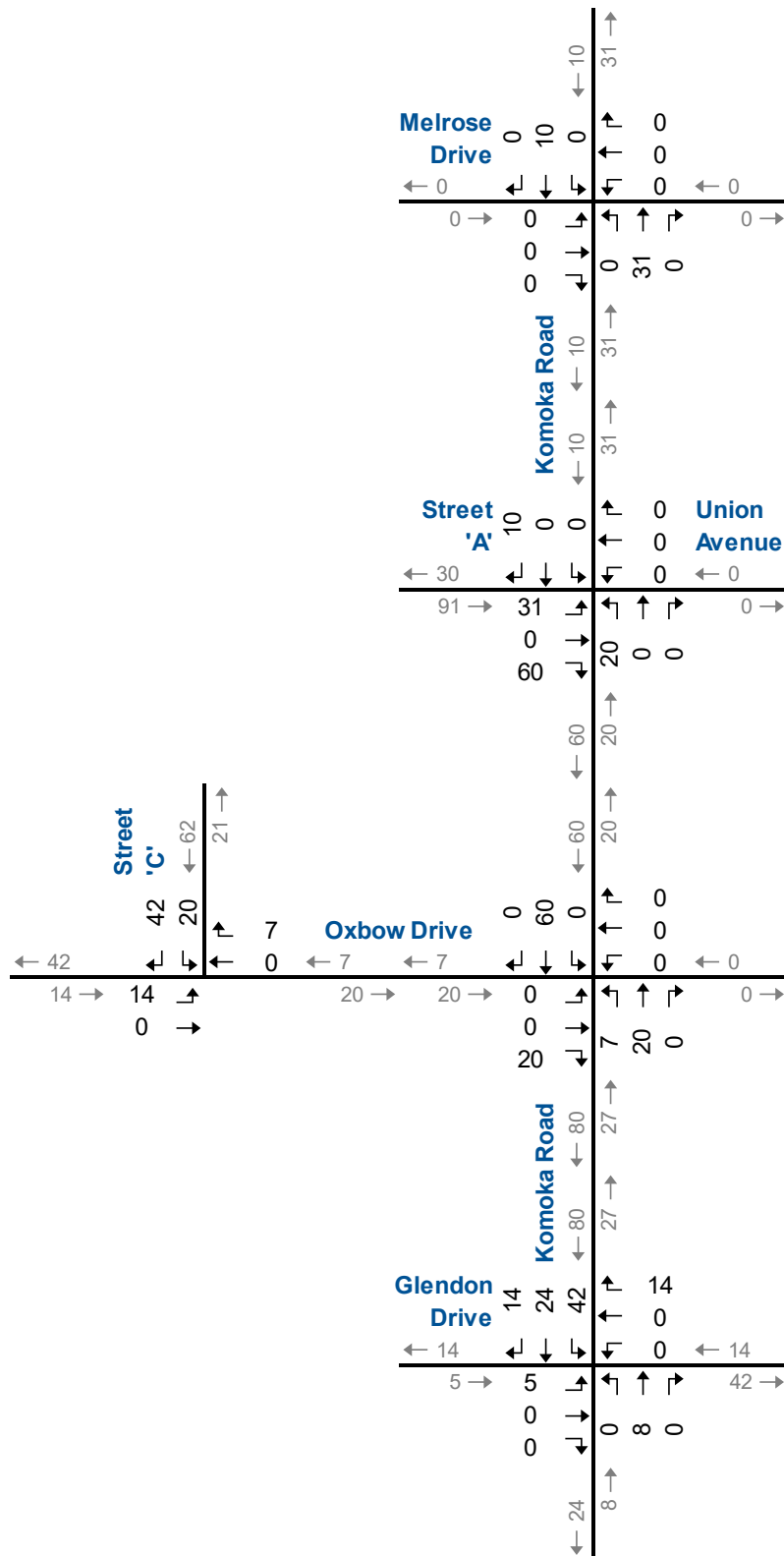


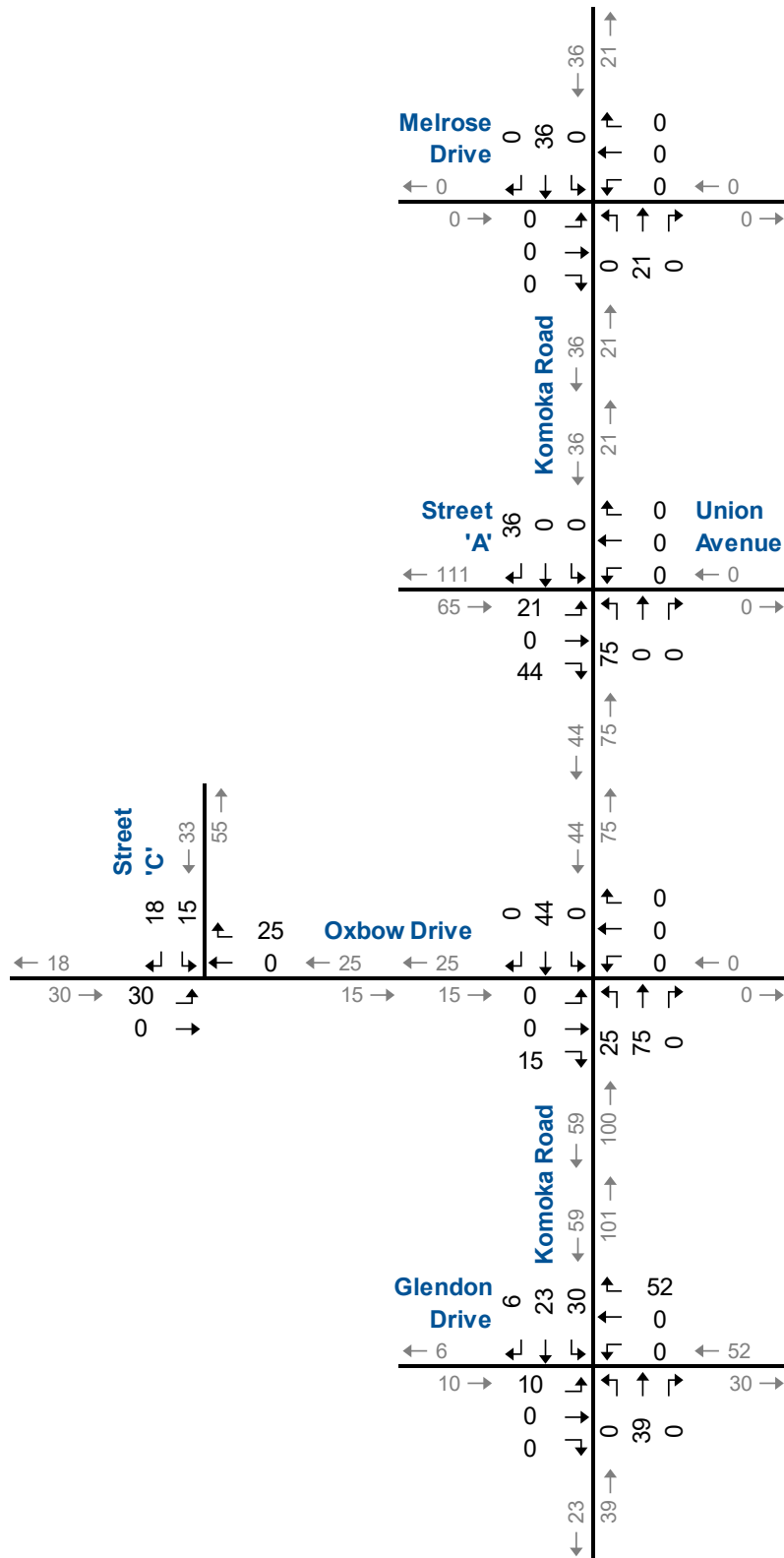


Proposed Site Plan

9904 Oxbow Drive TIS
 180218

Figure 3.1





4 Evaluation of Future Traffic Conditions

The assessment of future traffic conditions contained in this section includes estimates of future background and total traffic volumes, and the analyses for the 2023 horizon. The future traffic volumes in the vicinity of the development will likely consist of increased non-site traffic volumes (background traffic), traffic generated by other developments, and the traffic forecast to be generated by the proposed development.

4.1 2023 Background Traffic Growth

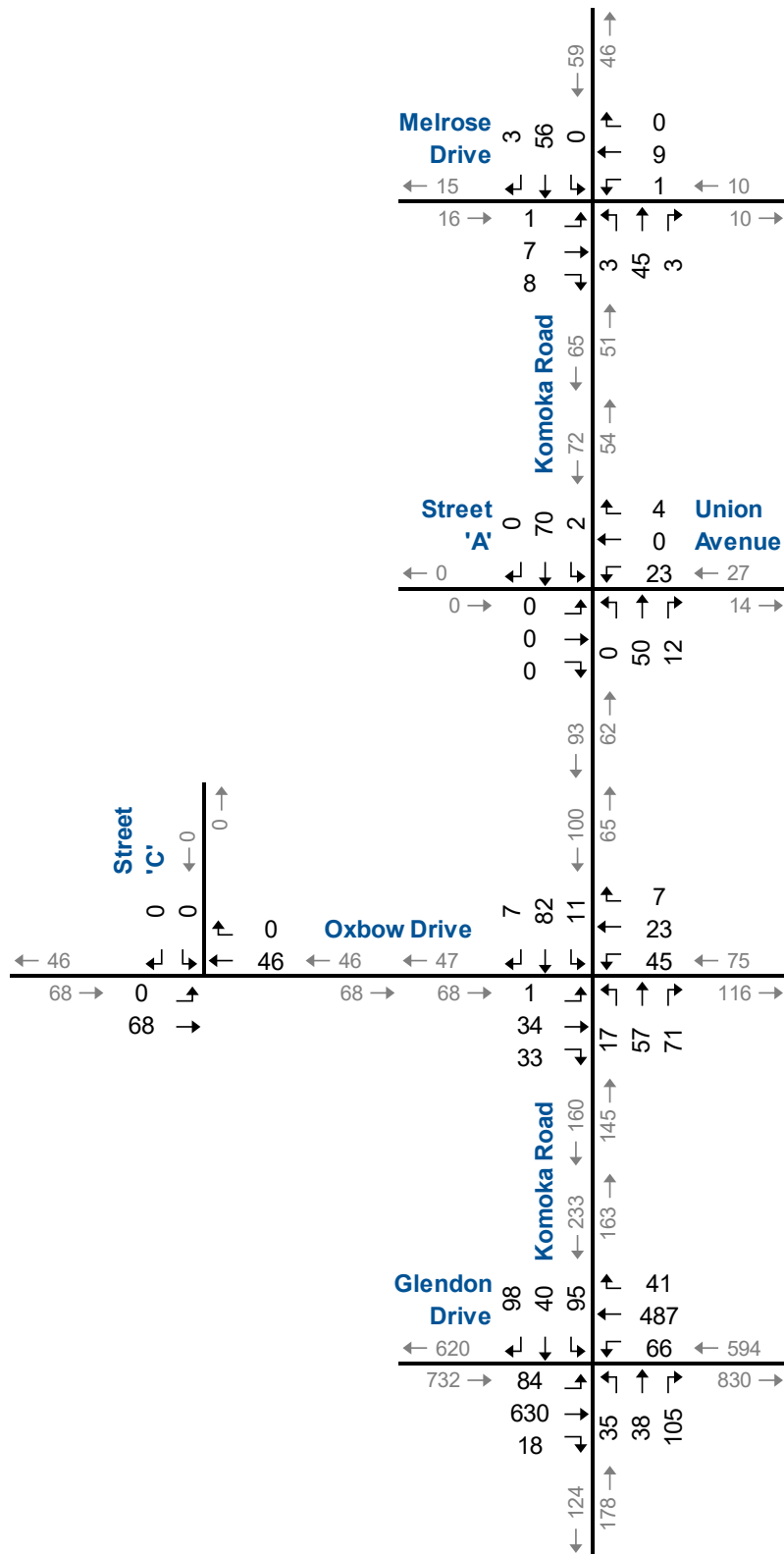
4.1.1 Background Traffic

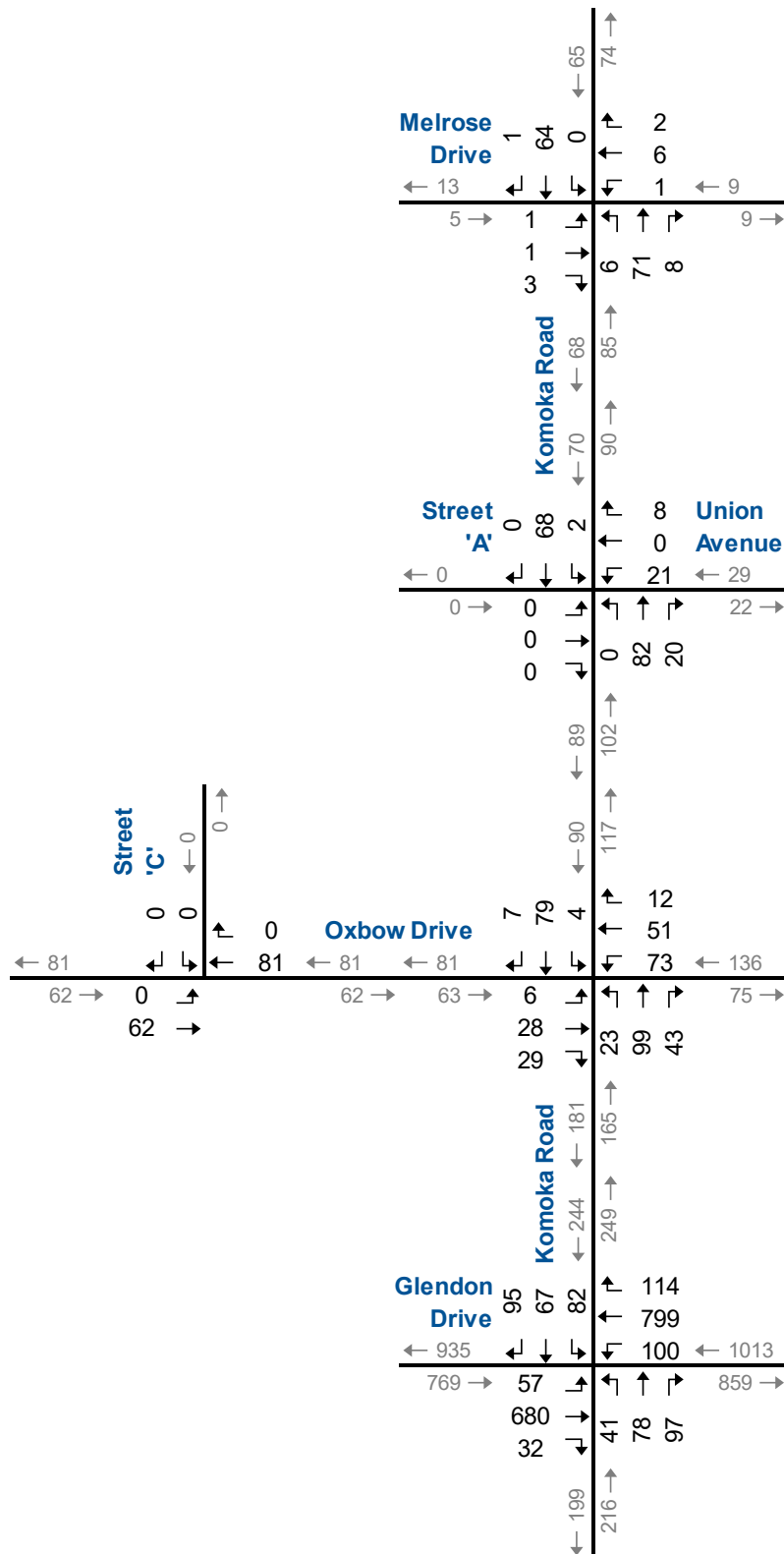
The non-site traffic increase is the generalized traffic growth in the Municipality of Middlesex Centre. The generalized growth is anticipated to follow the average increase in population within the area. The Municipality of Middlesex Centre confirmed a growth rate of 2% per annum to forecast the background traffic.

4.1.2 Other Developments

During pre-study consultations, Paradigm requested information from known development applications within the Municipality of Middlesex Centre. The Kilworth Heights West development was identified, and the development traffic information was added to the general background traffic volumes. **Figure 4.1a** and **Figure 4.1b** display the complete 2023 background traffic volumes.







4.2 2023 Background Traffic Operations

Based on the forecast 2023 background traffic volumes, LOS analyses have been conducted using Synchro 9 and Arcady roundabout analysis software to determine the AM and PM peak hour conditions for the intersections within the study area.

Currently, the intersection of Komoka Road and Glendon Drive has left-turn lanes on all intersection legs, separated through and right turn lanes on the east leg, and shared through-right lanes on all other legs as shown in **Figure 2.1**. The Glendon Drive Environmental Assessment (EA)³ recommends implementing a roundabout at this intersection and widening the east and west legs to accommodate four through lanes within the next five to ten years. Thus, the intersection of Komoka Road and Glendon Drive was analyzed as two separate scenarios: the first maintaining the existing signalized configuration and the second as a roundabout configuration discussed in the Glendon Drive EA.

Table 4.1 summarizes the 2023 background traffic operations and analyzes the Komoka Road and Glendon Drive intersection under signalized and roundabout configurations.

All intersections are forecast to operate within acceptable levels, with no specific problem movements under 2023 background traffic conditions.

It is noted that while the current signalized configuration of Komoka Road and Glendon Drive operates at LOS B or greater under 2023 background traffic conditions, reconfiguring the intersection to a roundabout further reduces the delays experienced at this intersection.

Appendix C contains the supporting detailed Synchro 9 reports and **Appendix D** contains the supporting detailed Arcady reports.

³ Glendon Drive Streetscape Schedule C Municipal Class Environmental Assessment Draft, Stantec Consulting Limited, April 2018



TABLE 4.1: 2023 BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
2023 Background AM Peak Hour	Melrose Drive & Komoka Road	TWSC	LOS Delay V/C Q	A 10 0.02 1	A 10 0.02 1	A 10 0.02 1	A 10 0.02 1	A 10 0.02 0	A 10 0.02 0	A 10 0.02 0	A 10 0.02 0	A 1 0.00 0	A 1 0.00 0	A 1 0.00 0	A 1 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	2
	Union Avenue & Komoka Road	TWSC	LOS Delay V/C Q					A 9 0.03 1		A 9 0.03 1	A 9 0.03 1		A 0 0.04 0	A 0 0.04 0	A 0 0.04 0	A 0 0.00 0	A 0 0.00 0		A 0 0.00 0	2
	Oxbow Drive & Komoka Road	TWSC	LOS Delay V/C Q	B 11 0.10 3	B 11 0.10 3	B 11 0.10 3	B 11 0.10 3	B 12 0.14 4	B 12 0.14 4	B 12 0.14 4	B 12 0.14 4	A 1 0.01 0	A 1 0.01 0	A 1 0.01 0	A 1 0.01 0	A 1 0.01 0	A 1 0.01 0	A 1 0.01 0	A 1 0.01 0	5
	Glendon Drive & Komoka Road	TCS	LOS Delay V/C Q	A 9 0.27 13	B 14 0.70 88	B 14 0.70 88	B 13 0.70 88	B 12 0.32 12	A 10 0.53 57	A 2 0.06 3	A 10 0.06 3	B 17 0.11 11	A 8 0.28 18	A 8 0.28 18	A 10 0.28 18	B 19 0.28 24	A 8 0.26 18	A 8 0.26 18	B 13 0.26 18	B 12 0.26 18
	Glendon Drive & Komoka Road	RBT	LOS Delay V/C Q	A 3 0.37 5	A 3 0.37 5	A 3 0.37 5	A 3 0.37 5	A 2 0.30 3	A 2 0.30 3	A 2 0.30 3	A 2 0.30 3	A 6 0.25 2	A 6 0.25 2	A 6 0.25 2	A 6 0.25 2	A 5 0.27 3	A 5 0.27 3	A 5 0.27 3	A 5 0.27 3	A 3 0.27 3
2023 Background PM Peak Hour	Melrose Drive & Komoka Road	TWSC	LOS Delay V/C Q	A 10 0.01 0	A 10 0.01 0	A 10 0.01 0	A 10 0.01 0	A 10 0.01 0	A 10 0.01 0	A 10 0.01 0	A 10 0.01 0	A 1 0.00 0	A 1 0.00 0	A 1 0.00 0	A 1 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	1
	Union Avenue & Komoka Road	TWSC	LOS Delay V/C Q					A 9 0.04 1		A 9 0.04 1	A 9 0.04 1		A 0 0.07 0	A 0 0.07 0	A 0 0.07 0	A 0 0.00 0	A 0 0.00 0		A 0 0.00 0	2
	Oxbow Drive & Komoka Road	TWSC	LOS Delay V/C Q	B 11 0.10 3	B 11 0.10 3	B 11 0.10 3	B 11 0.10 3	B 13 0.25 8	B 13 0.25 8	B 13 0.25 8	B 13 0.25 8	A 1 0.02 0	A 1 0.02 0	A 1 0.02 0	A 1 0.02 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	6
	Glendon Drive & Komoka Road	TCS	LOS Delay V/C Q	B 14 0.37 12	B 13 0.72 97	B 13 0.72 97	B 13 0.72 97	B 14 0.46 19	A 16 0.79 119	A 2 0.12 5	B 14 0.12 5	C 21 0.14 13	B 14 0.36 30	B 14 0.36 30	B 16 0.36 30	C 23 0.28 23	B 13 0.33 26	B 13 0.33 26	B 16 0.33 26	B 14 0.33 26
	Glendon Drive & Komoka Road	RBT	LOS Delay V/C Q	A 3 0.39 5	A 3 0.39 5	A 3 0.39 5	A 3 0.39 5	A 3 0.50 7	A 3 0.50 7	A 3 0.50 7	A 3 0.50 7	A 6 0.28 3	A 6 0.28 3	A 6 0.28 3	A 6 0.28 3	A 7 0.36 4	A 7 0.36 4	A 7 0.36 4	A 7 0.36 4	A 4 0.36 4

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

Q - 95th Percentile Queue Length

TCS - Traffic Control Signal

TWSC - Two-Way Stop Control

AWSC - All-Way Stop Control

RBT - Roundabout



4.3 2023 Total Traffic Operations

Figure 4.2a and **Figure 4.2b** displays the forecast 2023 total traffic volumes, which is the addition of the development traffic to the background traffic.

Based on the forecast 2023 total traffic volumes, LOS analyses have been conducted using Synchro 9 and Arcady to determine the AM and PM peak hour conditions for the intersections within the study area.

Table 4.2 summarizes the 2023 total traffic operations and analyzes the Komoka Road and Glendon Drive intersection under signalized and roundabout configurations.

All intersections are forecast to operate within acceptable levels, with no specific problem movements under 2023 total traffic conditions.

It is noted that while the current signalized configuration of Komoka Road and Glendon Drive operates at LOS C or greater under 2023 total traffic conditions, reconfiguring the intersection to a roundabout further reduces the delays experienced at this intersection.

Appendix E contains the supporting detailed Synchro 9 reports and **Appendix D** contains the supporting detailed Arcady reports.



TABLE 4.2: 2023 TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall	
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
2023 Total AM Peak Hour	Melrose Drive & Komoka Road	TWSC	LOS Delay V/C Q	A 10 0.02 1	A 10 0.02 1	A 10 0.02 1	A 10 0.02 1	B 10 0.01 0	B 10 0.01 0	B 10 0.01 0	B 10 0.01 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	2	
	Street 'A' / Union Avenue & Komoka Road	TWSC	LOS Delay V/C Q	A 10 0.11 3	A 10 0.11 3	A 10 0.11 3	A 10 0.11 3	B 11 0.04 1	B 11 0.04 1	B 11 0.04 1	B 11 0.04 1	A 2 0.01 0	A 2 0.01 0	A 2 0.01 0	A 2 0.01 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	5	
	Street 'C' & Oxbow Drive	TWSC	LOS Delay V/C Q	A 1 0.01 0	A 1 0.01 0		A 1 0.01 0		A 0 0.03 0	A 0 0.03 0	A 0 0.03 0					A 9 0.07 2		A 9 0.07 2	A 9 0.07 2	3	
	Oxbow Drive & Komoka Road	TWSC	LOS Delay V/C Q	B 11 0.14 4	B 11 0.14 4	B 11 0.14 4	B 11 0.14 4	B 14 0.16 5	B 14 0.16 5	B 14 0.16 5	B 14 0.16 5	A 1 0.02 1	A 1 0.02 1	A 1 0.02 1	A 1 0.02 1	A 1 0.01 0	A 1 0.01 0	A 1 0.01 0	A 1 0.01 0	5	
	Glendon Drive & Komoka Road	TCS	LOS Delay V/C Q	B 10 0.30 15	B 15 0.72 98	B 15 0.72 98	B 14 0.72 98	B 13 0.33 13	B 11 0.54 64	A 2 0.08 4	A 2 0.08 4	B 10 0.11 12	B 9 0.28 20	A 9 0.28 20	B 10 0.28 20	C 21 0.39 35	A 9 0.32 24	A 9 0.32 24	B 15 0.32 24	B 13 0.32 24	
	Glendon Drive & Komoka Road	RBT	LOS Delay V/C Q	A 3 0.39 5	A 3 0.39 5	A 3 0.39 5	A 3 0.39 5	A 2 0.31 3	A 2 0.31 3	A 2 0.31 3	A 2 0.31 3	A 2 0.31 3	A 7 0.27 3	A 7 0.27 3	A 7 0.27 3	A 7 0.27 3	A 6 0.37 4	A 6 0.37 4	A 6 0.37 4	A 6 0.37 4	A 4 0.37 4
2023 Total PM Peak Hour	Melrose Drive & Komoka Road	TWSC	LOS Delay V/C Q	B 10 0.01 0	B 10 0.01 0	B 10 0.01 0	B 10 0.01 0	B 10 0.01 0	B 10 0.01 0	B 10 0.01 0	B 10 0.01 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	1	
	Street 'A' / Union Avenue & Komoka Road	TWSC	LOS Delay V/C Q	B 10 0.09 2	B 10 0.09 2	B 10 0.09 2	B 10 0.09 2	B 12 0.05 1	B 12 0.05 1	B 12 0.05 1	B 12 0.05 1	A 4 0.06 1	A 4 0.06 1	A 4 0.06 1	A 4 0.06 1	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	4	
	Street 'C' & Oxbow Drive	TWSC	LOS Delay V/C Q	A 3 0.02 1	A 3 0.02 1		A 3 0.02 1		A 0 0.07 0	A 0 0.07 0	A 0 0.07 0	A 0 0.07 0					A 9 0.04 1		A 9 0.04 1	A 9 0.04 1	2
	Oxbow Drive & Komoka Road	TWSC	LOS Delay V/C Q	B 12 0.13 4	B 12 0.13 4	B 12 0.13 4	B 12 0.13 4	C 17 0.33 11	C 17 0.33 11	C 17 0.33 11	C 17 0.33 11	A 2 0.04 1	A 2 0.04 1	A 2 0.04 1	A 2 0.04 1	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0		
	Glendon Drive & Komoka Road	TCS	LOS Delay V/C Q	C 21 0.48 20	B 15 0.73 115	B 15 0.73 115	B 15 0.73 115	B 17 0.49 24	B 18 0.81 142	A 2 0.18 7	A 2 0.18 7	B 15 0.13 13	B 18 0.42 41	B 18 0.42 41	B 19 0.42 41	C 26 0.41 31	B 16 0.38 34	B 16 0.38 34	B 19 0.38 34	B 13 0.38 34	
	Glendon Drive & Komoka Road	RBT	LOS Delay V/C Q	A 3 0.40 5	A 3 0.40 5	A 3 0.40 5	A 3 0.40 5	A 3 0.53 8	A 3 0.53 8	A 3 0.53 8	A 3 0.53 8	A 3 0.53 8	A 7 0.34 4	A 7 0.34 4	A 7 0.34 4	A 7 0.34 4	A 8 0.43 6	A 8 0.43 6	A 8 0.43 6	A 8 0.43 6	A 4 0.43 6

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

Q - 95th Percentile Queue Length

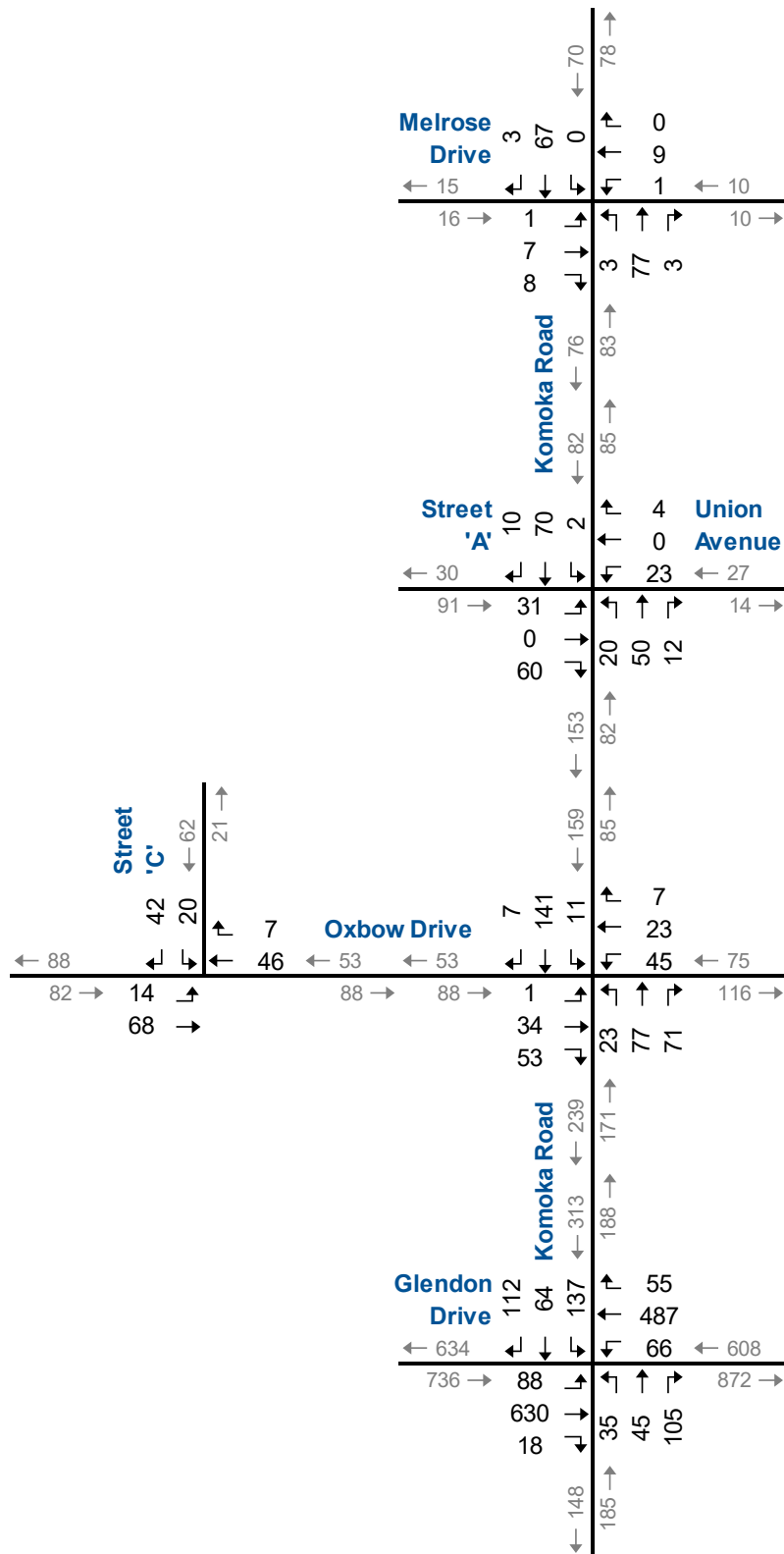
TCS - Traffic Control Signal

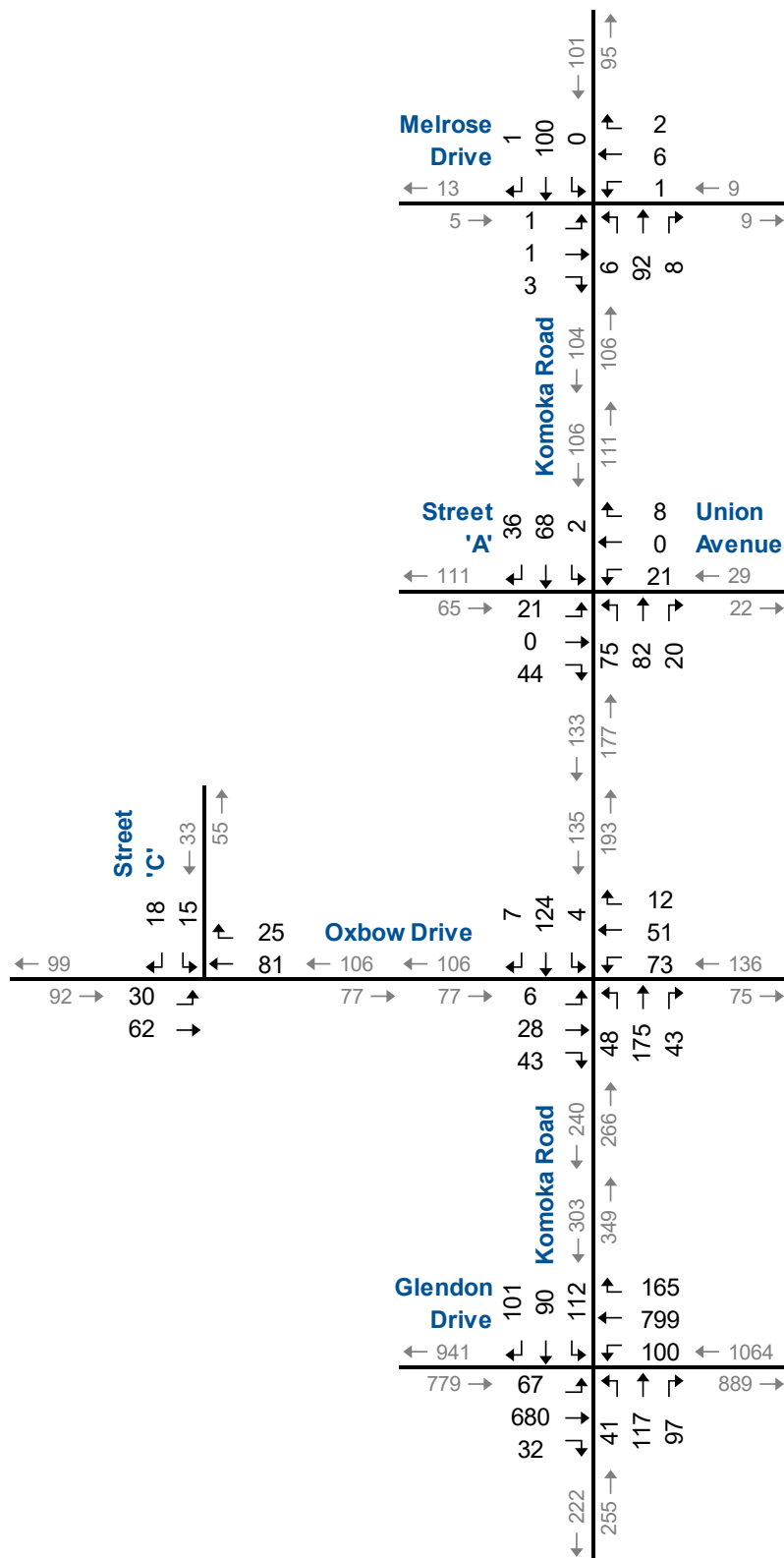
TWSC - Two-Way Stop Control

AWSC - All-Way Stop Control

RBT - Roundabout







5 Remedial Measures

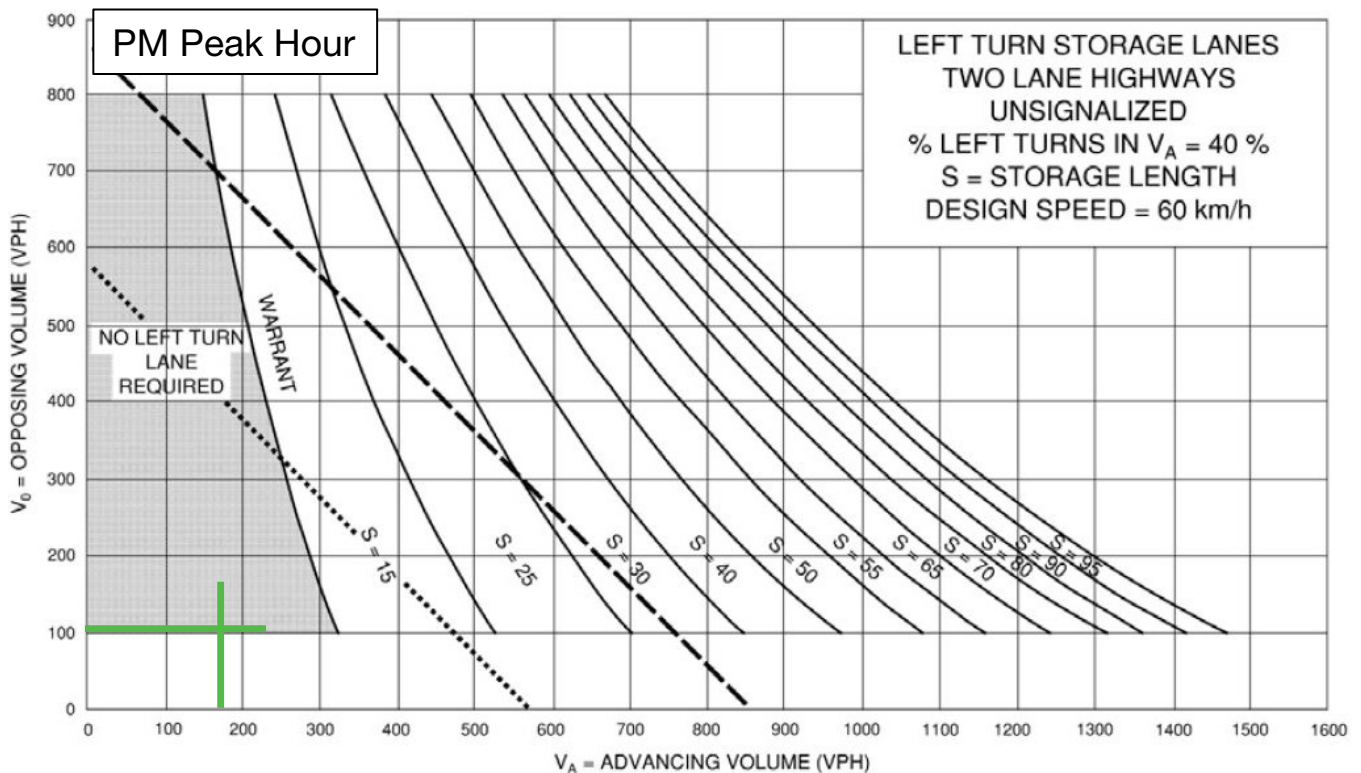
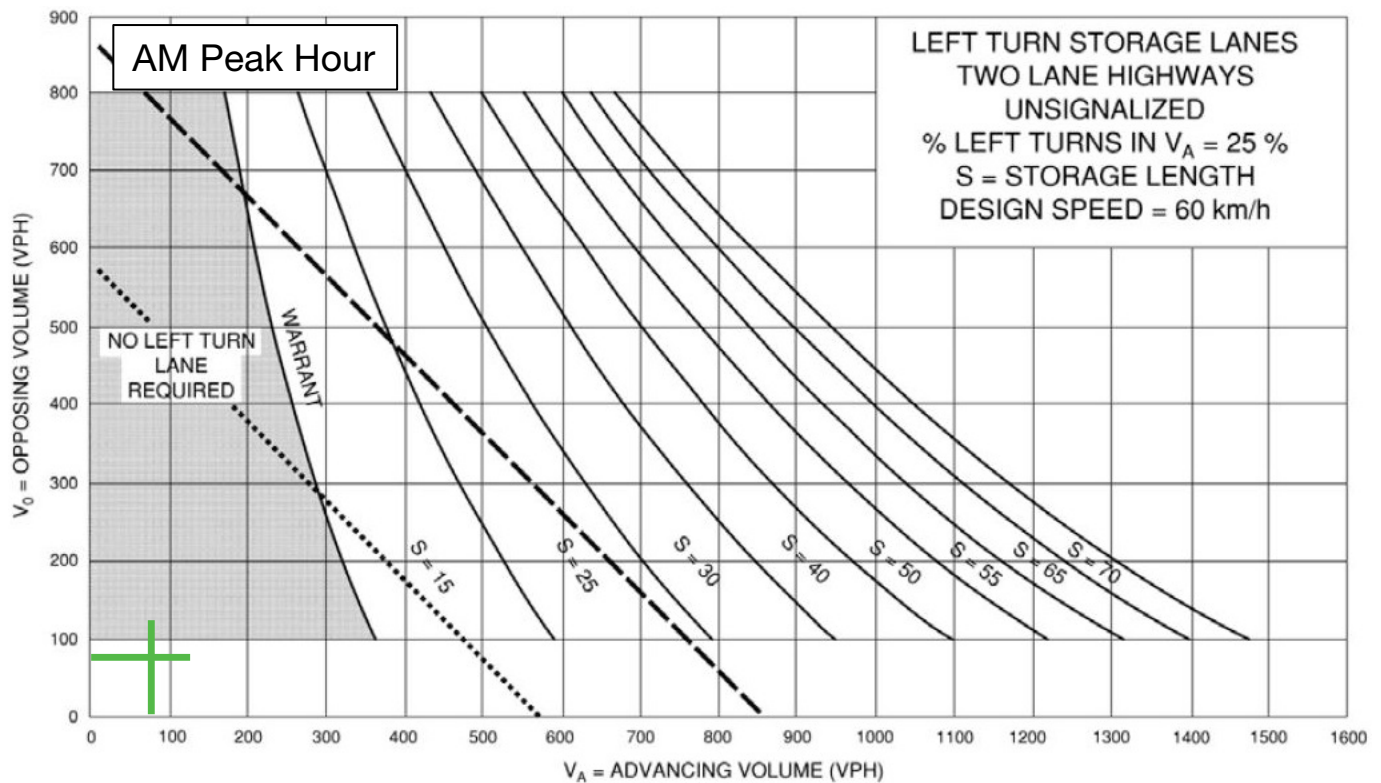
5.1 Left-turn Lanes

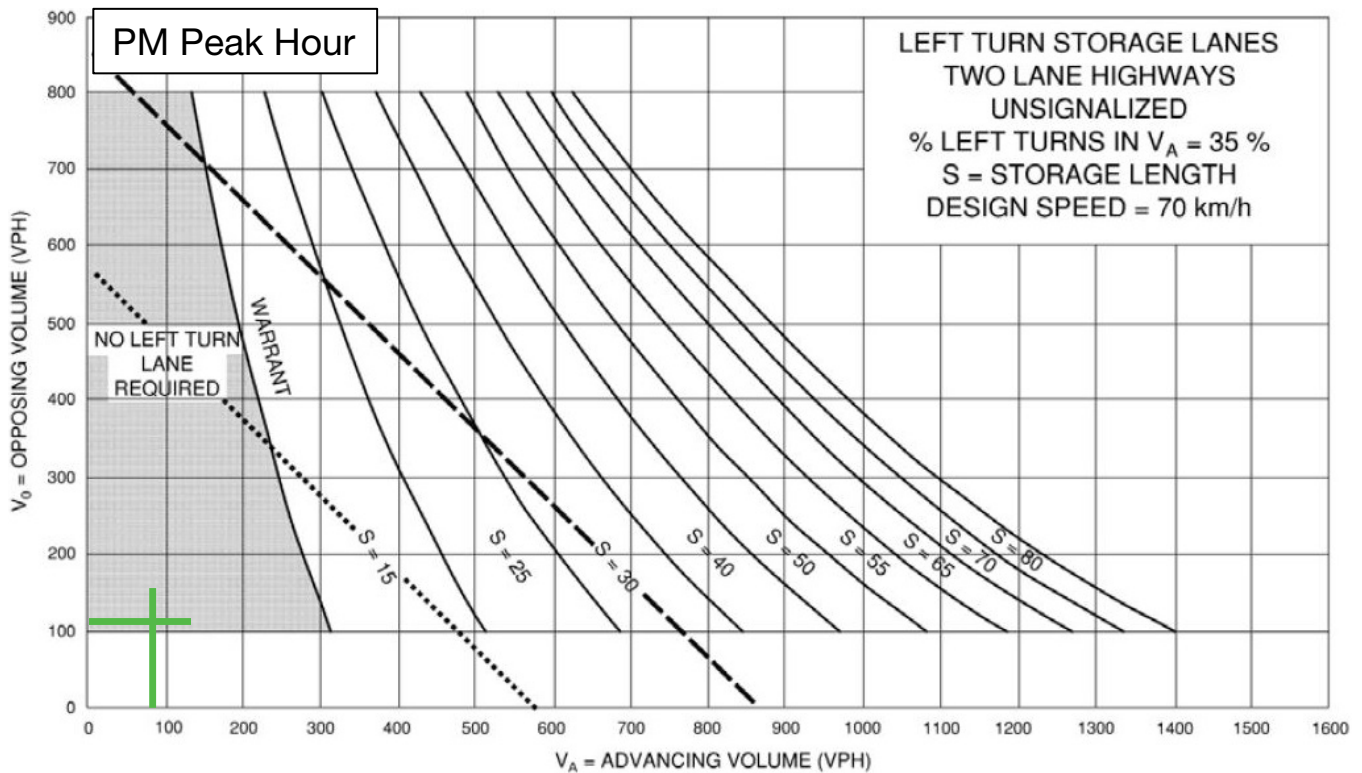
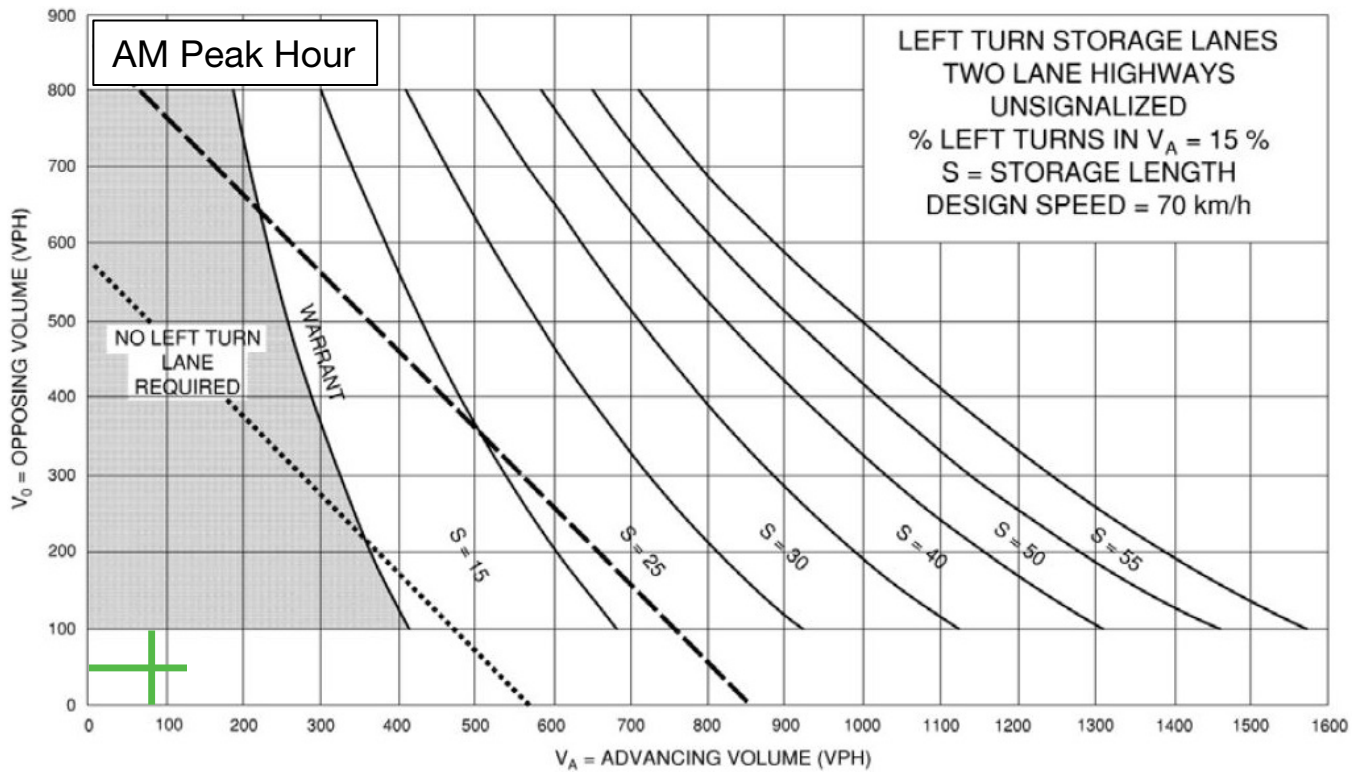
The need for auxiliary turning lanes at the study area intersections follows the requirements and procedures detailed in the Ministry of Transportation Geometric Design Manual⁴.

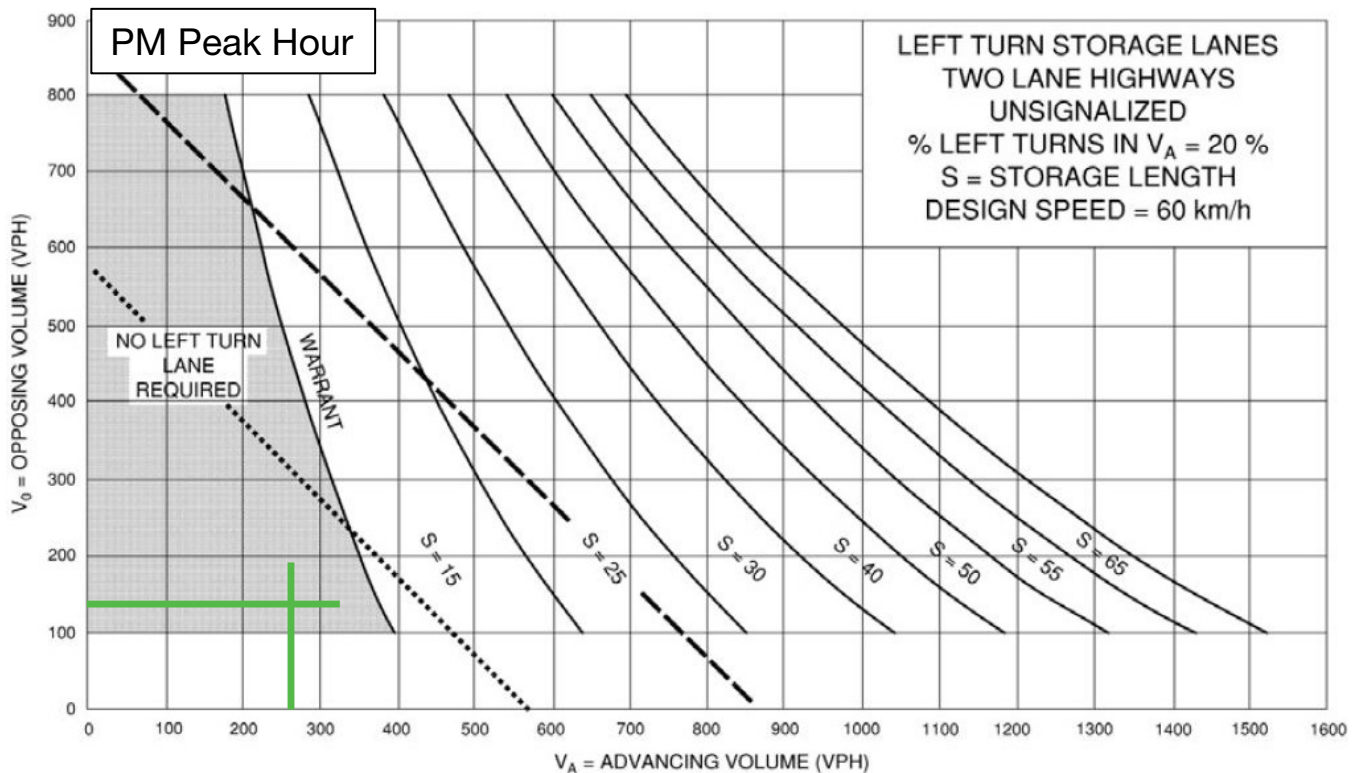
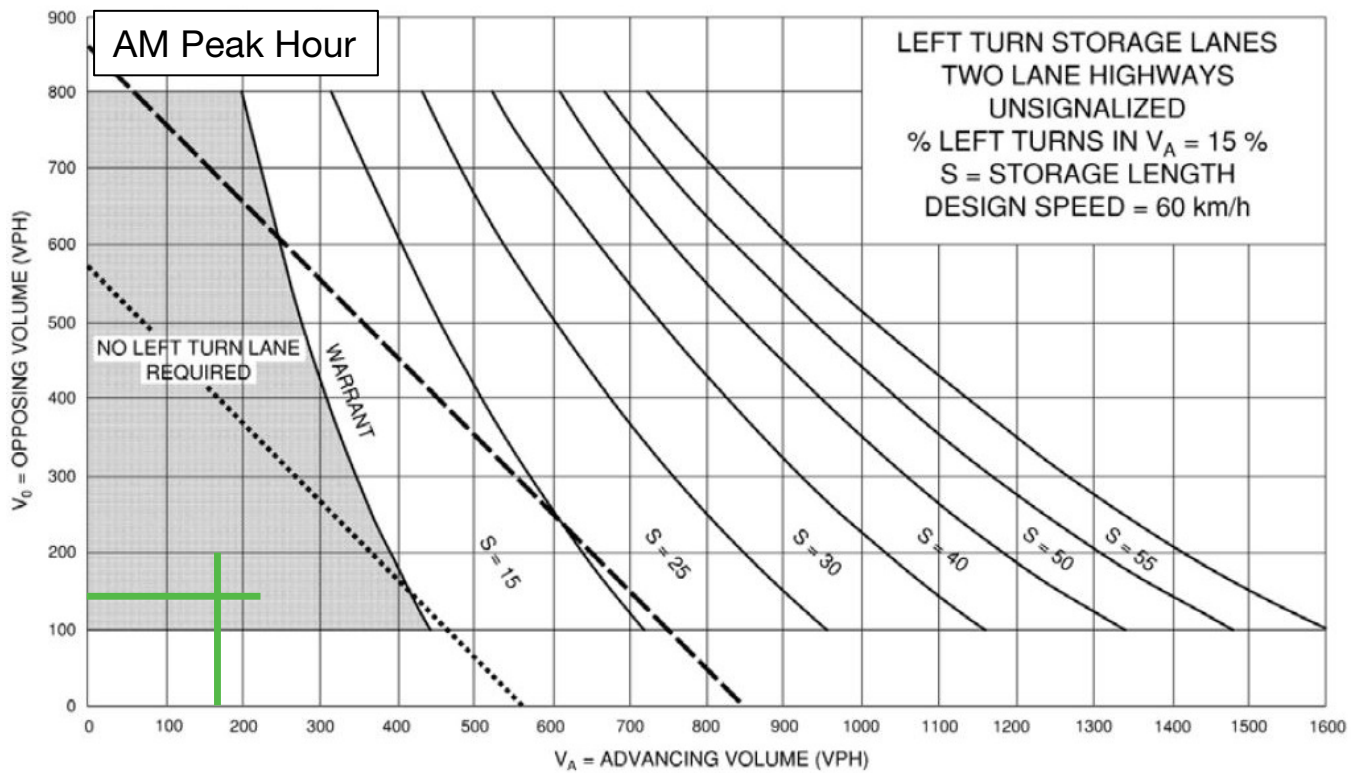
- ▶ a northbound left-turn lane on Komoka Road at Street 'A' / Union Avenue is not warranted under 2023 total AM or PM peak hour volumes, as shown on Figure 5.1;
- ▶ an eastbound left-turn lane on Oxbow Drive at Street 'C' is not warranted under 2023 total AM or PM peak hour volumes, as shown on Figure 5.2; and
- ▶ a northbound left-turn lane on Komoka Road at Oxbow Drive is not warranted under 2023 total AM or PM peak hour volumes, as shown on Figure 5.3.

⁴ Geometric Design Manual for Ontario Highways, Ministry of Transportation of Ontario, Queen's Printer for Ontario, 1986









6 Conclusions and Recommendations

6.1 Conclusions

Based on the investigations carried out, it is concluded that:

- ▶ under existing 2018 traffic conditions, all turning movements at all study area intersections operate within acceptable levels;
- ▶ the development is forecast to generate 203 and 264 new trips during the AM and PM peak hours, respectively;
- ▶ under 2023 background traffic conditions, all turning movements at all study area intersections operate within acceptable levels;
- ▶ under 2023 total traffic conditions, all turning movements at all study area intersections operate within acceptable levels; and
- ▶ left-turn lanes are not forecast to be warranted on study area roads under 2023 total volumes during the AM or PM peak hour.

6.2 Recommendations

Based on the findings of this study, it is recommended that the subject development be approved with:

- ▶ no additional improvements to the road network within the study area.



Appendix A

Existing Traffic Counts





Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Komoka Road & Melrose Drive
Site Code:
Start Date: 09/13/2018
Page No: 1

Turning Movement Data

Start Time	Melrose Drive Eastbound						Melrose Drive Westbound						Komoka Road Northbound						Komoka Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	0	2	1	0	0	3	1	0	0	0	0	1	0	6	1	0	0	7	0	13	0	0	0	13	24
7:15 AM	0	1	0	0	0	1	1	1	0	0	0	2	3	10	0	0	0	13	1	16	1	0	0	18	34
7:30 AM	0	0	4	0	0	4	1	1	0	0	0	2	1	8	1	0	0	10	0	12	0	0	0	12	28
7:45 AM	0	0	1	0	0	1	1	1	0	0	0	2	1	5	0	0	0	6	0	16	0	0	0	16	25
Hourly Total	0	3	6	0	0	9	4	3	0	0	0	7	5	29	2	0	0	36	1	57	1	0	0	59	111
8:00 AM	0	1	3	0	0	4	0	2	0	0	0	2	0	10	0	0	0	10	0	10	0	0	0	10	26
8:15 AM	0	2	5	0	0	7	0	1	0	0	0	1	0	14	1	0	0	15	0	15	1	0	0	16	39
8:30 AM	0	1	1	0	0	2	0	0	0	0	0	0	1	11	0	0	0	12	0	12	0	0	0	12	26
8:45 AM	0	0	0	0	0	0	1	5	0	0	0	6	1	10	0	0	0	11	0	12	2	0	0	14	31
Hourly Total	0	4	9	0	0	13	1	8	0	0	0	9	2	45	1	0	0	48	0	49	3	0	0	52	122
9:00 AM	1	3	1	0	0	5	0	2	0	0	0	2	1	6	2	0	0	9	0	12	0	0	0	12	28
9:15 AM	0	2	1	0	0	3	0	1	0	0	0	1	1	8	0	0	0	9	0	8	0	0	0	8	21
9:30 AM	0	0	0	0	0	0	0	1	0	0	0	1	2	12	1	0	0	15	0	12	0	0	0	12	28
9:45 AM	0	0	3	0	0	3	0	2	0	0	0	2	1	9	0	0	0	10	0	8	0	0	0	8	23
Hourly Total	1	5	5	0	0	11	0	6	0	0	0	6	5	35	3	0	0	43	0	40	0	0	0	40	100
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	0	2	1	0	0	3	1	2	0	0	0	3	3	1	0	0	0	4	0	9	1	0	0	10	20
11:15 AM	0	2	3	0	0	5	0	0	0	0	0	0	2	5	0	0	0	7	0	8	0	0	0	8	20
11:30 AM	0	1	3	0	0	4	1	2	0	0	0	3	0	12	1	0	0	13	1	6	0	0	0	7	27
11:45 AM	1	0	1	0	0	2	1	2	0	0	0	3	1	4	0	1	0	6	0	4	0	0	0	4	15
Hourly Total	1	5	8	0	0	14	3	6	0	0	0	9	6	22	1	1	0	30	1	27	1	0	0	29	82
12:00 PM	1	1	0	0	0	2	0	1	0	0	0	1	2	8	1	0	0	11	0	8	0	0	0	8	22
12:15 PM	0	2	1	0	0	3	0	1	0	0	0	1	0	11	1	0	0	12	0	2	0	0	0	2	18
12:30 PM	0	0	0	0	0	0	3	0	0	0	0	3	0	11	0	0	0	11	0	11	0	0	0	11	25
12:45 PM	0	0	0	0	0	0	0	3	0	0	0	3	1	8	0	0	0	9	0	6	0	0	0	6	18
Hourly Total	1	3	1	0	0	5	3	5	0	0	0	8	3	38	2	0	0	43	0	27	0	0	0	27	83
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	0	1	2	0	0	3	2	0	0	0	0	2	2	11	1	0	0	14	0	17	0	0	0	17	36
3:15 PM	0	0	1	0	0	1	0	2	1	0	0	3	2	9	1	0	0	12	0	6	0	0	0	6	22
3:30 PM	0	0	0	0	0	0	0	2	0	0	0	2	2	11	0	1	0	14	0	8	0	0	0	8	24
3:45 PM	0	2	2	0	0	4	0	2	0	0	0	2	3	14	0	0	0	17	0	10	0	0	0	10	33
Hourly Total	0	3	5	0	0	8	2	6	1	0	0	9	9	45	2	1	0	57	0	41	0	0	0	41	115
4:00 PM	0	1	0	0	0	1	1	0	2	0	0	3	1	17	1	0	0	19	0	15	0	0	0	15	38
4:15 PM	0	0	2	0	0	2	0	1	0	0	0	1	0	13	4	0	0	17	0	16	0	0	0	16	36
4:30 PM	0	0	0	0	0	0	0	3	0	0	0	3	3	11	0	0	0	14	0	15	1	0	0	16	33
4:45 PM	1	0	1	0	0	2	0	1	0	0	0	1	1	23	2	0	0	26	0	12	0	0	0	12	41
Hourly Total	1	1	3	0	0	5	1	5	2	0	0	8	5	64	7	0	0	76	0	58	1	0	0	59	148

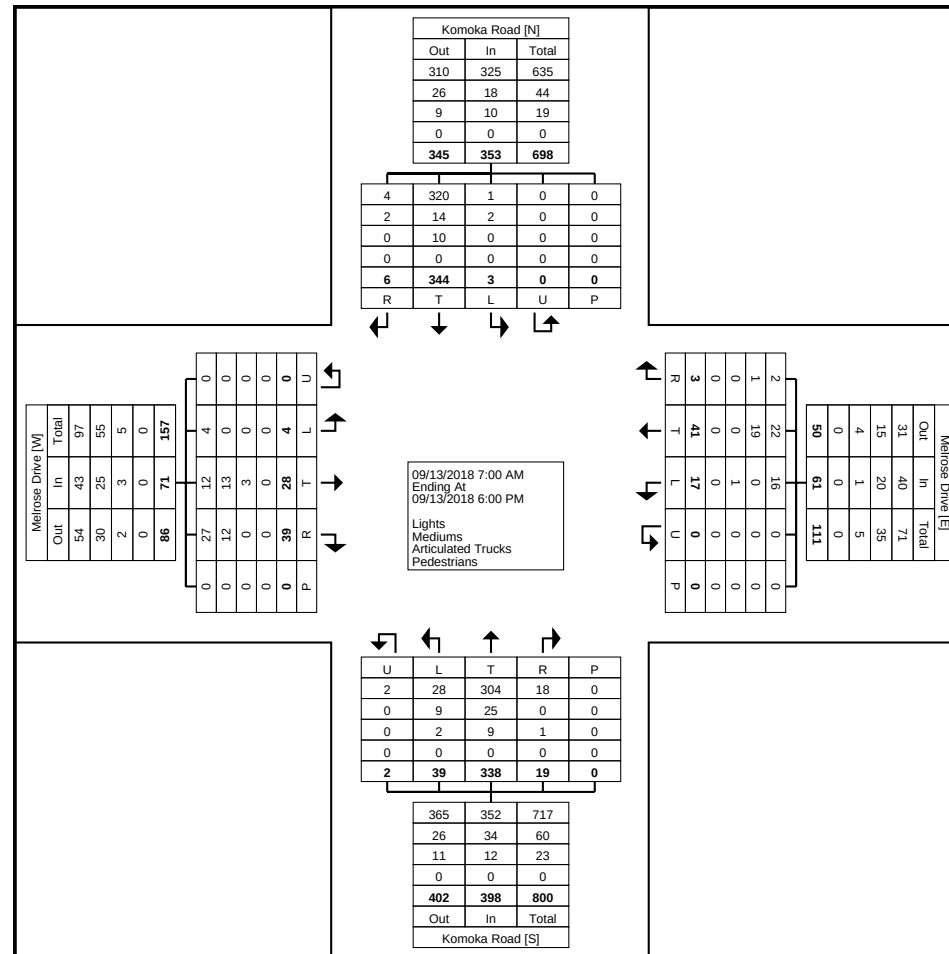
[illegible]



Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@pts1.com

Count Name: Komoka Road & Melrose Drive
Site Code:
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Turning Movement Data Plot

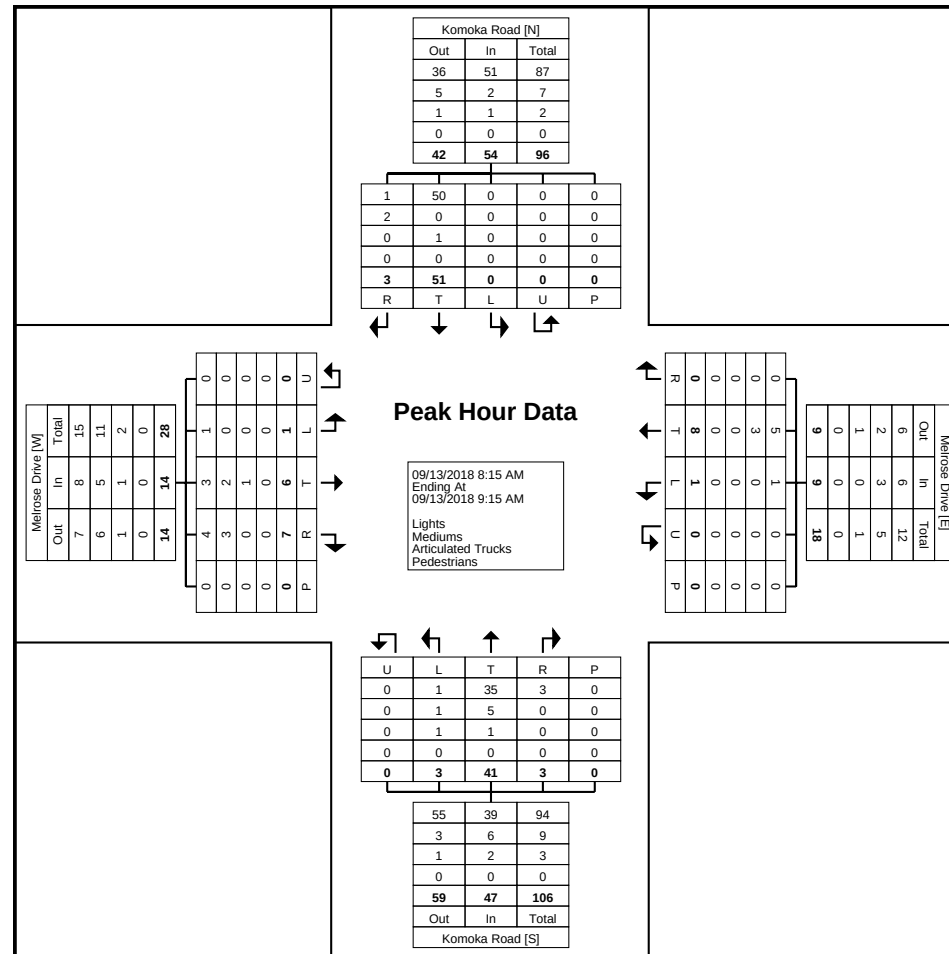
Start Time	Melrose Drive Eastbound						Melrose Drive Westbound						Komoka Road Northbound						Komoka Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
8:15 AM	0	2	5	0	0	7	0	1	0	0	0	1	0	14	1	0	0	15	0	15	1	0	0	16	39
8:30 AM	0	1	1	0	0	2	0	0	0	0	0	0	1	11	0	0	0	12	0	12	0	0	0	12	26
8:45 AM	0	0	0	0	0	0	1	5	0	0	0	6	1	10	0	0	0	11	0	12	2	0	0	14	31
9:00 AM	1	3	1	0	0	5	0	2	0	0	0	2	1	6	2	0	0	9	0	12	0	0	0	12	28
Total	1	6	7	0	0	14	1	8	0	0	0	9	3	41	3	0	0	47	0	51	3	0	0	54	124
Approach %	7.1	42.9	50.0	0.0	-	-	11.1	88.9	0.0	0.0	-	-	6.4	87.2	6.4	0.0	-	-	0.0	94.4	5.6	0.0	-	-	-
Total %	0.8	4.8	5.6	0.0	-	11.3	0.8	6.5	0.0	0.0	-	7.3	2.4	33.1	2.4	0.0	-	37.9	0.0	41.1	2.4	0.0	-	43.5	-
PHF	0.250	0.500	0.350	0.000	-	0.500	0.250	0.400	0.000	0.000	-	0.375	0.750	0.732	0.375	0.000	-	0.783	0.000	0.850	0.375	0.000	-	0.844	0.795
Lights	1	3	4	0	-	8	1	5	0	0	-	6	1	35	3	0	-	39	0	50	1	0	-	51	104
% Lights	100.0	50.0	57.1	-	-	57.1	100.0	62.5	-	-	-	66.7	33.3	85.4	100.0	-	-	83.0	-	98.0	33.3	-	-	94.4	83.9
Mediums	0	2	3	0	-	5	0	3	0	0	-	3	1	5	0	0	-	6	0	0	2	0	-	2	16
% Mediums	0.0	33.3	42.9	-	-	35.7	0.0	37.5	-	-	-	33.3	33.3	12.2	0.0	-	-	12.8	-	0.0	66.7	-	-	3.7	12.9
Articulated Trucks	0	1	0	0	-	1	0	0	0	0	-	0	1	1	0	0	-	2	0	1	0	0	-	1	4
% Articulated Trucks	0.0	16.7	0.0	-	-	7.1	0.0	0.0	-	-	-	0.0	33.3	2.4	0.0	-	-	4.3	-	2.0	0.0	-	-	1.9	3.2
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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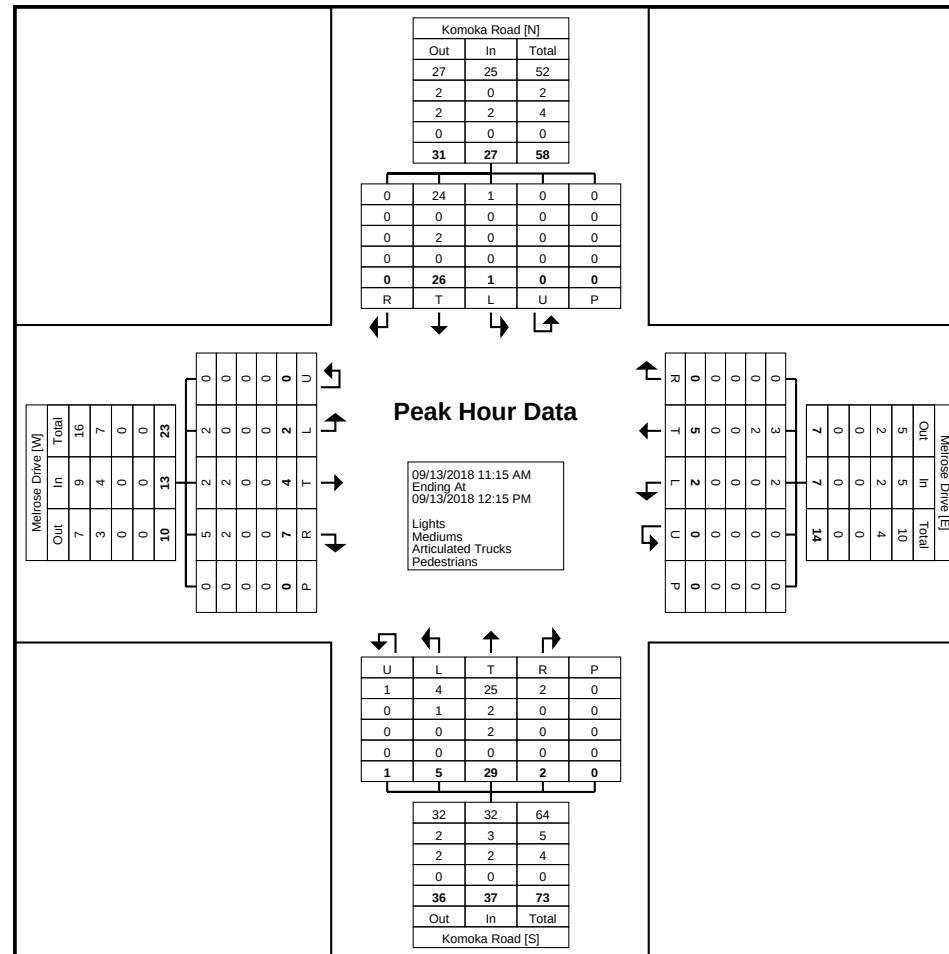
Start Time	Melrose Drive Eastbound						Melrose Drive Westbound						Komoka Road Northbound						Komoka Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
11:15 AM	0	2	3	0	0	5	0	0	0	0	0	0	2	5	0	0	0	7	0	8	0	0	0	8	20
11:30 AM	0	1	3	0	0	4	1	2	0	0	0	3	0	12	1	0	0	13	1	6	0	0	0	7	27
11:45 AM	1	0	1	0	0	2	1	2	0	0	0	3	1	4	0	1	0	6	0	4	0	0	0	4	15
12:00 PM	1	1	0	0	0	2	0	1	0	0	0	1	2	8	1	0	0	11	0	8	0	0	0	8	22
Total	2	4	7	0	0	13	2	5	0	0	0	7	5	29	2	1	0	37	1	26	0	0	0	27	84
Approach %	15.4	30.8	53.8	0.0	-	-	28.6	71.4	0.0	0.0	-	-	13.5	78.4	5.4	2.7	-	-	3.7	96.3	0.0	0.0	-	-	-
Total %	2.4	4.8	8.3	0.0	-	15.5	2.4	6.0	0.0	0.0	-	8.3	6.0	34.5	2.4	1.2	-	44.0	1.2	31.0	0.0	0.0	-	32.1	-
PHF	0.500	0.500	0.583	0.000	-	0.650	0.500	0.625	0.000	0.000	-	0.583	0.625	0.604	0.500	0.250	-	0.712	0.250	0.813	0.000	0.000	-	0.844	0.778
Lights	2	2	5	0	-	9	2	3	0	0	-	5	4	25	2	1	-	32	1	24	0	0	-	25	71
% Lights	100.0	50.0	71.4	-	-	69.2	100.0	60.0	-	-	-	71.4	80.0	86.2	100.0	100.0	-	86.5	100.0	92.3	-	-	-	92.6	84.5
Mediums	0	2	2	0	-	4	0	2	0	0	-	2	1	2	0	0	-	3	0	0	0	0	-	0	9
% Mediums	0.0	50.0	28.6	-	-	30.8	0.0	40.0	-	-	-	28.6	20.0	6.9	0.0	0.0	-	8.1	0.0	0.0	-	-	-	0.0	10.7
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	2	0	0	-	2	0	2	0	0	-	2	4
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	6.9	0.0	0.0	-	5.4	0.0	7.7	-	-	-	7.4	4.8
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

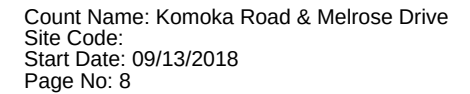


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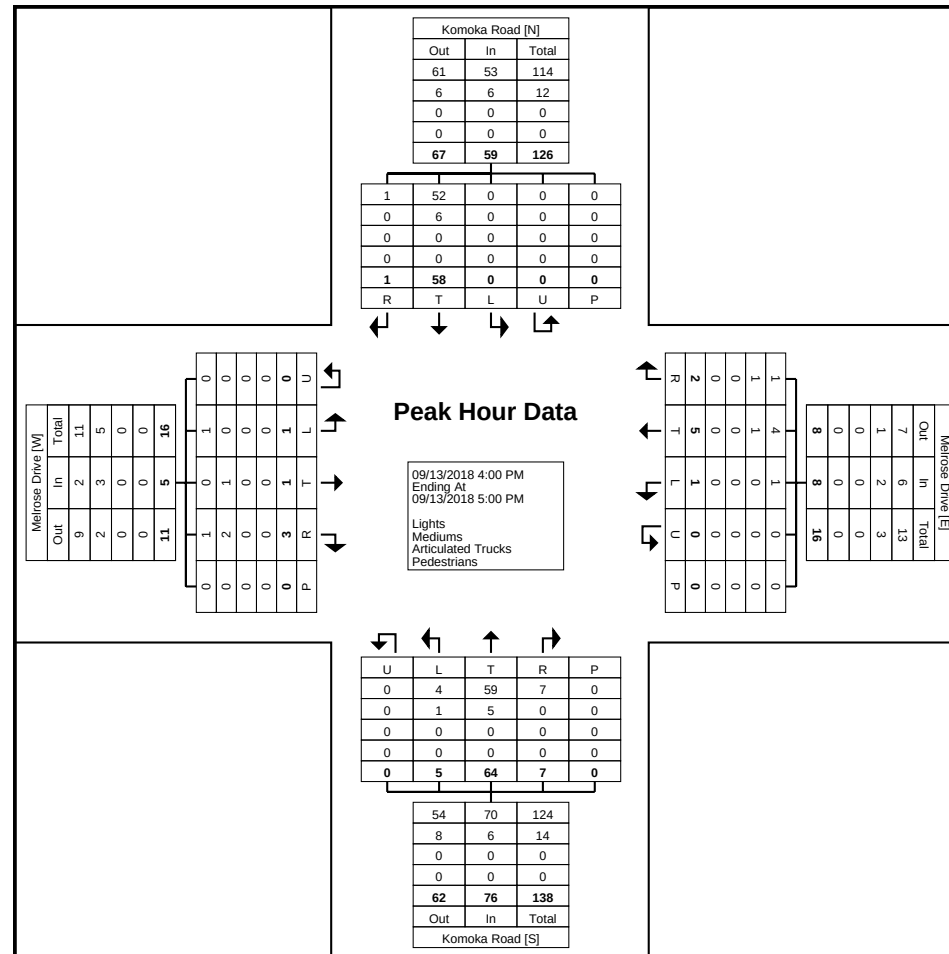




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Count Name: Komoka Road & Union Avenue
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Turning Movement Data

Start Time	Union Avenue Westbound					Komoka Road Northbound					Komoka Road Southbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	
7:00 AM	0	1	0	0	1	6	1	0	0	7	0	14	0	0	14	22
7:15 AM	1	1	0	0	2	12	0	0	0	12	1	20	0	0	21	35
7:30 AM	4	1	0	0	5	9	1	0	0	10	1	18	0	0	19	34
7:45 AM	2	0	0	0	2	6	2	0	0	8	0	15	0	0	15	25
Hourly Total	7	3	0	0	10	33	4	0	0	37	2	67	0	0	69	116
8:00 AM	5	2	0	0	7	8	2	0	0	10	0	17	0	0	17	34
8:15 AM	2	1	0	0	3	15	2	0	0	17	1	18	0	0	19	39
8:30 AM	7	0	0	0	7	11	4	0	0	15	0	15	0	0	15	37
8:45 AM	7	1	0	1	8	11	3	0	0	14	1	13	0	0	14	36
Hourly Total	21	4	0	1	25	45	11	0	0	56	2	63	0	0	65	146
9:00 AM	1	0	0	0	1	8	3	0	0	11	1	10	0	1	11	23
9:15 AM	4	1	0	0	5	7	2	0	0	9	0	10	0	0	10	24
9:30 AM	1	3	0	0	4	12	2	0	0	14	0	12	0	0	12	30
9:45 AM	3	1	0	0	4	10	1	0	0	11	0	12	0	0	12	27
Hourly Total	9	5	0	0	14	37	8	0	0	45	1	44	0	1	45	104
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	1	0	0	1	1	5	2	0	1	7	2	9	0	0	11	19
11:15 AM	0	0	0	0	0	9	3	0	0	12	0	10	0	0	10	22
11:30 AM	4	1	0	0	5	13	2	0	0	15	2	10	0	0	12	32
11:45 AM	1	1	0	0	2	7	0	0	0	7	0	7	0	0	7	16
Hourly Total	6	2	0	1	8	34	7	0	1	41	4	36	0	0	40	89
12:00 PM	4	1	0	0	5	10	3	0	0	13	0	9	0	0	9	27
12:15 PM	4	1	0	2	5	13	4	0	0	17	0	5	0	0	5	27
12:30 PM	1	0	0	0	1	10	1	0	0	11	0	12	0	0	12	24
12:45 PM	3	0	0	0	3	9	0	0	0	9	0	8	0	0	8	20
Hourly Total	12	2	0	2	14	42	8	0	0	50	0	34	0	0	34	98
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	3	1	0	0	4	15	2	0	0	17	2	19	0	0	21	42
3:15 PM	1	1	0	0	2	11	3	0	0	14	1	7	0	0	8	24
3:30 PM	1	0	0	0	1	14	3	0	0	17	0	6	0	0	6	24
3:45 PM	2	2	0	0	4	15	8	0	0	23	0	16	0	0	16	43
Hourly Total	7	4	0	0	11	55	16	0	0	71	3	48	0	0	51	133
4:00 PM	7	2	0	0	9	19	3	0	0	22	1	14	0	0	15	46
4:15 PM	3	0	0	0	3	17	6	0	0	23	0	18	0	0	18	44
4:30 PM	4	1	0	0	5	16	6	0	0	22	1	19	0	0	20	47
4:45 PM	5	4	0	0	9	22	3	0	0	25	0	11	0	0	11	45
Hourly Total	19	7	0	0	26	74	18	0	0	92	2	62	0	0	64	182
5:00 PM	2	1	0	0	3	20	4	0	0	24	3	14	0	0	17	44

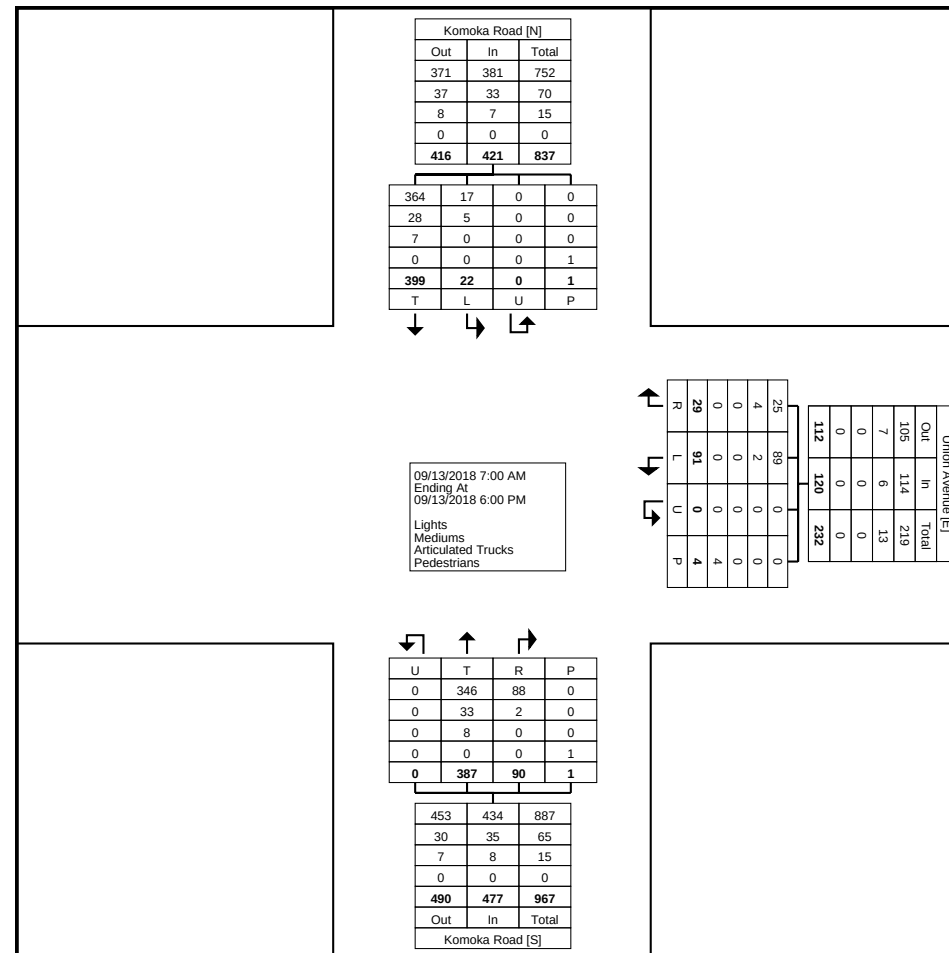
5:15 PM	0	0	0	0	0	13	4	0	0	17	2	15	0	0	17	34
5:30 PM	3	0	0	0	3	15	6	0	0	21	1	7	0	0	8	32
5:45 PM	5	1	0	0	6	19	4	0	0	23	2	9	0	0	11	40
Hourly Total	10	2	0	0	12	67	18	0	0	85	8	45	0	0	53	150
Grand Total	91	29	0	4	120	387	90	0	1	477	22	399	0	1	421	1018
Approach %	75.8	24.2	0.0	-	-	81.1	18.9	0.0	-	-	5.2	94.8	0.0	-	-	-
Total %	8.9	2.8	0.0	-	11.8	38.0	8.8	0.0	-	46.9	2.2	39.2	0.0	-	41.4	-
Lights	89	25	0	-	114	346	88	0	-	434	17	364	0	-	381	929
% Lights	97.8	86.2	-	-	95.0	89.4	97.8	-	-	91.0	77.3	91.2	-	-	90.5	91.3
Mediums	2	4	0	-	6	33	2	0	-	35	5	28	0	-	33	74
% Mediums	2.2	13.8	-	-	5.0	8.5	2.2	-	-	7.3	22.7	7.0	-	-	7.8	7.3
Articulated Trucks	0	0	0	-	0	8	0	0	-	8	0	7	0	-	7	15
% Articulated Trucks	0.0	0.0	-	-	0.0	2.1	0.0	-	-	1.7	0.0	1.8	-	-	1.7	1.5
Pedestrians	-	-	-	4	-	-	-	-	1	-	-	-	-	1	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-



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Count Name: Komoka Road & Union Avenue
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Turning Movement Data Plot

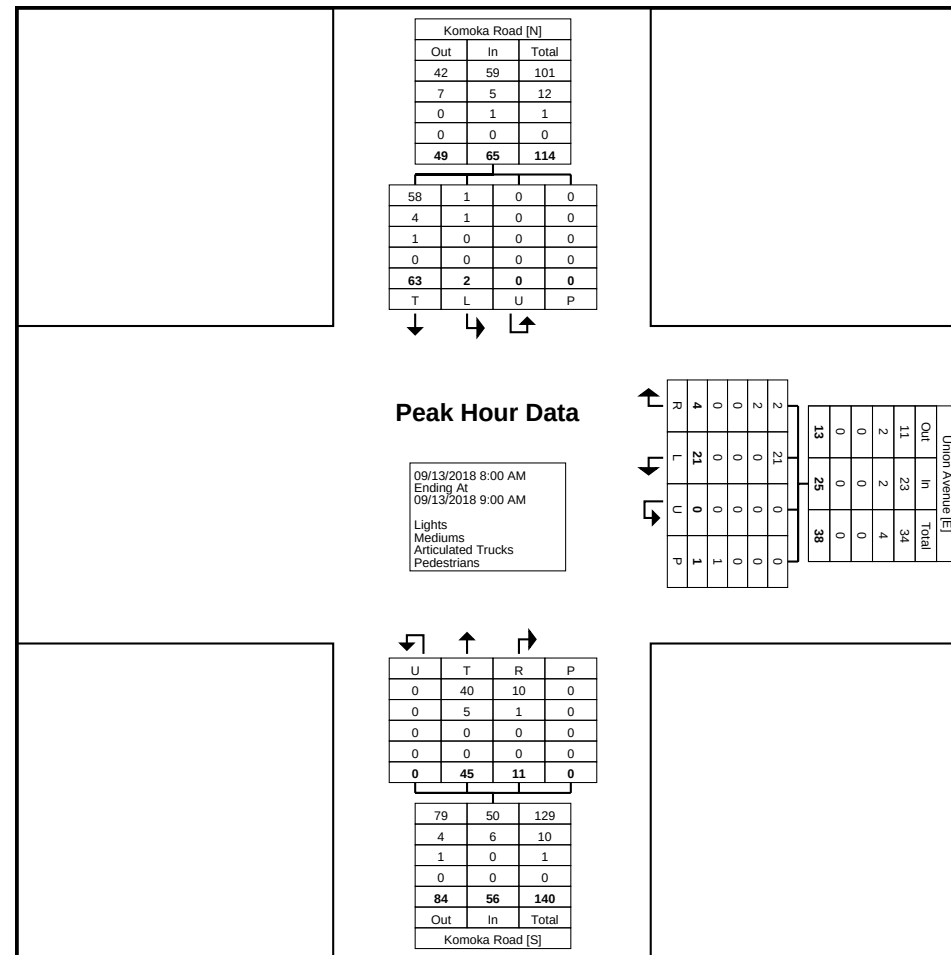
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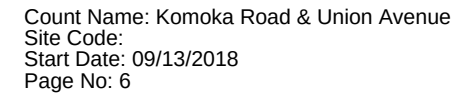


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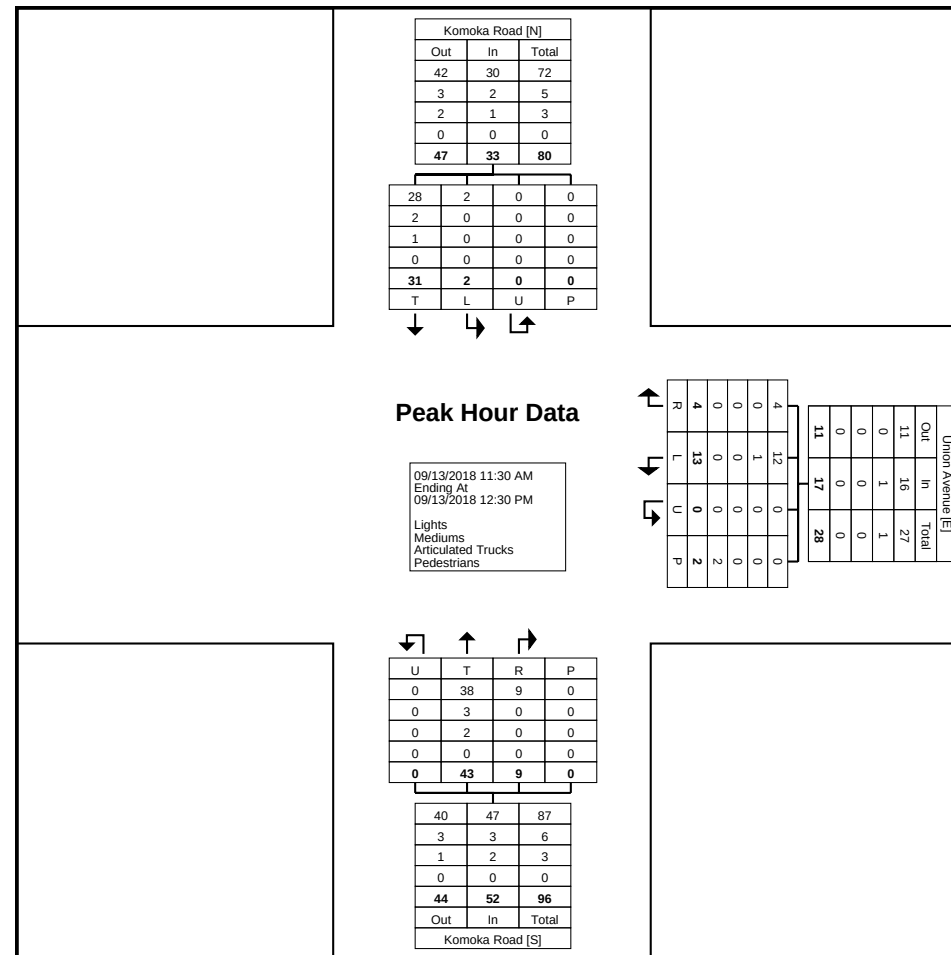




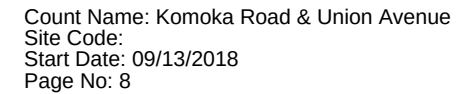
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Turning Movement Peak Hour Data Plot (11:30 AM)

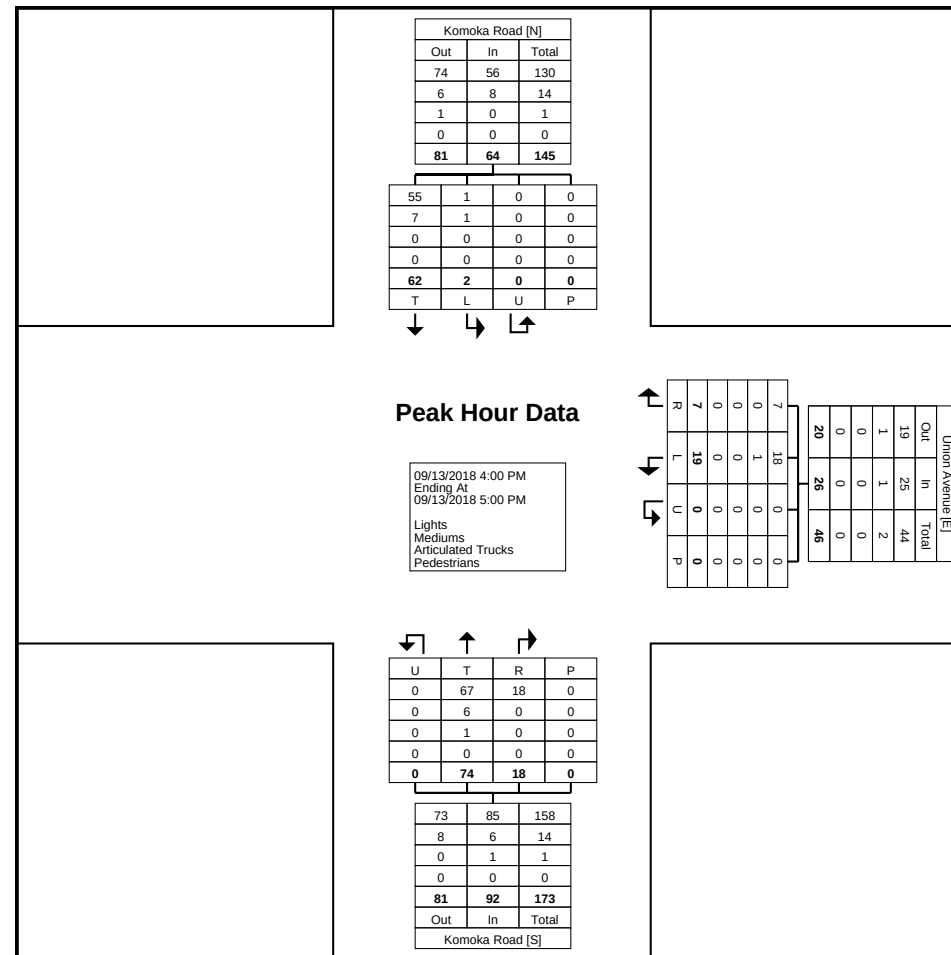




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Count Name: Komoka Road & Oxbow Drive
Site Code:
Start Date: 09/13/2018
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Turning Movement Data

Start Time	Oxbow Drive Eastbound						Oxbow Drive Westbound						Komoka Road Northbound						Komoka Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	2	5	8	0	0	15	3	6	1	0	1	10	1	5	13	0	0	19	1	16	0	0	0	17	61
7:15 AM	0	7	10	0	0	17	10	7	1	0	0	18	1	10	9	0	0	20	4	18	0	0	0	22	77
7:30 AM	0	4	3	0	0	7	9	7	0	0	0	16	1	11	17	0	0	29	2	23	0	0	0	25	77
7:45 AM	0	7	4	0	0	11	2	4	2	0	0	8	3	6	12	0	0	21	3	14	2	0	0	19	59
Hourly Total	2	23	25	0	0	50	24	24	4	0	1	52	6	32	51	0	0	89	10	71	2	0	0	83	274
8:00 AM	1	13	5	0	0	19	10	5	0	0	0	15	3	8	13	0	0	24	1	18	3	0	0	22	80
8:15 AM	0	5	3	0	0	8	7	4	1	0	0	12	4	19	16	0	0	39	3	18	1	0	0	22	81
8:30 AM	0	7	15	0	0	22	7	6	0	0	0	13	2	14	20	0	0	36	3	19	1	0	0	23	94
8:45 AM	0	6	7	0	0	13	17	6	5	1	1	29	6	11	15	0	1	32	3	19	1	0	0	23	97
Hourly Total	1	31	30	0	0	62	41	21	6	1	1	69	15	52	64	0	1	131	10	74	6	0	0	90	352
9:00 AM	2	5	5	0	0	12	18	5	3	0	0	26	3	6	12	0	0	21	0	10	1	0	0	11	70
9:15 AM	0	3	5	0	0	8	7	3	3	0	0	13	4	10	13	0	0	27	0	16	1	0	0	17	65
9:30 AM	0	3	6	0	0	9	8	2	1	0	0	11	3	12	12	0	0	27	0	13	1	0	0	14	61
9:45 AM	1	7	4	0	0	12	11	5	0	0	0	16	6	12	8	0	0	26	4	15	0	0	0	19	73
Hourly Total	3	18	20	0	0	41	44	15	7	0	0	66	16	40	45	0	0	101	4	54	3	0	0	61	269
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	0	1	2	0	0	3	7	8	2	0	1	17	3	6	6	0	0	15	1	12	0	0	0	13	48
11:15 AM	0	1	3	0	0	4	9	3	1	0	0	13	6	12	4	0	0	22	3	9	0	0	0	12	51
11:30 AM	0	4	5	0	0	9	15	1	0	0	0	16	3	17	15	0	0	35	1	12	1	0	0	14	74
11:45 AM	1	3	4	0	0	8	7	3	3	0	0	13	2	4	13	0	0	19	2	8	0	0	0	10	50
Hourly Total	1	9	14	0	0	24	38	15	6	0	1	59	14	39	38	0	0	91	7	41	1	0	0	49	223
12:00 PM	0	2	3	0	0	5	19	6	0	0	3	25	0	14	13	0	0	27	1	12	1	0	0	14	71
12:15 PM	1	3	3	0	0	7	15	4	2	0	0	21	3	15	5	0	1	23	1	9	1	0	0	11	62
12:30 PM	2	3	3	0	0	8	9	5	0	0	0	14	3	9	13	0	0	25	0	14	1	0	0	15	62
12:45 PM	0	7	3	0	0	10	16	6	0	0	0	22	7	10	8	0	0	25	0	11	2	0	1	13	70
Hourly Total	3	15	12	0	0	30	59	21	2	0	3	82	13	48	39	0	1	100	2	46	5	0	1	53	265
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	1	5	6	0	0	12	7	8	4	0	0	19	5	15	13	0	0	33	2	19	2	0	0	23	87
3:15 PM	1	3	4	0	0	8	12	11	2	0	1	25	5	11	18	0	0	34	1	8	0	0	0	9	76
3:30 PM	1	11	6	0	0	18	23	13	5	0	0	41	5	12	7	0	0	24	1	8	0	0	0	9	92
3:45 PM	0	7	4	0	0	11	11	19	0	0	0	30	1	23	10	0	0	34	3	14	2	0	0	19	94
Hourly Total	3	26	20	0	0	49	53	51	11	0	1	115	16	61	48	0	0	125	7	49	4	0	0	60	349
4:00 PM	1	7	8	0	0	16	13	12	2	0	0	27	5	23	11	0	0	39	1	19	1	0	0	21	103
4:15 PM	2	6	8	0	0	16	14	9	3	0	2	26	7	22	3	0	0	32	1	19	3	0	0	23	97
4:30 PM	1	7	4	0	0	12	19	12	3	0	3	34	5	22	8	0	0	35	2	18	1	0	0	21	102
4:45 PM	1	5	6	0	0	12	20	13	3	0	0	36	4	23	17	0	0	44	0	16	1	0	0	17	109
Hourly Total	5	25	26	0	0	56	66	46	11	0	5	123	21	90	39	0	0	150	4	72	6	0	0	82	411

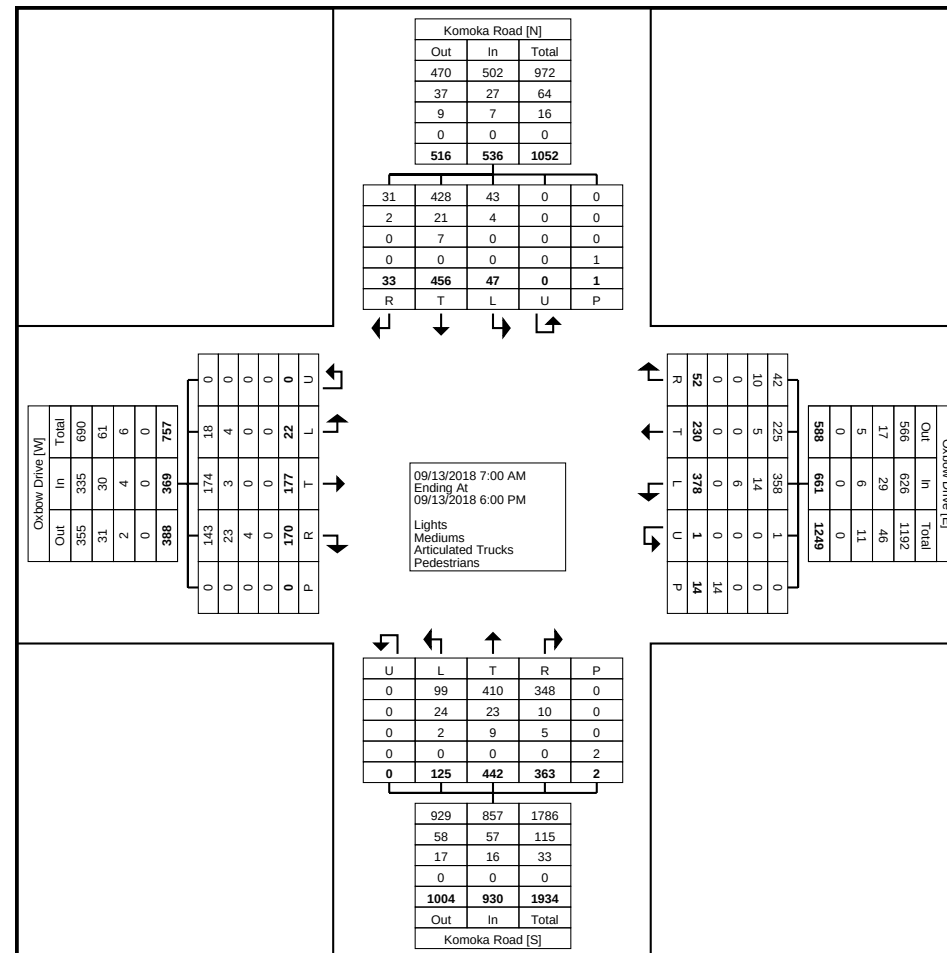
5:00 PM	1	11	6	0	0	18	15	11	1	0	0	27	7	22	12	0	0	41	2	14	0	0	0	16	102
5:15 PM	1	6	4	0	0	11	14	5	2	0	2	21	4	17	8	0	0	29	0	15	2	0	0	17	78
5:30 PM	2	9	8	0	0	19	10	15	1	0	0	26	11	19	10	0	0	40	0	9	1	0	0	10	95
5:45 PM	0	4	5	0	0	9	14	6	1	0	0	21	2	22	9	0	0	33	1	11	3	0	0	15	78
Hourly Total	4	30	23	0	0	57	53	37	5	0	2	95	24	80	39	0	0	143	3	49	6	0	0	58	353
Grand Total	22	177	170	0	0	369	378	230	52	1	14	661	125	442	363	0	2	930	47	456	33	0	1	536	2496
Approach %	6.0	48.0	46.1	0.0	-	-	57.2	34.8	7.9	0.2	-	-	13.4	47.5	39.0	0.0	-	-	8.8	85.1	6.2	0.0	-	-	-
Total %	0.9	7.1	6.8	0.0	-	14.8	15.1	9.2	2.1	0.0	-	26.5	5.0	17.7	14.5	0.0	-	37.3	1.9	18.3	1.3	0.0	-	21.5	-
Lights	18	174	143	0	-	335	358	225	42	1	-	626	99	410	348	0	-	857	43	428	31	0	-	502	2320
% Lights	81.8	98.3	84.1	-	-	90.8	94.7	97.8	80.8	100.0	-	94.7	79.2	92.8	95.9	-	-	92.2	91.5	93.9	93.9	-	-	93.7	92.9
Mediums	4	3	23	0	-	30	14	5	10	0	-	29	24	23	10	0	-	57	4	21	2	0	-	27	143
% Mediums	18.2	1.7	13.5	-	-	8.1	3.7	2.2	19.2	0.0	-	4.4	19.2	5.2	2.8	-	-	6.1	8.5	4.6	6.1	-	-	5.0	5.7
Articulated Trucks	0	0	4	0	-	4	6	0	0	0	-	6	2	9	5	0	-	16	0	7	0	0	-	7	33
% Articulated Trucks	0.0	0.0	2.4	-	-	1.1	1.6	0.0	0.0	0.0	-	0.9	1.6	2.0	1.4	-	-	1.7	0.0	1.5	0.0	-	-	1.3	1.3
Pedestrians	-	-	-	-	0	-	-	-	-	-	14	-	-	-	-	-	2	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



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Count Name: Komoka Road & Oxbow Drive
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Turning Movement Data Plot



Paradigm Transportation Solutions Limited
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Count Name: Komoka Road & Oxbow Drive
Site Code:
Start Date: 09/13/2018
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Turning Movement Peak Hour Data (8:00 AM)

Start Time	Oxbow Drive Eastbound						Oxbow Drive Westbound						Komoka Road Northbound						Komoka Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
8:00 AM	1	13	5	0	0	19	10	5	0	0	0	15	3	8	13	0	0	24	1	18	3	0	0	22	80
8:15 AM	0	5	3	0	0	8	7	4	1	0	0	12	4	19	16	0	0	39	3	18	1	0	0	22	81
8:30 AM	0	7	15	0	0	22	7	6	0	0	0	13	2	14	20	0	0	36	3	19	1	0	0	23	94
8:45 AM	0	6	7	0	0	13	17	6	5	1	1	29	6	11	15	0	1	32	3	19	1	0	0	23	97
Total	1	31	30	0	0	62	41	21	6	1	1	69	15	52	64	0	1	131	10	74	6	0	0	90	352
Approach %	1.6	50.0	48.4	0.0	-	-	59.4	30.4	8.7	1.4	-	-	11.5	39.7	48.9	0.0	-	-	11.1	82.2	6.7	0.0	-	-	-
Total %	0.3	8.8	8.5	0.0	-	17.6	11.6	6.0	1.7	0.3	-	19.6	4.3	14.8	18.2	0.0	-	37.2	2.8	21.0	1.7	0.0	-	25.6	-
PHF	0.250	0.596	0.500	0.000	-	0.705	0.603	0.875	0.300	0.250	-	0.595	0.625	0.684	0.800	0.000	-	0.840	0.833	0.974	0.500	0.000	-	0.978	0.907
Lights	1	31	22	0	-	54	39	20	3	1	-	63	9	48	61	0	-	118	9	71	5	0	-	85	320
% Lights	100.0	100.0	73.3	-	-	87.1	95.1	95.2	50.0	100.0	-	91.3	60.0	92.3	95.3	-	-	90.1	90.0	95.9	83.3	-	-	94.4	90.9
Mediums	0	0	7	0	-	7	2	1	3	0	-	6	6	4	2	0	-	12	1	2	1	0	-	4	29
% Mediums	0.0	0.0	23.3	-	-	11.3	4.9	4.8	50.0	0.0	-	8.7	40.0	7.7	3.1	-	-	9.2	10.0	2.7	16.7	-	-	4.4	8.2
Articulated Trucks	0	0	1	0	-	1	0	0	0	0	-	0	0	0	1	0	-	1	0	1	0	0	-	1	3
% Articulated Trucks	0.0	0.0	3.3	-	-	1.6	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	1.6	-	-	0.8	0.0	1.4	0.0	-	-	1.1	0.9
Pedestrians	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

Turning Movement Peak Hour Data Plot (8:00 AM)



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Count Name: Komoka Road & Oxbow Drive
Site Code:
Start Date: 09/13/2018
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Turning Movement Peak Hour Data (12:00 PM)

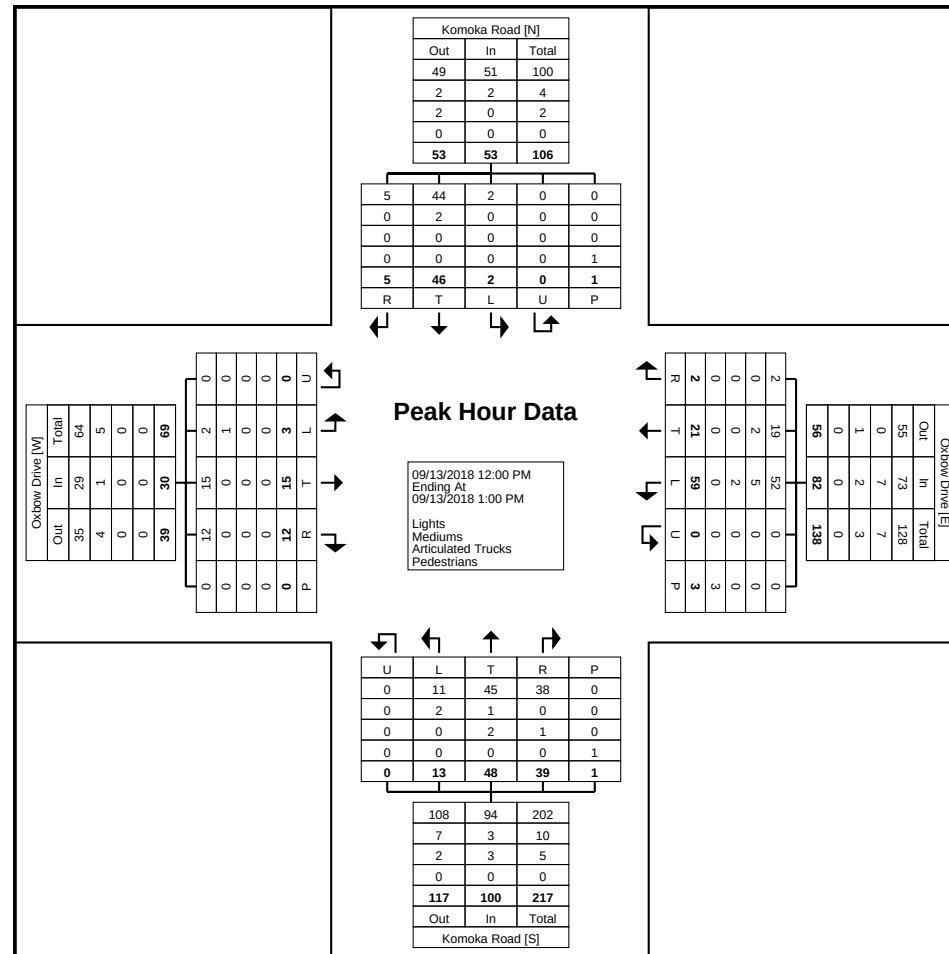
Start Time	Oxbow Drive Eastbound						Oxbow Drive Westbound						Komoka Road Northbound						Komoka Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:00 PM	0	2	3	0	0	5	19	6	0	0	3	25	0	14	13	0	0	27	1	12	1	0	0	14	71
12:15 PM	1	3	3	0	0	7	15	4	2	0	0	21	3	15	5	0	1	23	1	9	1	0	0	11	62
12:30 PM	2	3	3	0	0	8	9	5	0	0	0	14	3	9	13	0	0	25	0	14	1	0	0	15	62
12:45 PM	0	7	3	0	0	10	16	6	0	0	0	22	7	10	8	0	0	25	0	11	2	0	1	13	70
Total	3	15	12	0	0	30	59	21	2	0	3	82	13	48	39	0	1	100	2	46	5	0	1	53	265
Approach %	10.0	50.0	40.0	0.0	-	-	72.0	25.6	2.4	0.0	-	-	13.0	48.0	39.0	0.0	-	-	3.8	86.8	9.4	0.0	-	-	-
Total %	1.1	5.7	4.5	0.0	-	11.3	22.3	7.9	0.8	0.0	-	30.9	4.9	18.1	14.7	0.0	-	37.7	0.8	17.4	1.9	0.0	-	20.0	-
PHF	0.375	0.536	1.000	0.000	-	0.750	0.776	0.875	0.250	0.000	-	0.820	0.464	0.800	0.750	0.000	-	0.926	0.500	0.821	0.625	0.000	-	0.883	0.933
Lights	2	15	12	0	-	29	52	19	2	0	-	73	11	45	38	0	-	94	2	44	5	0	-	51	247
% Lights	66.7	100.0	100.0	-	-	96.7	88.1	90.5	100.0	-	-	89.0	84.6	93.8	97.4	-	-	94.0	100.0	95.7	100.0	-	-	96.2	93.2
Mediums	1	0	0	0	-	1	5	2	0	0	-	7	2	1	0	0	-	3	0	2	0	0	-	2	13
% Mediums	33.3	0.0	0.0	-	-	3.3	8.5	9.5	0.0	-	-	8.5	15.4	2.1	0.0	-	-	3.0	0.0	4.3	0.0	-	-	3.8	4.9
Articulated Trucks	0	0	0	0	-	0	2	0	0	0	-	2	0	2	1	0	-	3	0	0	0	0	-	0	5
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	3.4	0.0	0.0	-	-	2.4	0.0	4.2	2.6	-	-	3.0	0.0	0.0	0.0	-	-	0.0	1.9
Pedestrians	-	-	-	-	0	-	-	-	-	-	3	-	-	-	-	-	1	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



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Count Name: Komoka Road & Oxbow Drive
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Turning Movement Peak Hour Data Plot (12:00 PM)

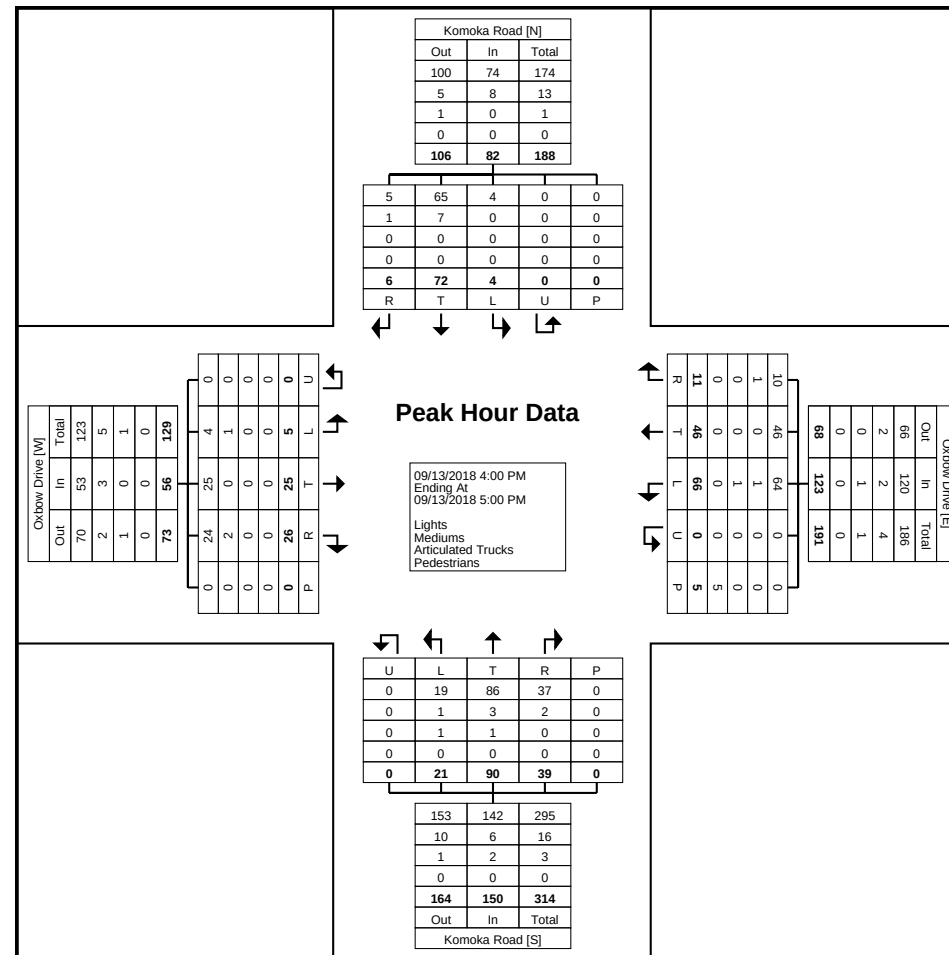
Start Time	Oxbow Drive Eastbound						Oxbow Drive Westbound						Komoka Road Northbound						Komoka Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:00 PM	1	7	8	0	0	16	13	12	2	0	0	27	5	23	11	0	0	39	1	19	1	0	0	21	103
4:15 PM	2	6	8	0	0	16	14	9	3	0	2	26	7	22	3	0	0	32	1	19	3	0	0	23	97
4:30 PM	1	7	4	0	0	12	19	12	3	0	3	34	5	22	8	0	0	35	2	18	1	0	0	21	102
4:45 PM	1	5	6	0	0	12	20	13	3	0	0	36	4	23	17	0	0	44	0	16	1	0	0	17	109
Total	5	25	26	0	0	56	66	46	11	0	5	123	21	90	39	0	0	150	4	72	6	0	0	82	411
Approach %	8.9	44.6	46.4	0.0	-	-	53.7	37.4	8.9	0.0	-	-	14.0	60.0	26.0	0.0	-	-	4.9	87.8	7.3	0.0	-	-	-
Total %	1.2	6.1	6.3	0.0	-	13.6	16.1	11.2	2.7	0.0	-	29.9	5.1	21.9	9.5	0.0	-	36.5	1.0	17.5	1.5	0.0	-	20.0	-
PHF	0.625	0.893	0.813	0.000	-	0.875	0.825	0.885	0.917	0.000	-	0.854	0.750	0.978	0.574	0.000	-	0.852	0.500	0.947	0.500	0.000	-	0.891	0.943
Lights	4	25	24	0	-	53	64	46	10	0	-	120	19	86	37	0	-	142	4	65	5	0	-	74	389
% Lights	80.0	100.0	92.3	-	-	94.6	97.0	100.0	90.9	-	-	97.6	90.5	95.6	94.9	-	-	94.7	100.0	90.3	83.3	-	-	90.2	94.6
Mediums	1	0	2	0	-	3	1	0	1	0	-	2	1	3	2	0	-	6	0	7	1	0	-	8	19
% Mediums	20.0	0.0	7.7	-	-	5.4	1.5	0.0	9.1	-	-	1.6	4.8	3.3	5.1	-	-	4.0	0.0	9.7	16.7	-	-	9.8	4.6
Articulated Trucks	0	0	0	0	-	0	1	0	0	0	-	1	1	1	0	0	-	2	0	0	0	0	-	0	3
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	1.5	0.0	0.0	-	-	0.8	4.8	1.1	0.0	-	-	1.3	0.0	0.0	0.0	-	-	0.0	0.7
Pedestrians	-	-	-	-	0	-	-	-	-	-	5	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Count Name: Komoka Road & Oxbow Drive
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Paradigm Transportation Solutions Limited
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Count Name: Komoka Road & Glendon Drive
Site Code:
Start Date: 09/13/2018
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Turning Movement Data

Start Time	Glendon Drive Eastbound						Glendon Drive Westbound						Komoka Road Northbound						Komoka Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	12	99	6	0	0	117	5	64	4	0	0	73	3	7	18	0	0	28	24	7	15	0	0	46	264
7:15 AM	9	131	6	0	0	146	10	83	7	0	0	100	2	4	6	0	0	12	19	8	19	0	0	46	304
7:30 AM	17	136	2	0	0	155	11	85	11	0	0	107	9	10	29	0	0	48	24	10	28	0	0	62	372
7:45 AM	15	128	5	0	0	148	13	84	9	0	0	106	4	7	19	0	0	30	24	9	16	0	0	49	333
Hourly Total	53	494	19	0	0	566	39	316	31	0	0	386	18	28	72	0	0	118	91	34	78	0	0	203	1273
8:00 AM	20	111	5	0	0	136	12	77	6	0	0	95	13	4	26	0	0	43	17	9	20	0	0	46	320
8:15 AM	24	123	4	0	0	151	24	94	11	0	0	129	6	13	21	0	0	40	21	8	25	0	0	54	374
8:30 AM	15	103	6	0	0	124	19	75	9	0	0	103	10	19	12	0	0	41	25	8	21	0	0	54	322
8:45 AM	12	95	7	0	1	114	15	67	12	0	0	94	9	7	24	0	0	40	20	12	27	0	1	59	307
Hourly Total	71	432	22	0	1	525	70	313	38	0	0	421	38	43	83	0	0	164	83	37	93	0	1	213	1323
9:00 AM	14	88	2	0	1	104	10	67	8	0	0	85	4	5	8	0	0	17	18	12	17	0	0	47	253
9:15 AM	10	96	5	0	0	111	13	72	13	0	0	98	7	8	14	0	0	29	17	7	15	0	0	39	277
9:30 AM	20	90	2	0	0	112	4	74	4	0	1	82	5	4	23	0	0	32	16	6	22	0	0	44	270
9:45 AM	14	84	2	0	0	100	7	70	9	0	1	86	6	12	12	0	0	30	15	5	16	0	0	36	252
Hourly Total	58	358	11	0	1	427	34	283	34	0	2	351	22	29	57	0	0	108	66	30	70	0	0	166	1052
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	12	75	4	0	0	91	18	50	8	0	0	76	4	8	8	0	0	20	8	8	7	0	0	23	210
11:15 AM	15	71	2	0	0	88	11	59	14	0	1	84	6	4	11	0	0	21	9	8	6	0	2	23	216
11:30 AM	14	79	2	0	0	95	16	61	11	0	0	88	6	9	16	0	0	31	15	8	24	0	0	47	261
11:45 AM	11	70	3	0	0	84	15	67	11	0	0	93	10	10	11	0	0	31	7	10	8	0	0	25	233
Hourly Total	52	295	11	0	0	358	60	237	44	0	1	341	26	31	46	0	0	103	39	34	45	0	2	118	920
12:00 PM	8	80	3	0	2	91	10	55	9	0	0	74	4	14	18	0	0	36	11	11	19	0	2	41	242
12:15 PM	10	66	6	0	0	82	9	70	14	0	0	93	3	9	16	0	0	28	20	7	9	0	0	36	239
12:30 PM	8	81	7	0	0	96	20	89	11	0	0	120	4	6	17	0	0	27	11	11	15	0	0	37	280
12:45 PM	22	70	3	0	0	95	19	58	14	0	0	91	9	3	17	0	0	29	7	20	10	0	0	37	252
Hourly Total	48	297	19	0	2	364	58	272	48	0	0	378	20	32	68	0	0	120	49	49	53	0	2	151	1013
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	12	72	6	0	0	90	13	95	20	0	0	128	9	15	16	0	0	40	12	7	16	0	0	35	293
3:15 PM	12	82	1	0	0	95	23	93	20	0	0	136	6	9	9	0	0	24	24	4	10	0	0	38	293
3:30 PM	15	77	4	0	0	96	25	121	6	0	0	152	11	11	23	0	0	45	14	10	21	0	0	45	338
3:45 PM	16	95	5	0	0	116	17	116	24	0	0	157	5	17	21	0	0	43	20	7	12	0	1	39	355
Hourly Total	55	326	16	0	0	397	78	425	70	0	0	573	31	52	69	0	0	152	70	28	59	0	1	157	1279
4:00 PM	9	89	10	0	0	108	20	111	21	0	0	152	9	14	25	0	0	48	26	11	17	0	0	54	362
4:15 PM	19	94	11	0	0	124	22	142	24	0	0	188	10	19	20	0	0	49	21	10	22	0	0	53	414
4:30 PM	18	99	4	0	0	121	22	134	25	0	0	181	12	13	17	0	0	42	21	15	22	0	0	58	402
4:45 PM	12	123	8	0	0	143	22	157	28	0	0	207	4	18	17	0	0	39	18	14	23	0	0	55	444
Hourly Total	58	405	33	0	0	496	86	544	98	0	0	728	35	64	79	0	0	178	86	50	84	0	0	220	1622

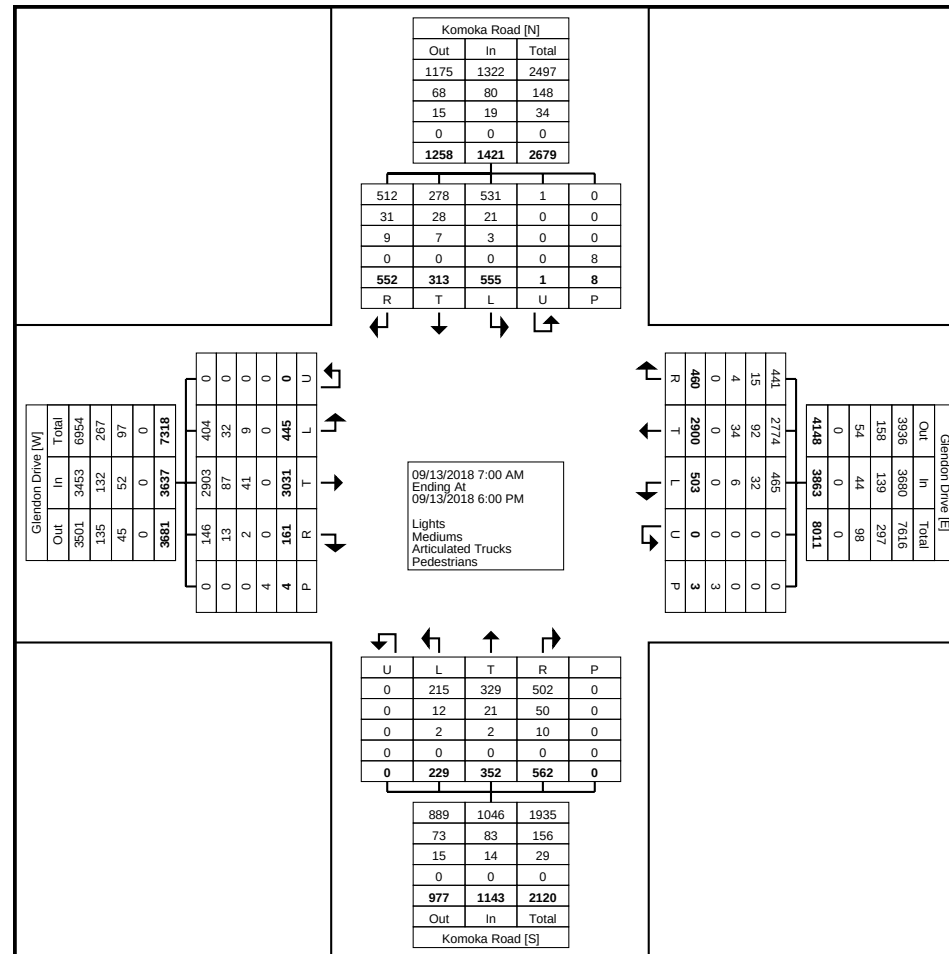
5:00 PM	9	112	11	0	0	132	21	140	32	0	0	193	10	24	27	0	0	61	24	20	21	0	0	65	451
5:15 PM	13	113	6	0	0	132	26	149	18	0	0	193	11	16	27	0	0	54	11	12	20	0	0	43	422
5:30 PM	16	113	8	0	0	137	13	120	22	0	0	155	10	14	19	0	0	43	21	11	13	1	2	46	381
5:45 PM	12	86	5	0	0	103	18	101	25	0	0	144	8	19	15	0	0	42	15	8	16	0	0	39	328
Hourly Total	50	424	30	0	0	504	78	510	97	0	0	685	39	73	88	0	0	200	71	51	70	1	2	193	1582
Grand Total	445	3031	161	0	4	3637	503	2900	460	0	3	3863	229	352	562	0	0	1143	555	313	552	1	8	1421	10064
Approach %	12.2	83.3	4.4	0.0	-	-	13.0	75.1	11.9	0.0	-	-	20.0	30.8	49.2	0.0	-	-	39.1	22.0	38.8	0.1	-	-	-
Total %	4.4	30.1	1.6	0.0	-	36.1	5.0	28.8	4.6	0.0	-	38.4	2.3	3.5	5.6	0.0	-	11.4	5.5	3.1	5.5	0.0	-	14.1	-
Lights	404	2903	146	0	-	3453	465	2774	441	0	-	3680	215	329	502	0	-	1046	531	278	512	1	-	1322	9501
% Lights	90.8	95.8	90.7	-	-	94.9	92.4	95.7	95.9	-	-	95.3	93.9	93.5	89.3	-	-	91.5	95.7	88.8	92.8	100.0	-	93.0	94.4
Mediums	32	87	13	0	-	132	32	92	15	0	-	139	12	21	50	0	-	83	21	28	31	0	-	80	434
% Mediums	7.2	2.9	8.1	-	-	3.6	6.4	3.2	3.3	-	-	3.6	5.2	6.0	8.9	-	-	7.3	3.8	8.9	5.6	0.0	-	5.6	4.3
Articulated Trucks	9	41	2	0	-	52	6	34	4	0	-	44	2	2	10	0	-	14	3	7	9	0	-	19	129
% Articulated Trucks	2.0	1.4	1.2	-	-	1.4	1.2	1.2	0.9	-	-	1.1	0.9	0.6	1.8	-	-	1.2	0.5	2.2	1.6	0.0	-	1.3	1.3
Pedestrians	-	-	-	-	4	-	-	-	-	-	3	-	-	-	-	-	0	-	-	-	-	-	8	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-



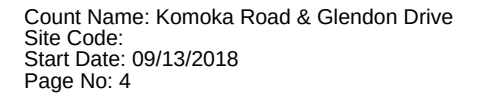
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Site Code:
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Turning Movement Data Plot

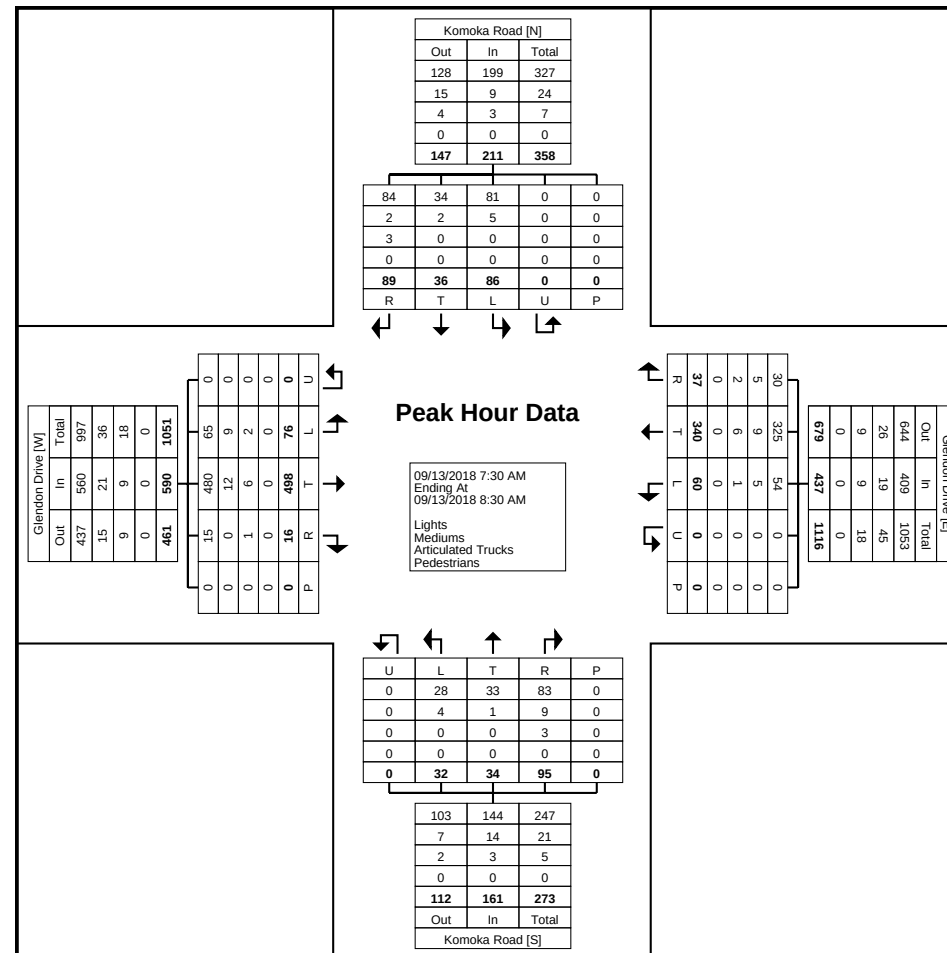




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Turning Movement Peak Hour Data (12:00 PM)

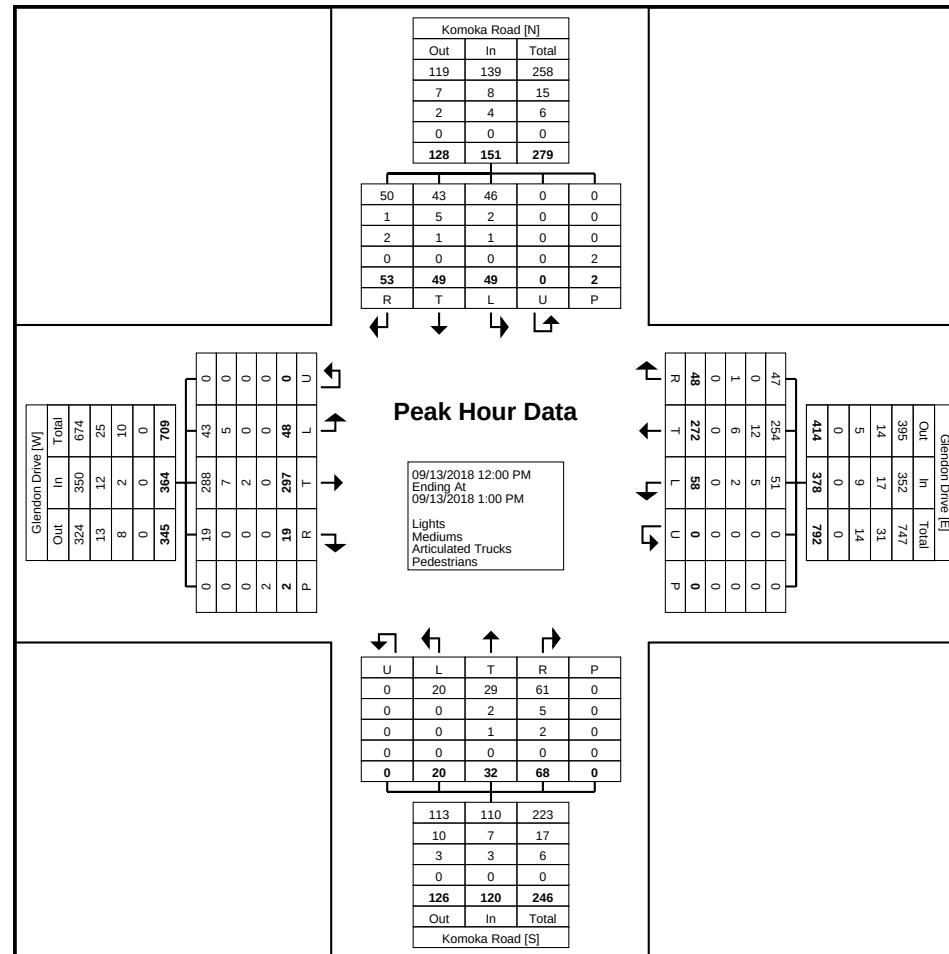
Start Time	Glendon Drive Eastbound						Glendon Drive Westbound						Komoka Road Northbound						Komoka Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:00 PM	8	80	3	0	2	91	10	55	9	0	0	74	4	14	18	0	0	36	11	11	19	0	2	41	242
12:15 PM	10	66	6	0	0	82	9	70	14	0	0	93	3	9	16	0	0	28	20	7	9	0	0	36	239
12:30 PM	8	81	7	0	0	96	20	89	11	0	0	120	4	6	17	0	0	27	11	11	15	0	0	37	280
12:45 PM	22	70	3	0	0	95	19	58	14	0	0	91	9	3	17	0	0	29	7	20	10	0	0	37	252
Total	48	297	19	0	2	364	58	272	48	0	0	378	20	32	68	0	0	120	49	49	53	0	2	151	1013
Approach %	13.2	81.6	5.2	0.0	-	-	15.3	72.0	12.7	0.0	-	-	16.7	26.7	56.7	0.0	-	-	32.5	32.5	35.1	0.0	-	-	-
Total %	4.7	29.3	1.9	0.0	-	35.9	5.7	26.9	4.7	0.0	-	37.3	2.0	3.2	6.7	0.0	-	11.8	4.8	4.8	5.2	0.0	-	14.9	-
PHF	0.545	0.917	0.679	0.000	-	0.948	0.725	0.764	0.857	0.000	-	0.788	0.556	0.571	0.944	0.000	-	0.833	0.613	0.613	0.697	0.000	-	0.921	0.904
Lights	43	288	19	0	-	350	51	254	47	0	-	352	20	29	61	0	-	110	46	43	50	0	-	139	951
% Lights	89.6	97.0	100.0	-	-	96.2	87.9	93.4	97.9	-	-	93.1	100.0	90.6	89.7	-	-	91.7	93.9	87.8	94.3	-	-	92.1	93.9
Mediums	5	7	0	0	-	12	5	12	0	0	-	17	0	2	5	0	-	7	2	5	1	0	-	8	44
% Mediums	10.4	2.4	0.0	-	-	3.3	8.6	4.4	0.0	-	-	4.5	0.0	6.3	7.4	-	-	5.8	4.1	10.2	1.9	-	-	5.3	4.3
Articulated Trucks	0	2	0	0	-	2	2	6	1	0	-	9	0	1	2	0	-	3	1	1	2	0	-	4	18
% Articulated Trucks	0.0	0.7	0.0	-	-	0.5	3.4	2.2	2.1	-	-	2.4	0.0	3.1	2.9	-	-	2.5	2.0	2.0	3.8	-	-	2.6	1.8
Pedestrians	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-



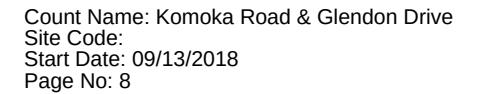
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Turning Movement Peak Hour Data Plot (12:00 PM)

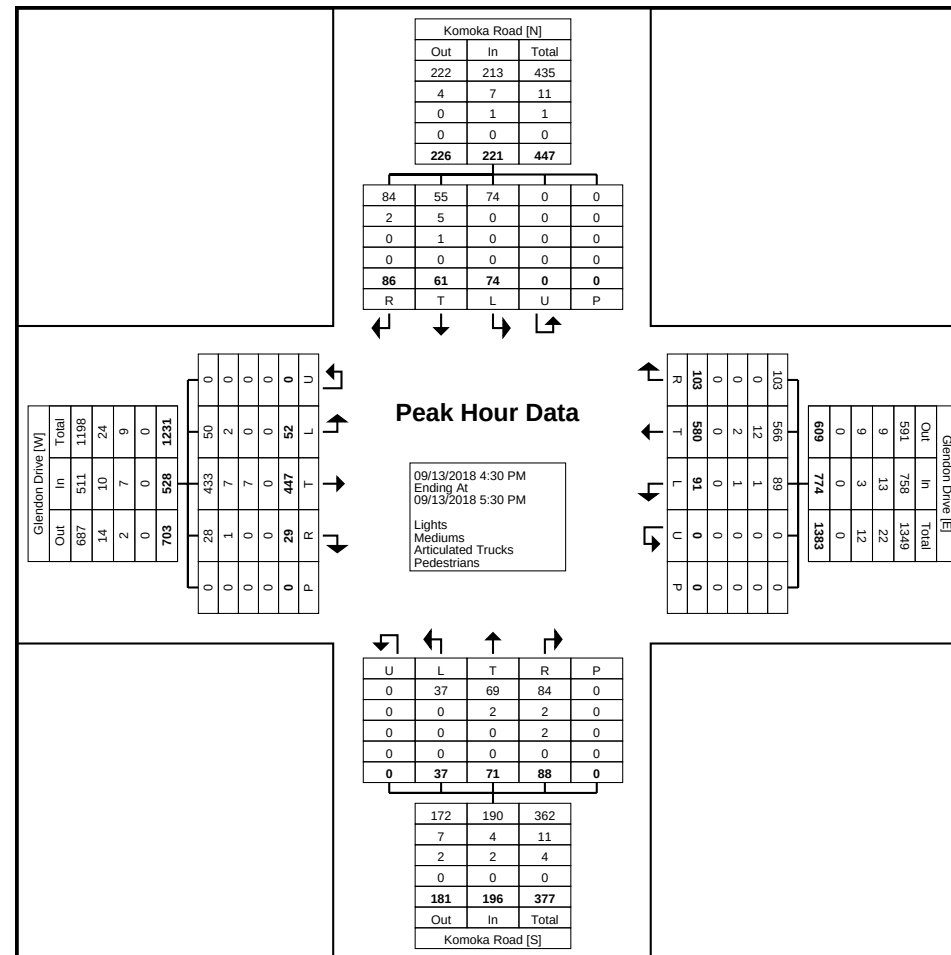




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Appendix B

Synchro 2018 Existing Traffic Operations Reports



Lanes, Volumes, Timings
1: Komoka Road & Melrose Drive

Existing AM Peak Hour
9904 Oxbow Drive

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	1	6	7	1	8	0	3	41	3	0	51	3
Future Volume (vph)	1	6	7	1	8	0	3	41	3	0	51	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.932						0.992			0.993	
Flt Protected		0.997			0.995			0.997				
Satd. Flow (prot)	0	1231	0	0	1409	0	0	1604	0	0	1791	0
Flt Permitted		0.997			0.995			0.997				
Satd. Flow (perm)	0	1231	0	0	1409	0	0	1604	0	0	1791	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		595.9			772.9			869.3			905.4	
Travel Time (s)		42.9			55.6			62.6			65.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	50%	43%	0%	38%	0%	67%	15%	0%	0%	2%	67%
Adj. Flow (vph)	1	7	8	1	9	0	3	45	3	0	55	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	0	0	10	0	0	51	0	0	58	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 14.8%

ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
1: Komoka Road & Melrose Drive

Existing AM Peak Hour
9904 Oxbow Drive

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	1	6	7	1	8	0	3	41	3	0	51	3
Future Volume (Veh/h)	1	6	7	1	8	0	3	41	3	0	51	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	7	8	1	9	0	3	45	3	0	55	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	114	110	56	120	110	46	58			48		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	114	110	56	120	110	46	58			48		
tC, single (s)	7.1	7.0	6.6	7.1	6.9	6.2	4.8			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.5	3.7	3.5	4.3	3.3	2.8			2.2		
p0 queue free %	100	99	99	100	99	100	100			100		
cM capacity (veh/h)	859	696	906	844	715	1029	1216			1572		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	16	10	51	58								
Volume Left	1	1	3	0								
Volume Right	8	0	3	3								
cSH	798	726	1216	1572								
Volume to Capacity	0.02	0.01	0.00	0.00								
Queue Length 95th (m)	0.5	0.3	0.1	0.0								
Control Delay (s)	9.6	10.0	0.5	0.0								
Lane LOS	A	B	A									
Approach Delay (s)	9.6	10.0	0.5	0.0								
Approach LOS	A	B										

Intersection Summary

Average Delay 2.1

Intersection Capacity Utilization 14.8%

ICU Level of Service A

Analysis Period (min) 15

Lanes, Volumes, Timings
2: Komoka Road & Union Avenue

Existing AM Peak Hour
9904 Oxbow Drive

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	21	4	45	11	2	63
Future Volume (vph)	21	4	45	11	2	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.980		0.973			
Flt Protected	0.959					0.999
Satd. Flow (prot)	1663	0	1671	0	0	1738
Flt Permitted	0.959					0.999
Satd. Flow (perm)	1663	0	1671	0	0	1738
Link Speed (k/h)	50		50			50
Link Distance (m)	295.1		489.1			869.3
Travel Time (s)	21.2		35.2			62.6
Confl. Peds. (#/hr)				1	1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	50%	11%	9%	50%	8%
Adj. Flow (vph)	23	4	49	12	2	68
Shared Lane Traffic (%)						
Lane Group Flow (vph)	27	0	61	0	0	70
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	14.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
2: Komoka Road & Union Avenue

Existing AM Peak Hour
9904 Oxbow Drive

	WBL	WBR	NBT	NBR	SBL	SBT
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	W	W	W	W
Traffic Volume (veh/h)	21	4	45	11	2	63
Future Volume (Veh/h)	21	4	45	11	2	63
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	4	49	12	2	68
Pedestrians	1					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type		None			None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	128	56			62	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	128	56			62	
tC, single (s)	6.4	6.7			4.6	
tC, 2 stage (s)						
tF (s)	3.5	3.8			2.7	
p0 queue free %	97	100			100	
cM capacity (veh/h)	869	890			1283	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	27	61	70			
Volume Left	23	0	2			
Volume Right	4	12	0			
cSH	872	1700	1283			
Volume to Capacity	0.03	0.04	0.00			
Queue Length 95th (m)	0.8	0.0	0.0			
Control Delay (s)	9.3	0.0	0.2			
Lane LOS	A		A			
Approach Delay (s)	9.3	0.0	0.2			
Approach LOS	A					
Intersection Summary						
Average Delay		1.7				
Intersection Capacity Utilization		14.9%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings
3: Komoka Road & Oxbow Drive

Existing AM Peak Hour
9904 Oxbow Drive

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	31	30	41	21	6	15	52	64	10	74	6
Future Volume (vph)	1	31	30	41	21	6	15	52	64	10	74	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.934			0.987			0.934			0.990	
Flt Protected		0.999			0.971			0.994			0.994	
Satd. Flow (prot)	0	1567	0	0	1668	0	0	1602	0	0	1771	0
Flt Permitted		0.999			0.971			0.994			0.994	
Satd. Flow (perm)	0	1567	0	0	1668	0	0	1602	0	0	1771	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		423.7			343.2			1366.1			489.1	
Travel Time (s)		30.5			24.7			98.4			35.2	
Confl. Peds. (#/hr)			1	1					1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	27%	5%	5%	50%	40%	8%	5%	10%	4%	17%
Adj. Flow (vph)	1	34	33	45	23	7	16	57	70	11	80	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	68	0	0	75	0	0	143	0	0	98	0
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	27.3%					ICU Level of Service A						
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
3: Komoka Road & Oxbow Drive

Existing AM Peak Hour
9904 Oxbow Drive

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	1	31	30	41	21	6	15	52	64	10	74	6
Future Volume (Veh/h)	1	31	30	41	21	6	15	52	64	10	74	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	34	33	45	23	7	16	57	70	11	80	7
Pedestrians					1			1				
Lane Width (m)					3.6			3.6				
Walking Speed (m/s)					1.2			1.2				
Percent Blockage					0			0				
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	248	266	84	282	234	93	87			128		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	248	266	84	282	234	93	87			128		
tC, single (s)	7.1	6.5	6.5	7.1	6.5	6.7	4.5			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.5	3.5	4.0	3.8	2.6			2.3		
p0 queue free %	100	95	96	93	96	99	99			99		
cM capacity (veh/h)	674	630	909	604	647	846	1301			1409		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	68	75	143	98								
Volume Left	1	45	16	11								
Volume Right	33	7	70	7								
cSH	741	634	1301	1409								
Volume to Capacity	0.09	0.12	0.01	0.01								
Queue Length 95th (m)	2.4	3.2	0.3	0.2								
Control Delay (s)	10.3	11.4	1.0	0.9								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.3	11.4	1.0	0.9								
Approach LOS	B	B										
Intersection Summary												
Average Delay			4.7									
Intersection Capacity Utilization			27.3%									
Analysis Period (min)			15									

Lanes, Volumes, Timings
4: Komoka Road & Glendon Drive

Existing AM Peak Hour
9904 Oxbow Drive

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰
Traffic Volume (vph)	76	498	16	60	340	37	32	34	95	86	36	89
Future Volume (vph)	76	498	16	60	340	37	32	34	95	86	36	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	40.0		50.0	25.0		0.0	25.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5		7.5			7.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995				0.850		0.890			0.893	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1817	0	1641	1827	1357	1597	1532	0	1703	1601	0
Flt Permitted	0.510			0.361			0.670			0.668		
Satd. Flow (perm)	850	1817	0	624	1827	1357	1127	1532	0	1197	1601	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				42		103			97	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		986.8			1182.6			612.4			1366.1	
Travel Time (s)		71.0			85.1			44.1			98.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	4%	6%	10%	4%	19%	13%	3%	13%	6%	6%	6%
Adj. Flow (vph)	83	541	17	65	370	40	35	37	103	93	39	97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	83	558	0	65	370	40	35	140	0	93	136	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		20.0	20.0	20.0	15.0	15.0		15.0	15.0	
Minimum Split (s)	26.0	26.0		26.0	26.0	26.0	21.0	21.0		21.0	21.0	
Total Split (s)	51.0	51.0		51.0	51.0	51.0	27.0	27.0		27.0	27.0	
Total Split (%)	65.4%	65.4%		65.4%	65.4%	65.4%	34.6%	34.6%		34.6%	34.6%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Ped	Ped		Ped	Ped	Ped	None	None		None	None	
Act Effct Green (s)	28.6	28.6		28.6	28.6	28.6	17.2	17.2		17.2	17.2	
Actuated g/C Ratio	0.60	0.60		0.60	0.60	0.60	0.36	0.36		0.36	0.36	
v/c Ratio	0.16	0.51		0.17	0.34	0.05	0.09	0.23		0.22	0.21	
Control Delay	7.9	10.4		8.4	8.4	2.5	13.0	6.4		14.2	6.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	7.9	10.4		8.4	8.4	2.5	13.0	6.4		14.2	6.5	
LOS	A	B		A	A	A	B	A		B	A	
Approach Delay		10.1			7.9			7.7			9.6	
Approach LOS		B			A			A			A	
Queue Length 50th (m)	3.9	33.8		3.1	19.6	0.0	1.9	2.0		5.4	2.1	

Lanes, Volumes, Timings
4: Komoka Road & Glendon Drive

Existing AM Peak Hour
9904 Oxbow Drive

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)	10.0	57.9		8.7	34.5	3.1	8.1	13.2		17.2	13.3	
Internal Link Dist (m)		962.8			1158.6			588.4			1342.1	
Turn Bay Length (m)	30.0			40.0		50.0	25.0			25.0		
Base Capacity (vph)	815	1743		598	1752	1303	545	794		579	824	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.10	0.32		0.11	0.21	0.03	0.06	0.18		0.16	0.17	

Intersection Summary

Area Type: Other

Cycle Length: 78

Actuated Cycle Length: 48

Natural Cycle: 50

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.51

Intersection Signal Delay: 9.1

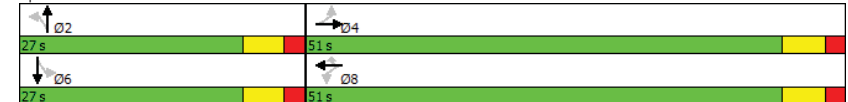
Intersection LOS: A

Intersection Capacity Utilization 82.2%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 4: Komoka Road & Glendon Drive



Lanes, Volumes, Timings
1: Komoka Road & Melrose Drive

Existing PM Peak Hour
9904 Oxbow Drive TIS

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1	3	1	5	2	5	64	7	0	58	1
Future Volume (vph)	1	1	3	1	5	2	5	64	7	0	58	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	0.919			0.966			0.987			0.998		
Flt Protected	0.990			0.994			0.997					
Satd. Flow (prot)	0	1079	0	0	1460	0	0	1732	0	0	1726	0
Flt Permitted	0.990			0.994			0.997					
Satd. Flow (perm)	0	1079	0	0	1460	0	0	1732	0	0	1726	0
Link Speed (k/h)	50			50			50			50		
Link Distance (m)	595.9			772.9			869.3			905.4		
Travel Time (s)	42.9			55.6			62.6			65.2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	100%	67%	0%	20%	50%	20%	8%	0%	0%	10%	0%
Adj. Flow (vph)	1	1	3	1	5	2	5	70	8	0	63	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	5	0	0	8	0	0	83	0	0	64	0
Sign Control	Stop			Stop			Free			Free		

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 18.0%

ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
1: Komoka Road & Melrose Drive

Existing PM Peak Hour
9904 Oxbow Drive TIS

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	3	1	5	2	5	64	7	0	58	1
Future Volume (Veh/h)	1	1	3	1	5	2	5	64	7	0	58	1
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1	3	1	5	2	5	70	8	0	63	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	152	152	64	151	148	74	64			78		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	152	152	64	151	148	74	64			78		
tC, single (s)	7.1	7.5	6.9	7.1	6.7	6.7	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.9	3.9	3.5	4.2	3.8	2.4			2.2		
p0 queue free %	100	100	100	100	99	100	100			100		
cM capacity (veh/h)	811	591	846	815	709	869	1431			1533		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	5	8	83	64								
Volume Left	1	1	5	0								
Volume Right	3	2	8	1								
cSH	772	756	1431	1533								
Volume to Capacity	0.01	0.01	0.00	0.00								
Queue Length 95th (m)	0.2	0.3	0.1	0.0								
Control Delay (s)	9.7	9.8	0.5	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	9.7	9.8	0.5	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			18.0%				ICU Level of Service			A		
Analysis Period (min)			15									

Lanes, Volumes, Timings
2: Komoka Road & Union Avenue

Existing PM Peak Hour
9904 Oxbow Drive TIS

	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	T	T
Traffic Volume (vph)	19	7	74	18	2	62
Future Volume (vph)	19	7	74	18	2	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.963		0.973			
Flt Protected	0.965				0.999	
Satd. Flow (prot)	1704	0	1712	0	0	1693
Flt Permitted	0.965				0.999	
Satd. Flow (perm)	1704	0	1712	0	0	1693
Link Speed (k/h)	50		50			50
Link Distance (m)	295.1		489.1			869.3
Travel Time (s)	21.2		35.2			62.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	0%	10%	0%	50%	11%
Adj. Flow (vph)	21	8	80	20	2	67
Shared Lane Traffic (%)						
Lane Group Flow (vph)	29	0	100	0	0	69
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 15.0%	ICU Level of Service A					
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis
2: Komoka Road & Union Avenue

Existing PM Peak Hour
9904 Oxbow Drive TIS

	WBL	WBR	NBT	NBR	SBL	SBT
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	T	T
Traffic Volume (veh/h)	19	7	74	18	2	62
Future Volume (Veh/h)	19	7	74	18	2	62
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	8	80	20	2	67
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	161	90			100	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	161	90			100	
tC, single (s)	6.4	6.2			4.6	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.7	
p0 queue free %	97	99			100	
cM capacity (veh/h)	822	973			1240	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	29	100	69			
Volume Left	21	0	2			
Volume Right	8	20	0			
cSH	859	1700	1240			
Volume to Capacity	0.03	0.06	0.00			
Queue Length 95th (m)	0.8	0.0	0.0			
Control Delay (s)	9.3	0.0	0.2			
Lane LOS	A		A			
Approach Delay (s)	9.3	0.0	0.2			
Approach LOS	A					
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization			15.0%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings
3: Komoka Road & Oxbow Drive

Existing PM Peak Hour
9904 Oxbow Drive TIS

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	5	25	26	66	46	11	21	90	39	4	72	6
Future Volume (vph)	5	25	26	66	46	11	21	90	39	4	72	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.937			0.988			0.965			0.989	
Flt Protected		0.996			0.974			0.993			0.998	
Satd. Flow (prot)	0	1682	0	0	1785	0	0	1732	0	0	1703	0
Flt Permitted		0.996			0.974			0.993			0.998	
Satd. Flow (perm)	0	1682	0	0	1785	0	0	1732	0	0	1703	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		423.7			343.2			1366.1			489.1	
Travel Time (s)		30.5			24.7			98.4			35.2	
Confl. Peds. (#/hr)								5	5			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	20%	0%	8%	3%	0%	9%	10%	4%	5%	0%	10%	17%
Adj. Flow (vph)	5	27	28	72	50	12	23	98	42	4	78	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	60	0	0	134	0	0	163	0	0	89	0
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	35.2%											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
3: Komoka Road & Oxbow Drive

Existing PM Peak Hour
9904 Oxbow Drive TIS

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	5	25	26	66	46	11	21	90	39	4	72	6
Future Volume (Veh/h)	5	25	26	66	46	11	21	90	39	4	72	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	27	28	72	50	12	23	98	42	4	78	7
Pedestrians					5							
Lane Width (m)					3.6							
Walking Speed (m/s)					1.2							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	292	280	82	301	263	124	85			145		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	292	280	82	301	263	124	85			145		
tC, single (s)	7.3	6.5	6.3	7.1	6.5	6.3	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.0	3.4	3.5	4.0	3.4	2.3			2.2		
p0 queue free %	99	96	97	88	92	99	98			100		
cM capacity (veh/h)	571	617	962	596	631	904	1462			1444		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	60	134	163	89								
Volume Left	5	72	23	4								
Volume Right	28	12	42	7								
cSH	735	628	1462	1444								
Volume to Capacity	0.08	0.21	0.02	0.00								
Queue Length 95th (m)	2.1	6.4	0.4	0.1								
Control Delay (s)	10.3	12.3	1.2	0.4								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.3	12.3	1.2	0.4								
Approach LOS	B	B										
Intersection Summary												
Average Delay			5.6									
Intersection Capacity Utilization			35.2%				ICU Level of Service			A		
Analysis Period (min)			15									

Lanes, Volumes, Timings
4: Komoka Road & Glendon Drive

Existing PM Peak Hour
9904 Oxbow Drive TIS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	52	447	29	91	580	103	37	71	88	74	61	86
Future Volume (vph)	52	447	29	91	580	103	37	71	88	74	61	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	40.0		50.0	25.0		0.0	25.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5		7.5			7.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.991				0.850		0.917			0.912	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1828	0	1770	1863	1615	1805	1674	0	1805	1645	0
Flt Permitted	0.283			0.370			0.656			0.648		
Satd. Flow (perm)	517	1828	0	689	1863	1615	1246	1674	0	1231	1645	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8				112		82			92	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		986.8			1182.6			612.4			1366.1	
Travel Time (s)		71.0			85.1			44.1			98.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	3%	3%	2%	2%	0%	0%	3%	5%	0%	10%	2%
Adj. Flow (vph)	57	486	32	99	630	112	40	77	96	80	66	93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	518	0	99	630	112	40	173	0	80	159	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		20.0	20.0	20.0	15.0	15.0		15.0	15.0	
Minimum Split (s)	26.0	26.0		26.0	26.0	26.0	21.0	21.0		21.0	21.0	
Total Split (s)	51.0	51.0		51.0	51.0	51.0	27.0	27.0		27.0	27.0	
Total Split (%)	65.4%	65.4%		65.4%	65.4%	65.4%	34.6%	34.6%		34.6%	34.6%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Ped	Ped		Ped	Ped	Ped	None	None		None	None	
Act Effct Green (s)	28.5	28.5		28.5	28.5	28.5	17.2	17.2		17.2	17.2	
Actuated g/C Ratio	0.53	0.53		0.53	0.53	0.53	0.32	0.32		0.32	0.32	
v/c Ratio	0.21	0.53		0.27	0.64	0.12	0.10	0.29		0.20	0.27	
Control Delay	8.8	10.4		9.2	12.4	1.8	14.7	9.7		15.7	8.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	8.8	10.4		9.2	12.4	1.8	14.7	9.7		15.7	8.5	
LOS	A	B		A	B	A	B	A		B	A	
Approach Delay		10.3			10.6			10.6			10.9	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	2.7	30.0		4.9	40.3	0.0	2.4	5.5		4.9	4.0	

Synchro 9 Report
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Paradigm Transportation Solutions Limited

Lanes, Volumes, Timings
4: Komoka Road & Glendon Drive

Existing PM Peak Hour
9904 Oxbow Drive TIS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)	8.0	50.4		12.2	66.7	5.0	9.8	21.4		16.9	18.3	
Internal Link Dist (m)		962.8			1158.6			588.4			1342.1	
Turn Bay Length (m)	30.0			40.0		50.0	25.0			25.0		
Base Capacity (vph)	457	1616		608	1646	1440	538	770		532	763	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.12	0.32		0.16	0.38	0.08	0.07	0.22		0.15	0.21	

Intersection Summary												
Area Type:	Other											
Cycle Length:	78											
Actuated Cycle Length:	53.8											
Natural Cycle:	50											
Control Type:	Actuated-Uncoordinated											
Maximum v/c Ratio:	0.64											
Intersection Signal Delay:	10.6											
Intersection Capacity Utilization	85.5%											
ICU Level of Service	E											
Analysis Period (min)	15											

Splits and Phases: 4: Komoka Road & Glendon Drive

↖ Ø2	↗ Ø4
27 s	51 s
↘ Ø6	↙ Ø8
27 s	51 s

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Synchro 9 Report
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Appendix C

Synchro 2023 Background Traffic Operations Reports



Lanes, Volumes, Timings
1: Komoka Road & Melrose Drive

2023 Background AM Peak Hour
9904 Oxbow Drive

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	7	8	1	9	0	3	45	3	0	56	3
Future Volume (vph)	1	7	8	1	9	0	3	45	3	0	56	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.932						0.993			0.994	
Flt Protected		0.997			0.995			0.997				
Satd. Flow (prot)	0	1228	0	0	1405	0	0	1607	0	0	1798	0
Flt Permitted		0.997			0.995			0.997				
Satd. Flow (perm)	0	1228	0	0	1405	0	0	1607	0	0	1798	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		595.9			772.9			869.3			905.4	
Travel Time (s)		42.9			55.6			62.6			65.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	50%	43%	0%	38%	0%	67%	15%	0%	0%	2%	67%
Adj. Flow (vph)	1	8	9	1	10	0	3	49	3	0	61	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	18	0	0	11	0	0	55	0	0	64	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 15.0%

ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
1: Komoka Road & Melrose Drive

2023 Background AM Peak Hour
9904 Oxbow Drive

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	7	8	1	9	0	3	45	3	0	56	3
Future Volume (Veh/h)	1	7	8	1	9	0	3	45	3	0	56	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	8	9	1	10	0	3	49	3	0	61	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	124	120	62	132	120	50	64			52		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	124	120	62	132	120	50	64			52		
tC, single (s)	7.1	7.0	6.6	7.1	6.9	6.2	4.8			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.5	3.7	3.5	4.3	3.3	2.8			2.2		
p0 queue free %	100	99	99	100	99	100	100			100		
cM capacity (veh/h)	844	687	898	827	706	1023	1210			1567		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	18	11	55	64
Volume Left	1	1	3	0
Volume Right	9	0	3	3
cSH	788	715	1210	1567
Volume to Capacity	0.02	0.02	0.00	0.00
Queue Length 95th (m)	0.6	0.4	0.1	0.0
Control Delay (s)	9.7	10.1	0.5	0.0
Lane LOS	A	B	A	
Approach Delay (s)	9.7	10.1	0.5	0.0
Approach LOS	A	B		

Intersection Summary

Average Delay	2.1
Intersection Capacity Utilization	15.0%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings
2: Komoka Road & Union Avenue

2023 Background AM Peak Hour
9904 Oxbow Drive

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	23	4	50	12	2	70
Future Volume (vph)	23	4	50	12	2	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.981		0.974			
Flt Protected	0.959					0.999
Satd. Flow (prot)	1672	0	1673	0	0	1740
Flt Permitted	0.959					0.999
Satd. Flow (perm)	1672	0	1673	0	0	1740
Link Speed (k/h)	50		50			50
Link Distance (m)	295.1		489.1			869.3
Travel Time (s)	21.2		35.2			62.6
Confl. Peds. (#/hr)				1	1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	50%	11%	9%	50%	8%
Adj. Flow (vph)	25	4	54	13	2	76
Shared Lane Traffic (%)						
Lane Group Flow (vph)	29	0	67	0	0	78
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	15.3%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
2: Komoka Road & Union Avenue

2023 Background AM Peak Hour
9904 Oxbow Drive

	WBL	WBR	NBT	NBR	SBL	SBT
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	R	L	T
Traffic Volume (veh/h)	23	4	50	12	2	70
Future Volume (Veh/h)	23	4	50	12	2	70
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	4	54	13	2	76
Pedestrians	1					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type		None			None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	142	62			68	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	142	62			68	
tC, single (s)	6.4	6.7			4.6	
tC, 2 stage (s)						
tF (s)	3.5	3.8			2.7	
p0 queue free %	97	100			100	
cM capacity (veh/h)	854	883			1276	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	29	67	78			
Volume Left	25	0	2			
Volume Right	4	13	0			
cSH	858	1700	1276			
Volume to Capacity	0.03	0.04	0.00			
Queue Length 95th (m)	0.8	0.0	0.0			
Control Delay (s)	9.3	0.0	0.2			
Lane LOS	A		A			
Approach Delay (s)	9.3	0.0	0.2			
Approach LOS	A					
Intersection Summary						
Average Delay		1.7				
Intersection Capacity Utilization		15.3%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings
3: Komoka Road & Oxbow Drive

2023 Background AM Peak Hour
9904 Oxbow Drive

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	34	33	45	23	7	17	57	71	11	82	7
Future Volume (vph)	1	34	33	45	23	7	17	57	71	11	82	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.934			0.987			0.934			0.990	
Flt Protected		0.999			0.971			0.994			0.995	
Satd. Flow (prot)	0	1567	0	0	1665	0	0	1601	0	0	1772	0
Flt Permitted		0.999			0.971			0.994			0.995	
Satd. Flow (perm)	0	1567	0	0	1665	0	0	1601	0	0	1772	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		423.7			343.2			1366.1			489.1	
Travel Time (s)		30.5			24.7			98.4			35.2	
Confl. Peds. (#/hr)			1	1					1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	27%	5%	5%	50%	40%	8%	5%	10%	4%	17%
Adj. Flow (vph)	1	37	36	49	25	8	18	62	77	12	89	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	74	0	0	82	0	0	157	0	0	109	0
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	28.8%											
Analysis Period (min)	15											
ICU Level of Service A												

HCM Unsignalized Intersection Capacity Analysis
3: Komoka Road & Oxbow Drive

2023 Background AM Peak Hour
9904 Oxbow Drive

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	1	34	33	45	23	7	17	57	71	11	82	7
Future Volume (Veh/h)	1	34	33	45	23	7	17	57	71	11	82	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	37	36	49	25	8	18	62	77	12	89	8
Pedestrians					1			1				
Lane Width (m)					3.6			3.6				
Walking Speed (m/s)					1.2			1.2				
Percent Blockage					0			0				
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	274	293	94	310	258	102	97			140		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	274	293	94	310	258	102	97			140		
tC, single (s)	7.1	6.5	6.5	7.1	6.5	6.7	4.5			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.5	3.5	4.0	3.8	2.6			2.3		
p0 queue free %	100	94	96	91	96	99	99			99		
cM capacity (veh/h)	644	607	898	571	626	837	1289			1394		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	74	82	157	109								
Volume Left	1	49	18	12								
Volume Right	36	8	77	8								
cSH	721	606	1289	1394								
Volume to Capacity	0.10	0.14	0.01	0.01								
Queue Length 95th (m)	2.7	3.7	0.3	0.2								
Control Delay (s)	10.6	11.9	1.0	0.9								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.6	11.9	1.0	0.9								
Approach LOS	B	B										
Intersection Summary												
Average Delay			4.8									
Intersection Capacity Utilization			28.8%									
Analysis Period (min)			15									
ICU Level of Service A												

Lanes, Volumes, Timings
4: Komoka Road & Glendon Drive

2023 Background AM Peak Hour
9904 Oxbow Drive

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰
Traffic Volume (vph)	84	630	18	66	487	41	35	38	105	95	40	98
Future Volume (vph)	84	630	18	66	487	41	35	38	105	95	40	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	40.0			50.0	25.0		0.0	25.0	0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996				0.850		0.890			0.893	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1819	0	1641	1827	1357	1597	1532	0	1703	1601	0
Flt Permitted	0.368			0.239			0.662			0.659		
Satd. Flow (perm)	613	1819	0	413	1827	1357	1113	1532	0	1181	1601	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				45		114			107	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		986.8			1182.6			612.4			1366.1	
Travel Time (s)		71.0			85.1			44.1			98.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	4%	6%	10%	4%	19%	13%	3%	13%	6%	6%	6%
Adj. Flow (vph)	91	685	20	72	529	45	38	41	114	103	43	107
Shared Lane Traffic (%)												
Lane Group Flow (vph)	91	705	0	72	529	45	38	155	0	103	150	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		20.0	20.0	20.0	15.0	15.0		15.0	15.0	
Minimum Split (s)	26.0	26.0		26.0	26.0	26.0	21.0	21.0		21.0	21.0	
Total Split (s)	51.0	51.0		51.0	51.0	51.0	27.0	27.0		27.0	27.0	
Total Split (%)	65.4%	65.4%		65.4%	65.4%	65.4%	34.6%	34.6%		34.6%	34.6%	
Maximum Green (s)	45.0	45.0		45.0	45.0	45.0	21.0	21.0		21.0	21.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Ped	Ped		Ped	Ped	Ped	None	None		None	None	
Walk Time (s)	3.0	3.0		3.0	3.0	3.0	8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0		0	0	
Act Effct Green (s)	31.7	31.7		31.7	31.7	31.7	17.8	17.8		17.8	17.8	
Actuated g/C Ratio	0.55	0.55		0.55	0.55	0.55	0.31	0.31		0.31	0.31	
v/c Ratio	0.27	0.70		0.32	0.53	0.06	0.11	0.28		0.28	0.26	
Control Delay	9.2	13.9		11.5	10.3	2.2	17.2	8.0		19.0	8.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	

Lanes, Volumes, Timings
4: Komoka Road & Glendon Drive

2023 Background AM Peak Hour
9904 Oxbow Drive

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	9.2	13.9		11.5	10.3	2.2	17.2	8.0		19.0	8.1	
LOS	A	B		B	B	A	B	A		B	A	
Approach Delay		13.4			9.9			9.8			12.5	
Approach LOS		B			A			A			B	
Queue Length 50th (m)	4.5	48.3		3.7	31.5	0.0	2.5	2.7		7.3	2.9	
Queue Length 95th (m)	12.6	88.3		11.9	57.0	3.4	11.0	17.7		24.3	17.6	
Internal Link Dist (m)		962.8			1158.6			588.4			1342.1	
Turn Bay Length (m)	30.0			40.0		50.0	25.0			25.0		
Base Capacity (vph)	510	1513		343	1520	1136	453	691		480	715	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.18	0.47		0.21	0.35	0.04	0.08	0.22		0.21	0.21	

Intersection Summary

Area Type: Other

Cycle Length: 78

Actuated Cycle Length: 57.6

Natural Cycle: 55

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 11.7

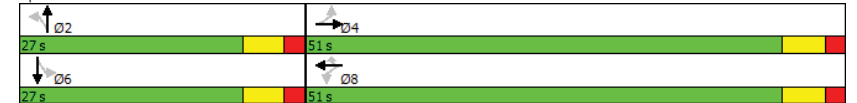
Intersection LOS: B

Intersection Capacity Utilization 89.2%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 4: Komoka Road & Glendon Drive



Lanes, Volumes, Timings
1: Komoka Road & Melrose Drive

2023 Background PM Peak Hour
9904 Oxbow Drive TIS

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1	3	1	6	2	6	71	8	0	64	1
Future Volume (vph)	1	1	3	1	6	2	6	71	8	0	64	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	0.919				0.973			0.987			0.998	
Flt Protected	0.990				0.995			0.996				
Satd. Flow (prot)	0	1079	0	0	1483	0	0	1727	0	0	1726	0
Flt Permitted	0.990				0.995			0.996				
Satd. Flow (perm)	0	1079	0	0	1483	0	0	1727	0	0	1726	0
Link Speed (k/h)	50				50			50			50	
Link Distance (m)	595.9				772.9			869.3			905.4	
Travel Time (s)	42.9				55.6			62.6			65.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	100%	67%	0%	20%	50%	20%	8%	0%	0%	10%	0%
Adj. Flow (vph)	1	1	3	1	7	2	7	77	9	0	70	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	5	0	0	10	0	0	93	0	0	71	0
Sign Control	Stop			Stop				Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 19.2%
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
1: Komoka Road & Melrose Drive

2023 Background PM Peak Hour
9904 Oxbow Drive TIS

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	3	1	6	2	6	71	8	0	64	1
Future Volume (Veh/h)	1	1	3	1	6	2	6	71	8	0	64	1
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1	3	1	7	2	7	77	9	0	70	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	172	170	70	170	166	82	71			86		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	172	170	70	170	166	82	71			86		
tC, single (s)	7.1	7.5	6.9	7.1	6.7	6.7	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.9	3.9	3.5	4.2	3.8	2.4			2.2		
p0 queue free %	100	100	100	100	99	100	100			100		
cM capacity (veh/h)	785	574	837	792	691	860	1422			1523		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	10	93	71
Volume Left	1	1	7	0
Volume Right	3	2	9	1
cSH	758	729	1422	1523
Volume to Capacity	0.01	0.01	0.00	0.00
Queue Length 95th (m)	0.2	0.3	0.1	0.0
Control Delay (s)	9.8	10.0	0.6	0.0
Lane LOS	A	B	A	
Approach Delay (s)	9.8	10.0	0.6	0.0
Approach LOS	A	B		

Intersection Summary

Average Delay 1.1
Intersection Capacity Utilization 19.2%
Analysis Period (min) 15

Lanes, Volumes, Timings
2: Komoka Road & Union Avenue

2023 Background PM Peak Hour
9904 Oxbow Drive TIS

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	21	8	82	20	2	68
Future Volume (vph)	21	8	82	20	2	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.962		0.973			
Flt Protected	0.965					0.999
Satd. Flow (prot)	1703	0	1711	0	0	1694
Flt Permitted	0.965					0.999
Satd. Flow (perm)	1703	0	1711	0	0	1694
Link Speed (k/h)	50		50			50
Link Distance (m)	295.1		489.1			869.3
Travel Time (s)	21.2		35.2			62.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	0%	10%	0%	50%	11%
Adj. Flow (vph)	23	9	89	22	2	74
Shared Lane Traffic (%)						
Lane Group Flow (vph)	32	0	111	0	0	76
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	15.5%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
2: Komoka Road & Union Avenue

2023 Background PM Peak Hour
9904 Oxbow Drive TIS

	WBL	WBR	NBT	NBR	SBL	SBT
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	T	T
Traffic Volume (veh/h)	21	8	82	20	2	68
Future Volume (Veh/h)	21	8	82	20	2	68
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	9	89	22	2	74
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None		None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	178	100			111	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	178	100			111	
tC, single (s)	6.4	6.2			4.6	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.7	
p0 queue free %	97	99			100	
cM capacity (veh/h)	803	961			1228	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	32	111	76			
Volume Left	23	0	2			
Volume Right	9	22	0			
cSH	842	1700	1228			
Volume to Capacity	0.04	0.07	0.00			
Queue Length 95th (m)	0.9	0.0	0.0			
Control Delay (s)	9.4	0.0	0.2			
Lane LOS	A		A			
Approach Delay (s)	9.4	0.0	0.2			
Approach LOS	A					
Intersection Summary						
Average Delay		1.5				
Intersection Capacity Utilization		15.5%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings
3: Komoka Road & Oxbow Drive

2023 Background PM Peak Hour
9904 Oxbow Drive TIS

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	6	28	29	73	51	12	23	99	43	4	79	7
Future Volume (vph)	6	28	29	73	51	12	23	99	43	4	79	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.937			0.988			0.965			0.989	
Flt Protected		0.995			0.974			0.993			0.998	
Satd. Flow (prot)	0	1675	0	0	1785	0	0	1732	0	0	1702	0
Flt Permitted		0.995			0.974			0.993			0.998	
Satd. Flow (perm)	0	1675	0	0	1785	0	0	1732	0	0	1702	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		423.7			343.2			1366.1			489.1	
Travel Time (s)		30.5			24.7			98.4			35.2	
Confl. Peds. (#/hr)								5	5			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	20%	0%	8%	3%	0%	9%	10%	4%	5%	0%	10%	17%
Adj. Flow (vph)	7	30	32	79	55	13	25	108	47	4	86	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	69	0	0	147	0	0	180	0	0	98	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 36.7%
ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
3: Komoka Road & Oxbow Drive

2023 Background PM Peak Hour
9904 Oxbow Drive TIS

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	6	28	29	73	51	12	23	99	43	4	79	7
Future Volume (Veh/h)	6	28	29	73	51	12	23	99	43	4	79	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	30	32	79	55	13	25	108	47	4	86	8
Pedestrians					5							
Lane Width (m)					3.6							
Walking Speed (m/s)					1.2							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	320	308	90	332	288	136	94			160		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	320	308	90	332	288	136	94			160		
tC, single (s)	7.3	6.5	6.3	7.1	6.5	6.3	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.0	3.4	3.5	4.0	3.4	2.3			2.2		
p0 queue free %	99	95	97	86	91	99	98			100		
cM capacity (veh/h)	540	595	951	563	610	890	1451			1426		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	69	147	180	98								
Volume Left	7	79	25	4								
Volume Right	32	13	47	8								
cSH	711	600	1451	1426								
Volume to Capacity	0.10	0.25	0.02	0.00								
Queue Length 95th (m)	2.6	7.7	0.4	0.1								
Control Delay (s)	10.6	12.9	1.2	0.3								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.6	12.9	1.2	0.3								
Approach LOS	B	B										

Intersection Summary

Average Delay 5.8
Intersection Capacity Utilization 36.7% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
4: Komoka Road & Glendon Drive

2023 Background PM Peak Hour
9904 Oxbow Drive TIS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	57	680	32	100	799	114	41	78	97	82	67	95
Future Volume (vph)	57	680	32	100	799	114	41	78	97	82	67	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	40.0		50.0	25.0		0.0	25.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5		7.5			7.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993				0.850		0.917			0.912	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1832	0	1770	1863	1615	1805	1674	0	1805	1645	0
Flt Permitted	0.156			0.217			0.616			0.592		
Satd. Flow (perm)	285	1832	0	404	1863	1615	1170	1674	0	1125	1645	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				120		81			92	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		986.8			1182.6			612.4			1366.1	
Travel Time (s)		71.0			85.1			44.1			98.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	3%	3%	2%	2%	0%	0%	3%	5%	0%	10%	2%
Adj. Flow (vph)	62	739	35	109	868	124	45	85	105	89	73	103
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	774	0	109	868	124	45	190	0	89	176	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		20.0	20.0	20.0	15.0	15.0		15.0	15.0	
Minimum Split (s)	26.0	26.0		26.0	26.0	26.0	21.0	21.0		21.0	21.0	
Total Split (s)	51.0	51.0		51.0	51.0	51.0	27.0	27.0		27.0	27.0	
Total Split (%)	65.4%	65.4%		65.4%	65.4%	65.4%	34.6%	34.6%		34.6%	34.6%	
Maximum Green (s)	45.0	45.0		45.0	45.0	45.0	21.0	21.0		21.0	21.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Ped	Ped		Ped	Ped	Ped	None	None		None	None	
Walk Time (s)	3.0	3.0		3.0	3.0	3.0	8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0		0	0	
Act Effct Green (s)	36.6	36.6		36.6	36.6	36.6	17.5	17.5		17.5	17.5	
Actuated g/C Ratio	0.59	0.59		0.59	0.59	0.59	0.28	0.28		0.28	0.28	
v/c Ratio	0.37	0.72		0.46	0.79	0.12	0.14	0.36		0.28	0.33	
Control Delay	13.9	13.3		14.4	16.1	1.6	20.9	14.3		22.9	12.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	

Lanes, Volumes, Timings
4: Komoka Road & Glendon Drive

2023 Background PM Peak Hour
9904 Oxbow Drive TIS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	13.9	13.3		14.4	16.1	1.6	20.9	14.3		22.9	12.6	
LOS	B	B		B	B	A	C	B		C	B	
Approach Delay		13.3			14.3			15.6			16.1	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	3.4	56.0		6.3	68.8	0.2	3.9	9.6		8.0	7.3	
Queue Length 95th (m)	12.3	97.0		19.3	119.3	5.2	13.2	29.9		23.1	25.6	
Internal Link Dist (m)		962.8			1158.6			588.4			1342.1	
Turn Bay Length (m)	30.0			40.0		50.0	25.0			25.0		
Base Capacity (vph)	218	1405		309	1427	1265	438	678		421	674	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.28	0.55		0.35	0.61	0.10	0.10	0.28		0.21	0.26	

Intersection Summary

Area Type: Other

Cycle Length: 78

Actuated Cycle Length: 62.2

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 14.3

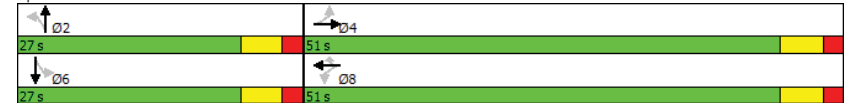
Intersection LOS: B

Intersection Capacity Utilization 97.1%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 4: Komoka Road & Glendon Drive



Appendix D

Arcady Traffic Operations Reports



Junctions 8
ARCADY 8 - Roundabout Module
Version: 8.0.6.541 [19821,26/11/2015] © Copyright TRL Limited, 2019
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Filename: Glendon & Komoka.arc8

Path: C:\Users\AdamMorrison\Paradigm\Projects - 180218 9904 Oxbow Drive\C5 - Analysis and Evaluation\Arcady

Report generation date: 2019-04-22 10:52:49 AM

Summary of intersection performance

	AM							PM						
	Queue (Veh)	95% Queue (Veh)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS	Queue (Veh)	95% Queue (Veh)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
	A1 - 2023 Background													
Leg North	0.37	~1	5.25	0.27	A	3.29	A	0.57	1.00	7.30	0.36	A	3.76	A
Leg West	0.60	1.00	2.67	0.37	A			0.64	1.00	2.72	0.39	A		
Leg South	0.33	~1	6.18	0.25	A			0.39	~1	5.97	0.28	A		
Leg East	0.43	~1	2.37	0.30	A			0.98	~1	3.16	0.50	A		
	A1 - 2023 Total													
Leg North	0.57	1.00	6.02	0.37	A	3.61	A	0.75	1.00	8.18	0.43	A	4.20	A
Leg West	0.63	1.00	2.79	0.39	A			0.68	1.00	2.85	0.40	A		
Leg South	0.37	~1	6.53	0.27	A			0.52	1.00	6.69	0.34	A		
Leg East	0.45	1.00	2.42	0.31	A			1.12	1.00	3.45	0.53	A		

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages.

"D1 - 2023 Background, AM" model duration: 8:00 AM - 9:30 AM

"D2 - 2023 Background, PM" model duration: 4:00 PM - 5:30 PM

"D3 - 2023 Total, AM" model duration: 8:00 AM - 9:30 AM

"D4 - 2023 Total, PM" model duration: 4:00 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2019-04-22 10:52:47 AM

File summary

Title	Glendon and Komoka
Location	Komoka
Site Number	
Date	2018-09-26
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	180218
Analyst	MattBrouwer
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	V/C Ratio Threshold	Average Delay Threshold (s)	Queue Threshold (PCE)
5.75	✓		N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	Veh	Veh	perHour	s	-Min	perMin

(Default Analysis Set) - 2023 Background, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set(s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
2023 Background, AM	2023 Background	AM		ONE HOUR	08:00	09:30	90	15				✓		

Intersection Network

Intersections

Intersection	Name	Intersection Type	Leg Order	Grade Separated	Large Roundabout	Do Geometric Delay	Intersection Delay (s)	Intersection LOS
1	(untitled)	Roundabout	North,West,South,East				3.29	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Komoka Road Southbound	
West	West	Glendon Drive Eastbound	
South	South	Komoka Road Northbound	
East	East	Glendon Drive Westbound	

Capacity Options

Leg	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
North	0.00	99999.00		0.00
West	0.00	99999.00		0.00
South	0.00	99999.00		0.00
East	0.00	99999.00		0.00

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
North	3.50	4.50	30.00	20.00	55.00	25.00	
West	7.00	8.00	30.00	20.00	55.00	25.00	
South	3.50	4.50	30.00	20.00	55.00	25.00	
East	7.00	8.00	30.00	20.00	55.00	25.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Leg	Enter slope and intercept directly	Entered slope	Entered intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
North		(calculated)	(calculated)	0.527	1357.445
West		(calculated)	(calculated)	0.723	2436.345
South		(calculated)	(calculated)	0.527	1357.445
East		(calculated)	(calculated)	0.723	2436.345

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	Truck Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Leg	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
North	ONE HOUR	✓	233.00	100.000
West	ONE HOUR	✓	732.00	100.000
South	ONE HOUR	✓	178.00	100.000
East	ONE HOUR	✓	594.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Intersection 1 (for whole period)

	To				
From		North	West	South	East
	North	0.000	98.000	40.000	95.000
	West	84.000	0.000	18.000	630.000
	South	38.000	35.000	0.000	105.000
	East	41.000	487.000	66.000	0.000

Turning Proportions (Veh) - Intersection 1 (for whole period)

	To				
From		North	West	South	East
	North	0.00	0.42	0.17	0.41
	West	0.11	0.00	0.02	0.86
	South	0.21	0.20	0.00	0.59
	East	0.07	0.82	0.11	0.00

Vehicle Mix

Average PCE Per Vehicle - Intersection 1 (for whole period)

	To				
From		North	West	South	East
	North	1.000	1.060	1.060	1.060
	West	1.140	1.000	1.060	1.040
	South	1.030	1.130	1.000	1.130
	East	1.190	1.040	1.100	1.000

Truck Percentages - Intersection 1 (for whole period)

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From	To				
		North	West	South	East
	North	0.0	6.0	6.0	6.0
	West	14.0	0.0	6.0	4.0
	South	3.0	13.0	0.0	13.0
	East	19.0	4.0	10.0	0.0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Intersection Arrivals (Veh)	Total Queueing Delay (Veh-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (Veh-min/min)	Inclusive Total Queueing Delay (Veh-min)	Inclusive Average Queueing Delay (s)
North	0.27	5.25	0.37	~1	A	213.80	320.71	24.95	4.67	0.28	24.96	4.67
West	0.37	2.67	0.60	1.00	A	671.69	1007.54	40.69	2.42	0.45	40.69	2.42
South	0.25	6.18	0.33	~1	A	163.34	245.00	21.85	5.35	0.24	21.85	5.35
East	0.30	2.37	0.43	~1	A	545.06	817.60	30.00	2.20	0.33	30.00	2.20

Main Results for each time segment

Main results: (08:00-08:15)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	175.41	43.85	174.62	122.35	441.60	0.00	1049.68	258.40	0.167	0.00	0.20	4.110	A
West	551.09	137.77	549.76	465.47	150.75	0.00	2204.80	2033.17	0.250	0.00	0.33	2.173	A
South	134.01	33.50	133.33	93.07	607.44	0.00	920.52	180.09	0.146	0.00	0.17	4.569	A
East	447.19	111.80	446.19	623.00	117.77	0.00	2215.42	2068.55	0.202	0.00	0.25	2.034	A

Main results: (08:15-08:30)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	209.46	52.37	209.21	146.42	528.30	0.00	1004.34	258.40	0.209	0.20	0.26	4.526	A
West	658.05	164.51	657.66	556.99	180.52	0.00	2182.85	2033.17	0.301	0.33	0.43	2.360	A
South	160.02	40.00	159.79	111.39	726.79	0.00	860.81	180.09	0.186	0.17	0.23	5.134	A
East	533.99	133.50	533.72	745.58	141.00	0.00	2197.76	2068.55	0.243	0.25	0.32	2.163	A

Main results: (08:30-08:45)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	256.54	64.13	256.10	179.27	646.91	0.00	942.32	258.40	0.272	0.26	0.37	5.242	A
West	805.94	201.49	805.28	682.01	221.00	0.00	2152.99	2033.17	0.374	0.43	0.60	2.669	A
South	195.98	49.00	195.56	136.39	889.90	0.00	779.21	180.09	0.252	0.23	0.33	6.164	A
East	654.01	163.50	653.57	912.85	172.61	0.00	2173.74	2068.55	0.301	0.32	0.43	2.368	A

Main results: (08:45-09:00)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	256.54	64.13	256.53	179.46	647.40	0.00	942.07	258.40	0.272	0.37	0.37	5.250	A
West	805.94	201.49	805.94	682.63	221.30	0.00	2152.77	2033.17	0.374	0.60	0.60	2.672	A
South	195.98	49.00	195.98	136.53	890.72	0.00	778.80	180.09	0.252	0.33	0.33	6.176	A
East	654.01	163.50	654.00	913.84	172.86	0.00	2173.55	2068.55	0.301	0.43	0.43	2.368	A

Main results: (09:00-09:15)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS

North	209.46	52.37	209.89	146.73	529.08	0.00	1003.93	258.40	0.209	0.37	0.27	4.535	A
West	658.05	164.51	658.71	557.98	180.99	0.00	2182.50	2033.17	0.302	0.60	0.43	2.363	A
South	160.02	40.00	160.44	111.61	728.09	0.00	860.16	180.09	0.186	0.33	0.23	5.149	A
East	533.99	133.50	534.42	747.14	141.39	0.00	2197.47	2068.55	0.243	0.43	0.32	2.166	A

Main results: (09:15-09:30)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	175.41	43.85	175.67	122.83	442.98	0.00	1048.96	258.40	0.167	0.27	0.20	4.123	A
West	551.09	137.77	551.48	467.14	151.50	0.00	2204.25	2033.17	0.250	0.43	0.33	2.180	A
South	134.01	33.50	134.24	93.44	609.55	0.00	919.46	180.09	0.146	0.23	0.17	4.587	A
East	447.19	111.80	447.47	625.45	118.34	0.00	2214.99	2068.55	0.202	0.32	0.25	2.038	A

Queueing Delay Results for each time segment

Queueing Delay results: (08:00-08:15)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	2.92	0.19	4.110	A	A
West	4.91	0.33	2.173	A	A
South	2.48	0.17	4.569	A	A
East	3.73	0.25	2.034	A	A

Queueing Delay results: (08:15-08:30)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	3.86	0.26	4.526	A	A
West	6.37	0.42	2.360	A	A
South	3.34	0.22	5.134	A	A
East	4.75	0.32	2.163	A	A

Queueing Delay results: (08:30-08:45)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	5.45	0.36	5.242	A	A
West	8.80	0.59	2.669	A	A
South	4.87	0.33	6.164	A	A
East	6.35	0.42	2.368	A	A

Queueing Delay results: (08:45-09:00)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	5.58	0.37	5.250	A	A
West	8.95	0.60	2.672	A	A
South	5.01	0.33	6.176	A	A
East	6.44	0.43	2.368	A	A

Queueing Delay results: (09:00-09:15)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	4.06	0.27	4.535	A	A
West	6.59	0.44	2.363	A	A
South	3.53	0.24	5.149	A	A
East	4.89	0.33	2.166	A	A

Queueing Delay results: (09:15-09:30)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	3.08	0.21	4.123	A	A
West	5.07	0.34	2.180	A	A
South	2.62	0.17	4.587	A	A
East	3.84	0.26	2.038	A	A

Queue Variation Results for each time segment

Queue Variation results: (08:00-08:15)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.20	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.33	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.17	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.25	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (08:15-08:30)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.26	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.43	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.23	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.32	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (08:30-08:45)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.37	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.60	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.33	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.43	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (08:45-09:00)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.37	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.60	0.00	0.00	0.00	1.00			N/A	N/A
South	0.33	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.43	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (09:00-09:15)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.27	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.43	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.23	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.32	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (09:15-09:30)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.20	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.33	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.17	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.25	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

(Default Analysis Set) - 2023 Background, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set(s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
2023 Background, PM	2023 Background	PM		ONE HOUR	16:00	17:30	90	15				✓		

Intersection Network

Intersections

Intersection	Name	Intersection Type	Leg Order	Grade Separated	Large Roundabout	Do Geometric Delay	Intersection Delay (s)	Intersection LOS
1	(untitled)	Roundabout	North,West,South,East				3.76	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Komoka Road Southbound	
West	West	Glendon Drive Eastbound	
South	South	Komoka Road Northbound	
East	East	Glendon Drive Westbound	

Capacity Options

Leg	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
North	0.00	99999.00		0.00
West	0.00	99999.00		0.00
South	0.00	99999.00		0.00
East	0.00	99999.00		0.00

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
North	3.50	4.50	30.00	20.00	55.00	25.00	
West	7.00	8.00	30.00	20.00	55.00	25.00	
South	3.50	4.50	30.00	20.00	55.00	25.00	
East	7.00	8.00	30.00	20.00	55.00	25.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Leg	Enter slope and intercept directly	Entered slope	Entered intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
North		(calculated)	(calculated)	0.527	1357.445
West		(calculated)	(calculated)	0.723	2436.345
South		(calculated)	(calculated)	0.527	1357.445
East		(calculated)	(calculated)	0.723	2436.345

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	Truck Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Leg	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
North	ONE HOUR	✓	257.00	100.000
West	ONE HOUR	✓	769.00	100.000
South	ONE HOUR	✓	216.00	100.000
East	ONE HOUR	✓	1013.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Intersection 1 (for whole period)

	To				
From		North	West	South	East
	North	0.000	112.000	63.000	82.000
	West	57.000	0.000	32.000	680.000
	South	78.000	41.000	0.000	97.000
	East	114.000	799.000	100.000	0.000

Turning Proportions (Veh) - Intersection 1 (for whole period)

	To				
From		North	West	South	East
	North	0.00	0.44	0.25	0.32
	West	0.07	0.00	0.04	0.88
	South	0.36	0.19	0.00	0.45
	East	0.11	0.79	0.10	0.00

Vehicle Mix

Average PCE Per Vehicle - Intersection 1 (for whole period)

	To				
From		North	West	South	East
	North	1.000	1.020	1.100	1.000
	West	1.040	1.000	1.030	1.030
	South	1.030	1.000	1.000	1.050
	East	1.000	1.020	1.020	1.000

Truck Percentages - Intersection 1 (for whole period)

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From	To				
		North	West	South	East
	North	0.0	2.0	10.0	0.0
	West	4.0	0.0	3.0	3.0
	South	3.0	0.0	0.0	5.0
	East	0.0	2.0	2.0	0.0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Intersection Arrivals (Veh)	Total Queueing Delay (Veh-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (Veh-min/min)	Inclusive Total Queueing Delay (Veh-min)	Inclusive Average Queueing Delay (s)
North	0.36	7.30	0.57	1.00	A	235.83	353.74	35.25	5.98	0.39	35.25	5.98
West	0.39	2.72	0.64	1.00	A	705.65	1058.47	43.22	2.45	0.48	43.22	2.45
South	0.28	5.97	0.39	~1	A	198.20	297.31	25.41	5.13	0.28	25.42	5.13
East	0.50	3.16	0.98	~1	A	929.55	1394.32	63.84	2.75	0.71	63.84	2.75

Main Results for each time segment

Main results: (16:00-16:15)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	193.48	48.37	192.46	186.85	705.78	0.00	947.02	280.42	0.204	0.00	0.26	4.765	A
West	578.94	144.74	577.55	714.56	183.68	0.00	2230.49	2092.95	0.260	0.00	0.35	2.176	A
South	162.62	40.65	161.84	146.30	614.92	0.00	991.49	213.86	0.164	0.00	0.20	4.336	A
East	762.64	190.66	760.66	644.79	131.97	0.00	2297.65	2193.91	0.332	0.00	0.49	2.339	A

Main results: (16:15-16:30)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	231.04	57.76	230.63	223.64	844.39	0.00	874.98	280.42	0.264	0.26	0.36	5.583	A
West	691.32	172.83	690.89	855.07	219.96	0.00	2204.18	2092.95	0.314	0.35	0.46	2.379	A
South	194.18	48.54	193.91	175.12	735.73	0.00	928.18	213.86	0.209	0.20	0.26	4.902	A
East	910.67	227.67	910.00	771.60	158.04	0.00	2278.64	2193.91	0.400	0.49	0.66	2.629	A

Main results: (16:30-16:45)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	282.96	70.74	282.12	273.78	1033.76	0.00	776.58	280.42	0.364	0.36	0.57	7.269	A
West	846.69	211.67	845.96	1046.73	269.15	0.00	2168.51	2092.95	0.390	0.46	0.64	2.720	A
South	237.82	59.45	237.31	214.34	900.77	0.00	841.70	213.86	0.283	0.26	0.39	5.951	A
East	1115.33	278.83	1114.09	944.63	193.44	0.00	2252.83	2193.91	0.495	0.66	0.97	3.159	A

Main results: (16:45-17:00)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	282.96	70.74	282.95	274.15	1034.94	0.00	775.96	280.42	0.365	0.57	0.57	7.301	A
West	846.69	211.67	846.68	1048.15	269.74	0.00	2168.08	2092.95	0.391	0.64	0.64	2.723	A
South	237.82	59.45	237.81	214.69	901.73	0.00	841.20	213.86	0.283	0.39	0.39	5.965	A
East	1115.33	278.83	1115.32	945.77	193.77	0.00	2252.59	2193.91	0.495	0.97	0.98	3.164	A

Main results: (17:00-17:15)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS

North	231.04	57.76	231.87	224.22	846.23	0.00	874.03	280.42	0.264	0.57	0.36	5.612	A
West	691.32	172.83	692.04	857.26	220.84	0.00	2203.54	2092.95	0.314	0.64	0.46	2.382	A
South	194.18	48.54	194.68	175.66	737.22	0.00	927.41	213.86	0.209	0.39	0.27	4.916	A
East	910.67	227.67	911.90	773.35	158.55	0.00	2278.27	2193.91	0.400	0.98	0.67	2.638	A

Main results: (17:15-17:30)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	193.48	48.37	193.90	187.67	708.34	0.00	945.69	280.42	0.205	0.36	0.26	4.792	A
West	578.94	144.74	579.37	717.48	184.75	0.00	2229.71	2092.95	0.260	0.46	0.35	2.181	A
South	162.62	40.65	162.89	146.99	617.13	0.00	990.33	213.86	0.164	0.27	0.20	4.353	A
East	762.64	190.66	763.32	647.34	132.69	0.00	2297.13	2193.91	0.332	0.67	0.50	2.349	A

Queueing Delay Results for each time segment

Queueing Delay results: (16:00-16:15)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	3.73	0.25	4.765	A	A
West	5.16	0.34	2.176	A	A
South	2.86	0.19	4.336	A	A
East	7.30	0.49	2.339	A	A

Queueing Delay results: (16:15-16:30)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	5.22	0.35	5.583	A	A
West	6.75	0.45	2.379	A	A
South	3.87	0.26	4.902	A	A
East	9.79	0.65	2.629	A	A

Queueing Delay results: (16:30-16:45)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	8.23	0.55	7.269	A	A
West	9.41	0.63	2.720	A	A
South	5.71	0.38	5.951	A	A
East	14.31	0.95	3.159	A	A

Queueing Delay results: (16:45-17:00)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	8.53	0.57	7.301	A	A
West	9.58	0.64	2.723	A	A
South	5.87	0.39	5.965	A	A
East	14.64	0.98	3.164	A	A

Queueing Delay results: (17:00-17:15)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	5.58	0.37	5.612	A	A
West	6.98	0.47	2.382	A	A
South	4.09	0.27	4.916	A	A
East	10.21	0.68	2.638	A	A

Queueing Delay results: (17:15-17:30)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	3.96	0.26	4.792	A	A
West	5.34	0.36	2.181	A	A
South	3.02	0.20	4.353	A	A
East	7.59	0.51	2.349	A	A

Queue Variation Results for each time segment

Queue Variation results: (16:00-16:15)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.26	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.35	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.20	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.49	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (16:15-16:30)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.36	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.46	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.26	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.66	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (16:30-16:45)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.57	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.64	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.39	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.97	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (16:45-17:00)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.57	0.00	0.00	0.00	1.00			N/A	N/A
West	0.64	0.00	0.00	0.00	1.00			N/A	N/A
South	0.39	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.98	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (17:00-17:15)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.36	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.46	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.27	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.67	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (17:15-17:30)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.26	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.35	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.20	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.50	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

(Default Analysis Set) - 2023 Total, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set(s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
2023 Total, AM	2023 Total	AM		ONE HOUR	08:00	09:30	90	15				✓		

Intersection Network

Intersections

Intersection	Name	Intersection Type	Leg Order	Grade Separated	Large Roundabout	Do Geometric Delay	Intersection Delay (s)	Intersection LOS
1	(untitled)	Roundabout	North,West,South,East				3.61	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Komoka Road Southbound	
West	West	Glendon Drive Eastbound	
South	South	Komoka Road Northbound	
East	East	Glendon Drive Westbound	

Capacity Options

Leg	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
North	0.00	99999.00		0.00
West	0.00	99999.00		0.00
South	0.00	99999.00		0.00
East	0.00	99999.00		0.00

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
North	3.50	4.50	30.00	20.00	55.00	25.00	
West	7.00	8.00	30.00	20.00	55.00	25.00	
South	3.50	4.50	30.00	20.00	55.00	25.00	
East	7.00	8.00	30.00	20.00	55.00	25.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Leg	Enter slope and intercept directly	Entered slope	Entered intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
North		(calculated)	(calculated)	0.527	1357.445
West		(calculated)	(calculated)	0.723	2436.345

South		(calculated)	(calculated)	0.527	1357.445
East		(calculated)	(calculated)	0.723	2436.345

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	Truck Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Leg	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
North	ONE HOUR	✓	313.00	100.000
West	ONE HOUR	✓	736.00	100.000
South	ONE HOUR	✓	185.00	100.000
East	ONE HOUR	✓	608.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	0.000	112.000	64.000	137.000
	West	88.000	0.000	18.000	630.000
	South	45.000	35.000	0.000	105.000
	East	55.000	487.000	66.000	0.000

Turning Proportions (Veh) - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	0.00	0.36	0.20	0.44
	West	0.12	0.00	0.02	0.86
	South	0.24	0.19	0.00	0.57
	East	0.09	0.80	0.11	0.00

Vehicle Mix

Average PCE Per Vehicle - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	1.000	1.060	1.060	1.060
	West	1.140	1.000	1.060	1.040
	South	1.030	1.130	1.000	1.130
	East	1.190	1.040	1.100	1.000

Truck Percentages - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	0.0	6.0	6.0	6.0
	West	14.0	0.0	6.0	4.0

	South	3.0	13.0	0.0	13.0
	East	19.0	4.0	10.0	0.0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Intersection Arrivals (Veh)	Total Queueing Delay (Veh-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (Veh-min/min)	Inclusive Total Queueing Delay (Veh-min)	Inclusive Average Queueing Delay (s)
North	0.37	6.02	0.57	1.00	A	287.21	430.82	37.29	5.19	0.41	37.29	5.19
West	0.39	2.79	0.63	1.00	A	675.36	1013.05	42.38	2.51	0.47	42.38	2.51
South	0.27	6.53	0.37	~1	A	169.76	254.64	23.69	5.58	0.26	23.69	5.58
East	0.31	2.42	0.45	1.00	A	557.91	836.87	31.23	2.24	0.35	31.24	2.24

Main Results for each time segment

Main results: (08:00-08:15)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	235.64	58.91	234.49	141.10	441.59	0.00	1049.69	288.99	0.224	0.00	0.29	4.409	A
West	554.10	138.52	552.73	475.92	200.16	0.00	2167.82	2011.30	0.256	0.00	0.34	2.227	A
South	139.28	34.82	138.55	111.04	641.85	0.00	905.50	180.00	0.154	0.00	0.18	4.690	A
East	457.74	114.43	456.69	654.40	126.00	0.00	2203.01	2054.30	0.208	0.00	0.26	2.060	A

Main results: (08:15-08:30)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	281.38	70.35	280.99	168.87	528.29	0.00	1004.35	288.99	0.280	0.29	0.39	4.975	A
West	661.65	165.41	661.23	569.53	239.74	0.00	2138.73	2011.30	0.309	0.34	0.45	2.436	A
South	166.31	41.58	166.06	132.93	768.05	0.00	842.15	180.00	0.197	0.18	0.24	5.324	A
East	546.58	136.65	546.30	783.24	150.87	0.00	2184.22	2054.30	0.250	0.26	0.33	2.197	A

Main results: (08:30-08:45)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	344.62	86.15	343.88	206.75	646.89	0.00	942.33	288.99	0.366	0.39	0.57	6.008	A
West	810.35	202.59	809.63	697.32	293.45	0.00	2099.26	2011.30	0.386	0.45	0.63	2.790	A
South	203.69	50.92	203.20	162.73	940.35	0.00	755.65	180.00	0.270	0.24	0.37	6.511	A
East	669.42	167.36	668.96	958.88	184.68	0.00	2158.66	2054.30	0.310	0.33	0.45	2.416	A

Main results: (08:45-09:00)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	344.62	86.15	344.61	206.99	647.40	0.00	942.07	288.99	0.366	0.57	0.57	6.024	A
West	810.35	202.59	810.34	698.04	293.96	0.00	2098.88	2011.30	0.386	0.63	0.63	2.793	A
South	203.69	50.92	203.68	162.95	941.36	0.00	755.14	180.00	0.270	0.37	0.37	6.527	A
East	669.42	167.36	669.42	960.07	184.97	0.00	2158.44	2054.30	0.310	0.45	0.45	2.417	A

Main results: (09:00-09:15)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	281.38	70.35	282.11	169.25	529.10	0.00	1003.92	288.99	0.280	0.57	0.39	4.993	A
West	661.65	165.41	662.36	570.67	240.54	0.00	2138.15	2011.30	0.309	0.63	0.45	2.441	A
South	166.31	41.58	166.79	133.26	769.64	0.00	841.35	180.00	0.198	0.37	0.25	5.342	A
East	546.58	136.65	547.04	785.10	151.32	0.00	2183.88	2054.30	0.250	0.45	0.33	2.199	A

Main results: (09:15-09:30)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	235.64	58.91	236.05	141.68	442.99	0.00	1048.96	288.99	0.225	0.39	0.29	4.432	A
West	554.10	138.52	554.52	477.73	201.30	0.00	2166.99	2011.30	0.256	0.45	0.34	2.232	A
South	139.28	34.82	139.54	111.55	644.27	0.00	904.28	180.00	0.154	0.25	0.18	4.710	A
East	457.74	114.43	458.02	657.17	126.64	0.00	2202.53	2054.30	0.208	0.33	0.26	2.065	A

Queueing Delay Results for each time segment**Queueing Delay results: (08:00-08:15)**

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	4.21	0.28	4.409	A	A
West	5.05	0.34	2.227	A	A
South	2.64	0.18	4.690	A	A
East	3.87	0.26	2.060	A	A

Queueing Delay results: (08:15-08:30)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	5.68	0.38	4.975	A	A
West	6.61	0.44	2.436	A	A
South	3.59	0.24	5.324	A	A
East	4.94	0.33	2.197	A	A

Queueing Delay results: (08:30-08:45)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	8.33	0.56	6.008	A	A
West	9.24	0.62	2.790	A	A
South	5.34	0.36	6.511	A	A
East	6.63	0.44	2.416	A	A

Queueing Delay results: (08:45-09:00)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	8.59	0.57	6.024	A	A
West	9.40	0.63	2.793	A	A
South	5.50	0.37	6.527	A	A
East	6.73	0.45	2.417	A	A

Queueing Delay results: (09:00-09:15)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	6.03	0.40	4.993	A	A
West	6.84	0.46	2.441	A	A
South	3.81	0.25	5.342	A	A
East	5.08	0.34	2.199	A	A

Queueing Delay results: (09:15-09:30)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	4.46	0.30	4.432	A	A
West	5.23	0.35	2.232	A	A
South	2.80	0.19	4.710	A	A
East	3.99	0.27	2.065	A	A

Queue Variation Results for each time segment**Queue Variation results: (08:00-08:15)**

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.29	~1	~1	~1	~1	Percentiles could not be calculated. This may be		N/A	N/A

						because the mean queue is very small or very big.		
West	0.34	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.	N/A	N/A
South	0.18	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.	N/A	N/A
East	0.26	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.	N/A	N/A

Queue Variation results: (08:15-08:30)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.39	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.45	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.24	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.33	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (08:30-08:45)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.57	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.63	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.37	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.45	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (08:45-09:00)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.57	0.00	0.00	0.00	1.00			N/A	N/A
West	0.63	0.00	0.00	0.00	1.00			N/A	N/A
South	0.37	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.45	0.00	0.00	0.00	1.00			N/A	N/A

Queue Variation results: (09:00-09:15)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.39	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.45	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.25	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.33	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (09:15-09:30)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.29	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.34	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.18	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.26	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

(Default Analysis Set) - 2023 Total, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set(s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
2023 Total, PM	2023 Total	PM		ONE HOUR	16:00	17:30	90	15				✓		

Intersection Network

Intersections

Intersection	Name	Intersection Type	Leg Order	Grade Separated	Large Roundabout	Do Geometric Delay	Intersection Delay (s)	Intersection LOS
1	(untitled)	Roundabout	North,West,South,East				4.20	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Komoka Road Southbound	
West	West	Glendon Drive Eastbound	
South	South	Komoka Road Northbound	
East	East	Glendon Drive Westbound	

Capacity Options

Leg	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
North	0.00	99999.00		0.00
West	0.00	99999.00		0.00
South	0.00	99999.00		0.00
East	0.00	99999.00		0.00

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
North	3.50	4.50	30.00	20.00	55.00	25.00	
West	7.00	8.00	30.00	20.00	55.00	25.00	
South	3.50	4.50	30.00	20.00	55.00	25.00	
East	7.00	8.00	30.00	20.00	55.00	25.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Leg	Enter slope and intercept directly	Entered slope	Entered intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
North		(calculated)	(calculated)	0.527	1357.445
West		(calculated)	(calculated)	0.723	2436.345
South		(calculated)	(calculated)	0.527	1357.445
East		(calculated)	(calculated)	0.723	2436.345

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	Truck Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Leg	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
North	ONE HOUR	✓	303.00	100.000
West	ONE HOUR	✓	779.00	100.000
South	ONE HOUR	✓	255.00	100.000
East	ONE HOUR	✓	1064.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	0.000	101.000	90.000	112.000
	West	67.000	0.000	32.000	680.000
	South	117.000	41.000	0.000	97.000
	East	165.000	799.000	100.000	0.000

Turning Proportions (Veh) - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	0.00	0.33	0.30	0.37
	West	0.09	0.00	0.04	0.87
	South	0.46	0.16	0.00	0.38
	East	0.16	0.75	0.09	0.00

Vehicle Mix

Average PCE Per Vehicle - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	1.000	1.020	1.100	1.000
	West	1.040	1.000	1.030	1.030
	South	1.030	1.000	1.000	1.050
	East	1.000	1.020	1.020	1.000

Truck Percentages - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	0.0	2.0	10.0	0.0
	West	4.0	0.0	3.0	3.0
	South	3.0	0.0	0.0	5.0
	East	0.0	2.0	2.0	0.0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Intersection Arrivals (Veh)	Total Queueing Delay (Veh-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (Veh-min/min)	Inclusive Total Queueing Delay (Veh-min)	Inclusive Average Queueing Delay (s)
North	0.43	8.18	0.75	1.00	A	278.04	417.06	45.23	6.51	0.50	45.23	6.51
West	0.40	2.85	0.68	1.00	A	714.82	1072.24	45.34	2.54	0.50	45.34	2.54
South	0.34	6.69	0.52	1.00	A	233.99	350.99	32.73	5.60	0.36	32.73	5.60
East	0.53	3.45	1.12	1.00	A	976.34	1464.52	71.63	2.93	0.80	71.63	2.93

Main Results for each time segment

Main results: (16:00-16:15)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	228.11	57.03	226.85	261.84	705.69	0.00	944.19	342.18	0.242	0.00	0.32	5.011	A
West	586.47	146.62	585.02	706.23	226.31	0.00	2198.92	2050.52	0.267	0.00	0.36	2.228	A
South	191.98	47.99	191.01	166.49	644.84	0.00	976.56	215.77	0.197	0.00	0.24	4.577	A
East	801.03	200.26	798.87	667.18	168.66	0.00	2272.65	2168.30	0.352	0.00	0.54	2.440	A

Main results: (16:15-16:30)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	272.39	68.10	271.86	313.42	844.32	0.00	872.37	342.18	0.312	0.32	0.45	5.990	A
West	700.31	175.08	699.85	845.12	271.06	0.00	2166.39	2050.52	0.323	0.36	0.48	2.455	A
South	229.24	57.31	228.88	199.32	771.59	0.00	910.16	215.77	0.252	0.24	0.33	5.282	A
East	956.51	239.13	955.73	798.46	202.01	0.00	2248.29	2168.30	0.425	0.54	0.74	2.784	A

Main results: (16:30-16:45)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	333.61	83.40	332.43	383.62	1033.57	0.00	774.32	342.18	0.431	0.45	0.75	8.125	A
West	857.70	214.42	856.90	1034.42	331.58	0.00	2122.40	2050.52	0.404	0.48	0.67	2.843	A
South	280.76	70.19	280.04	243.90	944.57	0.00	819.54	215.77	0.343	0.33	0.52	6.665	A
East	1171.48	292.87	1169.98	977.40	247.21	0.00	2215.27	2168.30	0.529	0.74	1.11	3.440	A

Main results: (16:45-17:00)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	333.61	83.40	333.58	384.25	1034.94	0.00	773.61	342.18	0.431	0.75	0.75	8.179	A
West	857.70	214.42	857.69	1036.03	332.49	0.00	2121.74	2050.52	0.404	0.67	0.68	2.847	A
South	280.76	70.19	280.75	244.42	945.76	0.00	818.93	215.77	0.343	0.52	0.52	6.688	A
East	1171.48	292.87	1171.47	978.79	247.72	0.00	2214.90	2168.30	0.529	1.11	1.12	3.449	A

Main results: (17:00-17:15)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	272.39	68.10	273.56	314.37	846.41	0.00	871.28	342.18	0.313	0.75	0.46	6.033	A
West	700.31	175.08	701.09	847.56	272.41	0.00	2165.40	2050.52	0.323	0.68	0.48	2.459	A
South	229.24	57.31	229.96	200.09	773.41	0.00	909.22	215.77	0.252	0.52	0.34	5.307	A
East	956.51	239.13	958.01	800.58	202.78	0.00	2247.73	2168.30	0.426	1.12	0.74	2.796	A

Main results: (17:15-17:30)

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Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	228.11	57.03	228.66	263.08	708.41	0.00	942.78	342.18	0.242	0.46	0.32	5.046	A
West	586.47	146.62	586.93	709.27	227.80	0.00	2197.83	2050.52	0.267	0.48	0.37	2.236	A
South	191.98	47.99	192.35	167.39	647.35	0.00	975.25	215.77	0.197	0.34	0.25	4.600	A
East	801.03	200.26	801.83	670.03	169.66	0.00	2271.92	2168.30	0.353	0.74	0.55	2.449	A

Queueing Delay Results for each time segment

Queueing Delay results: (16:00-16:15)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	4.61	0.31	5.011	A	A
West	5.35	0.36	2.228	A	A
South	3.55	0.24	4.577	A	A
East	7.98	0.53	2.440	A	A

Queueing Delay results: (16:15-16:30)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	6.58	0.44	5.990	A	A
West	7.05	0.47	2.455	A	A
South	4.91	0.33	5.282	A	A
East	10.87	0.72	2.784	A	A

Queueing Delay results: (16:30-16:45)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	10.77	0.72	8.125	A	A
West	9.96	0.66	2.843	A	A
South	7.51	0.50	6.665	A	A
East	16.32	1.09	3.440	A	A

Queueing Delay results: (16:45-17:00)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	11.24	0.75	8.179	A	A
West	10.14	0.68	2.847	A	A
South	7.76	0.52	6.688	A	A
East	16.74	1.12	3.449	A	A

Queueing Delay results: (17:00-17:15)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	7.10	0.47	6.033	A	A
West	7.30	0.49	2.459	A	A
South	5.22	0.35	5.307	A	A
East	11.38	0.76	2.796	A	A

Queueing Delay results: (17:15-17:30)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	4.93	0.33	5.046	A	A
West	5.54	0.37	2.236	A	A
South	3.77	0.25	4.600	A	A
East	8.32	0.55	2.449	A	A

Queue Variation Results for each time segment

Queue Variation results: (16:00-16:15)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.32	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

West	0.36	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.24	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.54	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (16:15-16:30)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.45	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.48	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.33	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.74	0.00	0.00	0.00	1.00			N/A	N/A

Queue Variation results: (16:30-16:45)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.75	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.67	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.52	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	1.11	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (16:45-17:00)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.75	0.00	0.00	0.00	1.00			N/A	N/A
West	0.68	0.00	0.00	0.00	1.00			N/A	N/A
South	0.52	0.00	0.00	0.00	1.00			N/A	N/A
East	1.12	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (17:00-17:15)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.46	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.48	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.34	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.74	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (17:15-17:30)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.32	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.37	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.25	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.55	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Appendix E

Synchro 2023 Total Traffic Operations Reports



Lanes, Volumes, Timings
1: Komoka Road & Melrose Drive

2023 Total AM Peak Hour
9904 Oxbow Drive

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	7	8	1	9	0	3	76	3	0	66	3
Future Volume (vph)	1	7	8	1	9	0	3	76	3	0	66	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.932						0.995			0.995	
Flt Protected		0.997			0.995			0.998				
Satd. Flow (prot)	0	1228	0	0	1405	0	0	1623	0	0	1807	0
Flt Permitted		0.997			0.995			0.998				
Satd. Flow (perm)	0	1228	0	0	1405	0	0	1623	0	0	1807	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		595.9			772.9			869.3			905.4	
Travel Time (s)		42.9			55.6			62.6			65.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	50%	43%	0%	38%	0%	67%	15%	0%	0%	2%	67%
Adj. Flow (vph)	1	8	9	1	10	0	3	83	3	0	72	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	18	0	0	11	0	0	89	0	0	75	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 16.6%
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
1: Komoka Road & Melrose Drive

2023 Total AM Peak Hour
9904 Oxbow Drive

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	7	8	1	9	0	3	76	3	0	66	3
Future Volume (Veh/h)	1	7	8	1	9	0	3	76	3	0	66	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	8	9	1	10	0	3	83	3	0	72	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	169	166	74	177	166	84	75			86		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	169	166	74	177	166	84	75			86		
tC, single (s)	7.1	7.0	6.6	7.1	6.9	6.2	4.8			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.5	3.7	3.5	4.3	3.3	2.8			2.2		
p0 queue free %	100	99	99	100	98	100	100			100		
cM capacity (veh/h)	789	647	885	773	665	980	1197			1523		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	18	11	89	75
Volume Left	1	1	3	0
Volume Right	9	0	3	3
cSH	756	673	1197	1523
Volume to Capacity	0.02	0.02	0.00	0.00
Queue Length 95th (m)	0.6	0.4	0.1	0.0
Control Delay (s)	9.9	10.4	0.3	0.0
Lane LOS	A	B	A	
Approach Delay (s)	9.9	10.4	0.3	0.0
Approach LOS	A	B		

Intersection Summary

Average Delay 1.6
Intersection Capacity Utilization 16.6%
Analysis Period (min) 15

Lanes, Volumes, Timings
2: Komoka Road & Street 'A'/Union Avenue

2023 Total AM Peak Hour
9904 Oxbow Drive

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	0	59	23	0	4	19	50	12	2	70	31
Future Volume (vph)	31	0	59	23	0	4	19	50	12	2	70	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.912			0.981			0.980			0.959	
Flt Protected		0.983			0.959			0.988			0.999	
Satd. Flow (prot)	0	1670	0	0	1672	0	0	1695	0	0	1702	0
Flt Permitted		0.983			0.959			0.988			0.999	
Satd. Flow (perm)	0	1670	0	0	1672	0	0	1695	0	0	1702	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		261.3			295.1			489.1			869.3	
Travel Time (s)		18.8			21.2			35.2			62.6	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	0%	2%	50%	2%	11%	9%	50%	8%	2%
Adj. Flow (vph)	34	0	64	25	0	4	21	54	13	2	76	34
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	98	0	0	29	0	0	88	0	0	112	0
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	22.9%											
Analysis Period (min)	15											
ICU Level of Service A												

HCM Unsignalized Intersection Capacity Analysis
2: Komoka Road & Street 'A'/Union Avenue

2023 Total AM Peak Hour
9904 Oxbow Drive

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	31	0	59	23	0	4	19	50	12	2	70	31
Future Volume (Veh/h)	31	0	59	23	0	4	19	50	12	2	70	31
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	34	0	64	25	0	4	21	54	13	2	76	34
Pedestrians					1							
Lane Width (m)					3.6							
Walking Speed (m/s)					1.2							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	204	207	93	264	218	62	110			68		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	204	207	93	264	218	62	110			68		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.7	4.1			4.6		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.8	2.2			2.7		
p0 queue free %	95	100	93	96	100	100	99			100		
cM capacity (veh/h)	742	678	964	638	669	883	1480			1276		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	98	29	88	112								
Volume Left	34	25	21	2								
Volume Right	64	4	13	34								
cSH	873	663	1480	1276								
Volume to Capacity	0.11	0.04	0.01	0.00								
Queue Length 95th (m)	3.0	1.1	0.3	0.0								
Control Delay (s)	9.6	10.7	1.9	0.2								
Lane LOS	A	B	A	A								
Approach Delay (s)	9.6	10.7	1.9	0.2								
Approach LOS	A	B										
Intersection Summary												
Average Delay		4.4										
Intersection Capacity Utilization		22.9%					ICU Level of Service			A		
Analysis Period (min)		15										

Lanes, Volumes, Timings
3: Oxbow Drive & Street 'C'

2023 Total AM Peak Hour
9904 Oxbow Drive

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	13	68	46	6	20	42
Future Volume (vph)	13	68	46	6	20	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.983		0.909	
Flt Protected		0.992			0.984	
Satd. Flow (prot)	0	1848	1831	0	1666	0
Flt Permitted		0.992			0.984	
Satd. Flow (perm)	0	1848	1831	0	1666	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		352.8	171.1		189.5	
Travel Time (s)		25.4	12.3		13.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	14	74	50	7	22	46
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	88	57	0	68	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization 21.3%	ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
3: Oxbow Drive & Street 'C'

2023 Total AM Peak Hour
9904 Oxbow Drive

	EBL	EBT	WBT	WBR	SBL	SBR
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	68	46	6	20	42
Future Volume (Veh/h)	13	68	46	6	20	42
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	74	50	7	22	46
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	57				156	54
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	57				156	54
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	95
cM capacity (veh/h)	1547				828	1014

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	88	57	68
Volume Left	14	0	22
Volume Right	0	7	46
cSH	1547	1700	945
Volume to Capacity	0.01	0.03	0.07
Queue Length 95th (m)	0.2	0.0	1.9
Control Delay (s)	1.2	0.0	9.1
Lane LOS	A		A
Approach Delay (s)	1.2	0.0	9.1
Approach LOS			A

Intersection Summary

Average Delay		3.4	
Intersection Capacity Utilization	21.3%	ICU Level of Service	A
Analysis Period (min)		15	

Lanes, Volumes, Timings
4: Komoka Road & Oxbow Drive

2023 Total AM Peak Hour
9904 Oxbow Drive

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	34	53	45	23	7	23	77	71	11	141	7
Future Volume (vph)	1	34	53	45	23	7	23	77	71	11	141	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.918			0.987			0.944			0.994	
Flt Protected		0.999			0.971			0.993			0.997	
Satd. Flow (prot)	0	1498	0	0	1665	0	0	1604	0	0	1793	0
Flt Permitted		0.999			0.971			0.993			0.997	
Satd. Flow (perm)	0	1498	0	0	1665	0	0	1604	0	0	1793	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		171.1			343.2			1366.1			489.1	
Travel Time (s)		12.3			24.7			98.4			35.2	
Confl. Peds. (#/hr)			1	1					1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	27%	5%	5%	50%	40%	8%	5%	10%	4%	17%
Adj. Flow (vph)	1	37	58	49	25	8	25	84	77	12	153	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	96	0	0	82	0	0	186	0	0	173	0
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	33.2%											
Analysis Period (min)	15											
ICU Level of Service A												

HCM Unsignalized Intersection Capacity Analysis
4: Komoka Road & Oxbow Drive

2023 Total AM Peak Hour
9904 Oxbow Drive

	↖	→	↘	↙	←	↖	↙	↗	↘	↖	↘	↗
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	1	34	53	45	23	7	23	77	71	11	141	7
Future Volume (Veh/h)	1	34	53	45	23	7	23	77	71	11	141	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	37	58	49	25	8	25	84	77	12	153	8
Pedestrians					1			1				
Lane Width (m)					3.6			3.6				
Walking Speed (m/s)					1.2			1.2				
Percent Blockage					0			0				
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	374	393	158	432	358	124	161			162		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	374	393	158	432	358	124	161			162		
tC, single (s)	7.1	6.5	6.5	7.1	6.5	6.7	4.5			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.5	3.5	4.0	3.8	2.6			2.3		
p0 queue free %	100	93	93	89	95	99	98			99		
cM capacity (veh/h)	548	530	825	454	546	812	1217			1368		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	96	82	186	173								
Volume Left	1	49	25	12								
Volume Right	58	8	77	8								
cSH	676	501	1217	1368								
Volume to Capacity	0.14	0.16	0.02	0.01								
Queue Length 95th (m)	3.9	4.6	0.5	0.2								
Control Delay (s)	11.2	13.6	1.2	0.6								
Lane LOS	B	B	A	A								
Approach Delay (s)	11.2	13.6	1.2	0.6								
Approach LOS	B	B										
Intersection Summary												
Average Delay		4.7										
Intersection Capacity Utilization		33.2%										
Analysis Period (min)		15										
ICU Level of Service A												

Lanes, Volumes, Timings
5: Komoka Road & Glendon Drive

2023 Total AM Peak Hour
9904 Oxbow Drive

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	88	630	18	66	487	54	35	45	105	136	63	112
Future Volume (vph)	88	630	18	66	487	54	35	45	105	136	63	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	40.0			50.0	25.0		0.0	25.0	0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996				0.850		0.895			0.904	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1819	0	1641	1827	1357	1597	1546	0	1703	1620	0
Flt Permitted	0.362			0.231			0.616			0.654		
Satd. Flow (perm)	603	1819	0	399	1827	1357	1036	1546	0	1172	1620	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3						114			117	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		986.8			1182.6			612.4			1366.1	
Travel Time (s)		71.0			85.1			44.1			98.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	4%	6%	10%	4%	19%	13%	3%	13%	6%	6%	6%
Adj. Flow (vph)	96	685	20	72	529	59	38	49	114	148	68	122
Shared Lane Traffic (%)												
Lane Group Flow (vph)	96	705	0	72	529	59	38	163	0	148	190	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		20.0	20.0	20.0	15.0	15.0		15.0	15.0	
Minimum Split (s)	26.0	26.0		26.0	26.0	26.0	21.0	21.0		21.0	21.0	
Total Split (s)	51.0	51.0		51.0	51.0	51.0	27.0	27.0		27.0	27.0	
Total Split (%)	65.4%	65.4%		65.4%	65.4%	65.4%	34.6%	34.6%		34.6%	34.6%	
Maximum Green (s)	45.0	45.0		45.0	45.0	45.0	21.0	21.0		21.0	21.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Ped	Ped		Ped	Ped	Ped	None	None		None	None	
Walk Time (s)	3.0	3.0		3.0	3.0	3.0	8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0		0	0	
Act Effct Green (s)	31.3	31.3		31.3	31.3	31.3	18.6	18.6		18.6	18.6	
Actuated g/C Ratio	0.54	0.54		0.54	0.54	0.54	0.32	0.32		0.32	0.32	
v/c Ratio	0.30	0.72		0.33	0.54	0.08	0.11	0.29		0.40	0.32	
Control Delay	10.1	14.8		12.5	10.9	2.2	18.1	8.6		21.5	9.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	

Lanes, Volumes, Timings
5: Komoka Road & Glendon Drive

2023 Total AM Peak Hour
9904 Oxbow Drive

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	10.1	14.8		12.5	10.9	2.2	18.1	8.6		21.5	9.5	
LOS	B	B		B	B	A	B	A		C	A	
Approach Delay		14.3			10.3			10.4			14.8	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	4.8	48.3		3.7	31.5	0.0	2.6	3.3		11.0	4.9	
Queue Length 95th (m)	14.8	99.1		13.4	64.2	4.2	11.5	19.6		35.7	24.1	
Internal Link Dist (m)		962.8			1158.6			588.4			1342.1	
Turn Bay Length (m)	30.0			40.0		50.0	25.0			25.0		
Base Capacity (vph)	502	1516		332	1522	1140	422	698		477	729	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.19	0.47		0.22	0.35	0.05	0.09	0.23		0.31	0.26	

Intersection Summary

Area Type: Other

Cycle Length: 78

Actuated Cycle Length: 58.1

Natural Cycle: 55

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 12.6

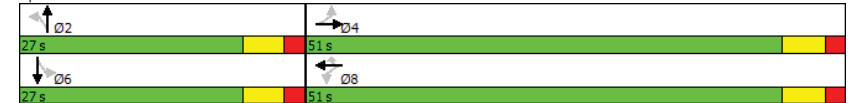
Intersection LOS: B

Intersection Capacity Utilization 89.2%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 5: Komoka Road & Glendon Drive



Lanes, Volumes, Timings
1: Komoka Road & Melrose Drive

2023 Total PM Peak Hour
9904 Oxbow Drive TIS

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1	3	1	6	2	6	91	8	0	99	1
Future Volume (vph)	1	1	3	1	6	2	6	91	8	0	99	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.919			0.973			0.989			0.999	
Flt Protected		0.990			0.995			0.997				
Satd. Flow (prot)	0	1079	0	0	1483	0	0	1733	0	0	1727	0
Flt Permitted		0.990			0.995			0.997				
Satd. Flow (perm)	0	1079	0	0	1483	0	0	1733	0	0	1727	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		595.9			772.9			869.3			905.4	
Travel Time (s)		42.9			55.6			62.6			65.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	100%	67%	0%	20%	50%	20%	8%	0%	0%	10%	0%
Adj. Flow (vph)	1	1	3	1	7	2	7	99	9	0	108	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	5	0	0	10	0	0	115	0	0	109	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 20.2%

ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
1: Komoka Road & Melrose Drive

2023 Total PM Peak Hour
9904 Oxbow Drive TIS

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	3	1	6	2	6	91	8	0	99	1
Future Volume (Veh/h)	1	1	3	1	6	2	6	91	8	0	99	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1	3	1	7	2	7	99	9	0	108	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	232	230	108	230	226	104	109			108		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	232	230	108	230	226	104	109			108		
tC, single (s)	7.1	7.5	6.9	7.1	6.7	6.7	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.9	3.9	3.5	4.2	3.8	2.4			2.2		
p0 queue free %	100	100	100	100	99	100	99			100		
cM capacity (veh/h)	717	527	795	723	639	835	1376			1495		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	10	115	109
Volume Left	1	1	7	0
Volume Right	3	2	9	1
cSH	708	679	1376	1495
Volume to Capacity	0.01	0.01	0.01	0.00
Queue Length 95th (m)	0.2	0.4	0.1	0.0
Control Delay (s)	10.1	10.4	0.5	0.0
Lane LOS	B	B	A	
Approach Delay (s)	10.1	10.4	0.5	0.0
Approach LOS	B	B		

Intersection Summary

Average Delay

0.9

Intersection Capacity Utilization

20.2%

ICU Level of Service

A

Analysis Period (min)

15

Lanes, Volumes, Timings
2: Komoka Road & Street 'A'/Union Avenue

2023 Total PM Peak Hour
9904 Oxbow Drive TIS

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	21	0	43	21	0	8	74	82	20	2	68	21
Future Volume (vph)	21	0	43	21	0	8	74	82	20	2	68	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.909			0.962			0.984			0.969	
Flt Protected		0.984			0.965			0.979			0.999	
Satd. Flow (prot)	0	1666	0	0	1703	0	0	1735	0	0	1677	0
Flt Permitted		0.984			0.965			0.979			0.999	
Satd. Flow (perm)	0	1666	0	0	1703	0	0	1735	0	0	1677	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		216.2			295.1			489.1			869.3	
Travel Time (s)		15.6			21.2			35.2			62.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	5%	2%	0%	2%	10%	0%	50%	11%	2%
Adj. Flow (vph)	23	0	47	23	0	9	80	89	22	2	74	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	70	0	0	32	0	0	191	0	0	99	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 26.7%

ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
2: Komoka Road & Street 'A'/Union Avenue

2023 Total PM Peak Hour
9904 Oxbow Drive TIS

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	21	0	43	21	0	8	74	82	20	2	68	21
Future Volume (Veh/h)	21	0	43	21	0	8	74	82	20	2	68	21
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	0	47	23	0	9	80	89	22	2	74	23
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	358	360	86	396	361	100	97			111		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	358	360	86	396	361	100	97			111		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.6		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.7		
p0 queue free %	96	100	95	95	100	99	95			100		
cM capacity (veh/h)	566	535	973	509	535	961	1496			1228		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	70	32	191	99
Volume Left	23	23	80	2
Volume Right	47	9	22	23
cSH	788	586	1496	1228
Volume to Capacity	0.09	0.05	0.05	0.00
Queue Length 95th (m)	2.3	1.4	1.4	0.0
Control Delay (s)	10.0	11.5	3.4	0.2
Lane LOS	B	B	A	A
Approach Delay (s)	10.0	11.5	3.4	0.2
Approach LOS	B	B		

Intersection Summary

Average Delay	4.4			
Intersection Capacity Utilization	26.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Lanes, Volumes, Timings
3: Oxbow Drive & Street 'C'

2023 Total PM Peak Hour
9904 Oxbow Drive TIS

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↗	↖		↘	↙
Traffic Volume (vph)	30	62	81	25	14	17
Future Volume (vph)	30	62	81	25	14	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.968		0.926	
Flt Protected		0.984			0.978	
Satd. Flow (prot)	0	1833	1803	0	1687	0
Flt Permitted		0.984			0.978	
Satd. Flow (perm)	0	1833	1803	0	1687	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		261.0	162.6		261.0	
Travel Time (s)		18.8	11.7		18.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	67	88	27	15	18
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	100	115	0	33	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	21.6%
Analysis Period (min)	15
ICU Level of Service A	

HCM Unsignalized Intersection Capacity Analysis
3: Oxbow Drive & Street 'C'

2023 Total PM Peak Hour
9904 Oxbow Drive TIS

	EBL	EBT	WBT	WBR	SBL	SBR
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↗	↖		↘	↙
Traffic Volume (veh/h)	30	62	81	25	14	17
Future Volume (Veh/h)	30	62	81	25	14	17
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	67	88	27	15	18
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	115				234	102
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	115				234	102
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				98	98
cM capacity (veh/h)	1474				737	954

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	100	115	33
Volume Left	33	0	15
Volume Right	0	27	18
cSH	1474	1700	841
Volume to Capacity	0.02	0.07	0.04
Queue Length 95th (m)	0.5	0.0	1.0
Control Delay (s)	2.6	0.0	9.5
Lane LOS	A		A
Approach Delay (s)	2.6	0.0	9.5
Approach LOS			A

Intersection Summary

Average Delay		2.3	
Intersection Capacity Utilization	21.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
4: Komoka Road & Oxbow Drive

2023 Total PM Peak Hour
9904 Oxbow Drive TIS

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	28	43	73	51	12	48	174	43	4	123	7
Future Volume (vph)	6	28	43	73	51	12	48	174	43	4	123	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.924			0.988			0.978			0.993	
Flt Protected		0.996			0.974			0.991			0.999	
Satd. Flow (prot)	0	1647	0	0	1785	0	0	1750	0	0	1712	0
Flt Permitted		0.996			0.974			0.991			0.999	
Satd. Flow (perm)	0	1647	0	0	1785	0	0	1750	0	0	1712	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		162.6			343.2			1366.1			489.1	
Travel Time (s)		11.7			24.7			98.4			35.2	
Confl. Peds. (#/hr)									5	5		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	20%	0%	8%	3%	0%	9%	10%	4%	5%	0%	10%	17%
Adj. Flow (vph)	7	30	47	79	55	13	52	189	47	4	134	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	84	0	0	147	0	0	288	0	0	146	0
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	45.8%											
Analysis Period (min)	15											
ICU Level of Service A												

HCM Unsignalized Intersection Capacity Analysis
4: Komoka Road & Oxbow Drive

2023 Total PM Peak Hour
9904 Oxbow Drive TIS

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	6	28	43	73	51	12	48	174	43	4	123	7
Future Volume (Veh/h)	6	28	43	73	51	12	48	174	43	4	123	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	30	47	79	55	13	52	189	47	4	134	8
Pedestrians					5							
Lane Width (m)					3.6							
Walking Speed (m/s)					1.2							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	503	491	138	530	472	218	142			241		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	503	491	138	530	472	218	142			241		
tC, single (s)	7.3	6.5	6.3	7.1	6.5	6.3	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.0	3.4	3.5	4.0	3.4	2.3			2.2		
p0 queue free %	98	93	95	80	88	98	96			100		
cM capacity (veh/h)	391	460	895	397	472	802	1393			1332		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	84	147	288	146								
Volume Left	7	79	52	4								
Volume Right	47	13	47	8								
cSH	619	443	1393	1332								
Volume to Capacity	0.14	0.33	0.04	0.00								
Queue Length 95th (m)	3.7	11.5	0.9	0.1								
Control Delay (s)	11.7	17.1	1.7	0.2								
Lane LOS	B	C	A	A								
Approach Delay (s)	11.7	17.1	1.7	0.2								
Approach LOS	B	C										
Intersection Summary												
Average Delay			6.0									
Intersection Capacity Utilization			45.8%									
Analysis Period (min)			15									
ICU Level of Service A												

Lanes, Volumes, Timings
5: Komoka Road & Glendon Drive

2023 Total PM Peak Hour
9904 Oxbow Drive TIS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰
Traffic Volume (vph)	67	680	32	100	799	165	41	116	97	112	90	101
Future Volume (vph)	67	680	32	100	799	165	41	116	97	112	90	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	40.0		50.0	25.0		0.0	25.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5		7.5	7.5		7.5	7.5		7.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993				0.850		0.932			0.921	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1832	0	1770	1863	1615	1805	1704	0	1805	1654	0
Flt Permitted	0.145			0.207			0.567			0.531		
Satd. Flow (perm)	265	1832	0	386	1863	1615	1077	1704	0	1009	1654	0
Right Turn on Red			Yes			Yes		Yes			Yes	
Satd. Flow (RTOR)		6				174		55			73	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		986.8			1182.6			612.4			1366.1	
Travel Time (s)		71.0			85.1			44.1			98.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	3%	3%	2%	2%	0%	0%	3%	5%	0%	10%	2%
Adj. Flow (vph)	73	739	35	109	868	179	45	126	105	122	98	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	73	774	0	109	868	179	45	231	0	122	208	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		20.0	20.0	20.0	15.0	15.0		15.0	15.0	
Minimum Split (s)	26.0	26.0		26.0	26.0	26.0	21.0	21.0		21.0	21.0	
Total Split (s)	51.0	51.0		51.0	51.0	51.0	27.0	27.0		27.0	27.0	
Total Split (%)	65.4%	65.4%		65.4%	65.4%	65.4%	34.6%	34.6%		34.6%	34.6%	
Maximum Green (s)	45.0	45.0		45.0	45.0	45.0	21.0	21.0		21.0	21.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Ped	Ped		Ped	Ped	Ped	None	None		None	None	
Walk Time (s)	3.0	3.0		3.0	3.0	3.0	8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0		0	0	
Act Effct Green (s)	36.5	36.5		36.5	36.5	36.5	18.9	18.9		18.9	18.9	
Actuated g/C Ratio	0.57	0.57		0.57	0.57	0.57	0.30	0.30		0.30	0.30	
v/c Ratio	0.48	0.73		0.49	0.81	0.18	0.14	0.42		0.41	0.38	
Control Delay	20.7	14.8		17.2	18.0	1.7	20.9	18.2		25.8	15.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	

Lanes, Volumes, Timings
5: Komoka Road & Glendon Drive

2023 Total PM Peak Hour
9904 Oxbow Drive TIS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	20.7	14.8		17.2	18.0	1.7	20.9	18.2		25.8	15.7	
LOS	C	B		B	B	A	C	B		C	B	
Approach Delay		15.3			15.4			18.6			19.5	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	4.3	56.0		6.5	68.8	0.3	4.0	16.6		11.8	12.5	
Queue Length 95th (m)	19.6	115.6		23.9	141.8	7.4	13.1	41.4		30.8	34.1	
Internal Link Dist (m)		962.8			1158.6			588.4			1342.1	
Turn Bay Length (m)	30.0			40.0		50.0	25.0			25.0		
Base Capacity (vph)	201	1393		293	1415	1268	400	667		375	660	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.36	0.56		0.37	0.61	0.14	0.11	0.35		0.33	0.32	

Intersection Summary

Area Type:	Other
Cycle Length: 78	
Actuated Cycle Length: 63.6	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 16.2	Intersection LOS: B
Intersection Capacity Utilization 97.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 5: Komoka Road & Glendon Drive

