



Municipal Office
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Re: Crosswalk Installation– Request for Quotation

To whom it may concern.

The Town of Devon is inviting proponents to supply solarized crosswalks for 4 locations in the Town. Specifications provided in *schedule "A"*, as well as a bid sheet *"schedule B"* and location map *"schedule C"*.

Scope of Work

The scope of work includes the supply of solarized crosswalks as per specifications located within Schedule "A" for 4 locations within the Town. The quotation shall include all required components for a fully functioning crosswalk including but not limited to the mounting post, push button and notification signage both push button signage and pedestrian crossing signage, ***DUAL*** RFIB per pole and solar engine and operating system.

Please provide separate costs for installation. First calls and locates and crossing agreements will be the responsibility of the proponent to complete and coordinate.

Specifications

The specifications provided are from existing crosswalks in Town that have performed to an expected standard. Other product submissions must be to an equal or greater standard to the specification provided.

Quotations Requirements

Quotations will be received until **2:00:00pm Wednesday April 24th** Copies will be received via email to sgoin@devon.ca cc shayden@devon.ca

Any costs incurred by proponents in preparing the quotation are the sole responsibility of the proponent. All proponents must be prepared to provide evidence of experience. The Town reserves the right to not accept the lowest price.

Quotations will be reviewed according to the rating criteria provided. Award of quotation is anticipated by **May 1st, 2024.**

Rating of Proposals

The Town of Devon will evaluate the proposals received by the deadline given and rate the proposals on the following basis:

<u>Proposal Element</u>	<u>Maximum</u>
Previous experience.....	40 points
Conformance to requirements	25 points
Cost.....	35 points

All proposals and written and verbal communication shall be with:

Sean Goin
Town of Devon
#1 Columbia Ave West
Devon Alberta
T9G 1A1
Phone (780) 987-8314
E-mail sgoin@devon.ca

Schedule A: SPECIFICATIONS

Purchase Specification for a Solar Self-Contained Rectangular Rapid Flashing Beacon (RRFB)

1.0 Overview

Each RRFB shall consist of a self-contained solar engine that houses the charge controller, flash controller, on-board user interface, wireless communications, batteries and solar panel. Each RRFB shall include either one or two light bars. The RRFB shall conform to all provisions of the MUTCD, Interim Approval IA-21 including VWW+S flash pattern. The RRFB shall be pre-wired to the maximum extent possible.

2.0 Mechanical Specifications

The solar engine shall be constructed from aluminum with an integrated solar panel. All batteries and electronics shall be mounted in the solar engine, with no external control cabinet or battery cabinet required.

The solar engine shall not exceed 15" in height from bottom of adapter fitting to top of solar panel. The depth of the solar engine shall not exceed 4".

The overall weight of the solar engine assembly (including two batteries but not including light bars or pushbutton) shall not exceed 20 lbs. (9.1 kg).

The solar engine shall be supplied with a fixed tilt angle of 45 degrees and shall be able to be oriented toward the equator with no additional mounting hardware.

Access to the interior of the solar engine shall be provided by a lid that is hinged on the bottom edge and is fitted with a foam gasket. The lid shall have a lockable latch.

The solar engine shall be vented to provide cooling of the battery and electronic system. The vents shall be screened to prevent ingress by insects and debris.

Fasteners shall be stainless steel.

3.0 Light Bars

The light bars shall be current-driven LED strings without active electronics. The LEDs shall be driven by pulse-width modulated fixed current.

The light bar housing shall be constructed from aluminum and shall have the approximate dimensions: 24" L x 1.5" D x 4.5" H (61.0 cm L x 3.8 cm D x 11.4 cm H).

Each light bar shall conform to all provisions of the MUTCD and FHWA requirements.

Each of the two modules in a light bar shall have 8 LEDs and shall be purpose-built by the manufacturer of the RRFB including the optics.

Each end of a light bar shall include a side-emitting pedestrian confirmation light composed of a single LED. Users shall have the option of using both confirmation lights for median applications, or covering one confirmation light with an included sticker for side-of-road applications.

The light bar shall be mounted to the post or pole using a separate bracket assembly to facilitate mounting two light bars back-to-back (bi-directional) and to allow the light bar(s) to rotate horizontally for aiming.

The light bar bracket shall be constructed from galvanized or stainless steel and shall have both banding and bolting mounting options and shall be able to be mounted to all specified pole types.

The light bar assembly shall open for access to the wiring connections for the LED modules. LED modules shall be rated to NEMA 3R.

4.0 Mounting

Mounting adapter hardware for the RRFB shall be available for the following configurations:

2" / 2.5" Perforated Square Pole Mount

2 3/8" - 2 7/8" Diameter Round Post Mount

4" - 4.5" Diameter Round Post Mount

Side-of-Pole Mount

Wooden Pole

Mounting configurations shall not require specialized tools.

5.0 Configuration

The solar engine shall house an auto-scrolling LED on-board user interface that provides on-site configuration adjustment, system status and fault notification.

The user interface shall provide a display of four (4) alphanumeric characters and three (3) control buttons to navigate and change settings and activate functions.

When editing the configuration, the user interface will flash the display indicating it is ready to accept editing and will flash the display rapidly 3 times to indicate the setting change has been accepted.

The flash duration shall be adjustable in-the-field from 5 to 60 seconds in one second increments, 60 to 1,200 seconds in 60-second steps, and 3,600 seconds. Default flash duration shall be 20 seconds.

The system shall provide configurable nighttime intensity settings ranging from 10% to 100% of daytime intensity.

The system shall be capable of enabling or disabling ambient brightness auto-adjustment. This feature allows the system to provide optimal output brightness in relation to ambient light levels while always maintaining adherence to SAE J595 Class I specifications. If enabled, the ambient brightness auto-adjustment shall adjust output to a range between 50% and 100% of daytime intensity.

The User Interface shall provide viewing and/or programming access for the following:

- Activation Duration (5 to 60, 60 to 1200, or 3600 seconds)
- Digital output that is active during the flashing cycle that allows the control of external devices such as crosswalk illumination. Digital output shall be configurable for night operation only or operation day or night
- Radio Channel (Choice of 1 to 14)
- Radio Status
- Night Intensity Setting
- Adjustment for Ambient Daytime Brightness
- Self-Test / BIST (Built-In Self-Test) including the detection of shorts or open circuits in the fixture outputs
- Battery Status – General description and actual battery voltage
- Day or Night Status (as determined by dedicated photosensor not solar panel output)
- Solar Panel Voltage
- Automatic Light Control. If this safety feature is enabled, it allows the RRFB to temporarily reduce the intensity of the light bars to maintain energy equilibrium. The user interface shall report the amount of dimming being applied in the range of 10% to 100%
- Daily activations averaged over 90 days
- Pushbutton detection
- Firmware Version number

Activation duration, Night intensity setting and adjustment for ambient daytime brightness shall be automatically broadcast to all RRFBs in the system when changed in one RRFB.

6.0 Solar Panel System

The solar engine shall include one 18V nominal solar panel rated between 10 and 15 watts with bypass diode. The solar panel shall be no larger than the footprint of the solar engine enclosure.

Electrical connections on the back of the solar panel shall be contained with an enclosure that prevents accidental contact with either of the power leads.

The solar charging system shall use maximum power point tracking (MPPT).

7.0 Battery System

The solar engine shall house two 7 amp-hour 12V nominal sealed valve-regulated AGM lead-acid maintenance-free batteries. Each battery shall be equipped with a 1.5 amp fast-blow barrel fuse on the positive lead.

The battery charging system shall be 3-stage and incorporate temperature-compensation to prevent battery overcharging in hot weather.

Batteries, in conjunction with recommended RRFB performance, shall be designed for a demonstrable service life of 5 years.

The battery shall be rated for -40° to 140°F (-40° to 60°C).

Batteries shall have quick connections to facilitate installation and be readily available from multiple suppliers and non-proprietary.

Batteries shall be supported by rubber bumpers and be secured in place with straps.

8.0 Operational Specifications

The RRFB shall meet the minimum photometric specifications of the Society of Automotive Engineers (SAE) standard J595 Class I dated January 2005. A photometric report by a certified third-party testing laboratory shall be provided to demonstrate compliance with J595.

The color of the yellow light bar indications shall meet the specifications of SAE standard J578 (Color Specification) dated December 2006.

The solar engine shall have the capacity to provide 300 20-second activations per day year-round using the applicable peak sun hours insolation available at the installation location. Refer to Section 8. Solar Simulations for details on insolation data sources.

The controller shall be able to support up to 1.4 amps combined current through the RRFB fixtures simultaneously.

The system shall use a dedicated light sensor to detect night and day states and apply any optionally-enabled intensity adjustments.

9.0 Radio System

The radio system shall operate at 2.4GHz

Upon detection of a pushbutton press, an RRFB will broadcast an activation to all other nearby RRFBs sharing the same channel.

The RRFB shall have the capability to activate other RRFBs by wireless communications within 1,000 feet (304 meters).

The RRFB shall have a minimum of 14 unique channels that can be configured on-site to avoid inadvertent activation of nearby systems.

The antenna shall be a low-profile "button" shape that cannot be bent or broken by vandals

10.0 Activations

The pedestrian push buttons shall have an LED indicator with audible tone with Piezo control and shall be ADA compliant. The RRFB shall be capable of operating with either 1 or 2 pushbuttons.

All RRFBs in the system shall initiate activation simultaneously within 150ms of activation.

If an additional activation occurs while the system is activated, the flash duration shall reset. For example, with the flash duration set to 20 seconds, if an additional activation occurs after the RRFB has been activated for 15 seconds the RRFB will continue for an additional 20 seconds, or 35 seconds in total.

If the RRFB has ceased its flashing cycle, any subsequent activation shall activate the RRFB immediately regardless of how recently the RRFB ceased operation.

Pushbutton wiring harnesses shall be included.

11.0 Solar Simulations

Detailed solar simulations shall be provided as evidence that the RRFB is capable of the claimed performance at a specific location. Solar Simulations shall be composed of three calculations: Energy Balance, Array-to-Load Ratio (ALR), and Autonomy. The manufacturer or bidder shall provide a detailed analysis of these three calculations in an "Energy Balance Report".

Monthly average sunlight (insolation), night length and temperature data for a specific, declared location shall be from recognized public sources such as the NASA Atmospheric Sciences Data Center. All sources shall be cited exactly and accessible online without cost to allow verification of the data.

Energy Balance

During a normal 24-hour cycle of operation, an RRFB will take energy in from the sun and consume energy through the flashing of the light bars, radio communication, and general quiescent power draw. Energy Balance refers to the evaluation of these energy values to determine overall system sustainability and resistance to variances in sunlight and activation load.

Energy Balance compares Energy-In and Energy-Out. Calculations shall be performed for the "Worst Month" of the year where worst month is determined by the lowest value of Energy-In divided by Energy-Out.

Energy-In

Energy-In is the total amount of sunlight energy in watt-hours *available* to the RRFB over a 24-hour period. Energy-In is available to operate the RRFB, charge the batteries, or both. Energy-In shall be determined as follows:

Insolation X Panel Wattage X Shading X charging efficiency X Battery charge acceptance

- The energy from the solar panel shall be based on available solar radiation at the installation location for the panel's inclination angle. The solar radiation (insolation) values used shall be for the worst-case month of the calendar year.
- Shading from nearby trees, buildings or other structures unique to a particular location are to be factored-in and the calculations shall clearly show and justify the de-rating of the solar panel energy input. A photograph showing the sun's path and obstructions it encounters shall be included.
- Batteries shall be returned to full charge by sunset at the end of each day.

Energy-Out

Energy-Out is the total amount of energy in watt-hours consumed by the RRFB in a 24-hour period of normal operation.

Energy-Out is the sum of quiescent and operating loads, measured in watt-hours, in all circuitry over 24 hours with an operating capacity of 300 20-second activations, including:

- Controller quiescent draw (daytime and between flashes)
- Wireless quiescent draw calculated over 24 hours;
- Operating load of pushbutton at rated operating capacity per activation (where applicable);
- Operating load of light bars including pedestrian indicators at rated intensity per activation. The number of light bars and their electrical load details (voltage, current and power when lit) shall be clearly indicated;

R920-E

RECTANGULAR RAPID FLASHING BEACON



MUTCD-compliant, pedestrian-activated warning beacon for uncontrolled marked crosswalks

- The R920-E is the benchmark for Rectangular Rapid Flashing Beacons (RRFBs)
- Ultra-efficient optics and Energy Management System (EMS)
- Compact design to simplify installation
- Proven technology platform
- Meets and exceeds MUTCD requirements, including IA-21

RRFBs have been found to provide vehicle yielding rates between 72 and 96 percent for crosswalk applications, including 4 lane roadways with average daily traffic (ADT) exceeding 12,000*.

Superior Design and Technology

The R920-E utilizes a self-contained solar engine integrating the Energy Management System (EMS) with an on-board user interface, housed in a compact enclosure together with the batteries and solar panel. MUTCD interim approval IA-21 flash pattern and multiple configurations enable the R920-E to handle all crosswalk applications.

Easy Installation

With its highly efficient and compact design, installation is quick and uncomplicated, dramatically reducing installation costs. Retrofitting can be done where existing sign bases are used to enhance existing marked crosswalks in minutes, and new installations can be completed without the cost of larger poles, new bases, and trenching.

Advanced User-Interface

The R920-E comes with an on-board user interface for quick configuration and status monitoring. It allows for simple in-the-field adjustment of flash pattern, duration, intensity, ambient auto adjust, night dimming, and many more. Settings are automatically sent wirelessly to all units in the system.

Reliable

Designed with Carmanah's industry-leading solar modeling tools to provide dependable year-after-year operation.

Trusted

With thousands of installations, Carmanah's beacons are the benchmark in traffic applications and other transportation applications worldwide.



WE SIMPLIFY PLANNING.

Contact us to get your Energy Balance Report and purchase specifications.

 1.844.412.8395

 traffic@carmanah.com

 carmanahtraffic.com

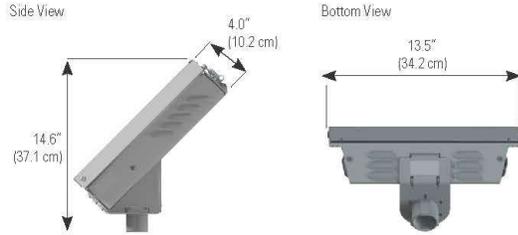
* U.S. Department of Transportation Federal Highways Administration, Publication No. FHWA-HRT-10-043 - "Effects of Yellow Rectangular Rapid-Flashing Beacons on Yielding at Multilane Uncontrolled Crosswalks"

R920-E

RECTANGULAR RAPID FLASHING BEACON



DIMENSIONS



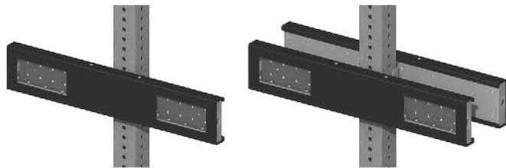
SOLAR ENGINE MOUNTING

2.0" - 2.5" Perforated Square Pole Mount 2.38" - 2.88" Diameter Round Pole Mount 4.0" - 4.5" Diameter Round Pole Mount Side Pole Mount

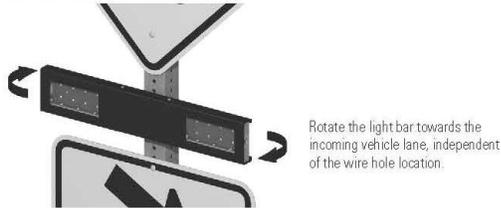


LIGHT BAR CONFIGURATION

Uni-directional Configuration Bi-directional Configuration



IN-THE-FIELD AIMING



Specifications subject to local environmental conditions, and may be subject to change.

All Carmanah products are manufactured in facilities that are certified to ISO quality standards.
 US Patent No 6,573,659, Other patents pending.
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 Document: SPEC_TRA_R920-E_RevS_canadian-sign

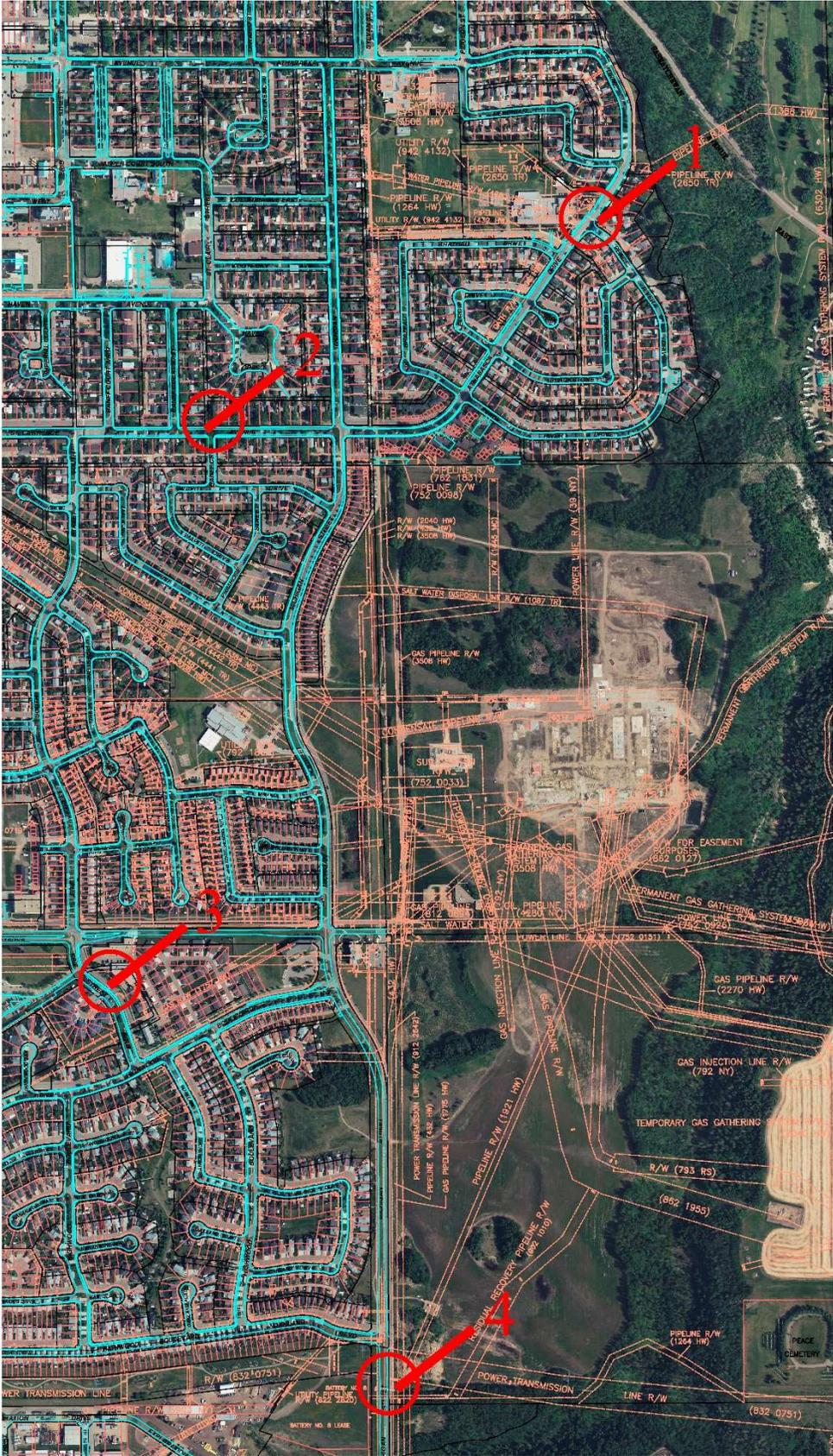
	Adjustable system settings with auto-scrolling LED display on our latest EMS
	System test, status, and fault detection: battery, solar, button, beacon, radio, day/night
	Flash patterns: RFB1 (WW4-S), RFB2 (WSDOT), 0.5 sec. alternating (MUTCD), 0.5 sec. unison (MUTCD), 0.1 sec. unison, 0.25 sec. unison, 0.1 sec. x3 quick flashes unison, 0.1 sec. x3 quick flashes alternating
	Input: momentary for push button activation, normally open switch, normally closed switch
	Flash duration: 5 sec. to 1 hr.
	Intensity setting: 20 to 1400 mA for multiple RFBs, circular beacons, or LED enhanced signs
	Nighttime dimming: 10 to 100% of daytime intensity
	Ambient Auto Adjust: increases intensity during bright daytime
	Automatic Light Control: reduces intensity if the battery is extremely low
	Temperature correction: yellow or red beacons
	Calendar: internal time clock function
	Radio settings: enable/disable, selectable channel from 1 to 14
	Output: enabled when beacons flashing daytime and nighttime, or nighttime only
	Activation counts and data reporting via OBU or optional USB connection
	MUTCD interim approval IA-21 and MUTCDC compliant
	Purpose-built light bar optics = maximum efficiency and no stray light Exceeds SAE J595 class 1 intensity by 2.5 to 3x when used as recommended Meets SAE J578 chromaticity
Optical	3 in (76 mm) x 7 in (178 mm) clear, UV-rated polycarbonate lens with yellow LEDs
	High-power LEDs: >90% lumen maintenance (L90) based on IES LM-80
	Side-emitting pedestrian confirmation LEDs
	Independent, stainless steel mounting brackets make back-to-back installation simple and enable in-field aiming for maximum effectiveness
	Yellow, black, or green powder coated light bar covers
	Encrypted, wireless radio with 2.4 GHz mesh technology
	Wireless update of settings from any unit to all systems on the same radio channel
	User-selectable multiple channels to group different beacons and ensure a robust wireless signal
Connectivity	Communicates with all other Gen III radio-enabled systems including our R820-E, -F, and -G circular beacons
	Instantaneous wireless activation: <150 ms
	Wireless range: 1000 ft (305 m)
	Integrated, vandal-proof antenna
	13 W high-efficiency photovoltaic solar panel
Energy Collection	45 deg tilt for optimal energy collection
	Maximum Power Point Tracking with Temperature Compensation (MPPT-TC) battery charger for optimal energy collection in all solar and battery conditions
	12 V 14 Ahr. battery system
Energy Storage	Replaceable, recyclable, sealed, maintenance-free, best-in-class AGM batteries offer the widest temperature range and longest life
	Battery design life: +5 yrs.
	Tool-less battery change with quick connect terminals and strapping for easy installation
	Weatherproof, gasketed enclosure with vents for ambient air transfer (NEMA 3R)
	Lockable, hinged lid for access to on-board user interface and batteries
Solar Engine Construction	Corrosion-resistant aluminum with stainless steel hardware
	Raw aluminum finish or yellow, black, or green powder coated
	Prewired to minimize installation time
	High-efficiency optics and EMS = the most compact, lightweight system
	19 lb (8.6 kg) including batteries, excluding beacons and push button
Environmental	-40 to 165° F (-40 to 74° C) system operating temperature
	-40 to 140° F (-40 to 60° C) battery operating temperature
	150 mph (241 kph) wind speed as per AASHTO LTS-6
Activation	Push button: ADA-compliant, piezo-driven with visual LED and two-tone audible confirmation
Warranty	5-year limited warranty

Schedule B: Bid Sheet

Solar Crosswalks Install				
Company		Purchase Cost	Install Cost	Total
	Location 1			
	Location 2			
	Location 3			
	Location 4			
				Total =

***Any costs for hydro-vac must be included in the install cost.**

Schedule C: Location Map



Location 1: East of Riverview School to corner of Athabasca Drive & Peace River Drive



Location 2: Connects 52 St. Lawrence Avenue Back Lane to Banff Court South



