



State of West Virginia
 Department of Administration
 Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

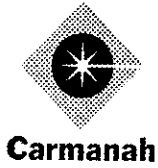
Request for Quotation

RFQ NUMBER
PTR07004

PAGE
7

ADDRESS CORRESPONDENCE TO ATTENTION OF
KRISTA FERRELL 304-558-2596

VENDOR



Carmanah Technologies ^{Corp.} Inc.
 Building 4-203 Harbour Road
 Victoria, BC V9A 3S2
 Canada

SHIP TO

DIVISION OF PUBLIC TRANSIT
 BUILDING 5, ROOM 830
 1900 KANAWHA BOULEVARD, EAST
 CHARLESTON, WV
 25305-0432 304-558-0428

DATE PRINTED	TERMS OF SALE	SHIP VIA	FOB	FREIGHT TERMS
08/07/2006				
BID OPENING DATE: 08/31/2006		BID OPENING TIME 01:30PM		

LINE	QUANTITY	UOP	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
			DATE: n/a			
			SIGNED: n/a			
			TITLE: n/a			
<p>* CHECK ANY COMBINATION OF PREFERENCE CONSIDERATION(S) IN EITHER "A" OR "B", OR BOTH "A" AND "B" WHICH YOU ARE ENTITLED TO RECEIVE. YOU MAY REQUEST UP TO THE MAXIMUM 5% PREFERENCE FOR BOTH "A" AND "B". (REV. 12/00)</p> <p>NOTICE</p> <p>A SIGNED BID MUST BE SUBMITTED TO:</p> <p>DEPARTMENT OF ADMINISTRATION PURCHASING DIVISION BUILDING 15 2019 WASHINGTON STREET, EAST CHARLESTON, WV 25305-0130</p> <p>THE BID SHOULD CONTAIN THIS INFORMATION ON THE FACE OF THE ENVELOPE OR THE BID MAY NOT BE CONSIDERED:</p> <p>SEALED BID</p> <p>BUYER: 21</p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS			
SIGNATURE	TELEPHONE	DATE	
<i>[Signature]</i>	250-350-0052 ext. 8320	August 28, 2006	
TITLE	FERN	ADDRESS CHANGES TO BE NOTED ABOVE	
Business Manager	98-0436474		

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED "VENDOR"



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ADDRESS CORRESPONDENCE TO ATTENTION OF
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304-558-2596

BIDDING

Carmanah Technologies Inc Corp.
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 Victoria, BC V9A 3S2
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BIDDING

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BID OPENING DATE: 08/31/2006		BID OPENING TIME: 01:30PM		

LINE	QUANTITY	UOP	CA NO	ITEM NUMBER	UNIT PRICE	AMOUNT
0001	1	EA		155-12		
<p>PRE-ENGINEERED BUS SHELTERS AND SOLAR LIGHTING</p> <p>REQUEST FOR QUOTATION</p> <p>THE WEST VIRGINIA PURCHASING DIVISION FOR THE AGENCY, THE WEST VIRGINIA DIVISION OF PUBLIC TRANSIT, IS SOLICITING BIDS FOR AN OPEN END CONTRACT TO PROVIDE THE AGENCY WITH PRE-ENGINEERED BUS PASSENGER SHELTERS, SOLAR LIGHTING SYSTEM FOR BUS SHELTERS, AND SOLAR POWERED TRANSIT STOPS PER THE ATTACHED SPECIFICATIONS.</p> <p>EXHIBIT 3</p> <p>LIFE OF CONTRACT: THIS CONTRACT BECOMES EFFECTIVE ON UPON AWARD AND EXTENDS FOR A PERIOD OF ONE (1) YEAR OR UNTIL SUCH "REASONABLE TIME" THEREAFTER AS IS NECESSARY TO OBTAIN A NEW CONTRACT OR RENEW THE ORIGINAL CONTRACT. THE "REASONABLE TIME" PERIOD SHALL NOT EXCEED TWELVE (12) MONTHS. DURING THIS "REASONABLE TIME" THE VENDOR MAY TERMINATE THIS CONTRACT FOR ANY REASON UPON GIVING THE DIRECTOR OF PURCHASING 30 DAYS WRITTEN NOTICE.</p> <p>UNLESS SPECIFIC PROVISIONS ARE STIPULATED ELSEWHERE IN THIS CONTRACT DOCUMENT, THE TERMS, CONDITIONS AND PRICING SET HEREIN ARE FIRM FOR THE LIFE OF THE CONTRACT.</p> <p>RENEWAL: THIS CONTRACT MAY BE RENEWED UPON THE MUTUAL</p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE *[Signature]* TELEPHONE **250-380-0052 ext 830** DATE **August 28, 2006**
 TITLE **Business Manager** FEIN **98-0436474** ADDRESS CHANGES TO BE NOTED ABOVE

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ADDRESS CORRESPONDENCE TO ATTENTION OF
**KRISTA FERRELL
 304-558-2596**

VENDOR ROOM



Carmanah

Corp. Inc.
 Carmanah Technologies
 Building 4-203 Harbour Road
 Victoria, BC V9A 3S2
 Canada

S.H.C.

**DIVISION OF PUBLIC TRANSIT
 BUILDING 5, ROOM 830
 1900 KANAWHA BOULEVARD, EAST
 CHARLESTON, WV
 25305-0432 304-558-0428**

DATE PRINTED 08/07/2006	TERMS OF SALE	SHIP VIA	FOB	FREIGHT TERMS
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BID OPENING DATE: **08/31/2006** BID OPENING TIME **01:30PM**

LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
<p>WRITTEN CONSENT OF THE SPENDING UNIT AND VENDOR, SUBMITTED TO THE DIRECTOR OF PURCHASING THIRTY (30) DAYS PRIOR TO THE EXPIRATION DATE. SUCH RENEWAL SHALL BE IN ACCORDANCE WITH THE TERMS AND CONDITIONS OF THE ORIGINAL CONTRACT AND SHALL BE LIMITED TO TWO (2) ONE (1) YEAR PERIODS.</p> <p>CANCELLATION: THE DIRECTOR OF PURCHASING RESERVES THE RIGHT TO CANCEL THIS CONTRACT IMMEDIATELY UPON WRITTEN NOTICE TO THE VENDOR IF THE COMMODITIES AND/OR SERVICES SUPPLIED ARE OF AN INFERIOR QUALITY OR DO NOT CONFORM TO THE SPECIFICATIONS OF THE BID AND CONTRACT HEREIN.</p> <p>OPEN MARKET CLAUSE: THE DIRECTOR OF PURCHASING MAY AUTHORIZE A SPENDING UNIT TO PURCHASE ON THE OPEN MARKET, WITHOUT THE FILING OF A REQUISITION OR COST ESTIMATE, ITEMS SPECIFIED ON THIS CONTRACT FOR IMMEDIATE DELIVERY IN EMERGENCIES DUE TO UNFORESEEN CAUSES (INCLUDING BUT NOT LIMITED TO DELAYS IN TRANSPORTATION OR AN UNANTICIPATED INCREASE IN THE VOLUME OF WORK.)</p> <p>QUANTITIES: QUANTITIES LISTED IN THE REQUISITION ARE APPROXIMATIONS ONLY, BASED ON ESTIMATES SUPPLIED BY THE STATE SPENDING UNIT. IT IS UNDERSTOOD AND AGREED THAT THE CONTRACT SHALL COVER THE QUANTITIES ACTUALLY ORDERED FOR DELIVERY DURING THE TERM OF THE CONTRACT, WHETHER MORE OR LESS THAN THE QUANTITIES SHOWN.</p> <p>BANKRUPTCY: IN THE EVENT THE VENDOR/CONTRACTOR FILES FOR BANKRUPTCY PROTECTION, THIS CONTRACT IS AUTOMATICALLY NULL AND VOID, AND IS TERMINATED WITHOUT FURTHER ORDER.</p> <p>THE TERMS AND CONDITIONS CONTAINED IN THIS CONTRACT</p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE <i>[Signature]</i>	TELEPHONE <i>250-380-0522 ext 8310</i>	DATE <i>August 28, 2006</i>
TITLE <i>Business Manager</i>	FERN <i>98-0436474</i>	ADDRESS CHANGES TO BE NOTED ABOVE

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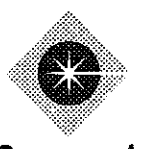
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ADDRESS CORRESPONDENCE TO ATTENTION OF:
**KRISTA FERRELL
 304-558-2596**

VENDOR



Carmanah

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OFFER

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 BUILDING 5, ROOM 830
 1900 KANAWHA BOULEVARD, EAST
 CHARLESTON, WV
 25305-0432 304-558-0428

DATE PRINTED 08/07/2006	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
BID OPENING DATE: 08/31/2006	BID OPENING TIME		01:30PM	

LINE	QUANTITY	UOP	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
<p>SHALL SUPERSEDE ANY AND ALL SUBSEQUENT TERMS AND CONDITIONS WHICH MAY APPEAR ON ANY ATTACHED PRINTED DOCUMENTS SUCH AS PRICE LISTS, ORDER FORMS, SALES AGREEMENTS OR MAINTENANCE AGREEMENTS, INCLUDING ANY ELECTRONIC MEDIUM SUCH AS CD-ROM.</p> <p>REV. 04/11/2001</p> <p>EXHIBIT 6</p> <p>PRICE ADJUSTMENT PROVISION: THE STATE OF WEST VIRGINIA WILL CONSIDER BIDS THAT CONTAIN PROVISIONS FOR PRICE ADJUSTMENTS PRIOR TO THE ORIGINAL EXPIRATION OF THE CONTRACT, PROVIDED THAT SUCH PRICE ADJUSTMENT COVERS BOTH UPWARD AND DOWNWARD MOVEMENT OF THE COMMODITY PRICE, AND THAT ADJUSTMENT IS BASED ON THE "PASS THROUGH" INCREASE OR DECREASE OF RAW MATERIALS AND/OR LABOR, WHICH MAKE UP ALL OR A SUBSTANTIAL PART OF A PRODUCT. ADJUSTMENTS ARE TO BE BASED UPON AN ACTUAL DOLLAR FIGURE, NOT A PERCENTAGE. ALL PRICE ADJUSTMENT REQUESTS MUST BE SUBSTANTIATED IN A MANNER ACCEPTABLE TO THE DIRECTOR PURCHASING, E.G. GOVERNMENTAL BENCH MARKS, GENERAL MARKET INCREASE, PUBLISHED PRICE LISTS. SUCH REQUESTS FOR AN INCREASE SHOULD BE RECEIVED IN WRITING BY THE DIRECTOR OF PURCHASING AT LEAST 30 DAYS IN ADVANCE OF THE EFFECTIVE DATE OF THE INCREASE. ANY TIME THE VENDOR REQUESTS A PRICE ADJUSTMENT, THE PURCHASING DIVISION MAY EITHER ACCEPT THE PRICE ADJUSTMENT AND AMEND THE CONTRACT ACCORDINGLY OR REJECT THE ADJUSTMENT IN ITS ENTIRETY AND CANCEL THE CONTRACT.</p> <p>PREFERRED TERMS:</p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS.

SIGNATURE <i>[Signature]</i>	TELEPHONE 250-380-0552 ext. 8320	DATE August 28, 2006
TITLE Business Manager	FERN 98-0436474	ADDRESS CHANGES TO BE NOTED ABOVE

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<p>IT IS PREFERRED THAT THE PRICES ON THIS CONTRACT ARE FIRM FOR LIFE OF THE CONTRACT, AS INDICATED IN THE LIFE OF CONTRACT CLAUSE CONTAINED HEREIN, NOT TO EXCEED ONE (1) YEAR. PRICE INCREASES WILL BE CONSIDERED AT THE TIME OF RENEWAL ONLY.</p> <p>THE MODEL/BRAND/SPECIFICATIONS NAMED HEREIN ESTABLISH THE ACCEPTABLE LEVEL OF QUALITY ONLY AND ARE NOT INTENDED TO REFLECT A PREFERENCE OR FAVOR ANY PARTICULAR BRAND OR VENDOR. VENDORS WHO ARE BIDDING ALTERNATES SHOULD SO STATE AND INCLUDE PERTINENT LITERATURE AND SPECIFICATIONS. FAILURE TO PROVIDE INFORMATION FOR ANY ALTERNATES MAY BE GROUNDS FOR REJECTION OF THE BID. THE STATE RESERVES THE RIGHT TO WAIVE MINOR IRREGULARITIES IN BIDS OR SPECIFICATIONS IN ACCORDANCE WITH SECTION 148-1-4(F) OF THE WEST VIRGINIA LEGISLATIVE RULES AND REGULATIONS.</p> <p>VENDOR PREFERENCE CERTIFICATE</p> <p>CERTIFICATION AND APPLICATION* IS HEREBY MADE FOR PREFERENCE IN ACCORDANCE WITH WEST VIRGINIA CODE, 5A-3-37 (DOES NOT APPLY TO CONSTRUCTION CONTRACTS).</p> <p>A. APPLICATION IS MADE FOR 2.5% PREFERENCE FOR THE REASON CHECKED:</p> <p>() BIDDER IS AN INDIVIDUAL RESIDENT VENDOR AND HAS RESIDED CONTINUOUSLY IN WEST VIRGINIA FOR FOUR (4) YEARS IMMEDIATELY PRECEDING THE DATE OF THIS CERTIFICATION; OR</p> <p>() BIDDER IS A PARTNERSHIP, ASSOCIATION OR CORPORATION RESIDENT VENDOR AND HAS MAINTAINED ITS HEAD-</p>						<p><i>\$ to remain firm</i></p>

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE: *[Signature]* TELEPHONE: *250-380-0052 ext 828* DATE: *August 28, 2006*

TITLE: *Business Manager* FEIN: *98-0436474* ADDRESS CHANGES TO BE NOTED ABOVE

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S U B P O C



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S U B P O C

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<p>QUARTERS OR PRINCIPAL PLACE OF BUSINESS CONTINUOUSLY IN WEST VIRGINIA FOR FOUR (4) YEARS IMMEDIATELY PRECEDING THE DATE OF THIS CERTIFICATION; OR 80% OF THE OWNERSHIP INTEREST OF BIDDER IS HELD BY ANOTHER INDIVIDUAL, PARTNERSHIP, ASSOCIATION OR CORPORATION RESIDENT VENDOR WHO HAS MAINTAINED ITS HEADQUARTERS OR PRINCIPAL PLACE OF BUSINESS CONTINUOUSLY IN WEST VIRGINIA FOR FOUR (4) YEARS IMMEDIATELY PRECEDING THE DATE OF THIS CERTIFICATION; OR</p> <p>() BIDDER IS A CORPORATION NONRESIDENT VENDOR WHICH HAS AN AFFILIATE OR SUBSIDIARY WHICH EMPLOYS A MINIMUM OF ONE HUNDRED STATE RESIDENTS AND WHICH HAS MAINTAINED ITS HEADQUARTERS OR PRINCIPAL PLACE OF BUSINESS WITHIN WEST VIRGINIA CONTINUOUSLY FOR THE FOUR (4) YEARS IMMEDIATELY PRECEDING THE DATE OF THIS CERTIFICATION.</p> <p>B. APPLICATION IS MADE FOR 2.5% PREFERENCE FOR THE REASON CHECKED:</p> <p>() BIDDER IS A RESIDENT VENDOR WHO CERTIFIES THAT, DURING THE LIFE OF THE CONTRACT, ON AVERAGE AT LEAST 75% OF THE EMPLOYEES WORKING ON THE PROJECT BEING BID ARE RESIDENTS OF WEST VIRGINIA WHO HAVE RESIDED IN THE STATE CONTINUOUSLY FOR THE TWO YEARS IMMEDIATELY PRECEDING SUBMISSION OF THIS BID;</p> <p>OR</p> <p>() BIDDER IS A NONRESIDENT VENDOR EMPLOYING A MINIMUM OF ONE HUNDRED STATE RESIDENTS OR IS A NONRESIDENT VENDOR WITH AN AFFILIATE OR SUBSIDIARY WHICH MAINTAINS ITS HEADQUARTERS OR PRINCIPAL PLACE OF BUSINESS WITHIN WEST VIRGINIA EMPLOYING A MINIMUM OF ONE HUNDRED STATE RESIDENTS WHO CERTIFIES THAT, DURING THE LIFE OF THE CONTRACT, ON AVERAGE AT LEAST 75% OF THE EMPLOYEES OR BIDDERS' AFFILIATE'S OR</p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS.

SIGNATURE *[Signature]* TELEPHONE **250-380-0052 ext. 8320** DATE **August 28, 2006**
 TITLE **Business Manager** FEIN **98-0436474** ADDRESS CHANGES TO BE NOTED ABOVE

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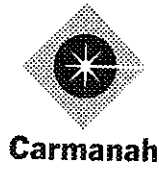
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<p>SUBSIDIARY'S EMPLOYEES ARE RESIDENTS OF WEST VIRGINIA WHO HAVE RESIDED IN THE STATE CONTINUOUSLY FOR THE TWO YEARS IMMEDIATELY PRECEDING SUBMISSION OF THIS BID.</p> <p>BIDDER UNDERSTANDS IF THE SECRETARY OF TAX & REVENUE DETERMINES THAT A BIDDER RECEIVING PREFERENCE HAS FAILED TO CONTINUE TO MEET THE REQUIREMENTS FOR SUCH PREFERENCE, THE SECRETARY MAY ORDER THE DIRECTOR OF PURCHASING TO: (A) RESCIND THE CONTRACT OR PURCHASE ORDER ISSUED; OR (B) ASSESS A PENALTY AGAINST SUCH BIDDER IN AN AMOUNT NOT TO EXCEED 5% OF THE BID AMOUNT AND THAT SUCH PENALTY WILL BE PAID TO THE CONTRACTING AGENCY OR DEDUCTED FROM ANY UNPAID BALANCE ON THE CONTRACT OR PURCHASE ORDER.</p> <p>BY SUBMISSION OF THIS CERTIFICATE, BIDDER AGREES TO DISCLOSE ANY REASONABLY REQUESTED INFORMATION TO THE PURCHASING DIVISION AND AUTHORIZES THE DEPARTMENT OF TAX AND REVENUE TO DISCLOSE TO THE DIRECTOR OF PURCHASING APPROPRIATE INFORMATION VERIFYING THAT BIDDER HAS PAID THE REQUIRED BUSINESS TAXES, PROVIDED THAT SUCH INFORMATION DOES NOT CONTAIN THE AMOUNTS OF TAXES PAID NOR ANY OTHER INFORMATION DEEMED BY THE TAX COMMISSIONER TO BE CONFIDENTIAL.</p> <p>UNDER PENALTY OF LAW FOR FALSE SWEARING (WEST VIRGINIA CODE 61-5-3), BIDDER HEREBY CERTIFIES THAT THIS CERTIFICATE IS TRUE AND ACCURATE IN ALL RESPECTS; AND THAT IF A CONTRACT IS ISSUED TO BIDDER AND IF ANYTHING CONTAINED WITHIN THIS CERTIFICATE CHANGES DURING THE TERM OF THE CONTRACT, BIDDER WILL NOTIFY THE PURCHASING DIVISION IN WRITING IMMEDIATELY.</p> <p>BIDDER: <i>not applicable</i></p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE <i>[Signature]</i>	TELEPHONE 250-380-0052	a.t. 8320	DATE August 28, 2006
TITLE Business Manager	FEN 98-0436474	ADDRESS CHANGES TO BE NOTED ABOVE	

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<p>DATE: <i>n/a</i></p> <p>SIGNED: <i>n/a</i></p> <p>TITLE: <i>n/a</i></p> <p>* CHECK ANY COMBINATION OF PREFERENCE CONSIDERATION(S) IN EITHER "A" OR "B", OR BOTH "A" AND "B" WHICH YOU ARE ENTITLED TO RECEIVE. YOU MAY REQUEST UP TO THE MAXIMUM 5% PREFERENCE FOR BOTH "A" AND "B". (REV. 12/00)</p> <p>NOTICE</p> <p>A SIGNED BID MUST BE SUBMITTED TO:</p> <p>DEPARTMENT OF ADMINISTRATION PURCHASING DIVISION BUILDING 15 2019 WASHINGTON STREET, EAST CHARLESTON, WV 25305-0130</p> <p>THE BID SHOULD CONTAIN THIS INFORMATION ON THE FACE OF THE ENVELOPE OR THE BID MAY NOT BE CONSIDERED:</p> <p>SEALED BID</p> <p>BUYER: 21</p>						

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SIGNATURE *[Signature]* TELEPHONE **250-380-0052 ext. 830** DATE **August 28, 2006**

TITLE **Business Manager** FERN **98-0436474** ADDRESS CHANGES TO BE NOTED ABOVE

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LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
				RFQ. NO. : PTR07004		
				BID OPENING DATE: 08/31/2006		
				BID OPENING TIME: 1:30 PM		
				PLEASE PROVIDE A FAX NUMBER IN CASE IT IS NECESSARY TO CONTACT YOU REGARDING YOUR BID: 250-389-0040 or 250-380-0062		
				CONTACT PERSON (PLEASE PRINT CLEARLY): Marion Randell 250-412-8321 or 250-727-5626 or Jeff Peters 250-412-8320 or 250-727-5673		
				***** THIS IS THE END OF RFQ PTR07004 ***** TOTAL:		

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SIGNATURE <i>[Signature]</i>	TELEPHONE 250-380-0052 ext 8320	DATE August 28, 2006
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014

PRICE SHEET
 For
 PTR07004

BUS SHELTER SIZES

1. STANDARD SHELTERS

	Estimated number of units	Extended Price
A: Size 3 x 9	100	\$ _____
B: Size 3 x 12	100	\$ _____
C: Size 5 x 7	100	\$ _____
D: Size 5 x 9	100	\$ _____
E: Size 5 x 10	100	\$ _____
F: Size 5 x 12	100	\$ _____

2. VICTORIAN STYLE SHELTERS

A: Size 3 x 9	100	\$ _____
B: Size 3 x 12	100	\$ _____
C: Size 5 x 7	100	\$ _____
D: Size 5 x 9	100	\$ _____
E: Size 5 x 10	100	\$ _____
F: Size 5 x 12	100	\$ _____

TOTAL FOR BID EVALUATION:

\$ 11/91

Note: Unit pricing above must be firm and will be used for when awarding the contract for these items.

Buyer KF-21 Page PO#PTR07004
Spending Unit: Division of Public Transit
Department of Transportation

OPTION SHEET
For
PTR07004

OPTIONS	Estimated number of units	Extended Price
OPTION 1: PERFORATED STEEL SIDE PANELS \$	100	\$
OPTION 2: ALUMINUM SIDE PANELS \$	100	\$
OPTION 3: SHELTER BENCH WITH ANTI-VAGRANT BARS \$	100	\$
OPTION 4: SOLAR LIGHTING SYSTEM \$ 1890.00	100	\$ 189,000.00
OPTION 5: SOLAR POWERED TRANSIT STOP \$ 760.00	100	\$ 76,000.00
TOTAL FOR BID EVALUATION:		\$ 265,000.00

Note: Unit pricing above must be firm and will be used for when awarding the contract for these items.

015

PTR07004

021

BID FORM 1
BUY AMERICA CERTIFICATION

Bidder or offerer to complete correct certification.

Certificate of Compliance with Section 165(a)

The bidder or offerer hereby certifies that it will comply with the requirements of section 165(a) of the Surface Transportation Act of 1982, as amended, and the applicable regulations in 49 CFR part 661.

August 28, 2006
Date

[Signature]
Authorized Signature

Carnaval Technologies Corp.
Company Name

Jeff Peters
Name

Business Manager.
Title

Certificate for Non-Compliance with Section 165(a)

The bidder or offerer hereby certifies that it cannot comply with the requirements of section 165(a) of the Surface Transportation Assistance Act of 1982, as amended, but it may qualify for an exception to the requirement pursuant to section 165(b)(2) or (b)(4) of the Surface Transportation Act of 1982, as amended, and the regulations in 49 CFR 661.7.

Date

Authorized Signature

Company Name

Name

Title

PTR07004

 022

BID FORM 2

VENDOR'S CERTIFICATION OF UNDERSTANDING AND ACCEPTANCE

The Contractor hereby certifies that all Technical Specifications and Contract Terms and Conditions have been carefully reviewed, are fully understood and shall be adhered to in performance and completion of any contract resulting from this bid.

August 28, 2006
Date

[Signature]
Authorized Signature

Business Manager
Title

Carmanah Technologies Corp.
Company Name

SPECIFICATION COMPLIANCE

NOTE: Please check if what is offered is in exact compliance with specifications. Any discrepancies must be addressed. Exact dimensions and/or descriptions must be provided. This information should be submitted via attachment.

Bid proposal submitted meets and/or exceeds all specification requirements.

Bid proposal submitted contains deviations from specification requirements. Detailed descriptions of these deviations have been provided with this bid proposal.

Buyer: Page 023 PO# PTR 07004
Spending Unit: Division of Public Transit
Department of Transportation

BID FORM 3

CERTIFICATION OF RESTRICTIONS ON LOBBYING

The undersigned (Vendor, Contractor) certifies, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for making lobbying contacts to an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions. [as amended by "Government Wide Guidance for New Restrictions on Lobbying," 61 Fed. Reg. 1413 (1/19/96). Note: Language in paragraph (2) herein has been modified in accordance with Section 10 of the Lobbying Disclosure Act of 1995 (P.L. 104-65, to be codified at 2 U.S.C. 1601, et seq.)]
3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure. [Note: Pursuant to 31 U.S.C. § 1352(c)(1)-(2)(A), any person who makes a prohibited expenditure or fails to file or amend a required certification or disclosure form shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such expenditure or failure.]

The Vendor, Carmanah Technologies Corp., certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Vendor understands and agrees that the provisions of 31 U.S.C. § 3801, et seq., apply to this certification and disclosure, if any.

August 28, 2006
Date [Signature]
Authorized Signature

Business Manager
Title

RFQ No. PTR07004

AFFIDAVIT

024

West Virginia Code §5A-3-10a states:

No contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and the debt owned is an amount greater than one thousand dollars in the aggregate

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Debtor" means any individual, corporation, partnership, association, limited liability company or any other form or business association owing a debt to the state or any of its political subdivisions.

"Political subdivision" means any county commission; municipality; county board of education; any instrumentality established by a county or municipality; any separate corporation or instrumentality established by one or more counties or municipalities, as permitted by law; or any public body charged by law with the performance of a government function or whose jurisdiction is coextensive with one or more counties or municipalities.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

EXCEPTION:

The prohibition of this section does not apply where a vendor has contested any tax administered pursuant to chapter eleven of this code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

LICENSING:

The vendor must be licensed in accordance with any and all state requirements to do business with the state of West Virginia.

CONFIDENTIALITY:

The vendor agrees that he or she will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the agency's policies, procedures and rules. Vendors should visit www.state.wv.us/admin/purchase/privacy for the Notice of Agency Confidentiality Policies.

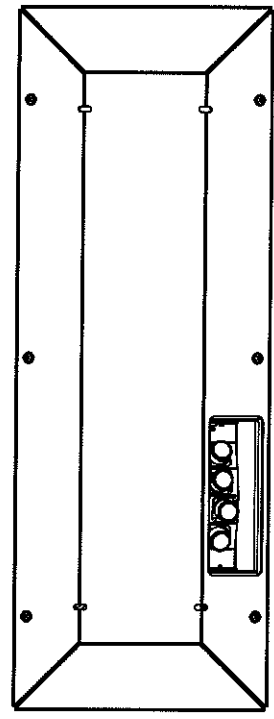
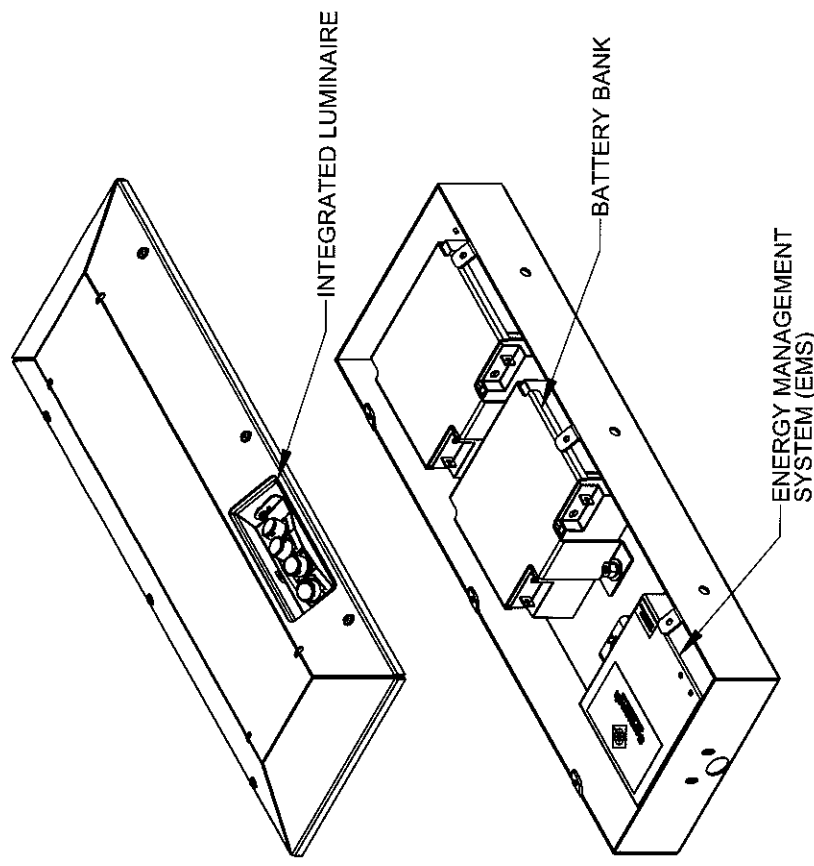
Under penalty of law for false swearing (West Virginia Code, §61-5-3), it is hereby certified that the vendor acknowledges the information in this said affidavit and are in compliance with the requirements as stated.

Vendor's Name: Carmanah Technologies Corp.

Authorized Signature: [Signature] Date: August 28, 2006

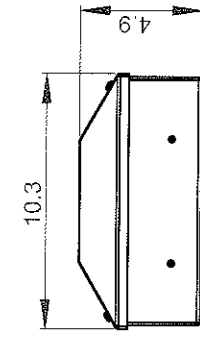
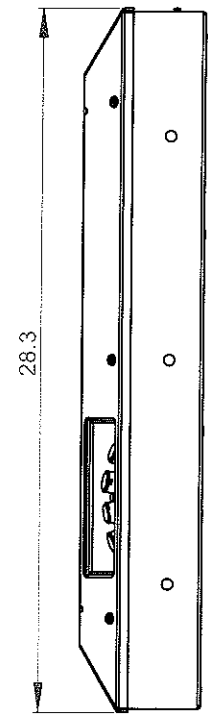
Appendix 1 – Solar Lighting System Specifications (Standard)

8 7 6 5 4 3 2 1



SPECIFICATIONS:

WEIGHT: ~40LBS (W/ 2 BATTERIES)
 BATTERY CAPACITY: 34.4Ah (32Ah HIGH TEMP)
 CHASSIS MATERIAL: ALUMINUM ALLOY - 5052
 OUTPUTS: SINGLE CHANNEL
 FINISH: POWDER COAT (POLYESTER)
 HARDWARE: CORROSION / VANDAL RESISTANT



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 Building 4-203 Harbour Road
 Victoria, BC Canada V8A 3S2
 Tel (250) 380-0052
 Fax (250) 380-0062

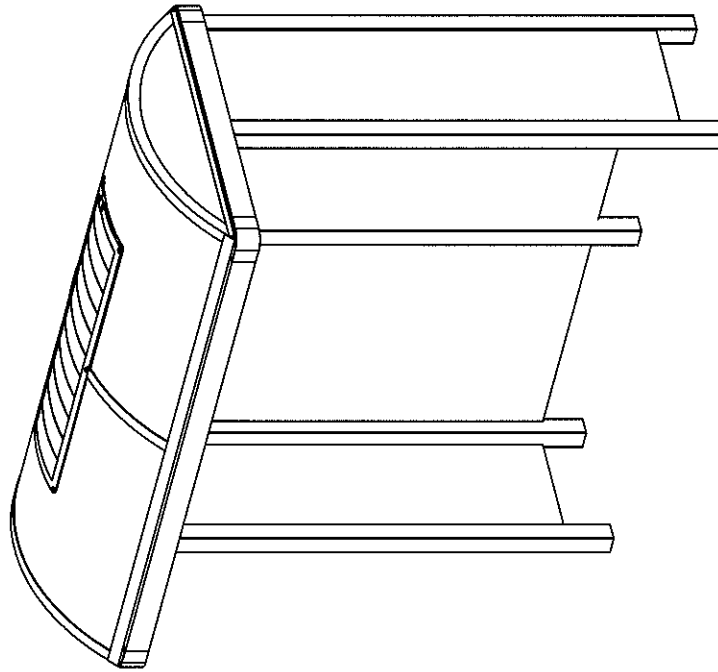
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TITLE
POWER MODULE, BR-30

DRAWN BY David Hanks
 DATE 09-Aug-2006
 DRAWING NO **43441_01**
 REVISION **X1**
 SHEET **1 OF 1**



i-SHELTER INSTALLATION INSTRUCTIONS



UNLESS OTHERWISE SPECIFIED
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INTERPRET DIMENSIONS AND TOLERANCES
AS SHOWN UNLESS OTHERWISE NOTED
TOLERANCES APPLY AS SHOWN BELOW
X DECIMALS SURF FINISH ANGLER
.XX ± .01 45° 41°
.XXX ± .005

THIRD ANGLE PROJECTION

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DESIGNED BY DATE 03-Sep-2004
DRAWN BY DATE 10-Sep-2004
APPROVED DATE

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Tel: (250) 380-0052
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TITLE
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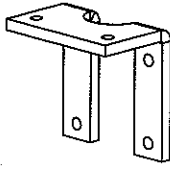
SIZE B DRAWING NO 37505 01 REVISION B
SCALE 1:1.5 CAD REFERENCE 37505.SLDASM SHEET 1 OF 6

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

POWER MODULE INSTALLATION

1. SECURE POWER MODULE MOUNT BRACKET TO SHELTER WITH SIX (6) 10-24 SELF TAPPING SCREWS
2. REMOVE POWER MODULE LID (SIX (6) 10-32 SCREWS) AND DISCONNECT LUMINAIRE AND MOTION SENSOR HARNESSSES.
3. TEMPORARILY SECURE POWER MODULE ON MOUNT BRACKET AND SECURE AS NOTED.
4. POSITION POWER MODULE ANCHOR BRACKET AS NOTED AND MARK LOCATION OF MOUNT HOLES ON CENTER ROOF BOW.
5. DRILL FOUR (4) $\phi 5/32"$ HOLES.
6. DRILL A $\phi 1"$ HOLE IN CENTER OF FOUR HOLES JUST DRILLED (APPROXIMATE).



ANCHOR BRACKET

TEMPORARILY SECURE ANCHOR BRACKET TO POWER MODULE AND MARK 5/32" HOLE LOCATIONS IN ROOF BOW

DRILL $\phi 1"$ HOLE IN CENTER OF FOUR HOLES JUST DRILLED (ONLY PENETRATE FIRST WALL OF BOW)

BRACKET TIGHT TO ROOF BOW

DRILL 6X $\phi 5/32"$ AND SECURE WITH 10-24 SELF TAPPING SCREW

SECURE WITH"
5/16-18 NUT
5/16 LOCK WASHER
5/16 FLAT WASHER

INSTALLING SOLAR PANEL MOUNT BRACKET

UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DRAWING
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AS SHOWN UNLESS OTHERWISE NOTED
TOLERANCES APPLY AS SHOWN BELOW
SURF FINISH
ANGLES
X ±.1
XX ±.01
XXX ±.005
INCHES
THIRD ANGLE PROJECTION

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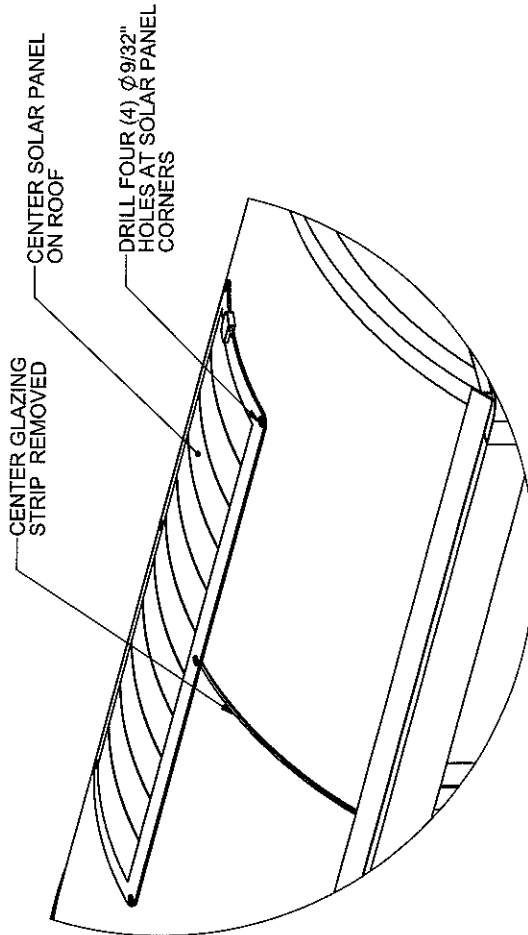
DESIGNED BY DATE 03-Sep-2004
DRAWN BY David Henke DATE 10-Sep-2004
APPROVED DATE
SIZE B
SCALE 1:1.5
DRAWING NO. 37505_01
CAD REFERENCE 37505.SLDASM
REVISION B
SHEET 2 OF 6

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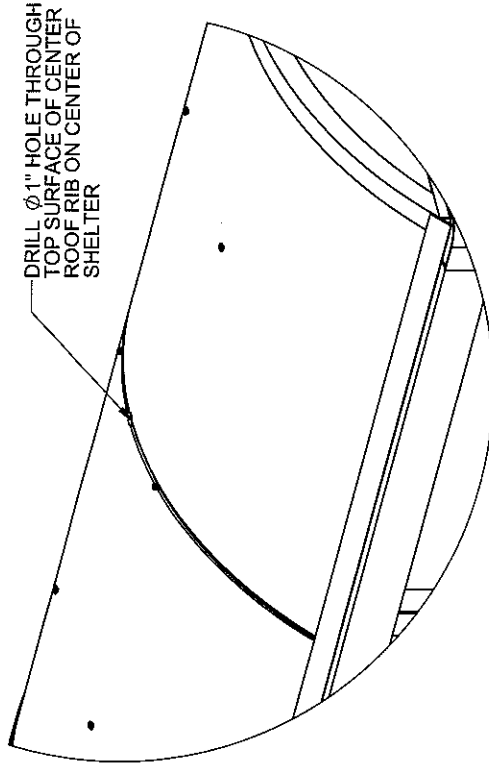
TITLE
ISHELTER-BR30-SELF CONTAINED-BARREL-CEILING MOUNT

MOUNTING SOLAR PANEL

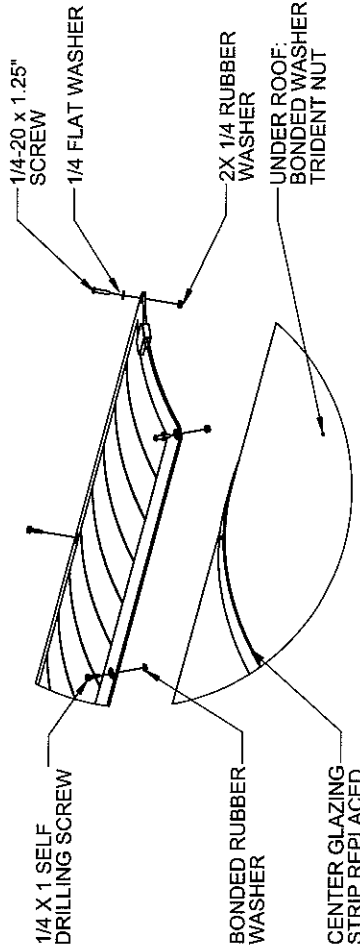
1. REMOVE CENTER GLAZING STRIP FROM ROOF (NOTE ORIENTATION).
2. CENTER SOLAR PANEL ON ROOF (LEFT-RIGHT, FRONT-BACK) AND ENSURE IT IS STRAIGHT.
3. DRILL FOUR (4) ϕ 9-32" HOLES AT EACH CORNER OF SOLAR PANEL.
4. REMOVE SOLAR PANEL AND DRILL A ϕ 1" HOLE THROUGH TOP SURFACE OF CENTER ROOF RIB.
5. PASS SOLAR PANEL WIRE HARNESS THROUGH ROOF RIB TO POWER MODULE.
6. REPLACE CENTER GLAZING STRIP.
7. INSTALL SOLAR PANEL AS SHOWN IN MOUNTING DETAIL.



SOLAR PANEL MOUNT HOLES



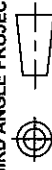
SOLAR PANEL WIRE HARNESS HOLE



SOLAR PANEL MOUNTING DETAIL

UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DRAWING
INTERPRET DIMENSIONS AND TOLERANCES
REFER ASME Y 14.5, 2000
TOLERANCES UNLESS SHOWN BELOW
DECIMALS SURF FINISH ANGLE
X 2:1 45° 41°
.XX ±.01
.XXX ±.005

THIRD ANGLE PROJECTION



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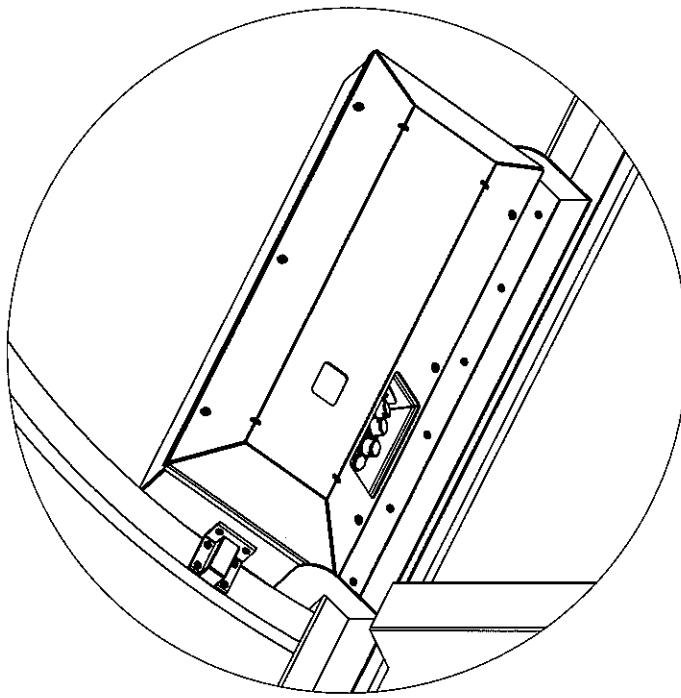
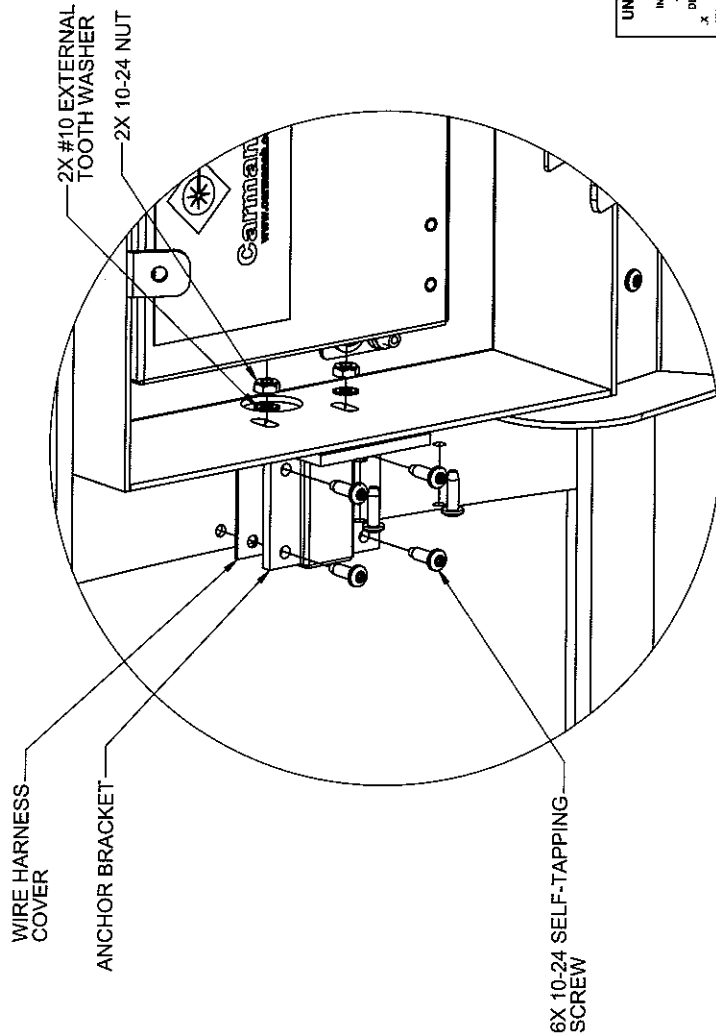
DESIGNED BY DATE 03-SEP-2004
DRAWN BY David Henke DATE 10-SEP-2004
APPROVED DATE

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Fax: (250) 380-0362

TITLE ISHELTER-BR30-SELF CONTAINED-BARREL-CEILING MOUNT
SIZE B DRAWING NO 37505_01
SCALE 1:48 CAD REFERENCE 37505.SLDASM
REVISION B SHEET 3 OF 6

POWER MODULE SETUP

1. CONNECT SOLAR PANEL HARNESS - REFER TO SHEET 5 FOR SCHEMATIC.
2. RECORD REQUIRED INFORMATION ON SITE ACCEPTANCE REPORT.
3. INSTALL WIRE COVER AND ANCHOR BRACKET AS SHOWN - WIRE COVER SLIPS INSIDE ANCHOR BRACKET AS SHOWN.
4. REVIEW INITIALIZATION SEQUENCE ON LAST PAGE OF THESE INSTRUCTIONS. CONNECT LUMINAIRE, MOTION SENSOR AND EMS INTERCONNECT - OBSERVE STARTUP SEQUENCE AS DESCRIBED.
5. PERFORM SYSTEM TEST DESCRIBED ON SHEET 6.
6. REPLACE POWER MODULE LID.
7. SYSTEM IS NOW READY FOR OPERATION.

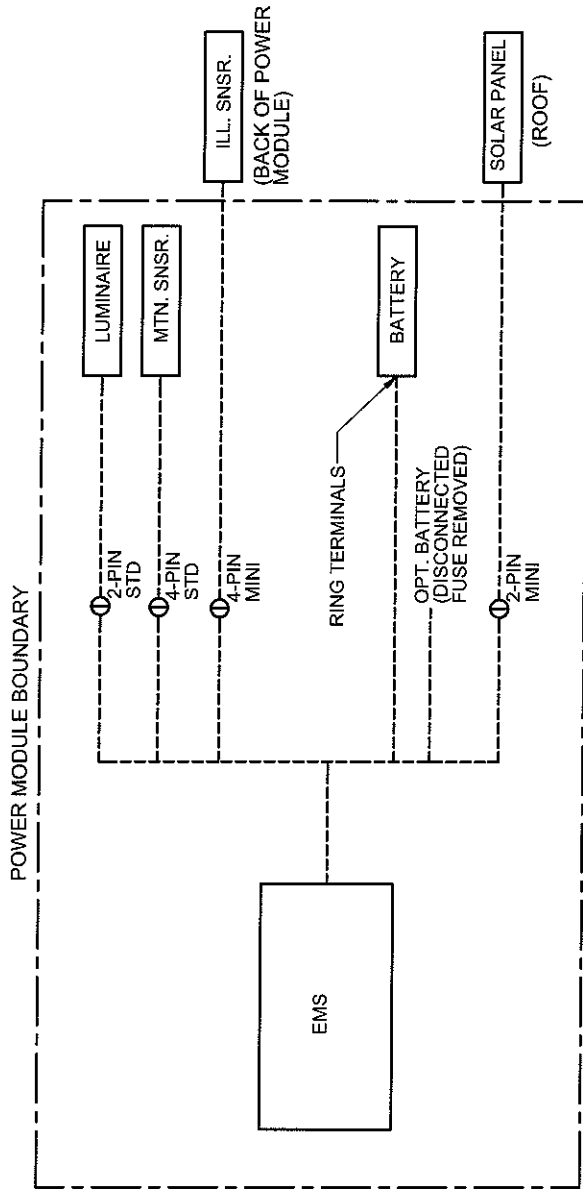


POWER MODULE COMPLETELY INSTALLED

WIRE COVER AND ANCHOR BRACKET INSTALLATION

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	<p>TITLE iSHELTER-BR30-SELF CONTAINED-BARREL-CEILING MOUNT</p>	<p>SIZE B</p>	<p>SCALE 1:5</p>	<p>DRAWING NO 37505_01</p>

ELECTRICAL CONNECTION DIAGRAM



NOTES:

- ENSURE RED WIRE RING TERMINAL IS CONNECTED TO POSITIVE TERMINAL OF BATTERY AND BLACK WIRE RING TERMINAL IS CONNECTED TO NEGATIVE BATTERY TERMINAL
- ***DO NOT REVERSE POLARITY***
- CONNECT ALL ELECTRICAL CONNECTORS (FOUR CONNECTORS, THREE RING TERMINALS), CONNECTIONS CAN BE MADE IN ANY ORDER
- ALL CONNECTIONS (BESIDES RING TERMINALS) USE UNIQUE CONNECTOR PAIRS WHICH CANNOT BE CONNECTED INCORRECTLY.

UNLESS OTHERWISE SPECIFIED DO NOT SCALE DRAWING INTERPRET DIMENSIONS AND TOLERANCES TO THE FOLLOWING UNLESS SHOWN OTHERWISE DIMENSIONS ARE IN MILLIMETERS UNLESS SHOWN OTHERWISE DECIMALS: .1 .2 .3 .4 .5 .6 .7 .8 .9 ANGLES: 30° 45° 60° 90° 120° 150° 180° SURF FINISH: 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 THIRD ANGLE PROJECTION	PDM MAINTAINED DATA CHANGES SHALL BE INCORPORATED ELECTRONICALLY BY THE DESIGN AUTHORITY	Carmanah Carmanah Technologies Inc. Building 4, 203 Harbour Road Victoria, BC Canada V8A 3S2 Tel: 250-380-0022 Fax: 250-380-0822
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SYSTEM STARTUP PROCEDURE:

The following text will further explain the i-shelter's behavior in standby and startup.

Connections

All electrical connections must be made for the system to operate properly. The i-shelter is shipped with EMS interconnect and solar panel harnesses disconnected. After installation connect the EMS harness to activate the system.

Startup Sequence

Once power is connected to the Energy Management System (EMS) it will immediately follow a startup sequence. This sequence consists of turning the luminaire on for 30 seconds. If the motion sensor is triggered initialization will advance more rapidly.

Illumination Sensor

This component detects the onset of dusk or dawn - switching the lights off or on.

Standby Current

With the battery connected, the i-shelter system will operate the processor in the EMS and the charge circuit. In its box, without solar charging, the battery will last for 40 days. To ensure maximum performance, install the i-shelter within 24 days of connecting a fully charged battery.

If the fully connected system experiences 24 hours of darkness it will go into 24 hour shutdown mode and will not reactivate until the illumination sensor sees light for more than 10 seconds.

SYSTEM TEST PROCEDURE:

This procedure outlines tests required to ensure correct operation of the i-shelter.

Procedure

1. Ensure that all system components are connected:
 - Luminaire (containing LED array)
 - Motion detector
 - Illumination sensor
 - Battery
 - Solar panel
2. Completely cover the illumination sensor
 - This will mimic a transition from day to night.
3. Wait ten seconds
 - This is a deliberate delay to reduce the chance of a false transition. During this time, position yourself below the Luminaire and motion detector. Remain still.
4. Observe the LEDs turn on.
 - Anyone within the range of the motion detector must be still at the time when the LEDs turn on to observe them at their regular illumination level.
5. Move in front of the motion detector to activate enhanced light level (if equipped).
6. Observe increase in LED intensity (if equipped)
 - The LEDs will remain at the enhanced intensity until the motion sensor has observed five minutes of inactivity. At this time the lights will return to the regular illumination level. It is not required to wait for this event.
7. Uncover the illumination sensor
8. Wait ten seconds
9. Observe the LEDs turn off
10. If both levels of LED illumination were not observed, repeat the procedure.

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DO NOT SCALE DRAWING
INTERPRET DIMENSIONS AND TOLERANCES
AS SHOWN
TOLERANCES APPLY UNLESS OTHERWISE SPECIFIED
DECIMALS SURF FINISH ANGLES
X ±.1
XX ±.01
XXX ±.005
XXXX ±.0005

THIRD ANGLE PROJECTION



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DESIGNED BY David Henke DATE 03-Sep-2004
DRAWN BY David Henke DATE 10-Sep-2004
APPROVED DATE

Carmanah
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TITLE
ISHELTER-BR30-SELF CONTAINED-BARREL-CEILING MOUNT

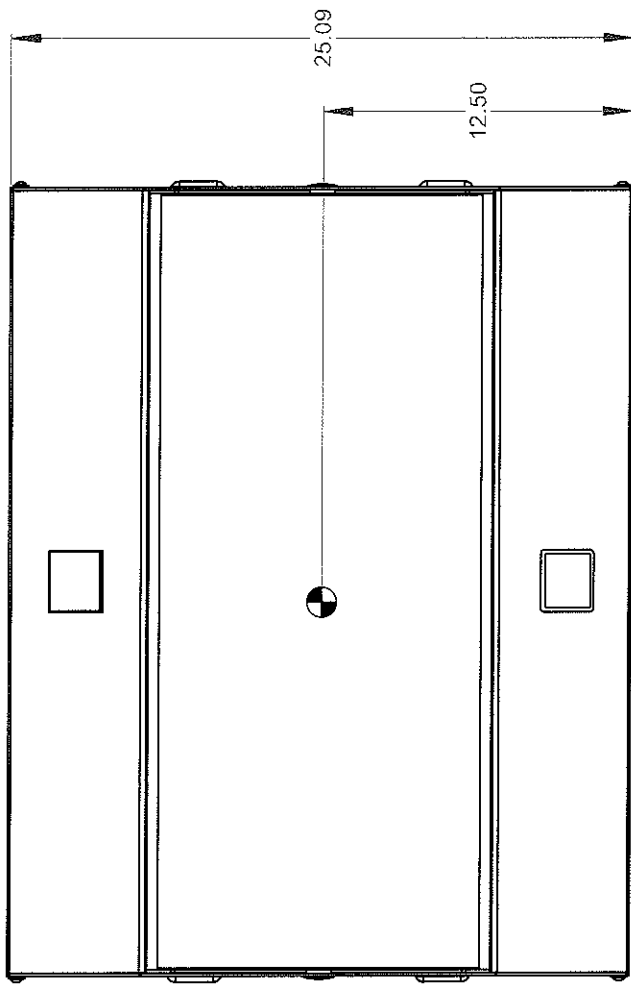
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REVISION
DRAWING NO
37505_01
SCALE
1:48
CAD REFERENCE
37505.SLDASM

SHEET
6 OF 6

Appendix 2 – Solar Lighting System Specifications (Victorian)

REVISION		
REV.	DESCRIPTION	DATE
A	INITIAL RELEASE	4/19/2006

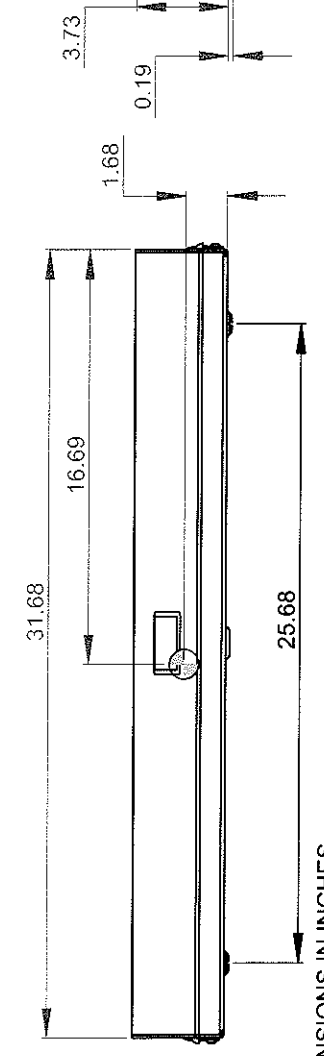
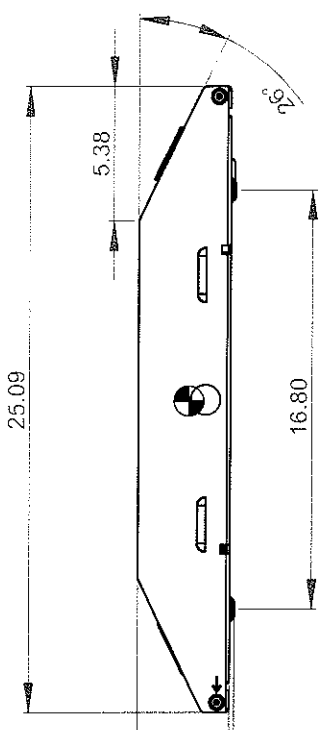


SPECIFICATIONS

SOLAR ARRAY
 MAX. POWER: 30W
 NOMINAL VOLTAGE: 12V
 MAX. VOLTAGE: 17.4V
 MAX. CURRENT: 1.85A

BATTERY BANK
 TYPE: SEALED LEAD ACID
 NOMINAL VOLTAGE: 12V
 MAX. CAPACITY: 34.4Ah (32Ah EXTREME TEMP.)

SYSTEM
 WEIGHT: 57.53LBS (MAX.)
 NO. OUTPUT CHANNELS: 2



NOTE:
ALL DIMENSIONS IN INCHES



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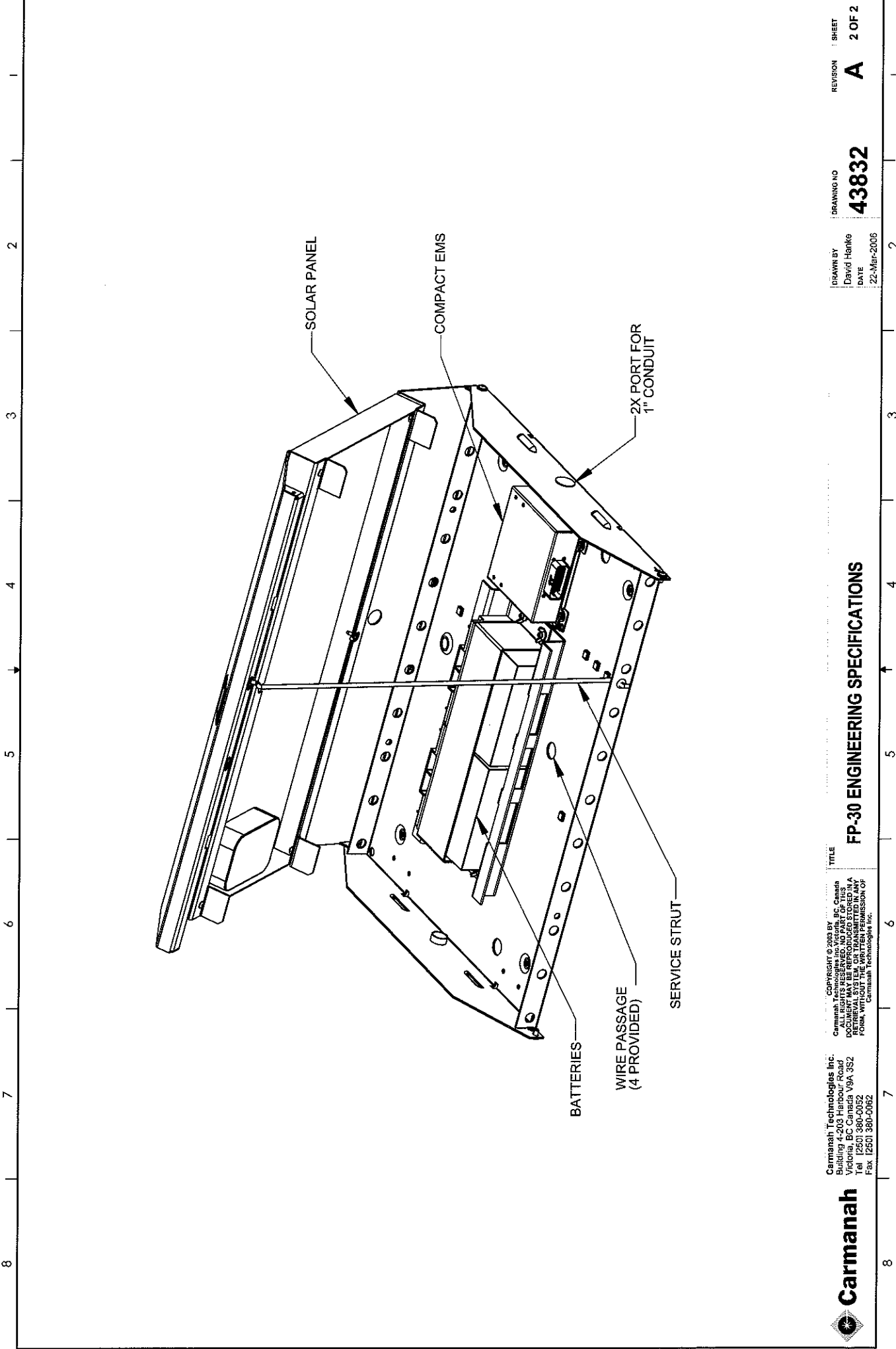
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TITLE
FP-30 ENGINEERING SPECIFICATIONS

DRAWING NO
43832

REVISION SHEET
A 1 OF 2

DRAWN BY
 David Henke
 DATE
 22-Mar-2006



8 7 6 5 4 3 2

REVISION SHEET
A 2 OF 2

DRAWING NO
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DRAWN BY
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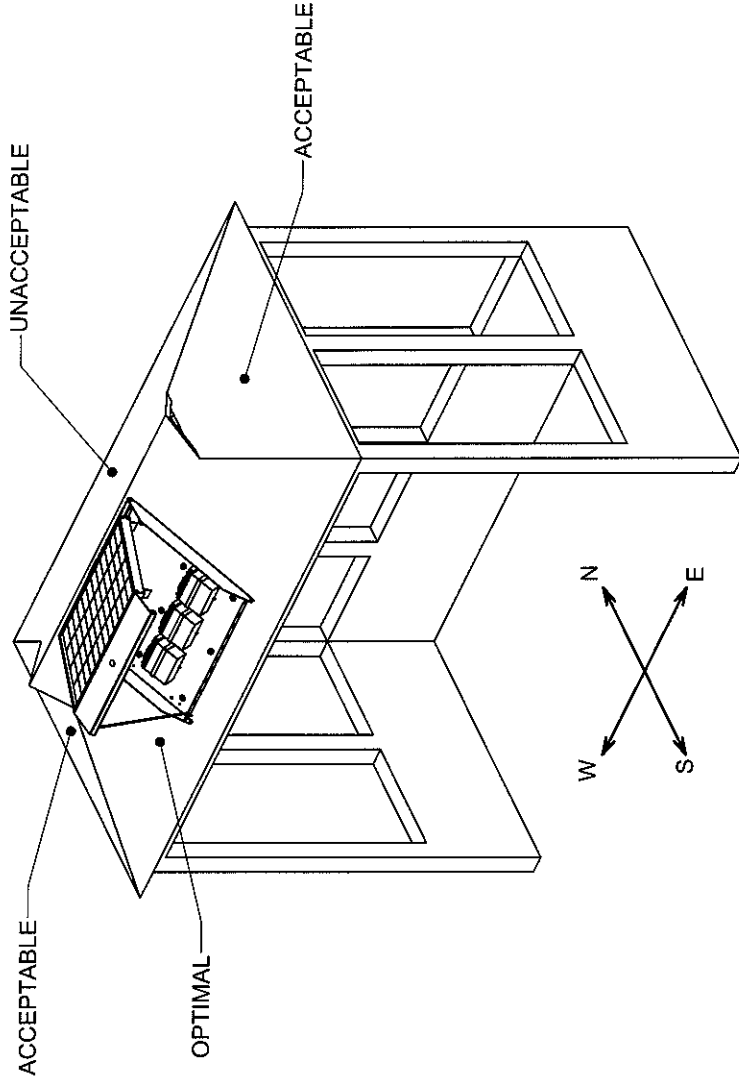
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 Building 4-203 Harbour Road
 Victoria, BC Canada V9A 3S2
 Tel: (250) 380-0052
 Fax: (250) 380-0062



30 WATT POWER MODULE

INSTALL INSTRUCTIONS

1. DETERMINE WHICH PART OF SHELTER TO MOUNT POWER MODULE ON. FOR FLAT ROOF SHELTER THE SYSTEM CAN BE MOUNTED ANYWHERE PROVIDED IT IS NOT SHADED OR DIFFICULT TO ACCESS. ON SHELTERS WITH PEAKED ROOFS MOUNT POWER MODULE ON SOUTH FACING ROOF SECTION. IF SOUTH FACING SECTION IS SHADED EAST OR WEST FACING SECTIONS ARE ACCEPTABLE. NORTH FACING ROOF SECTION IS NOT ACCEPTABLE.
2. DETERMINE LOCATION OF LUMINAIRES IN SHELTER.



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TITLE
POWER MODULE, 30W INTEGRATED PV

DRAWN BY
 Trevor Harmon
 DATE
 28-Dec-2005

DRAWING NO
43584_02

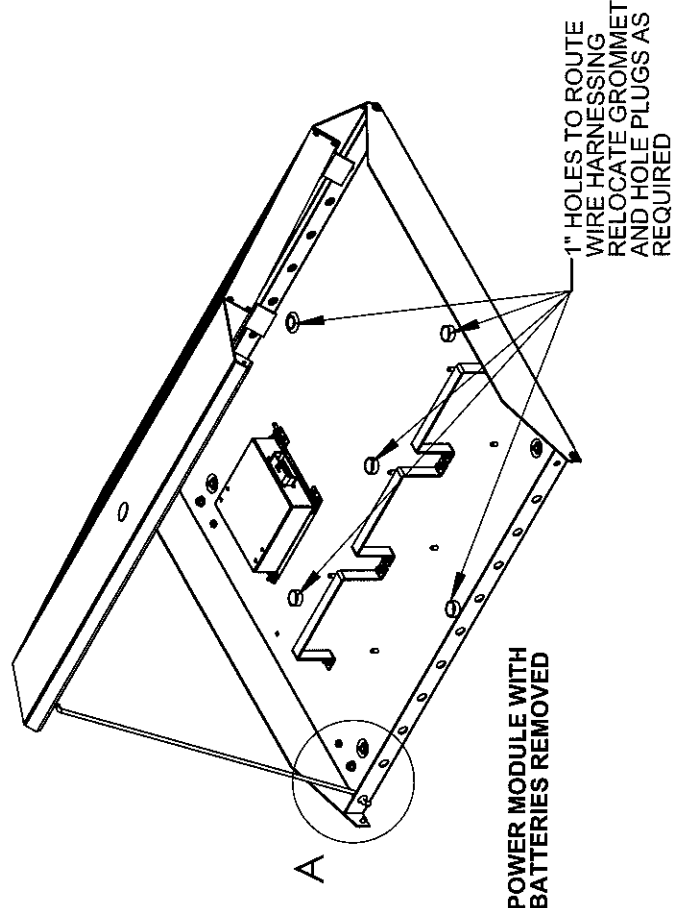
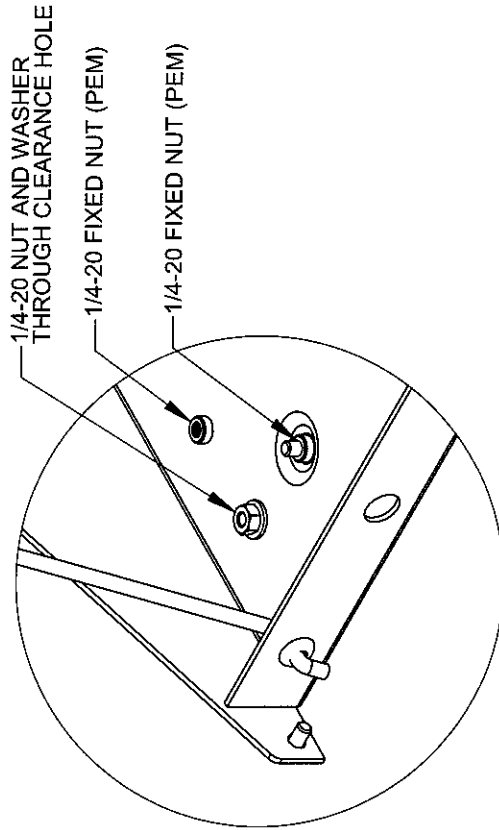
REVISION
X1

SHEET
1 OF 4

30 WATT POWER MODULE

INSTALL INSTRUCTIONS

1. DRILL HOLES THROUGH SHELTER ROOF TO MOUNT POWER MODULE AND ROUTE WIRING. THREE MOUNT OPTIONS ARE AVAILABLE (SEE DETAIL A); CHOOSE MOST CONVENIENT OPTION FOR THIS APPLICATION. FIVE HOLES ARE PROVIDED IN BOTTOM OF POWER MODULE FOR WIRE HARENSS ROUTING.



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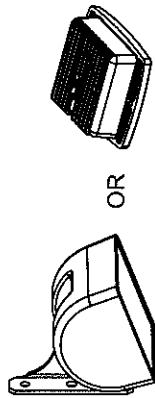
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SHEET
2 OF 4

30 WATT POWER MODULE

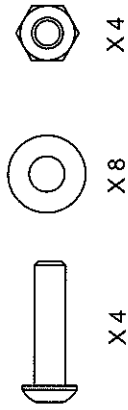
INSTALL INSTRUCTIONS

1. PROVIDE ELECTRICAL CONDUIT OR OTHER CABLEWAY TO PROTECT LUMINAIRE WIRE HARNESSSES. CONDUIT MUST HAVE 3/4" MINIMUM INSIDE DIAMETER. ENSURE ROOF PENETRATION IS SEALED.
2. SECURE POWER MODULE TO ROOF. FOR SHELTERS WITH STANDING SEAM METAL ROOFS LONG SCREWS AND SPACERS ARE PROVIDED. ILLUMINATION SENSOR MUST BE AWAY FROM ROOF EDGE TO ALLOW POWER MODULE TO BE OPENED FOR SERVICING.
3. ROUTE LUMINAIRE HARNESSSES FROM POWER MODULE TO EACH LUMINAIRE AND CONNECT. SECURE LUMINAIRES TO SHELTER WITH PROVIDED HARDWARE.



OR

LUMINAIRE OPTIONS

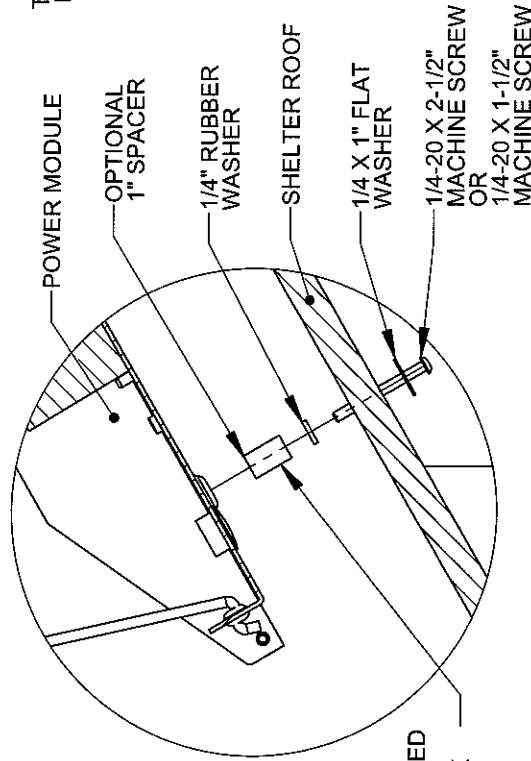


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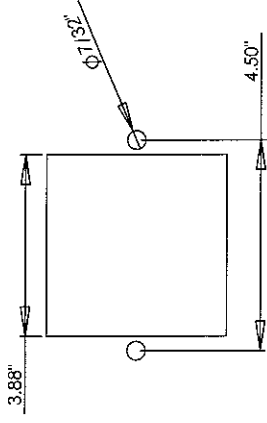
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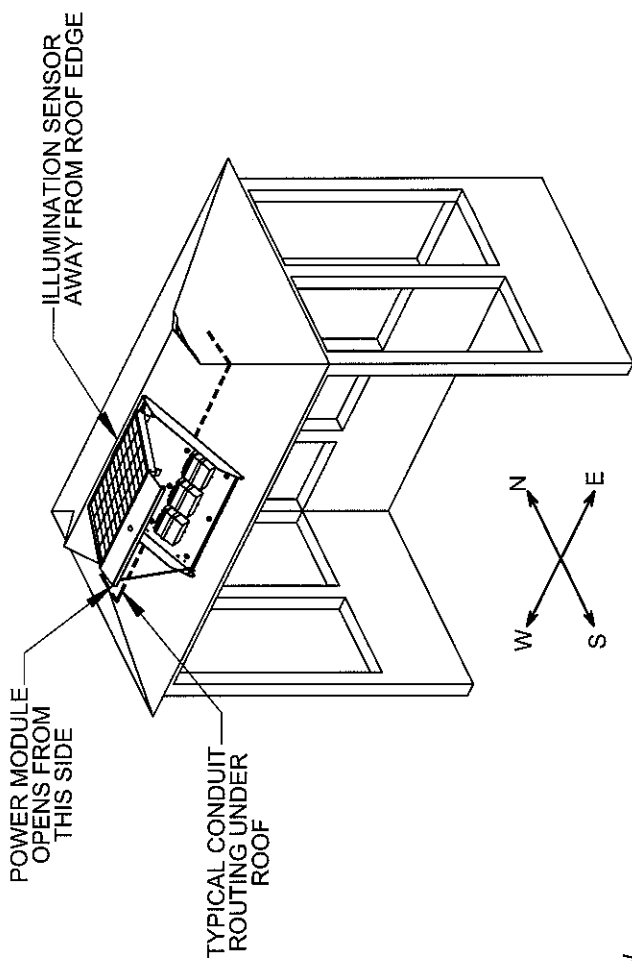
LUMINAIRE MOUNTING HARDWARE (INCLUDED IN KIT)



**OPTIONAL - ONLY
USE WHEN REQUIRED
TO RAISE SYSTEM
ABOVE ROOF DECK**



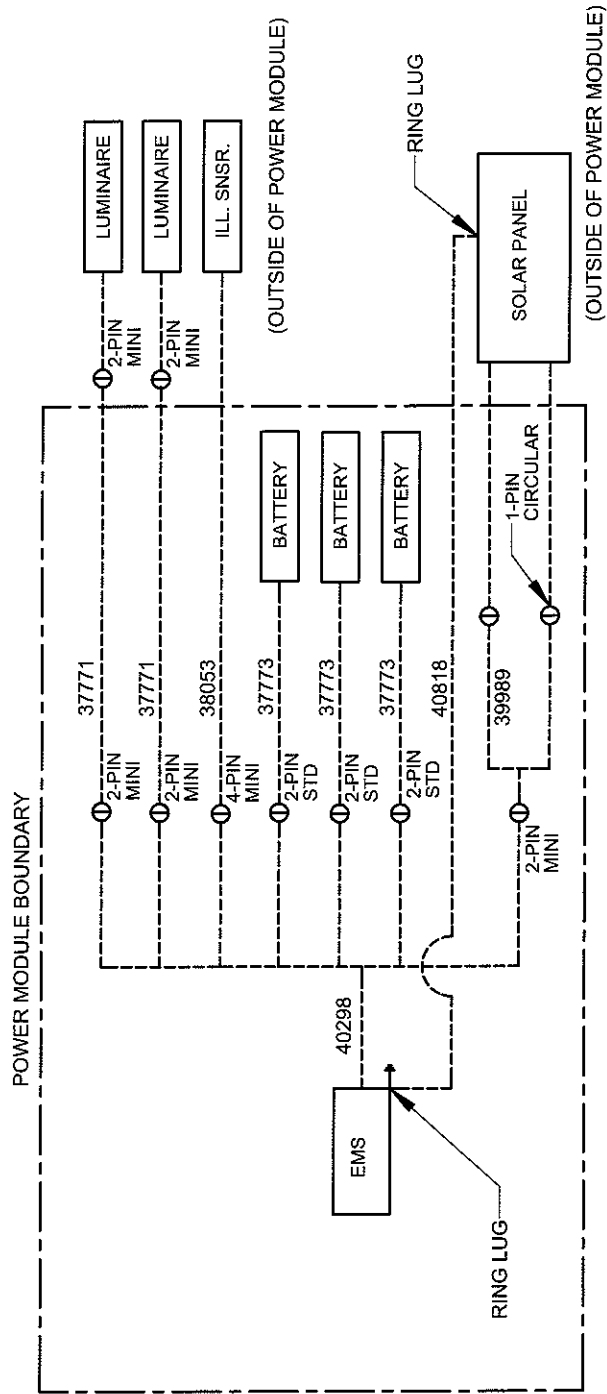
LUMINAIRE CUTOUT DETAIL FLUSH MOUNT ONLY



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				DATE 28-Dec-2005			

30 WATT POWER MODULE INSTALL INSTRUCTIONS

1. OBTAIN "SITE ACCEPTANCE REPORT" PROVIDED WITH SYSTEM DOCUMENTATION. MAKE FINAL ELECTRICAL CONNECTION INSIDE POWER MODULE ACCORDING TO THIS PROCEDURE.
 1. MEASURE BATTERY VOLTAGE ON ONE BATTERY AND NOTE IN "SITE ACCEPTANCE REPORT"
 2. MAKE ALL REMAINING ELECTRICAL CONNECTIONS - REFER TO SCHEMATIC BELOW.
 3. OBSERVE SYSTEM STARTUP SEQUENCE; LUMINAIRES WILL LIGHT UP SHORTLY AFTER BATTERIES ARE CONNECTED AND REMAIN ON FOR ~1MINUTE BEFORE GOING OUT.
 4. INDICATE WHETHER OR NOT STARTUP PROCEDURE WAS OBSERVED IN "SITE ACCEPTANCE REPORT"
 5. MEASURE BATTERY VOLTAGE AND NOTE IN "SITE ACCEPTANCE REPORT"
2. I-SHELTER INSTALLATION IS NOW COMPLETE. ENSURE LUMINAIRES ARE PROPERLY ADJUSTED AND POWER MODULE COVER IS SECURE.



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POWER MODULE, 30W INTEGRATED PV

DRAWN BY

Trevor Hermon
DATE
28-Dec-2005

DRAWING NO

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SHEET

4 OF 4

30 WATT POWER MODULE

BASIC OPERATION

System Description

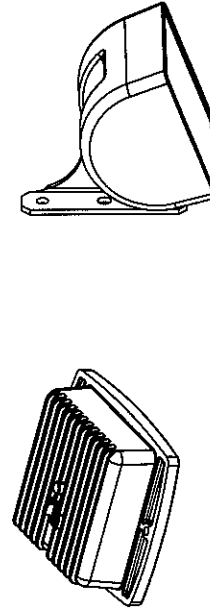
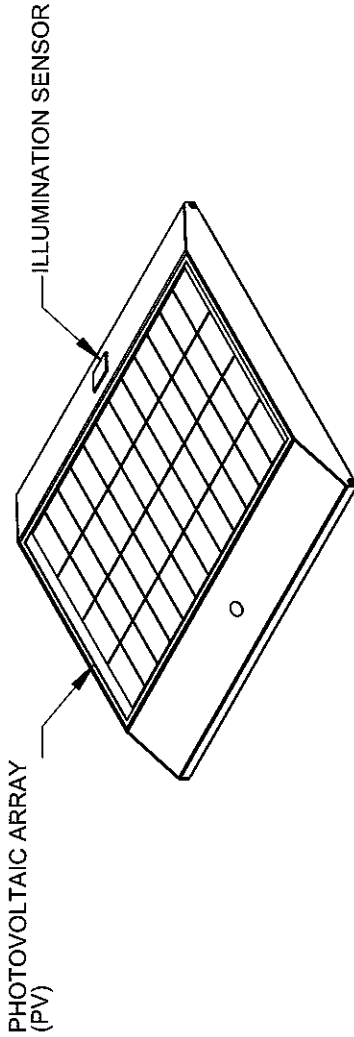
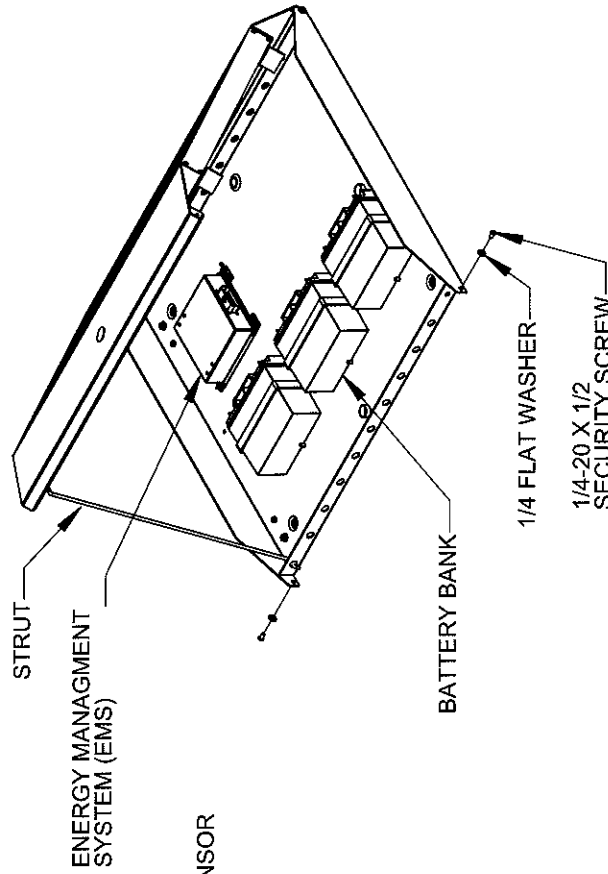
The power module is a self-contained unit, providing power to run remotely mounted luminaires. On the outside of the power module are the Photovoltaic array (PV) and illumination sensor. Inside the power module are the Energy Management System (EMS) and battery bank.

How It Works

During daylight the PV provides DC current to the EMS, which then distributes this power to the battery bank. At nightfall the illumination sensor provides a signal to the EMS allowing it to decide when to switch on the luminaires. At night the EMS controls current flow from the battery bank to the luminaires.

Testing The System

To test the system during daylight cover the illumination sensor for ~10 seconds. At this point, observe the luminaires light up.



LUMINAIRE OPTIONS



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 DATE
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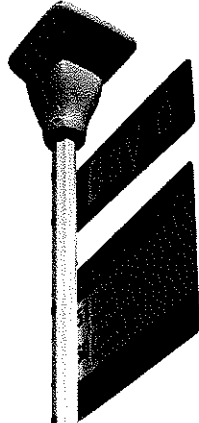
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1 OF 1

Appendix 3 – Solar Power Transit Stop i-STOP[®] Installation and Operation Manual



Carmanah®



OWNER'S MANUAL

**i-STOP®
Solar-Powered Transit Stop**



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1.0 Introduction

The i-STOP® solar-powered LED transit stop is a completely self-contained unit that offers three distinct features: an on-demand flashing bus signaling device; a security down light, and; an illuminated schedule. Using advanced electronics and the latest LED lighting technology, Carmanah's i-STOP® is revolutionizing passenger safety and security at transit stops around the world.

The i-STOP® transit stop offers numerous benefits for transit agencies which include:

- Enhanced passenger safety and access to information during nighttime hours.
- Reducing or eliminating rider pass-bys.
- Providing a flexible illumination solution with no external power requirements. Transit agencies are now able to add to or modify routes with little disruption to traffic patterns or pavement cutting typically related to hardwiring.
- Offering an entirely modular system. Transit authorities can choose the features to match their current needs, with the ability to upgrade in the future.
- A flexible design that allows for easy replacement of any damaged components, extending the life of the overall system.
- Zero scheduled maintenance for up to five years.
- Easy installation - no external wiring and it mounts on any round, square or octagonal pole from 1 3/4" to 2" in size (requested when ordering). Custom pole sizes available upon request.

Large, illuminated, ADA-compliant buttons are used to activate each of the i-STOP® features, allowing any user to operate it. There is a Braille button identification plate for the visually impaired, and an LED in the center of each button illuminates the buttons at night.

1.1 *Standard LED "On Time" Functionality*

The i-STOP® transit stop offers three different user-activated functions that turn off automatically after a predetermined period of operation:

- i-SIGNAL™ Flashing Beacon – 60 seconds.
- Security Downlight – 5 minutes.
- Illuminated Schedule – 30 seconds.

1.1.1 i-SIGNAL™ Flashing Beacon

The i-SIGNAL™ flashing beacon is a signaling device that enables waiting passengers to notify an oncoming bus that a stop is requested. It can be activated during both the day and night and it flashes at a rate of 60 flashes per minute for 60 seconds (default time). If more time is required, the signal can be activated again.

The signal is located at the top of the i-STOP® head unit directly below the solar panel. The direction of the signal is adjustable independent of the other two features (i.e. the signal can be rotated around the head in increments of 22.5° for a total of 16 different positions). Precise positioning of the i-SIGNAL™ can have an impact on reducing rider pass-bys.

1.1.2 Security Downlighting

The security downlighting feature provides enhanced security for waiting passengers. Ultra bright LEDs located in the head of unit cast a pool of light downwards, illuminating a large area around

the i-STOP® transit stop. The light is activated only at night (when it is needed) and the default "on" time is five minutes. The security downlighting can be rotated around the head in increments of 90° for a total of four different positions. This allows downlighting to be directed where illumination is required, and independent of the other functions.

1.1.3 Illuminated Schedule

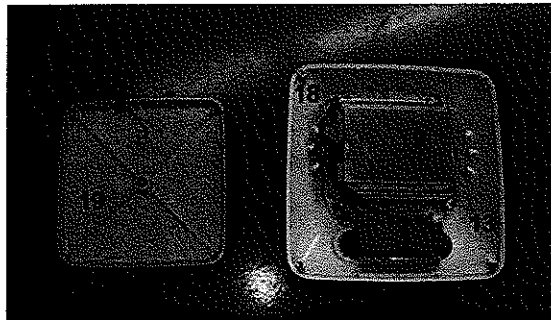
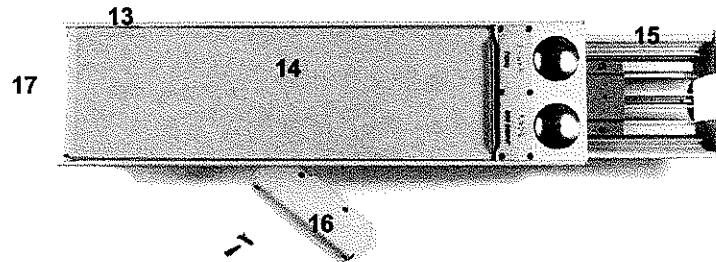
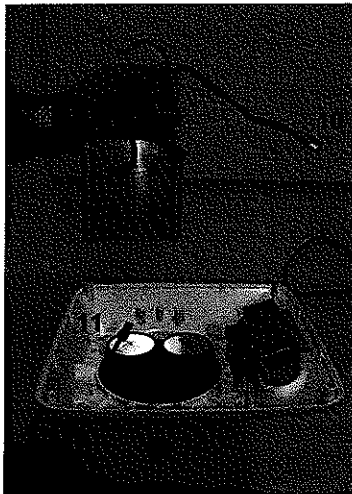
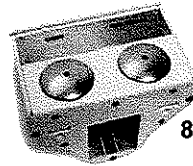
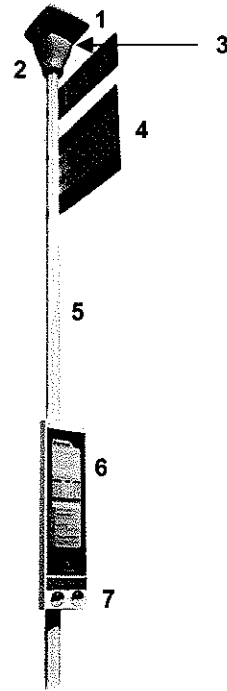
The schedule display is illuminated using proprietary edge-lit technology. High-intensity LEDs illuminate light-reflective acrylic that provides backlighting for the schedule material. It is an on-demand system with a default "on" time of 30 seconds. The light-pipe assembly is housed in a tough, extruded aluminum housing and protected by tempered glass. This aesthetically pleasing design, with the display housing wrapping around the pole, offers maximum viewing area with increased vandal-resistance.

1.1.4 Button Illumination/Functionality

Lights will not "stay on" if a button is held down. If a button is pressed and held down, the corresponding LED feature will illuminate for the pre-programmed time, and then turn off. The button must be released and pressed again to activate the LED feature again. Each button has an LED that is illuminated at night but turns off during the day. When any button is pressed, all button LEDs will turn off for 50 milliseconds to provide visual feedback.

2.0 Component Identification

1. Head Assembly
2. Bottom Collar
3. Security Downlighting
4. Flag
5. Pole
6. Schedule Assembly
7. 2-Button Assembly
8. Optional 2-Button Assembly (for no illuminated schedule)
9. EMS
10. Connectors
11. Battery Pack Assembly
12. i-SIGNAL™
13. Front Panel Assembly
14. Tempered Glass
15. Back Housing Assembly
16. Top Plate
17. The Light Pipe with LED assembly
18. Solar Panel Connector
19. Bottom of Solar Panel
20. Top Housing



3.0 Installation and Assembly Instructions

Assembly instructions can vary depending on the options selected. Since the i-STOP® transit stop is upgradeable with different options that can be installed at any time, this manual outlines installation and assembly of the complete system with provisions for different options. The head and schedule assemblies are delivered completely assembled; they simply require mounting on the pole using the instructions outlined below. All parts required for installation and assembly are provided with the exception of tools, such as a drill and screwdriver with replaceable drivers. The connectors are not interchangeable and the features can only be connected one way (the connectors are designed in such a way that it is not possible to confuse them).

3.1 Pole

3.1.1 Pole Preparation

The i-STOP® unit can be mounted on any round, square or octagonal pole from 1¾" to 2" in diameter.

Two holes must be drilled into the pole in order to accommodate the head and the schedule assembly. (Note: Nex® Poles ordered for this application come pre-drilled so you can skip the following step). Both of these holes should be drilled on the same side of the pole.

For the schedule assembly or 2-button assembly without schedule illumination, drill a 3/8" diameter hole 1½" from the top of the pole. This hole will anchor the head, as the notch in the metal bracket located on the bottom collar of the head will snap into the hole.

1. The hole placement varies slightly for units depending on whether they have two- or three-button assemblies:
 - a. **Standard i-STOP® Unit:** Drill a 3/4" diameter hole in the pole 52" from ground level. This hole should be in the middle of the schedule assembly and will allow connection between the head and the schedule assembly.
 - b. **i-STOP® (two-button assembly):** Drill a 3/4" diameter hole 42", instead of 52", from ground level. This hole should be in the middle of the schedule assembly and will allow connection between the head and the button assembly. In case the schedule is added at a later date, the new hole will need to be drilled at 52" height.

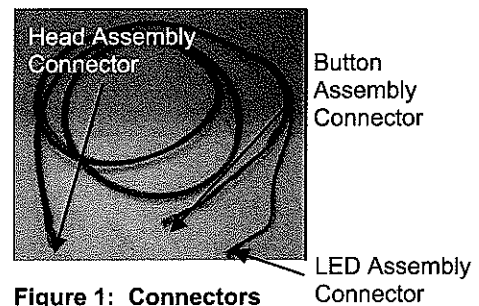
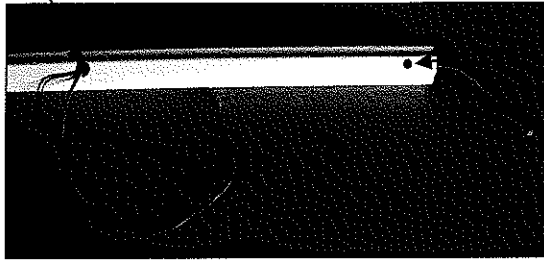


Figure 1: Connectors

3/4" diameter hole



3/8" diameter hole

Note: Before inserting the harness as shown in Figure 2, it is recommended to deburr both the inside and outside edges of the 3/4" to reduce the chance of damaging wires.

Note: Hole locations in this diagram are not to scale.

Figure 2: Pole

3.1.2 Using the NEX® Sign Support System

The NEX® Sign Support System for octagonal pole provides an anchor for the i-STOP® solar-powered transit stop. To install the NEX® Sign Support System, follow the steps below:

1. Place the drive cap on the opening of the anchor.
2. Using a power driver or sledgehammer, drive the anchor into the ground.
3. When the anchor is two inches from the ground, remove the drive cap. Alternatively, the anchor can be mounted flush with the ground.
4. Place NEX® Post into the anchor, approximately twelve inches, and insert the NEX® Wedge between the anchor and the NEX® Post. Using a hammer, drive it approximately two inches in between the sleeve and the pole.
5. The NEX® Sign Support System installation is now complete.



Figure 3: Nex® Sign Support System Installation

3.1.3 Flag Addition

If the pole being used is structurally tested and certified for this type of installation, it is possible to add a flag to the pole at this point. The flag will not hinder the operation of the i-STOP® unit in any way. In fact, the security downlighting, in the right orientation, provides flag illumination as an extra feature. Consult with the pole manufacturer to determine whether it is possible to add the flag to your pole. If adding the flag, drill the holes at the same time as preparing the pole for the i-STOP® unit's installation. It will be easier to run the harness prior to bolting the flag. Care must be taken when inserting the bolts for the flag, to not damage the wire harness that runs inside the pole.

3.2 Schedule Button Assembly

3.2.1 Mounting Schedule Assembly on the Pole

1. The schedule assembly is shipped assembled. It consists of two different components:
 - a. The front panel assembly (Figure 4) contains the light pipe and tempered glass. The light pipe, schedule and tempered glass slide in separate channels (see Figure 5 for light pipe assembly).

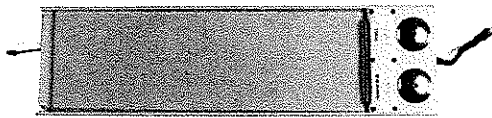


Figure 4: Front Panel Assembly

LED assembly attached to acrylic

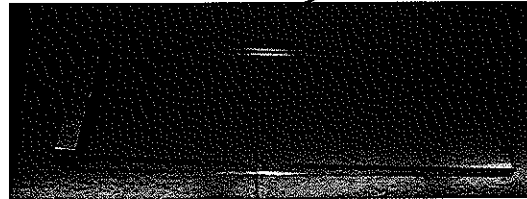


Figure 5: The Light Pipe with LED assembly

- b. The back housing, which wraps around the pole (see Figure 6).
2. Separate the front from the back housing in order to install the assembly on the pole. The pole should have a 3/4" hole already drilled and the harness threaded through the pole, with the connectors exposed (see Figure 2).
3. Remove the two security fasteners from the top (see Figure 7) and remove the top plate.
4. Slide the front panel assembly away from the back housing as shown in Figure 8.

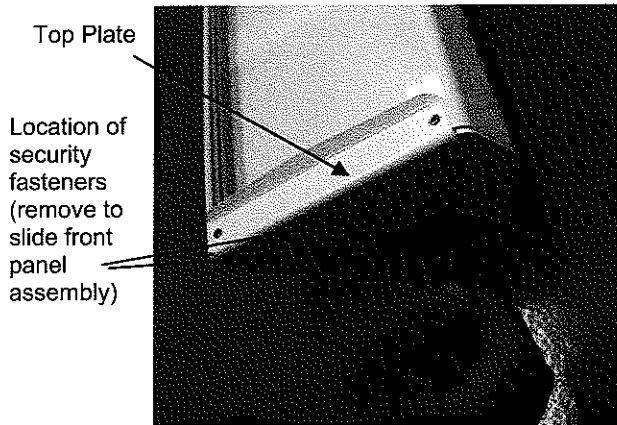


Figure 7: Top of the Schedule Assembly

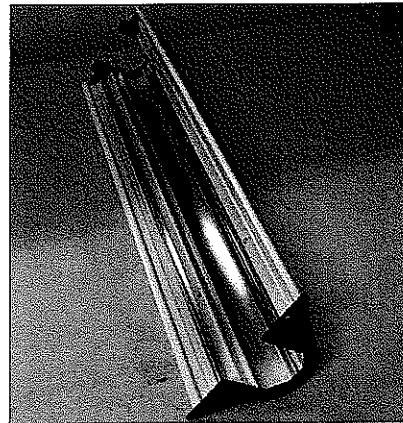


Figure 6: Back Housing Assembly

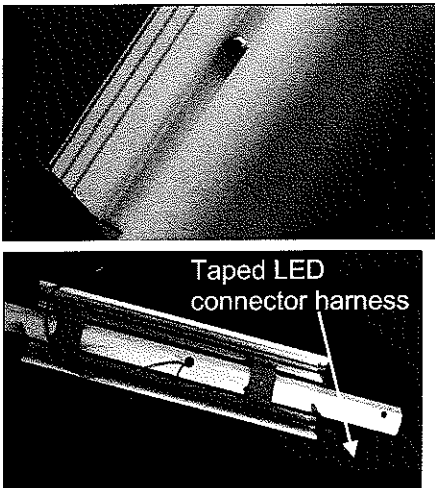


Figure 9: Location of the Brackets (front and back view)

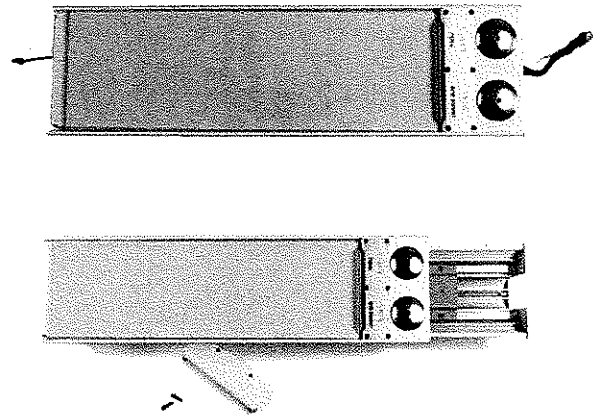


Figure 8: Direction of Sliding the Front Panel Assembly from Back Housing Assembly

5. Place the back housing around the pole. The predrilled hole in the pole should be located approximately in the middle of the housing.
6. Anchor the back housing to the pole using two metal brackets and two security fasteners for each bracket. See Figure 9 for different views of the brackets and their fastening.
7. In order to secure the brackets to the pole, drill a 5/32" diameter hole in the pole through the hole in each bracket (Figure 10) and secure with the supplied sheet metal fastener.
8. The harness has two connectors: one for the button assembly (Figure 11) and the other for the LED assembly attached to the acrylic. The connectors are very different and they cannot be interchanged. Tape the LED connector harness to the top of housing as shown in Figure 9 to easily connect it to the acrylic light pipe when sliding down the front panel back onto the back housing assembly (refer to Figure 8).

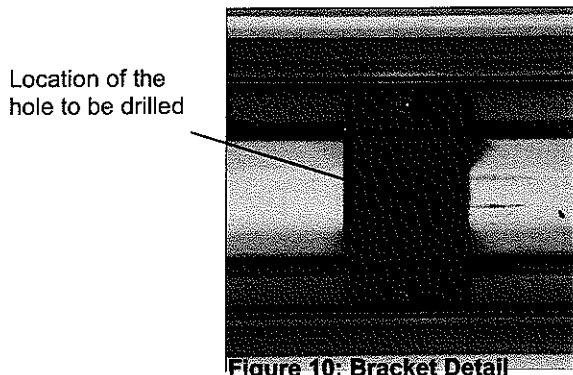


Figure 10: Bracket Detail

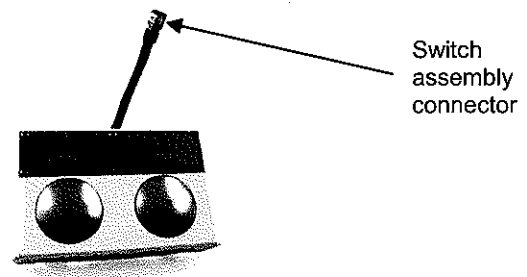


Figure 11: Button Assembly

9. Start sliding the front panel assembly back. Attach the button connector first, when you are approximately halfway down the channel (Figure 12). Make sure that the wires are out of the way so that they do not get pinched. The easiest way to do this is to make sure that the wires are all on one side and placed inside the channel (right beside the pole).

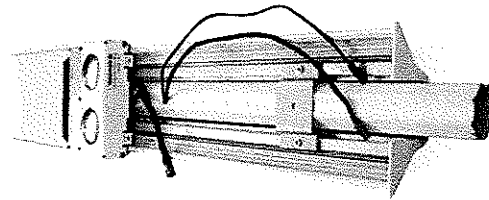


Figure 12: Assembly of the Schedule Assembly

10. The LED connector should be connected when the front panel is completely pushed in place (this is where taping the connector to the top of the extrusion comes in handy).
11. Tuck the connector with wires inside the housing and away from the top housing.

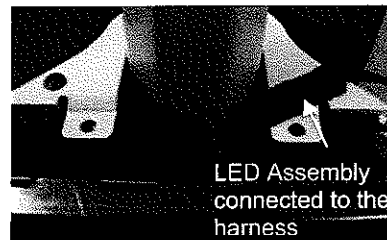
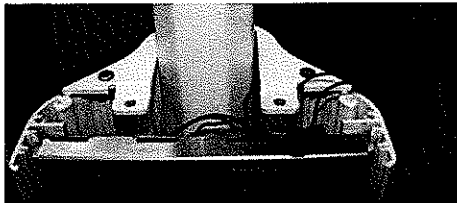


Figure 13: Connecting LED Assembly to Harness

12. Ensure that the wires are not pinched when the housing is reattached.
13. Reattach the top plate and test the system after you have installed the head where the batteries are located.

3.2.2 Button Assembly without Schedule

A separate button assembly is supplied when schedule illumination is not required. It does not contain the illuminated light pipe but does have two buttons that will activate the security down lighting and i-SIGNAL™ flashing beacon.

The installation is very similar to the schedule button assembly:

1. Drill a 3/4" diameter hole 42" from ground level instead of 52" as already described in Section 3.1 Pole Preparation.
2. Thread the harness as outlined.
3. Follow Schedule Assembly to attach the housing to the pole.

The only difference is that there is only one bracket instead of two to be mounted on the back housing and there is no light pipe assembly; therefore, the LED connector on the harness will stay unused (connect only the button connector to the harness).

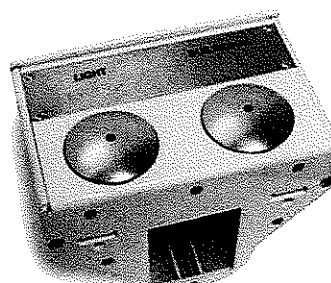


Figure 14: Button Assembly without Schedule

3.2.3 Schedule Material Selection

In order to ensure maximum visibility and life span, Carmanah recommends the timetable to be printed on a durable, transparent material like Vellum. In case of paper, the timetable material can be laminated for extra protection. Since water can permeate the housing, the ink will have to be waterproof. Print the timetable with pigment based inks, rather than dye-based, for greater UV stability. Carmanah recommends material for your timetable that is manufactured by a company called *Rexam* and the product name is *5 mil backlit film*; however there are a number of similar products made by other manufacturers, such as *3M*.

Tolerance level should be +/- 0.125". Scheduled insert size is 6.25" wide by 19.75" long.

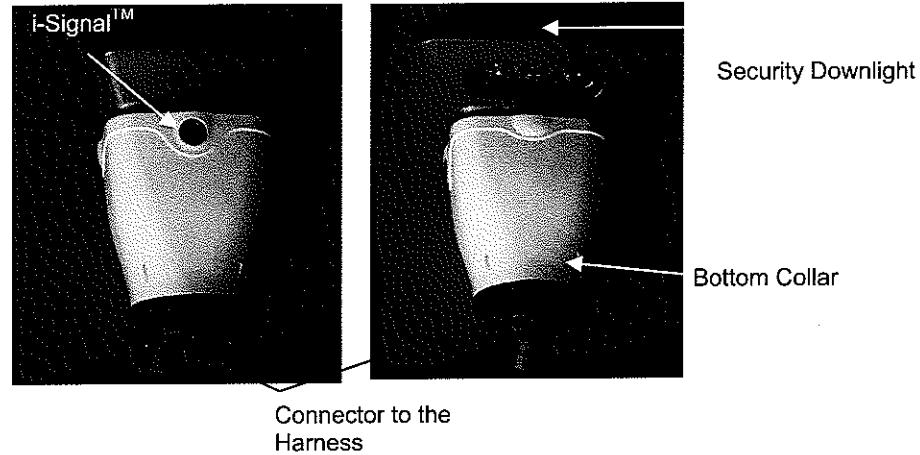
3.3 Head Assembly

3.3.1 Mounting the Head on the Pole

The head is delivered completely assembled; the security downlighting and i-SIGNAL™ features are already installed and the battery is connected to the board (see Figure 15).

Note: if you would like to change the orientation of the head, please see section 3.3.2 before continuing with this installation.

Figure 15: Assembled Head with Security Downlighting and i-SIGNAL™



If the orientation of these two features is satisfactory, follow the steps below to mount the head on the pole:

1. The pole should already have two holes drilled, as per section 3.1.1, and the harness should be in place.
2. Connect the wire hanging from the bottom of the head (See Figure 15 & 16) with the harness coming from the top of the pole.
3. Mount the head on the pole, making sure that the notch on the metal bracket at the bottom of the head snaps into the pre-drilled 3/8" hole.
4. Firmly tighten the security fasteners located in the bottom collar with the supplied Allen key. The location of the screws is shown in Figure 16.
5. Check the function of the features by activating the button sensors on the schedule assembly.

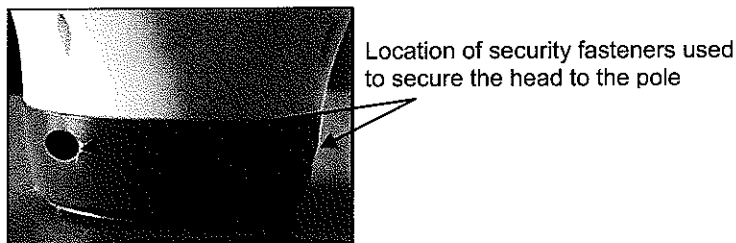


Figure 16: Bottom Collar with Location of Security Bolts

3.3.2 Changing The Head Orientation

If you would like to change the default orientation of the i-STOP® features, the head will have to be disassembled to varying degrees, depending on the feature to be changed. It is recommended that all changes be made before the head is installed in the field. This will simplify making the required changes and will minimize the chance of damaging or losing parts.

3.3.2.1 Changing Security Downlighting Orientation

The security down lighting can be rotated in increments of 90° with respect to the i-SIGNAL™, for a total of four positions. Changing the orientation of the security down lighting is as follows:

1. Remove the solar panel assembly by unscrewing the four security fasteners at the top of the head (one in each corner of the solar panel). This will allow access to the top housing where the three downlighting LEDs are located.
2. Disconnect the solar panel connector (see Figure 17)



Figure 17: Head with the Solar Panel Assembly Removed

3. Unscrew four fasteners at the bottom of the top housing as shown in Figure 18.

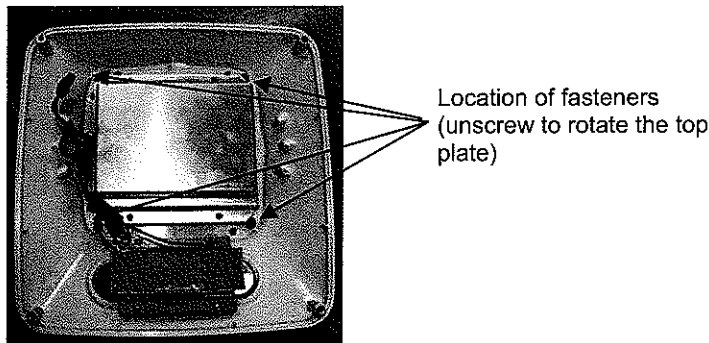


Figure 18: Top Housing

4. Turn the top housing so that the Security Downlighting faces the required direction and reattach the top housing back to the head.
5. Reconnect the wiring of the solar panel assembly, fasten it to the head and reattach the wiring and mount head assembly to the pole as outlined before.
6. Test the LEDs by activating one of the button sensors.

Note: Pay special attention to wiring, ensuring that none of the wires are pinched or twisted. Security down lighting and schedule illumination will only work when it is dark, therefore the solar panel will need to be completely covered before testing these functions.

3.3.3 Changing i-SIGNAL™ Flashing Beacon Orientation

The i-SIGNAL™ flashing beacon can be rotated in increments of 22.5° with respect to the bottom collar, for a total of 16 different positions. It is recommended to adjust the orientation of the i-SIGNAL™ flashing beacon before the head is installed. The head does not need to be disassembled; only the bottom collar needs to be removed:

1. Remove the four fasteners from the bottom of the head and separate the bottom collar from the rest of the assembly. The collar should still be located within the head assembly, not attached to it, and free to rotate.

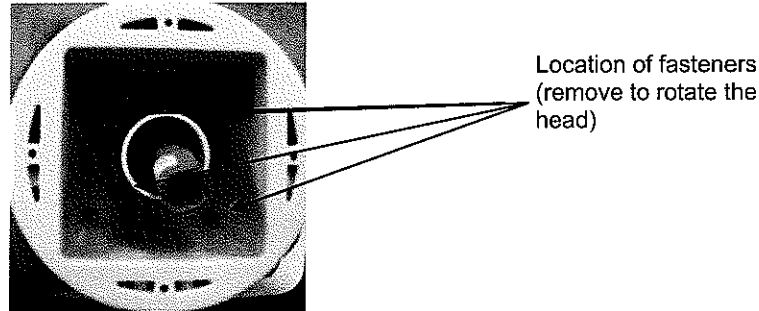


Figure 19: Bottom Side of the Collar

2. Rotate the head (or the collar) in increments of 22.5° until you are satisfied with the position of the flashing beacon. Each increment of 22.5° is preset and you will be able to “feel” each position as you turn the head.
3. Once you are satisfied with the position of the beacon, re-insert the screws and mount the head on the pole by following the instructions as outlined in section 3.3.1.
4. Test the i-SIGNAL™ flashing beacon.

3.4 Part Replacement for the Schedule Assembly

3.4.1 Schedule Replacement

1. Unscrew the security fasteners from the top plate (see Figure 2, page 6) and remove the top plate.
2. Remove the timetable and replace with the new one.
3. Re-attach the top plate and fasten security fasteners. Test the system.

3.4.2 Glass Replacement

1. Unscrew the security screws from the top plate (See Figure 2) and remove the top plate.
2. Slide the glass up and replace with the new one.
3. Re-attach the top plate and fasten security fasteners. Test the system.

3.4.3 Light Pipe Assembly Replacement

1. Unscrew the security screws from the top plate (see Figure 18) and remove it.
2. Disconnect LED assembly from the harness and slide the light pipe assembly out of the front panel assembly.
3. Replace the light pipe assembly with new one and slide the light pipe assembly back into the housing.
4. Connect the LED connector to the harness. Tuck the connector and wiring out of the way.
5. Fasten the top plate and test the system.

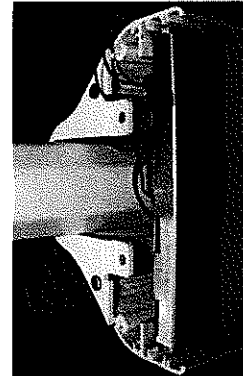


Figure 20

Slide up the light pipe assembly.

3.4.4 Button Assembly Replacement

1. Slide the front panel from the housing by following the instructions outlined in section 3.2.1.
2. Remove the bottom plate by removing two security fasteners as shown in Figure 21.

Security Fasteners
(remove to
disassemble the button
assembly from the
front panel assembly)

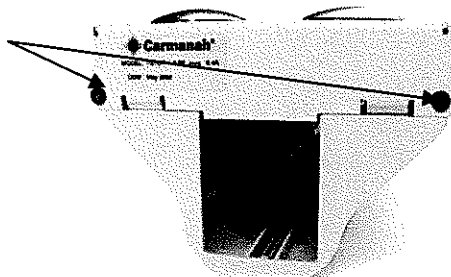


Figure 21: Front Panel Assembly with Button Plate

Warning: Ensure that the LED and button assembly connectors are unplugged from the harness.

3. Slide the button assembly out of its position and replace it with new one.
4. Slide the front panel back inside the housing, making sure that both connectors (LED and sensor) are properly plugged back into the harness. Fasten the top plate back on and secure the front panel to the back housing assembly.
5. Test the system.

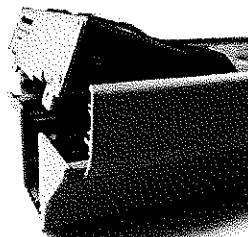


Figure 22: Removal of the Button Assembly

3.5 Part Replacement for Assembly

Head

3.5.1 Battery Replacement

1. Remove the solar panel assembly and the top housing assembly by following the instructions outlined in section 3.3.2.
2. Disconnect the various connectors from the EMS assembly.
3. Remove the four fasteners that attach the EMS.
4. Remove four fasteners that attach the top unit to the housing unit.

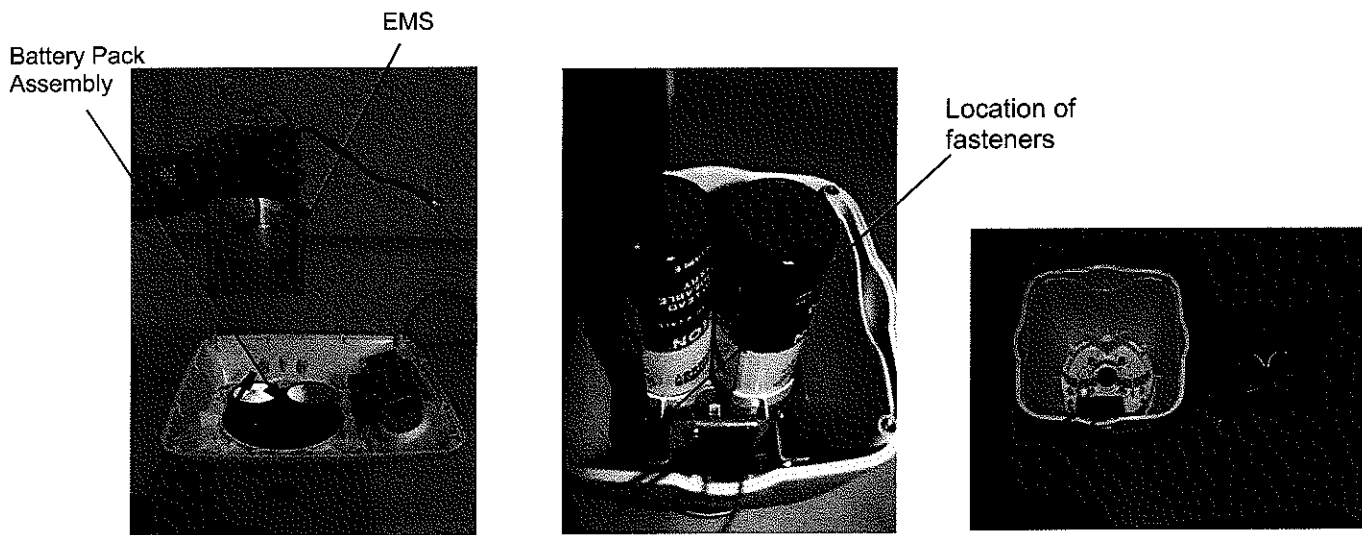


Figure 23: Head Assembly with i-SIGNAL™ and Batteries

5. Remove old battery pack by unscrewing from housing.
6. Insert new battery pack and fasten with screws.
7. Reattach top unit.
8. Reconnect battery pack and various other connectors to EMS; feed wiring back into housing unit; reattach EMS to top unit.

9. Reconnect remaining harnesses
10. Test the system.

3.5.2 i-SIGNAL™ Replacement

1. Remove the solar panel assembly and the top housing by following the instructions from previous sections.
2. Disconnect the i-SIGNAL™ from the EMS assembly.
3. Slide the i-SIGNAL™ bracket with the LED (Figure 22) from its "seat" and replace with the new part.
4. Ensure that lens of i-SIGNAL™ is still in place.
5. Reconnect the i-SIGNAL™ to the EMS assembly and reassemble the head assembly in reverse order.
6. Test the system.

3.5.3 Security Downlighting Replacement

1. Remove the solar panel assembly and repeat the steps as outlined in section 3.3.2. **Changing The Head Orientation**
2. Disconnect the solar panel and the security downlighting LED assembly from the EMS assembly.
3. Remove the Security Downlighting Assembly by removing the four fasteners (see Figure 24) and replace with new Security Downlighting Assembly.
4. Tighten fasteners, reconnect wiring to EMS assembly, and reassemble the head assembly in reverse order.
5. Test the LEDs.

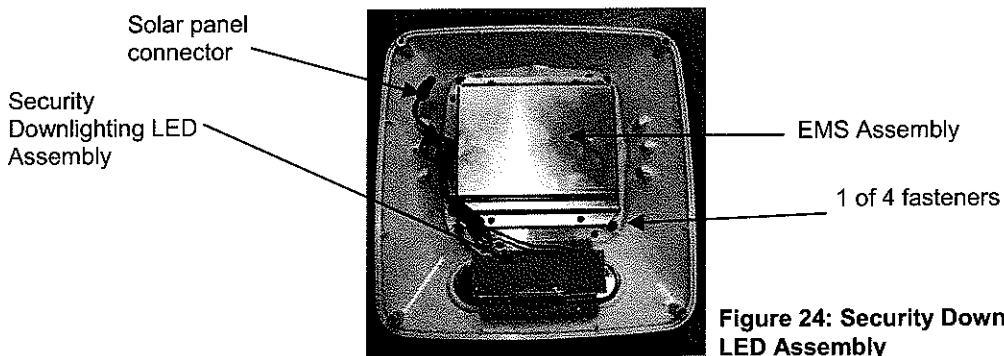


Figure 24: Security Downlighting LED Assembly

3.6 Removal of the NEX® Sign Support System

The signpost can be removed using a slide hammer.

1. Place the slide hammer hook in the slot in the NEX® Wedge.

2. Lift the wedge by operating the slide hammer. Once the wedge is removed, lift the post out of the anchor. Although removing the NEX® Post with a slide hammer takes minimal effort and time, it is virtually impossible to remove the post without this tool—making the pole tamper resistant.

4.0 System Diagnostics

A diagnostic test can be initiated by a specific key press sequence. Any of the three buttons can activate the diagnostic test. The key press sequence is be a long press of at least 5 seconds, followed by 5 presses within the next 5 seconds.

The test will flash each of the light features in turn, including the button LEDs, at a “fast” rate of 4 Hz for 10 flashes. If the light is in low battery cut-off when the test is initiated, the flash sequence will be abbreviated to one “fast” flash of 200 ms of each light feature, 500 ms apart. The order or progression through the features shall be: pushbutton LEDs, Schedule Light, i-SIGNAL™, Security light.

5.0 Service and Product Information

5.1 Service

If the unit requires troubleshooting or warranty service, contact Carmanah's Technical Support team at:

Email: customerservice@carmanah.com

Toll Free in the U.S. & Canada: 1 (877) 722-8877
International: +1 (250) 380-0052

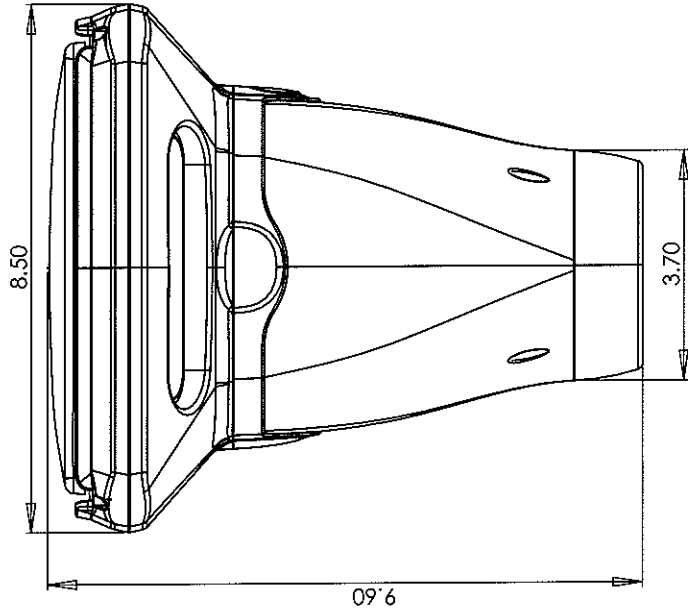
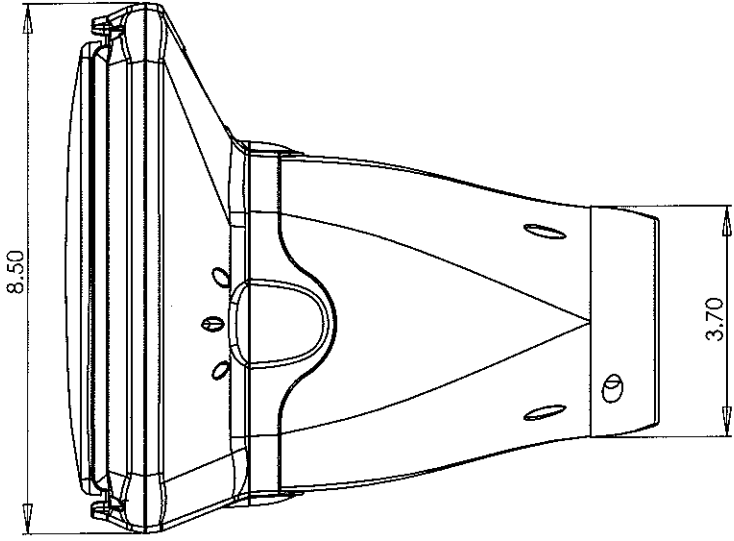
Fax: +1 (250) 389-0040


5.2 Additional Products

Carmanah offers a variety of solar-powered and energy efficient LED lighting products. For transit authorities, the i-SIGNAL bus signaling system and the i-SHELTER™ solar-powered LED lighting system enhance passenger safety and comfort during nighttime hours. For more information, please visit our website at: www.transitlights.com.

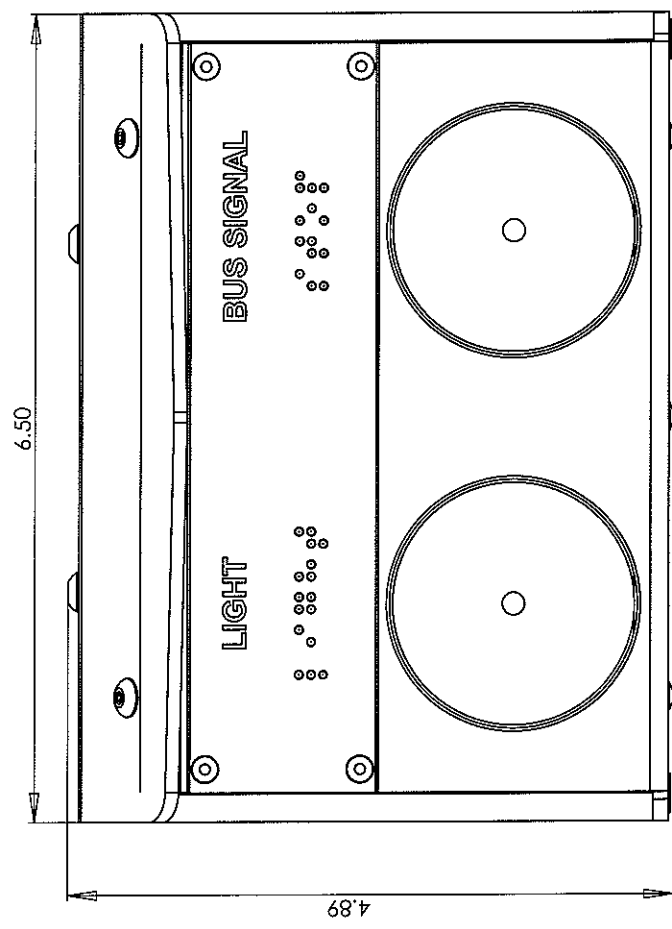
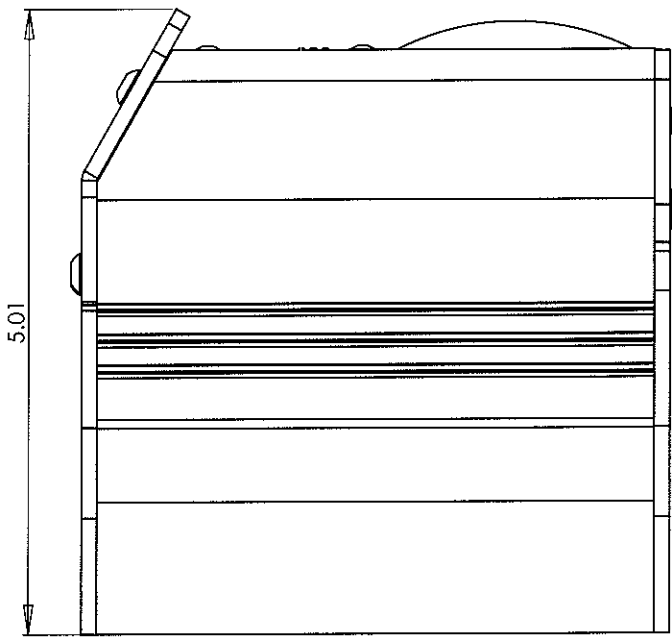
Appendix 4 – Solar Power Transit Stop Specifications and Drawings

8 7 6 5 4 3 2 1



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	DATE 21-Sep-2005						

1 2 3 4 5 6 7 8



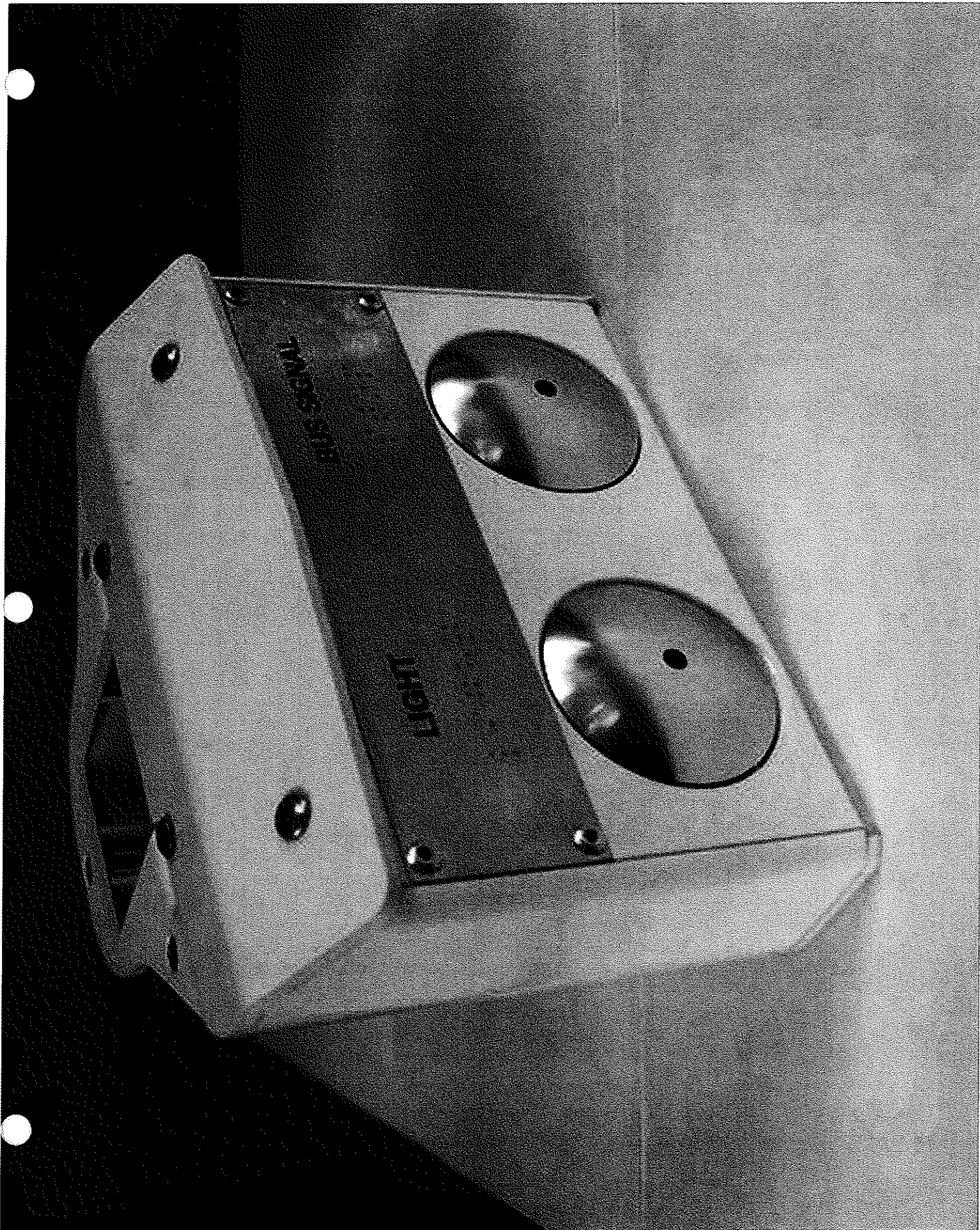
DRAWN BY Trevor Harmon	DRAWING NO 37810_01	REVISION A.2	SHEET 1 OF 1
DATE 21-Sep-2005			

TITLE
Assembly, 1 Stop II, 2 x 2" Button

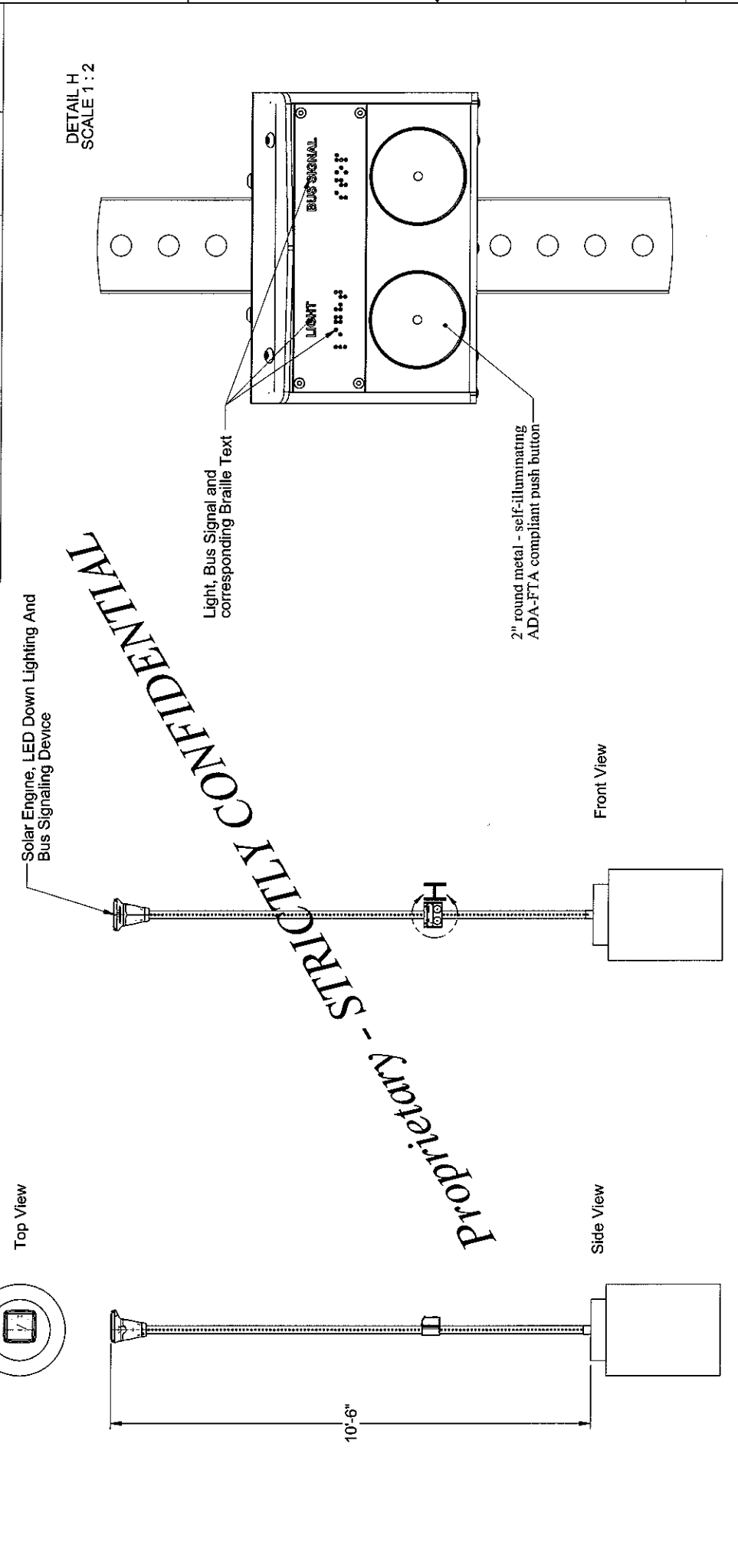
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Fax: (250) 380-0062





REVISION			
REV.	DESCRIPTION	DATE	APPROVED



Carmanah
Carmanah Technologies Inc.
Building 4-203 Harbour Road
Victoria, BC Canada V8A 3S2
Tel [250] 380-0052
Fax [250] 380-0062

ISTOP F2 - on 1.75" square steel pole

DATE: 04-Apr-2005
DRAWN BY: Werner Simbeck
APPROVED: Werner Simbeck

DATE: 04-Apr-2005

SCALE: 1:25

DRAWING NO: **39400**

REVISION: **X1**

CAD REFERENCE: 39400.SLDASM

SHEET: 1 OF 1

UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DRAWING
INTERPRET DIMENSIONS AND TOLERANCES
TOLERANCES APPLY AS SHOWN BELOW
DECIMALS .1
X .1
XX .1
XXX .1
XXXX .1

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Carmanah Technologies Inc.

DESIGNED BY: Werner Simbeck
DATE: 04-Apr-2005
DRAWN BY: Werner Simbeck
DATE: 04-Apr-2005
APPROVED: Werner Simbeck

THIRD ANGLE PROJECTION

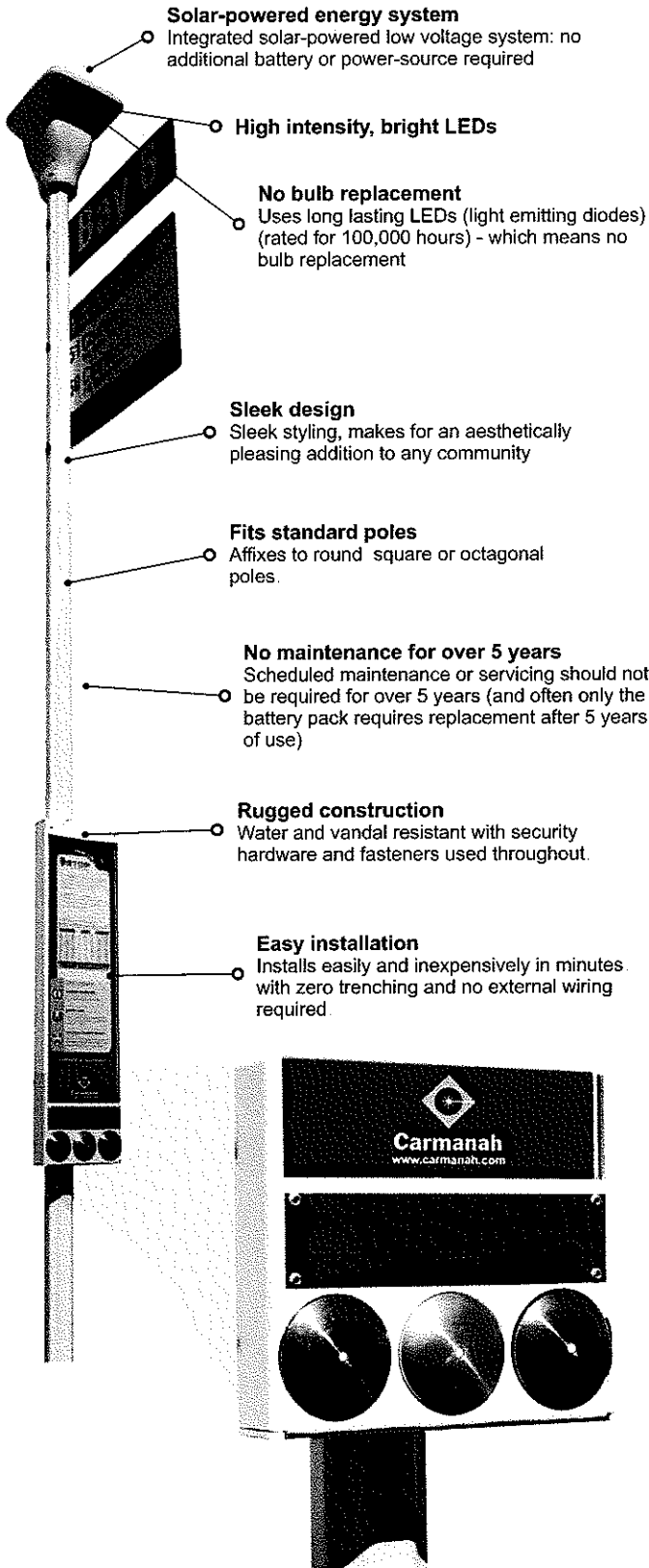
INCHES

i-STOP®

Solar-Powered LED-Illuminated Transit Stop



Carmanah®



Solar-powered energy system

Integrated solar-powered low voltage system: no additional battery or power-source required

High intensity, bright LEDs

No bulb replacement

Uses long lasting LEDs (light emitting diodes) (rated for 100,000 hours) - which means no bulb replacement

Sleek design

Sleek styling, makes for an aesthetically pleasing addition to any community

Fits standard poles

Affixes to round square or octagonal poles.

No maintenance for over 5 years

Scheduled maintenance or servicing should not be required for over 5 years (and often only the battery pack requires replacement after 5 years of use)

Rugged construction

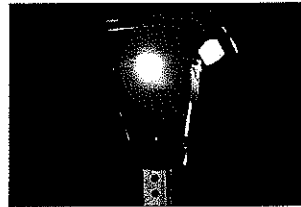
Water and vandal resistant with security hardware and fasteners used throughout.

Easy installation

Installs easily and inexpensively in minutes with zero trenching and no external wiring required.

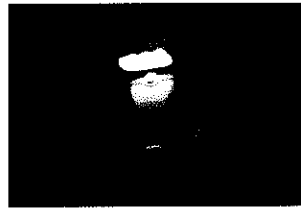
i-STOP®

The i-STOP® solar-powered LED lighting system provides a safer bus stop environment with the following features:



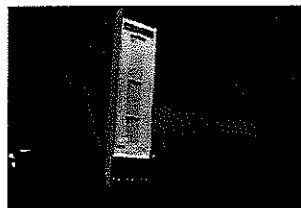
i-SIGNAL™ Flashing Beacon

- An efficient day/night signaling device enables waiting passengers to notify oncoming buses that a stop is required
- This unique patented feature, reduces or eliminates rider pass-bys
- Increases ridership



Security Downlighting

- Bright white safety lighting
- User activated at the push of a button
- Provides enhanced security and convenience for waiting passengers
- When mounted on a 10 foot pole provides direct lighting of approximately 6 ft in diameter and ambient light for a larger area



Illuminated Schedule

- On demand illumination using unique LED edge-lighting
- Sleek, compact, vandal-resistant design offering maximum viewing area

New and Improved Activation Buttons

- UL compliant
- ADA compliant
- 2" round stainless steel
- Self illuminating with an LED in the center of each button
- Vandal resistant
- Braille button identification plate for visually impaired persons

Canada & US: 1-877-722-8877

Worldwide: +1 250-380-0052

www.carmanah.com

CHANGE THE WORLD WITH US™

i-STOP®

Solar-Powered LED-Illuminated Transit Stop

**Carmanah®****What do transit agencies say about the benefits of the i-STOP® system?****The i-STOP® system is a wise investment**

"Whenever you have light at night, you have a safer area regardless of where you are. It reduces rider pass-bys by clearly signaling bus operators. This project is a smart infrastructure investment from a cost-benefit perspective. Installations are quick and inexpensive because each unit is self-contained and requires no digging or electrical hookup." - TJ Ross, Executive Director, PACE Suburban Bus

The i-STOP® system intensifies customer satisfaction and increases safety

"Our drivers really like the signal and say it makes their jobs safer and easier. Also, the security down-lighting provides a bright halo of light that greatly improves safety and convenience for our customers. Our analysis also found the i-STOP by far to be the easiest product to assemble and install. Last, but not least, we judged the i-STOP to be the most aesthetically pleasing product available on the market." - Joe Meer, Morongo Basin Transit Authority, Joshua Tree, CA

The i-STOP® system can increase ridership

"Last month, Pace [installed] solar-powered illuminated bus stops installed along the Sibley Boulevard route in Harvey, Dolton and Calumet City. 'They want to make sure the drivers are seeing them at night,' said Blaine Krage, a Pace spokesman. 'With it getting dark early now, and if you're at a stop where you can have a light turned on for added safety, we think that definitely helps,' Krage said. 'Conveniences like that help draw people to public transit when you are making it easier for them to ride,' Krage said." - Virginia Groark, Tribune staff reporter, Chicago Tribune, Chicago, Ill.: Dec 6, 2003, pg. 4

i-SIGNAL™ Flashing Beacon (US Patent #6,355,989)

Night visibility range	~ 1 Mile (1.6km)
Day visibility range	~ 0.25 Mile (0.4km)
Flasher colors	White
Illumination technology	Bright, high-intensity LEDs
Flash pattern	60 fpm
Duration of flashing per activation	60 seconds default *

Security Downlighting

Illumination technology	Bright, high-intensity LEDs
Output color	White
Illumination area	~ 6ft (182 cm) diameter circle from 10ft (304 cm) pole
Output Orientation	Four options in relation to i-Signal™
'On' time per activation	5 minutes default *

Illuminated Schedule (Patent Pending)

Illumination technology	Bright, high-intensity LEDs, edge-lit acrylic panel
"On" time per activation	30 seconds default *
Dimensions (viewable area)	5.9 inches (15 cm) wide x 19.9 inches (51 cm) long
Actual dimension of schedule	6.25 inches (15.88 cm) wide x 19.75 inches (50.17 cm) long

Construction	Vandal-resistant aluminum extrusion
Trim	Powder coated any color

Solar Engine (Patent issued)

Solar panel	High-efficiency mono-crystalline solar cells. Potted with UV-resistant polyurethane. Domed for superior protection and efficiency.
Battery	Pure-lead thin plate with starved-electrolyte (fully recyclable)
Light control	Automatic Light Control (ALC) adjusts illumination intensity/autonomy according to prevailing weather and solar conditions.
Power Management System	MICROSOURCE® Energy Management System
Minimum autonomy	35 Hours
Minimum equivalent peak sun hours to maintain minimum autonomy	2 Hours
Operating temperature range	-40°F to 176°F (-40°C to +80°C)
Housing	Injection-molded high-impact polycarbonate. UV-protected.
Patent	ALC patent #: 6,573,659 and 5,782,552

Jeff Peters

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Marion Randell

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www.transitlights.com

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* Contact Carmanah for different options.
All specifications are subject to change without notice.

Toll-Free: 1-877-722-8877**Worldwide: +1 (250) 380-0052****www.carmanah.com**

i-SHELTER™

Solar-Powered LED Lighting System for Bus Shelters



The i-SHELTER™ is the most reliable solar-powered LED lighting system for bus shelters in the industry. Its first-class design and functionality offers many benefits for the transit agency and its customers:

Provides Enhanced Customer Service

- Passengers waiting for the bus feel safer during nighttime hours when they can see other people at or around the shelter
- Passengers become more visible for bus drivers, thereby reducing rider pass-bys – the #1 complaint reported by most transit authorities
- The overall transit experience improves and increases ridership

Creates Operational Cost-Savings

- Provides a flexible illumination solution with no external power requirements
- Installation or upgrading to shelters can occur without the typical disruption to pavement and traffic patterns related to hardwiring
- Scalable design for reliable operation up to 60° north
- Rated for reliable performance in ambient temperatures between -22°F and +122°F (-30°C and +50°C)
- Using a proven technology, it provides a cost effective, low-maintenance customer service solution
- Designed to operate without scheduled servicing for up to 5 years, after which the battery packs can be easily replaced to extend its lifetime.

Heightens the Transit Agency's Reputation as an Innovative Leader

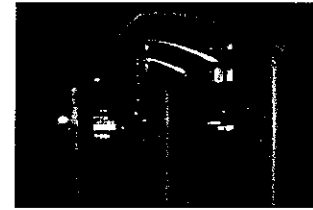
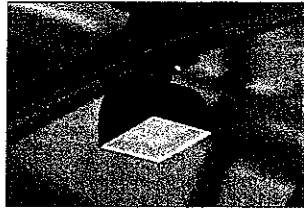
- A customer-focused system, which incorporates leading-edge technology, enhances the identity and reputation of the transit authority
- Use of a renewable energy resource reinforces the profile of public transit as a sustainable transportation alternative

Toll-Free: 1-877-722-8877

Worldwide: +1 (250) 380-0052

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- All-night illumination reduces undesirable behavior around the shelter
- Custom operating profiles, can be designed to suit local site requirements
- Instead of traditional incandescent bulbs, the i-SHELTER™ uses durable, high-intensity light emitting diodes (LEDs), which have a life span of up to 100,000 hours

- Integrated solar panel gives aesthetically pleasing result
- Minimum 10 nights of operating capacity from a full battery charge
- Size of solar panel can be tailored to your agency's operating location and conditions

- Completely self-contained
- Extremely rugged and vandal resistant
- Easy installation: no trenching or cabling required
- No scheduled maintenance or servicing required in the first five years

Lighting

Illuminated area	~ 4.92 ft x 9.84 ft* (1.5 m x 3 m)
Illumination level - standard level	2.0 Foot Candles (22 lux at seat level)
Illumination level - peak hours	6.0 Foot Candles (65 lux at seat level)
Output color	White
Illumination technology	High-brightness LEDs
Luminaire dimensions	4.53" Ø (115 mm)
Construction	Aluminum

Solar Engine (Patent Pending)

Solar panel	Crystalline potted with UV-protected polyurethane
Battery	Pure-lead thin plate with starved-electrolyte (fully recyclable)
Power Management	Automatic Light Control (ALC) adjust illumination intensity/autonomy according to prevailing weather and solar conditions
Minimum autonomy	10 Nights
Operating temperature range	-22°F to + 122°F (-30°C to + 50°C)

Jeff Peters

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www.transitlights.com

* Contact Carmanah for different options as well as for an accurate system dimensioning for your geographical and operation conditions.

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