Pursuant to the order of Justice Walker made on June 25, 2025

No. S-243389

Vancouver Registry

IN THE SUPREME COURT OF BRITISH COLUMBIA

IN BANKRUPTCY AND INSOLVENCY

IN THE MATTER OF THE RECEIVERSHIP OF ECOASIS DEVELOPMENTS LLP AND OTHERS

BETWEEN

SANOVEST HOLDINGS LTD.

PETITIONER

AND

**ECOASIS DEVELOPMENTS LLP,
ECOASIS BEAR MOUNTAIN DEVELOPMENTS LTD.,
ECOASIS RESORT AND GOLF LLP,
0884185 B.C. LTD., 0884188 B.C. LTD.,
0884190 B.C. LTD., 0884194 B.C. LTD.,
BM 81/82 LANDS LTD., BM 83 LANDS LTD.,
BM 84 LANDS LTD., BM CAPELLA LANDS LTD.,
BM HIGHLANDS GOLF COURSE LTD.,
BM HIGHLANDS LANDS LTD.,
BM MOUNTAIN GOLF COURSE LTD., and
BEAR MOUNTAIN ADVENTURES LTD.**

RESPONDENTS

FOURTH REPORT OF THE RECEIVER

ALVAREZ & MARSAL CANADA INC.

April 14, 2025

ALVAREZ & MARSAL

TABLE OF CONTENTS

Appendices

1.0 INTRODUCTION

1.1 On September 18, 2024, upon the application of Sanovest Holdings Ltd. (the "**Petitioner**") in the Supreme Court of British Columbia (the "**Court**") Action No. S-243389, Vancouver Registry, the Court granted an order (the "**Receivership Order**") pursuant to section 243(1) of the *Bankruptcy and Insolvency Act,* R.S.C. 1985, c. B-3, as amended (the "**BIA**") and section 39 of the *Law and Equity Act,* R.S.B.C. 1996 c. 253, as amended appointing Alvarez & Marsal Canada Inc. as receiver and manager (in such capacity, the **"Receiver**") without security, of certain lands of the Respondent Bear Mountain Adventures Ltd. **("BMA**"), any interests in real property of Ecoasis Resort and Golf LLP **("Resorts**") and all of the assets, undertakings and property of the Respondents Ecoasis Developments LLP **("EDL**"), Ecoasis Bear Mountain Developments Ltd. ("**EBMD**"), 0884185 B.C. Ltd., 0884188 B.C. Ltd., 0884190 B.C. Ltd., 0884194 B.C. Ltd., BM 81/82 Lands Ltd., BM 83 Lands Ltd., BM 84 Lands Ltd., BM Capella Lands Ltd., BM Highlands Golf Course Ltd., BM Highlands Lands Ltd. and BM Mountain Golf Course Ltd. (collectively, "**Developments**" and together with BMA and Resorts, the "**Ecoasis Entities**"). Developments and Resorts are hereinafter referred to as "**Ecoasis**" and these proceedings are referred to as the "**Receivership Proceedings**".

1.2 Pursuant to paragraph 2(b) of the Receivership Order, Resorts' operations and business (the "**Resorts Business**"), subject to further order of this Court, shall continue to be managed by EBMD, provided that EBMD and Resorts are required to provide access and cooperation to the Receiver pursuant to paragraphs 7 to 10 of the Receivership Order, including in respect of Resorts and the Resorts Business. For greater clarity, the Resorts Business does not include the ownership, disposition or encumbrance of any interests in real property.

1.3 Pursuant to paragraph 4 of the Receivership Order, the Receiver was to deliver, on or before October 25, 2024, a report (the "**Resorts Report**" or the "**First Report**") and recommendation regarding Resorts, including the inclusion of other assets, undertakings and properties of Resorts, management by EBMD of the Resorts Business and whether EBMD ought to continue to manage the Resorts Business and, if so, on what terms, if any. Accordingly, on October 25, 2024, the Receiver delivered the Resorts Report to 599315 B.C. Ltd. ("**599**") and Mr. Matthews, and Sanovest Holdings Ltd. ("**Sanovest**"), and their respective legal counsel.

1.4 Pursuant to paragraph 5 of the Receivership Order, a hearing for the Receiver's counsel to speak to the Resorts Report, and for any applications resulting from the Resorts Report or any ancillary relief, was scheduled to be held at the Court at 10am on the 6th day of November 2024, or such other date as the Court may order. No applications or ancillary relief were sought and accordingly, on November

4, 2024, the Receiver filed a requisition adjourning the hearing scheduled for November 6, 2024 (the "**November 6 Hearing**") and, as such,the November 6 Hearing was adjourned.

1.5 At the request of the Court, a Judicial Management Conference was held on November 15, 2024.

1.6 Pursuant to paragraph 6 of the Receivership Order, the Receiver was to deliver, on or before December 2, 2024, or such other date as the Court may order, a report (the "**Developments Report**" or the "**Second Report**") in respect of a marketing and sales process, to be approved by the Court, and shall only market or sell the Property or business in accordance with that marketing and sale process, except for the sale of Property within the limits in paragraph 3(l)(i) of the Receivership Order. Accordingly, on December 2, 2024, the Receiver delivered the Developments Report to 599, Mr. Matthews, and Sanovest, and their respective legal counsel.

1.7 On December 9, 2024, pursuant to the recommendations made in the Resorts Report, management of Resorts ("**Resorts Management**") provided to the Receiver its response (the "**Resorts Response**") reporting on corrective measures to address deficiencies and challenges described in the Resorts Report, and Management's plans where such steps could not be implemented in the very near term. On December 20, 2024, the Receiver delivered an interim report with its preliminary comments on the Resorts Response (the "**Third Report**").

1.8 On January 30, 2025, upon the application made by the Receiver on January 24, 2025, a hearing was held to seek advice and directions from the Court including (i) whether the First Report, Second Report and/or the Third Report (collectively, the "**Reports**"), or any of them, ought to be filed with the Court; and (ii) if the Reports, or any of them, were directed by Court to be filed with the Court, whether any of the Reports, or portions thereof, ought to be filed under seal. The Court confirmed that pursuant to the terms of the Receivership Order the Reports are not required to be filed with the Court

1.9 The Receivership Order, along with other materials filed with the Court in these Receivership Proceedings (the "**Filed Materials**"), is available on the Receiver's website (the "**Receiver's Website**") at www.alvarezandmarsal.com/ecoasisdevelopments.

2.0 PURPOSE OF THE FOURTH REPORT

2.1 This fourth report (the "**Fourth Report**") has been prepared to provide a status update on the following:

a) the Receiver's interim statement of cash receipts and disbursements for the period ending March 28, 2025;

b) the third cash flow forecast for the period from March 29, 2025 to June 27, 2025 (the "**Third Cash Flow Forecast**");
c) an update to the Resorts Response and the Receiver's comments with respect to same;
d) Resorts Management's request for funding to pay certain of the outstanding fees owing to Resorts litigation counsel in the hotel arbitration ("**Hotel Arbitration**") as well as certain accounts payables and statutory obligations; and
e) the Receiver's concluding comments and recommendations related to the above.

3.0 TERMS OF REFERENCE

3.1 In preparing the Fourth Report, the Receiver has relied upon the representations of certain management ("**Management**") and employees of Resorts as well as unaudited financial information contained in the books and records of Resorts.

3.2 The Receiver has undertaken preliminary reviews and investigations in respect of the assets and liabilities of Resorts; however, it has not performed an audit, review or otherwise substantiated the completeness or accuracy of the financial position of Resorts that would wholly or partially comply with the Canadian Auditing Standards ("**CASs**") pursuant to the Chartered Professional Accountants Canada Handbook, and accordingly, the Receiver expresses no opinion or other form of assurance contemplated under CASs in respect of the information.

3.3 This Fourth Report has been prepared to provide (i) an update on the Resorts Response and the Receiver's comments therein, and (ii) the Receiver's comments with respect to a request to fund certain litigation fees related to the Hotel Arbitration, accounts payables and statutory obligations, and accordingly, the reader is cautioned that this Fourth Report may not be appropriate for any other purpose.

3.4 Capitalized terms not defined in this Fourth Report have the meanings ascribed to them in the Receivership Order, the Resorts Report, the Developments Reports and the Filed Materials.

3.5 All monetary amounts in the Fourth Report are expressed in Canadian dollars unless stated otherwise.

4.0 RECEIVER'S INTERIM STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS

4.1 The Receiver's interim statement of cash receipts and disbursements for the period from September 18, 2024, to March 28, 2025 (the "**Reporting Period**") is summarized in the table below:

Ecoasis Developments LLP et al. Receiver's Interim Statement of Cash Receipts and Disbursements For the Period September 18, 2024 to March 28, 2025	
Receipts	
Receiver's certificates	$ 1,300,000
Reimbursement from Resorts	8,444
Pinehurst administration fee	1,575
Interest on Deposits	2,267
Total Receipts	**1,312,286**
Disbursements	
Payroll costs	278,481
Computer, subscriptions and IT	18,813
Leases	921
Statutory	80
Office supplies, cleaning and other misc.	3,106
Resorts shared costs	5,712
Utilities	8,803
Bank fees	88
Appraisal	5,000
Bear Mountain Legacy Homes	8,534
Professional fees - Receiver, counsel	584,151
Other professional fees	205,341
GST paid	41,840
PST paid	12,479
Total Disbursements	**1,173,349**
Cash on hand in trust	**$ 138,936**

4.2 As at March 28, 2025, cash held in trust by the Receiver totaled $138,936.

4.3 Total receipts during the Reporting Period totaled $1.3 million and consisted primarily of the Receiver's borrowings.

4.4 Total disbursements during the Reporting Period totaled $1.2 million consisting primarily of payroll costs for Developments Staff (inclusive of regular wages and salaries, source deductions and third-party payroll provider fees) totaling $278,481 and payments in respect of professional fees and disbursements of the Receiver and its legal counsel through to February 28, 2025 totaling $584,151, and Placemark fees and disbursements totaling $205,341.

5.0 THIRD CASH FLOW FORECAST

5.1 The Receiver has prepared the Third Cash Flow Forecast for the period from March 29, 2025, to June 27, 2025 ("**Forecast Period**"). The Third Cash Flow Forecast is appended herewith as **Appendix "A"** and is summarized in the table below:

Ecoasis Developments LLP et al. Third Cash Flow Forecast For the period March 29, 2025 to June 27, 2025 *$CAD'000s*		
Cash operating receipts		
Receiver's certificates	$	700
Reimbursement from Resorts		5
Other receipts		-
		705
Cash operating disbursements		
Payroll costs		117
Repairs and maintenance		0
Utilities		5
Insurance		-
Computer, subscriptions and IT		11
Office supplies, cleaning and other misc.		3
Regulatory compliance		-
Operating disbursements paid by Resorts reimbursement		-
Bear Mountain Legacy Homes		2
		138
Net operating cash flow		**566**
Other cash disbursements		
Professional fees - Receiver, counsel		340
Other professional fees		148
		488
Net cash flow (deficit)	**$**	**79**
Cash continuity		
Opening cash balance	$	139
Net cash flow (deficit)		79
Ending cash balance	**$**	**218**
Receiver's borrowings		
Opening balance		1,300
Receiver's borrowings (repayments)		700
Ending Receiver's borrowings	**$**	**2,000**

5.2 Net cash flow of $79,000 is expected during the Forecast Period and a closing cash balance of approximately $218,000 is forecast as at June 27, 2025.

5.3 Key assumptions in respect of the Third Cash Flow Forecast include the following:

a) receipts totaling $705,000 primarily consist of Receiver's borrowings;

b) operating disbursements totaling $138,000 consists primarily of payroll costs for Developments Staff ($117,000) and other routine operating expenses such as utilities, IT, and repairs and maintenance, among other things; and

c) other disbursements totaling $488,000 consists of the Receiver's and its legal counsel's fees and disbursements ($340,000) and other consulting fees and disbursements ($148,000).

5.4 The Receiver's borrowings are estimated to total $2.0 million at the end of the Forecast Period. Pursuant to paragraph 28 of the Receivership Order, the Receiver is permitted to borrow up to $2.5 million in the Receivership Proceedings. Receiver Borrowings to date have been funded by Sanovest (the "**Interim Lender**").

6.0 UPDATE ON THE RESORTS RESPONSE

6.1 As described in section 1.7 above, Resorts Management has provided the Resorts Response to address the recommendations made by the Receiver in the Resorts Report (or First Report) (the "**Receiver's Recommendations**"). The Receiver's Recommendations are attached herewith as **Appendix "B"**.

6.2 Since delivering the Third Report to the shareholders on December 20, 2024, Resorts Management has provided progress updates to the Receiver by way of (i) two progress reports prepared by Resorts' external accounting firm, Dale Matheson Carr-Hilton LaBonte LLP ("**DMCL**"), dated January 17, 2025 (the "**Jan 17 DMCL Report**") and February 19, 2025 (the "**Feb 19 DMCL Report**", together with the Jan 17 DMCL Report are referred to as the "**DMCL Progress Reports**"), and (ii) a progress report on the Resorts business dated February 19, 2025 by Resorts Management (the "**Feb 19 Resorts Update**" and together with the DMCL Progress Reports, the "**Progress Update Reports**"). The Progress Update Reports are attached as **Appendix "C"**. `Additional financial forecast information was provided to the Receiver on March 25, 2025 that is further discussed below.

6.3 Updated responses to the Receiver's Recommendations since the Third Report are presented in the table below. The numbering in the table below corresponds to the numbering in the table included in Appendix "B":

Receiver's Update on Resorts Response	
a)	**Corporate Controller:** As reported in the Third Report, Resorts Management was considering potential applicants. **Update**: Subsequent to the Third Report, Resorts Management hired a controller with a start date commencing on February 3, 2025. **F&B Manager:** As reported in the Third Report, Resorts Management intended to post the F&B manager position in February 2025 in advance of the busier summer season.

Receiver's Update on Resorts Response	
	Update: No update has been provided on whether the F&B position has been posted.
b)	**HR Manager (full time):** As reported in the Third Report, Resorts Management views its existing arrangement as sufficient. **Update**: No additional update. **Roles previously filled by Developments Staff:** As reported in the Third Report, Resorts Management confirmed all Resorts-related work currently performed by Developments Staff would be transitioned to the Resorts Staff, with the exception of certain limited hours and work to be provided by the Developments manager (~5 hours per week for cash flow assistance) and the Developments legal/executive assistant (~1 hour per week for benefits administration). **Update:** The Receiver understands that a substantial amount of Resorts-related work has been transitioned to Resorts Staff with the exception of setting up wire payments and transfers, among other banking-related tasks.
c)	As reported in the Third Report, Resorts Management provided an operational overview for the agronomy department ("the "**Agronomy Overview**"). **Update:** Resorts Management confirmed the resignation of the Superintendent of Agronomy which will become effective in late May 2025. The Head of Agronomy position will be filled by the Assistant Superintendent of Agronomy who has been employed by Resorts for over 10 years. It is unclear if Resorts Management is planning for increased Agronomy staffing needs beyond filling the Superintendent of Agronomy position in May.
d)	As reported in the Third Report, Resorts Management provided a chart illustrating the reporting structure in the Resorts Response. **Update:** Resorts Management confirmed the resignations of the Head Golf Pro and Superintendent of Agronomy with departure dates of March 7, 2025 and late May 2025, respectively. The Head of Sales is a certified Golf Professional and has filled the Head Golf Pro position while concurrently maintaining the Head of Sales position. The Head of Agronomy position will be filled by the Assistant Superintendent of Agronomy.
e)	As reported in the Third Report, Resorts Management provided an overview of Resorts leadership and governance by summarizing key senior leadership roles, budgeting and operations management process and outlining key stakeholder groups engaged by Resorts Management. **Update:** Resorts Management confirmed the resignations of the Head Golf Pro and Superintendent of Agronomy with departure dates of March 7, 2025 and late May 2025, respectively. The Head of Sales is a certified Golf Professional and has filled the Head Golf Pro position while concurrently maintaining the Head of Sales position. The Head of Agronomy position will be filled by the Assistant Superintendent of Agronomy.
f)	As reported in the Third Report, the Resorts Response included a memo from DMCL (the "**DMCL Memo**") outlining the status of various financial information. With respect to financial statements, the DMCL Memo confirmed the reconciliation of intercompany accounts of Resorts and Developments (2022, 2023 and up to October 24, 2024) have been completed. Finalization of financial statements (2020, 2021, 2022, 2023 and draft YTD 2024) are expected to be completed by January 31, 2025. **Update:** Per DMCL Progress Reports, reconciliation of intercompany accounts of BM Legacy Homes and BMA are anticipated to be completed by February 28, 2025. The draft

Receiver's Update on Resorts Response	
	financial statements for 2020 and 2021 are complete and pending partner approvals. It was noted that the completion of the draft financial statements for 2022, 2023 and YTD 2024 may require several weeks following the date of the Feb 19 DMCL Report.
g)	As reported in the Third Report, the DMCL Memo advised that statutory filings (GST, PST, BC EHT and Worksafe BC) are being brought current. **Update:** Pursuant to the Feb 19 DMCL Report, statutory filings have been brought current; however, remittances totaling $373,663 related to the BC EHT, PST and GST have not been paid.
h)	**BMAC lease:** As reported in the Third Report, Resorts Management is reviewing lease arrangements with its advisors and will report back by January 15, 2025. **Update:** The Feb 19 Resorts Update advised that a lease document will be completed by February 28, 2025. To date, Resorts Management has not presented a proposal for a lease arrangement. **Office lease**: As reported in the Third Report, Resorts Management intends to review and clarify the scope and parameters of applicable lease arrangements with the Receiver at a mutually agreed upon date. **Update:** The Receiver has not been contacted to discuss this matter.
i)	As reported in the Third Report, Resorts Management outlined the control procedures in place for use of the corporate Mastercard. **Update**: No further update has been provided.
j)	**Advancing the Transition Plan:** As reported in the Third Report, Resorts Management confirmed that an implementation schedule of the Transition Plan will be set following finalization of funding. **Update**: There has not been any funding to Resorts from the Receiver. An implementation schedule for the Transition Plan has not been presented. Pursuant to the Feb 19 DMCL Report, the Transition Plan is intended to be included in the three-way integrated financial forecast (balance sheet, income statement and cash flow statement) for FY25 and FY26 (collectively the "**FY25/26 Financial Forecasts**"). The Receiver understands this information was anticipated to be delivered before the end of March 2025. **Rectifying the stop work order issued by the District of Highlands ("Highlands"):** As reported in the Third Report, Resorts Management described preliminary site visits and discussions that were had with Highlands. **Update**: Resorts Management confirms a plan and cost estimate has been provided by a consultant and Resorts will be seeking approval of the plan from Highlands.
k)	As reported in the Third Report, the DMCL Memo confirmed that once adjustments to intercorporate accounts are completed and the general ledger is made current, Resorts Management will be able to provide a better estimate of its working capital requirements and prepare a financing plan to address same. **Update**: Working capital requirements and related financing plan has not been provided. Pursuant to the Feb 19 DMCL Report, the capital expenditures plan is intended to be included in the integrated FY25/26 Financial Forecasts. The Receiver understands this information was anticipated to be delivered before the end of March 2025.

Receiver's Update on Resorts Response	
l)	As reported in the Third Report, the DMCL Memo confirmed that DMCL expects to finish reviewing Resorts' rolling 13-week cash flow forecast by December 31, 2024. **Update**: On February 19, 2025, Resorts Management provided a 17-week cash flow forecast ending on May 30, 2025 (the "**Resorts 17-Week CFF**"). The Resorts 17-Week CFF is attached herewith as **Appendix "D"** and further discussed below.
m)	As reported in the Third Report, the DMCL Memo confirmed that DMCL expects to finish reviewing Resorts' integrated FY25/26 Financial Forecasts for FY25 and FY26 by January 15, 2025 and February 28, 2025, respectively. **Update**: Per the DMCL Progress Reports, the FY25/26 Financial Forecasts are anticipated to be completed as soon as possible following analysis of December 31, 2024 balance sheet accounts. The DMCL Progress Reports indicate it is challenging to provide estimates on deliverable dates. The Receiver understands this information was anticipated to be delivered before the end of March 2025.

6.4 The Receiver's observations with respect to the updates to the Resorts Response include the following:

Operational

a) actions taken to address operational matters since the Third Report have included advancing progress to resolve the Highlands stop work order, hiring a corporate controller and managing employee transitions for two roles: Superintendent of Agronomy and Head Golf Pro;

b) the following operational matters remain unclear and/or outstanding:

   i. whether Resorts Management will be delivering a proposal for the BMAC and office lease arrangements;

   ii. whether the F&B Manager position has been posted; and

   iii. whether the Transition Plan will be advanced, at what cost and how it will be funded;

Financial

c) financial information delivered to the Receiver as part of the Progress Update Reports included the following:

   i. an accounts payable listing totaling $2.3 million including unreleased cheques totaling $471,016;

   ii. a summary of other liabilities (i.e. property taxes for 2024 and merchant advances from Lightspeed Capital as described in the Third Report and is not repeated herein) totaling $370,519; and

   iii. the Resorts 17-Week CFF (further described below) for the period February 1, 2025 to May 30, 2025;

d) longer-term monthly forecasts for fiscal years ending December 31, 2025 (the "**Resorts FY25 Forecast**"), December 31, 2026 ("**FY26**"), December 31, 2027 ("**FY27**") and December 31, 2028 ("**FY28**") (the Resorts FY25 Forecast, together with the FY26, FY27 and FY28 forecasts are referred to as the "**2025 to 2028 Forecasts**") are attached as **Appendix "E"**. The 2025 to 2028 Forecasts were delivered to the Receiver on March 25, 2025;

e) financial-related information that remains outstanding includes the following:

   i. the finalized financial statements for 2020, 2021, 2022, 2023 and 2024;

   ii. an implementation schedule for the Transition Plan;

   iii. the working capital requirements and related financing plan; and

   iv. the integrated FY25/26 Financial Forecasts.

Resorts 17-Week Cash Flow Forecast

6.5 The Resorts 17-Week CFF is summarized in the table below:

Ecoasis Resort and Gold LLP 17 Week Cash Flow Forecast For the period February 1, 2025 to May 30, 2025 *$CAD*	
Cash operating receipts	
Initiation fees - golf	$ 396,950
Initiation fees - tennis	26,040
Transfer fees - GMEA golf	24,000
Dues - golf	422,132
Dues - tennis	71,636
Daily sales	1,174,780
Cash/check account/event deposits	16,088
Pepsi rebate	4,500
GST collected	103,495
PST collected	33,383
Funding request	1,350,000
	3,623,004
Cash operating disbursements	
Payroll costs	1,271,827
Inventory purchases	173,919
Operating expenses	853,915
Accounting fees (non-recurring)	29,498
GST paid	106,994
PST paid	34,238
	2,470,391
Net operating cash flow	**1,152,612**
Other disbursements	
Lightspeed Advance (13% of Daily Sales Pro Shop Only)	113,980
Aged accounts payables	803,509
Aged statutory remittances	410,427
	1,327,916
Net cash flow (deficit)	**$ (175,304)**
Cash continuity	
Opening cash balance	$ 376,800
Net cash flow (deficit)	(175,304)
Ending cash balance	**$ 201,496**

6.6 The Resorts 17-Week CFF forecasts an ending cash balance totaling $201,491 on May 30, 2025.

6.7 Total receipts over the forecast period approximate $3.6 million and are predicated on receiving an advance (loan) from the Receiver totaling $1.35 million (the "**Receiver's Advance**"), as well as, among other things, golf and tennis initiation fees ($422,990); golf and tennis membership dues ($493,768); and retail (largely green fees) and recreational activities sales ($1.2 million).

6.8 [redacted]

[redacted]

6.9 The Receiver Advance is contemplated to be repaid from the Hotel Arbitration awards (described in section 7.0), if successful. Absent the Receiver Advance it appears Resorts will experience ongoing liquidity challenges.

6.10 Resorts Management confirmed that the Receiver Advance will:

a) provide the Resorts Business with liquidity to offset lower than forecast collections due to inclement weather during the winter of 2025 causing longer periods of golf course closures and lower than expected annual member due prepayment collections for FY25 and FY26;

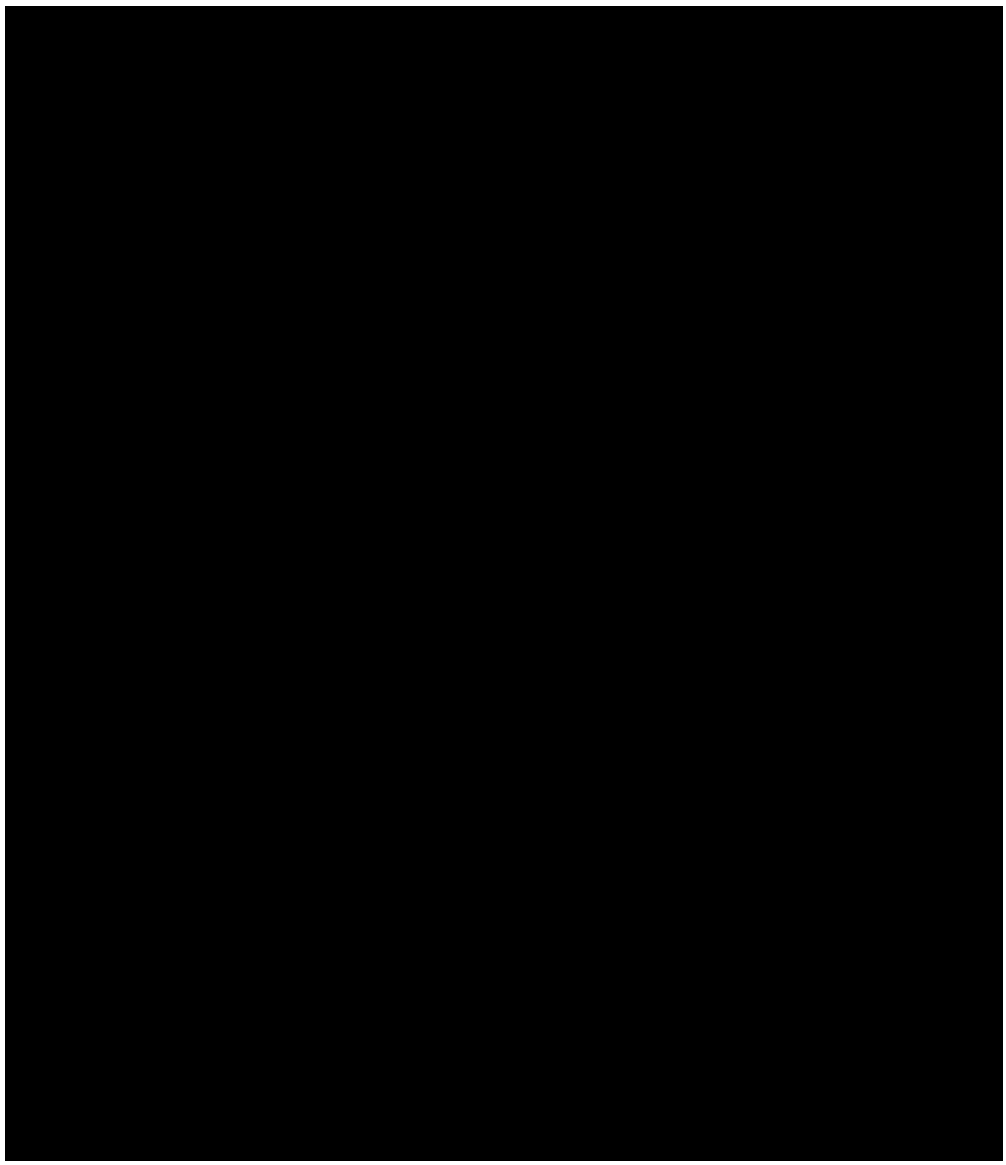
b) permit certain aged trade payables and statutory payables to be funded to facilitate ongoing operations; and

c) [redacted]

6.11 The Receiver understands that the Receiver Advance is not expected to fund any part of the Transition Plan for which an implementation and financing plan have not yet been presented to the Receiver.

Resorts FY25 Forecast

6.12 [redacted]



6.13 

[redacted]

6.14 [redacted] The Resorts FY25 Forecast does not include collections from the Hotel Arbitration (or consequent repayment of the proposed Receiver Advance should any awards be collected) or funding towards the Transition Plan.

6.15 In the event the Resorts FY25 Forecast is achieved it could permit payment of a substantial portion of the aged accounts payables, which are currently estimated to approximate $2.7 million (less in the event the Receiver Advance is made and certain accounts are paid as described in section 6.8). However, given that the sales process for Bear Mountain has not commenced and will likely take until the Fall of 2025 to conclude, it would appear optimistic at this stage to forecast a significant increase in golf initiation fees for FY25. Once a clear vision with development plans is communicated to the market outside of a receivership scenario and new sales can commence in earnest it would then appear probable to expect an increase in membership initiation revenues.

6.16 If the initiation fees for FY25 are normalized to levels recorded in FY23 and FY24 (say a reduction of $1.8 million from the $2.1 million forecast), the Resorts Business may be closer to break-even in FY25 absent significant unexpected litigation costs (as previously noted). With the potential for

break-even operations in FY25 it would appear unlikely that the Resorts Business' liquidity position would improve absent an external injection of capital.

6.17 The Receiver has not reviewed the FY26, FY27 and FY28 forecasts in detail nor provided comments herein. Resorts Management confirms that the growth illustrated in the 2025 to 2028 Forecasts are tied to real estate sales following a successful sales process for Bear Mountain.

Receiver's Comments

6.18 The Receiver's comments with respect to the Resorts Response and updates to same include the following:

a) the Resorts 17-Week CFF contemplates a Receiver Advance of $1.35 million largely to fund unsecured creditors that would be repaid from a successful arbitration award. [redacted]

b) certain financial information has not been provided including the FY25/26 Financial Forecasts to understand liquidity needs beyond the Resorts 17-Week CFF. The financial information provided to date includes the (i) Resorts 17-Week CFF inclusive of a funding request (as well as supporting accounts payable and other listings), and (ii) the 2025 to 2028 Forecasts; and

c) the Resorts FY25 Forecast may not be entirely realistic as the forecast profit is based on higher golf initiation fees which may not be achievable during 2025.

7.0 HOTEL ARBITRATION

7.1 [redacted]

Timeline through to Conclusion of the Hotel Arbitration

7.2 As described in the First Report, it is the Receiver's understanding that the Hotel Arbitration commenced in 2020 and since then, a partial final award was issued in or around February 2021 awarding Resorts damages for the Hotel's breach of certain terms included in certain contracts between Resorts and the Hotel. A hearing for damages was held from mid-September 2024 to mid-October 2024 and closing arguments were made in November 2024, with follow-up submissions

made through February 2025, whereby Resorts claimed damages exceeding [redacted] The arbitrator is to render its decision on the final award (the "**Arbitration Award**") within 60 days of the latter of: (a) the close of the hearing, and (b) the last written submissions received. Following the issuance of the Arbitration Award, Resorts will have 30 days to make submissions on costs to recover legal fees.

Litigation Counsel and Arbitrator Fees

7.3 [redacted]

7.4 [redacted]

7.5 [redacted]

7.6 [redacted]

Receiver's Comments

7.7 [redacted]

a) [redacted]

b) [redacted]

c) [redacted]

8.0 RECEIVER ADVANCE

8.1 Resorts Management has requested a Receiver Advance be funded through the Interim Lender (Sanovest), or alternatively, Mr. Matthews has provided a preliminary indication that either personally or via 599, he may provide funding to the Receiver on the condition that Mr. Matthews would have the ability to direct the Receiver to fund the Receiver Advance.

8.2 The Receiver has presented these two alternative paths for a Receiver Advance to Sanovest. Sanovest has confirmed that it is opposed to providing funding to the Resorts Business and has confirmed to the Receiver that any attempts made by Mr. Matthews (or 599) to provide interim lending to the Resorts Business in these Receivership Proceedings would be opposed.

8.3 Separately, Resorts Management has confirmed to the Receiver that without the Receiver Advance the Resorts Business can likely continue operating in the normal course. [redacted]

8.4 The Receiver has requested that Mr. Matthews/599 confirm its intentions and ability to provide interim funding to the Estate and if so, on what terms and conditions. As at the date of this report, no reply has been received from Mr. Matthews/599.

9.0 RECEIVER'S CONCLUSIONS AND RECOMMENDATIONS

9.1 Upon consideration of the Resorts financial forecast information and its operational activities to date, the Receiver has identified a number of concerns and/or challenges including the following:

a) Resorts has not been able to fully respond to the Receiver's Recommendations over the course of the past five months (including, among other things, providing integrated FY25/26 Financial Forecasts, advancing the Transition Plan and advancing lease arrangements for the BMAC and office);

b) the Resorts 17-Week forecast illustrates very near-term liquidity challenges absent a capital injection;

c) the Resorts FY25 Forecast does not appear realistic at this time as it projects higher revenues and profits than prior years based on higher initiation fees (approximately $1.8 million more than FY24). At best, the forecast appears to break-even when initiation fee revenues are normalized. The 2025 to 2028 Forecasts appear to be optimistic and highly reliant on strong golf revenues tied to real estate sales resulting from a successful sales process;

d) the Resorts FY24 does not appear to budget for advancement of the Transition Plan that would provide near-term capital improvements (primarily a golf cart storage area, bag storage, pro shop and enhanced food and beverage facilities) and offer members and guests an enhanced customer experience until such time that a full-scale clubhouse could be constructed. Resorts Management had anticipated the Transition Plan would have facilities in place for the next five years;

e) aged accounts payables are approximately $2.7 million inclusive of statutory payables ($373,663), which were to be brought current as part of the Receiver's Recommendations, as well [redacted]

f) with respect to the Receiver Advance requested by Resorts:

   i. Resorts contemplates repaying the Receiver Advance using successful arbitration awards from the Hotel Arbitration for which there is no certainty as to quantum of damages that may be awarded and ultimately collectability of any award, or a definitive end date to the proceedings;

   ii. the Receivership Order carves out the Hotel Arbitration confirming that the Receiver in Paragraph 2(a) of the Receivership Order "…shall have no obligation to manage or otherwise participate in…"; and

iii. the Interim Lender has confirmed that a Receiver Advance to Resorts would not be funded by the Interim Lender, is not supported, and would be opposed by the Interim Lender; and

g) there appears to be financial and operational instability (liquidity concerns and recent leadership resignations, among other things) that may impact the impending sales process that the Receiver anticipates commencing in the near-term. Liquidity challenges may impact Resorts through several avenues including suboptimal performance or enforcement and/or collection actions by creditors.

9.2 The Receiver is of the view that the Receivership Order grants discretion to the Receiver to borrow funds within the limits set out in the Receivership Order and while the consent of Sanovest is not required, the Receiver would prefer to avoid disputes between the two main interested parties if possible.

9.3 One of the key issues for the Resorts Business is a lack of funding with operating debts built up and an inability to fund ongoing costly litigation. Absent significant additional capital to advance the Transition Plan and other potential improvements to the operations, the Receiver does not view that management of the Resorts Business by the Receiver would significantly improve operations. If the Resorts Business was added to the Receivership Proceedings, the Receiver's goal would be to maintain stable operations where all expenses would be planned to be funded in a timely manner. Additional costs would be incurred due to Receiver professional fees, particularly at the outset, when the Receiver needs to further understand the operations and establish control and reporting structures to stabilize and oversee the operations. After initial efforts to stabilize operations are completed Receiver fees would be expected to decline to maintain a supervisory role over operations.

9.4 The Receiver Advance of $1.35 million would largely be utilized to fund creditor claims that may not improve the current state of Resorts operations but merely maintain the status quo temporarily. Creditor claims would be stayed if Resorts were added to the Receivership Proceedings and generally, such costs would not be funded in a receivership. The Receiver acknowledges that such claims may ultimately be paid from the sale of Developments and Resorts (depending on total realizations and transaction structure). However, there is no certainty at this stage as to whether proceeds could be sufficient to permit payment of these unsecured claims.

9.5 Although the Receiver has the discretion to advance funds to Resorts, the Receiver (i) is not supportive of paying down creditor liabilities that may otherwise be stayed in a receivership and which may not provide material or long-term benefit to the Resorts Business; and (ii) would prefer

to avoid taking steps that may initiate shareholder disputes particularly where such steps would not appear to the Receiver to have material advantages.

9.6 It is the Receiver's view that now would be the appropriate time to transition the Resorts Business to the Receivership Proceedings to provide the necessary stability to the Resorts Business in parallel to the Receiver advancing a sales and marketing process for Bear Mountain.

*****

Dated this 14th day of April 2025

Alvarez & Marsal Canada Inc.,
in its capacity as Receiver of Developments
and not in its personal capacity

Per: Anthony Tillman
Senior Vice President

Appendix A

Cash Flow Statement for the Period March 29, 2025 to June 27, 2025

Ecoasis Developments LLP et al.
Third Cash Flow Forecast
For the period March 29, 2025 to June 27, 2025
$CAD'000s

Week Week ending	Notes	Actual 18-Sep-24 to 28-Mar-25	Forecast Week 1 04-Apr-25	Forecast Week 2 11-Apr-25	Forecast Week 3 18-Apr-25	Forecast Week 4 25-Apr-25	Forecast Week 5 02-May-25	Forecast Week 6 09-May-25	Forecast Week 7 16-May-25	Forecast Week 8 23-May-25	Forecast Week 9 30-May-25	Forecast Week 10 06-Jun-25	Forecast Week 11 13-Jun-25	Forecast Week 12 20-Jun-25	Forecast Week 13 27-Jun-25	Total Forecast 29-Mar-25 to 27-Jun-25	Total 18-Sep-24 to 27-Jun-25
Cash operating receipts																	
Receiver's certificates		$ 1,300	$ -	$ 250	$ -	$ -	$ -	$ 250	$ -	$ -	$ -	$ 200	$ -	$ -	$ -	$ 700	$ 2,000
Reimbursement from Resorts	1	8	1	0	-	-	1	0	-	-	1	0	-	-	1	5	13
Other receipts	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
		1,312	**1**	**250**	**-**	**-**	**1**	**250**	**-**	**-**	**1**	**200**	**-**	**-**	**1**	**705**	**2,017**
Cash operating disbursements																	
Payroll costs	3	279	16	3	15	2	16	3	15	-	16	3	15	-	16	117	396
Repairs and maintenance		-	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Utilities		9	1	0	-	-	1	0	-	-	1	0	-	-	1	5	14
Insurance	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Computer, subscriptions and IT	5	22	1	-	2	-	1	-	2	-	1	-	2	-	1	11	33
Office supplies, cleaning and other misc.		3	1	0	-	-	1	0	-	-	1	0	-	-	1	3	6
Appraisal	6	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Regulatory compliance	7	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Operating disbursements paid by Resorts reimbursement	8	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Bear Mountain Legacy Homes	9	9	0	1	-	-	0	-	-	-	0	-	-	-	0	2	11
		334	**19**	**4**	**17**	**2**	**19**	**3**	**17**	**-**	**19**	**3**	**17**	**-**	**19**	**138**	**472**
Net operating cash flow		**979**	**(18)**	**246**	**(17)**	**(2)**	**(18)**	**247**	**(17)**	**-**	**(18)**	**197**	**(17)**	**-**	**(18)**	**566**	**1,545**
Other cash disbursements																	
Professional fees - Receiver, counsel		624	-	-	110	-	-	-	115	-	-	-	115	-	-	340	964
Other professional fees		216	-	-	73	-	75	-	-	-	-	-	-	-	-	148	363
		840	**-**	**-**	**183**	**-**	**75**	**-**	**115**	**-**	**-**	**-**	**115**	**-**	**-**	**488**	**1,327**
Net cash flow (deficit)		**$ 139**	**$ (18)**	**$ 246**	**$ (199)**	**$ (2)**	**$ (93)**	**$ 247**	**$ (132)**	**$ -**	**$ (18)**	**$ 197**	**$ (132)**	**$ -**	**$ (18)**	**$ 79**	**$ 218**
Cash continuity																	
Opening cash balance		$ -	$ 139	$ 121	$ 367	$ 167	$ 166	$ 73	$ 320	$ 188	$ 188	$ 170	$ 368	$ 236	$ 236	$ 139	-
Net cash flow (deficit)		139	(18)	246	(199)	(2)	(93)	247	(132)	-	(18)	197	(132)	-	(18)	79	218
Ending cash balance		**$ 139**	**$ 121**	**$ 367**	**$ 167**	**$ 166**	**$ 73**	**$ 320**	**$ 188**	**$ 188**	**$ 170**	**$ 368**	**$ 236**	**$ 236**	**$ 218**	**$ 218**	**$ 218**
Receiver's borrowings																	
Opening balance		-	1,300	1,300	1,550	1,550	1,550	1,550	1,800	1,800	1,800	1,800	2,000	2,000	2,000	1,300	-
Receiver's borrowings (repayments)		1,300	-	250	-	-	-	250	-	-	-	200	-	-	-	700	2,000
Ending Receiver's borrowings		**$ 1,300**	**$ 1,300**	**$ 1,550**	**$ 1,550**	**$ 1,550**	**$ 1,550**	**$ 1,800**	**$ 1,800**	**$ 1,800**	**$ 1,800**	**$ 2,000**	**$ 2,000**	**$ 2,000**	**$ 2,000**	**$ 2,000**	**$ 2,000**

Notes

1 Reimbursements from Resorts represents receipts for the Resorts Business's portion of certain operating disbursements initially paid by the Developments Business.
2 Other receipts include monthly interest on deposits and other miscellaneous receipts.
3 Payroll costs are for biweekly salaries and wages, source deductions and extended benefits to three Developments staff.
4 Insurance represents monthly instalments for general liability, property, umbrella, among other, policies.
5 Computer, subscriptions and IT services include storage of data and monthly costs for software and other licences.
6 Appraisal for Cypress Gates Phase 1 to 3 development site.
7 Regulatory compliance is the cost for engineering services to satisfy water sampling requirements mandated by the City of Langford.
8 Operating disbursements paid by Resorts reimbursements represents costs paid by Resorts, including insurance, that are periodically reimbursed to Resorts.
9 Bear Mountain Legacy Homes payments represent monthly fencing for security at Cypress Gates and related materials storage costs.

Appendix B

Receiver's Recommendations

Receiver's Recommendations	
a)	Hire a qualified corporate controller, and food and beverage ("**F&B**") manager.
b)	Consider the need for a full-time human resources ("**HR**") manager and other roles that will not be filled by Developments Staff in the future.
c)	Plan for increased agronomy staffing needs in 2025.
d)	Revisit roles and responsibilities for certain Resorts staff to ensure responsibilities are appropriately allocated.
e)	Clarify the Resorts Business' governance and leadership structure.
f)	Finalize historical financial statements for at least FY24 (income statement, balance sheet and cash flow statement) with reconciled reporting of transactions between the Resorts Business and the Developments Business.
g)	Keep current and fund all statutory filings including GST, PST, BC EHT, and Worksafe BC.
h)	Implement appropriate lease arrangements with BMAC and the Developments Business (office space and the Golf Courses).
i)	Implement control procedures for Mastercard use by Resorts Staff.
j)	Advance the Transition Plan including rectification of the Stop Work Order from the District of Highlands and ensure permitting costs are fully budgeted.
k)	Develop a financing plan to address current working capital needs and pending capital requirements.
l)	Prepare and maintain a rolling 13-week cash flow forecast.
m)	Prepare a robust FY25/26 integrated (balance sheet, income statement and cash-flow statement) financial forecast incorporating the Transition Plan, the Capex Plan and a strategy to manage aged payables.

Appendix C

The Progress Update Reports

Memorandum

To: Dan Matthews, Ecoasis Resort & Golf LLP ("Resort")

From: Kevin Isomura, CPA, CA Incorporated Partner DMCL LLP

Date: January 17, 2025

Subject: Progress report on financial accounting and tax compliance matters for Resort

---

A. Finalizing historical financial statements for at least FY24 (income statement, balance sheet and cash flow statement) with reconciled reporting of transactions between the Resorts Business and the Developments Business

i) DMCL has reconciled Resort's bank accounts up to and including the month of December 2024. Credit card accounts, accounts payable, and intercorporate balances between Resort, Ecoasis Developments LLP, Bear Mountain Adventures Ltd., and Bear Mountain Legacy Homes LLP are still in progress.

ii) Differences between Resort's and Development's intercompany accounts have been identified are reconciled for 2022, 2023 and up to and including November 2024.

iii) Several balance sheet clearing accounts need to be analyzed and cleared for November and December 2024 – in progress.

iv) Draft financial statements have previously been compiled for the fiscal years ending December 31, 2020 and 2021, but are still awaiting approval by the partners pending the resolution of certain litigation matters that require conclusion prior to financial statements being finalized.

v) Pending resolution of issues noted above, expected completion date of 2022, 2023, and year to date December 31, 2024 draft financial statements is January 31, 2025.

B. Keeping current and funding all statutory filings including GST, PST, BC EHT, and Worksafe BC

WORKSAFE:

- Q3 Filed by Resort
- Q4 Resort staff is preparing and will be filed by due date of January 20, 2025.

EHT:

- 2023 Filed by Resort
- 2024 To be prepared and filed by Resort staff by March 31, 2025.

GST:

- GST to November 30, 2024 - Filed
- December - To be filed - due date of January 31, 2025

PST:
DMCL has contacted the BC Ministry of Finance several times and finally resolved the issue on January 9, 2025. Ministry believed Resort was in receivership per the Order and after explanation by DMCL and consulting their legal department the PST account was reactivated.

- PST to November 30, 2024 - Filed
- December – to be prepared and filed by January 31, 2025.

C. Developing a financing plan to address current working capital needs and pending capital requirements

Estimate of working capital requirements is still in progress and we expect to provide a draft preliminary plan by January 31st.

D. Preparing and maintaining a rolling 13-week cash flow forecast

Resort's Management has prepared a rolling 13-week cashflow forecast which is currently being reviewed by DMCL in conjunction with the adjustments referred to above.

DMCL expects this review to be completed by January 31st.

E. Preparing a robust FY25/26 integrated (balance sheet, income statement and cash-flow statement) financial forecast incorporating the Transition Plan, the Capex Plan and a strategy to manage aged payables

Resort's management has completed a profit and loss, and its capex forecast for FY25 which is currently being reviewed by DMCL. In conjunction with the adjustments referred to above, DMCL will assist in compiling the integrated financial forecast.

Payables will be managed in conjunction with the forecast and assuming the financing plan to address current working capital requirements is realized.

DMCL expects FY25 draft to be completed by January 31st.

DMCL has compiled the information requested by CRA on November 6, 2024 in connection with the trust accounts examination - payroll and GST for the period January 1, 2023 – November 30, 2024 and attempted to submit the information on January 10, 2025 but unable to as CRA portal was not in service. DMCL hand delivered information to CRA auditor in Victoria on Wednesday January 15, 2025.

Delays in meeting original target dates were due to holiday vacations previously scheduled and volume of workload including preparation of information for CRA audits. The above dates represent our best estimate at this time and we continue to work diligently in completing these deliverables.

If you require additional information, please contact me at 604 941-8266 or by email at Kisomura@dmcl.ca.

ECOASIS
INNOVATION DRIVEN LAND DEVELOPMENT
2050 COUNTRY CLUB WAY
VICTORIA BRITISH COLUMBIA
V9B 6R3 CANADA
ecoasis.com

February 19, 2025

Re: Progress Report on Resort Business

The Receiver delivered a First Report on Ecoasis Resort and Golf LLP ("Resort") dated October 25, 2024 ("First Report"). The Receiver requested that the Resort implement corrective measures to address deficiencies and challenges noted in the First Report or provide a plan for implementation.

Since the First Report was issued, many of the itemized recommendations have been fulfilled, and the purpose of this update is to report on the progress of the remaining Report Recommendations and provide further detail on the Resort Funding Request.

A. Report Recommendations:

1. **Hiring a qualified corporate controller**

   Further to the last update from Resort, the Resort Controller has been hired and commenced work on February 3, 2025.

2. **Finalizing historical financial statements for at least FY24 (income statement, balance sheet and cash flow statement) with reconciled reporting of transactions between the Resorts Business and the Developments Business.**

   Attached as **Appendix "A"** is the progress update from the Resort's external accountant (Kevin Isomura of DMCL) dated February 19, 2025 which is responsive to this item.

3. **Keeping current and funding all statutory filings including GST, PST, BC EHT, and Worksafe BC.**

   Attached as **Appendix "A"** is the progress update from the Resort's external accountant (Kevin Isomura of DMCL) dated February 19, 2025 which is responsive to this item.

4. **Preparing a robust FY25/26 integrated (balance sheet, income statement and cash-flow statement) financial forecast incorporating the Transition Plan, the Capex Plan and a strategy to manage aged payables**

   Attached as **Appendix "A"** is the progress update from the Resort's external accountant (Kevin Isomura of DMCL) dated February 19, 2025 which is responsive to this item.

   As noted in the DMCL update, Resort Management and staff are working diligently to assist DMCL in the preparation and completion of all financial deliverables and will continue to do so. The volume of the work has been significant which has been

exacerbated by the enduring challenges from the failure of the Hotel to complete the Resort's financial reporting, as noted in the First Report.

5. **Implementing appropriate lease arrangements with BMAC and the Developments Business (office space and the Golf Courses).**

   a) BMAC Lease (Pro Shop, bag storage, change room usage, office space, F&B areas): The lease document is in progress and will be completed by February 28, 2025.

   b) Office Lease: Resort to review and clarify scope and parameters of applicable lease arrangements with Receiver at a mutually agreed upon date.

   c) Lease of Golf Courses: Require clarification from Receiver as Mountain Golf course is owned by Ecoasis Resort and Golf LLP.

6. **Advancing the Transition Plan including rectification of the Stop Work Order from the District of Highlands and ensuring permitting costs are fully budgeted.**

   Stop Work Order Rectification Process

   As detailed in our December update, the following steps had been undertaken:

   a) Reviewed stop work order ("Order"), MDA, zoning bylaws and performed an assessment of issues. The Order relates to some unpermitted structures (seacans, storage structures) most of which were installed on the property prior to Ecoasis'ownership.
   b) Met with District of Highlands staff including Head of Planning and the Building Inspector. Advised by Highlands staff that all issues are resolvable and once rectification of the issues is complete, building permit approval would take approximately two weeks from date of submission.
   c) Conducted site visit and review of building and structures with Dale Douglas (Senior Civil Engineer - McElhanney), engaged to oversee the consultants necessary to resolve the issues outlined in the Order.
   d) Assessment by Mr. Douglas of non-compliant structures, relevant documentation and applicable zoning and recommendation on the engagement of the appropriate consultant.

   Recent Steps:

   e) Community Fire Prevention a division of Onyx-Fire ("Consultant") have been engaged. Resort has had a long-standing relationship with this company, and they are pleased to work with Resort and the District of Highlands to establish a solution that will rectify the issues as outlined in the Order.
   f) We have had ongoing discussions with the Consultant leading up to the meeting with the District of Highlands Building Inspector and Fire Chief to review the structures in

question and to review potential resolution strategies. Consistent with our fire prevention philosophy and internal fire prevention efforts we are working closely with District of Highlands to establish what we consider a prudent and effective path to satisfy the requirement.

g) Attached as **Appendix "B"** is the Consultant's proposal for resolution in the amount of $79,499. Resort will now move forward with procuring approval of the plan by the District of Highlands.

Transition Plan Advancement: Transition Plan implementation schedule to be set once funding is finalized.

7. Preparing and maintaining a rolling 13-week cash flow forecast

In consultation with DMCL, Resort has prepared the 13-week cash flow forecast, attached as **Appendix "C"**. The cashflow provides written assumptions, however we have added some additional comments below regarding challenges to cashflow in the near term created from confusion and uncertainty in the marketplace that Resort was in receivership.

a) As noted in a previous update, Resort was down $196,232 in golf and tennis dues prepayments for 2025 as compared to 2024. This has impacted cashflow for the slower winter months.
b) We have experienced an unusual extended closure of the golf courses due to weather conditions which has impacted sales for January/February 2025.
c) Anticipated revenue in Q4 from [redacted] golf membership sales of $85,000 was not received due to the uncertainty and confusion in the marketplace over potential Resort receivership.
d) Certain Resort vendors and suppliers have changed to COD status and required immediate payment of outstanding accounts.

8. Developing a financing plan to address current working capital needs and pending capital requirements

Resort Management in consultation with DMCL has prepared a plan to address current working capital needs. As part of the plan, Resort management previously provided a detailed summary of the Hotel arbitration legal costs and anticipated recovery. Included in this progress update is the 13-week cashflow forecast, progress update from DMCL (Kevin Isomura) on the remaining financial deliverables and an updated A/P and funding request.

B. A/P and Other Liabilities

1. Accounts Payable:

The Resort accounts payable as of January 31, 2025 is attached as **Appendix "D"**. The accounts payable are $2,320,500 [redacted]

The A/P increase of $695,360 since October 2, 2024 is attributable to the following non-recurring expenses such as hotel litigation/accounting and other payables as detailed below.

- [redacted]
- $ 33,129: Accounting Fees –Preparation of financial deliverables per Report
- $ 75,019: Statutory Filings
- $ 53,500: Management Fees

2. Other Liabilities:

Resort has detailed other liabilities in **Appendix "D"** and the proposed payment plan.

C. Funding Request:

The Receiver noted in the First Report that funding is required in the near term for the Resorts Business and requested that Resort provide a liquidity plan in respect of a funding request.

The Resort funding request in the amount of $1,350,000 is detailed in **Appendix "D".** The requested funding is allocated toward certain aged payables as shown in the spreadsheet. For the balance of aged payables not requested in the funding request, it is the expectation that the receipt of the amounts listed below in paragraphs 2(a) and 2(b) can be used to retire those payables.

1. Basis for Funding

In the second report of the Receiver dated December 2, 2024 ("Development Report"), prepared in respect of the sales and marketing process, the Receiver confirms that Bear Mountain Resort has consistently sold at a premium compared to other Westshore communities and has achieved historic price premiums for single-family home sales ranging from 27% in 2011 to 93% in 2020 as compared to Langford, B.C.

Further, the Development Report notes that Resort amenities include the only 36-hole Nicklaus design golf course in Canada establishing Bear Mountain Resort as a one-of-a-kind golf resort. The Receiver concludes that stability of the Resorts Business and deliberate coordination between the Resorts Business and Developments Business is critical to overall value creation at Bear Mountain Resort.

Developments Business has not executed any real estate transactions since 2021 to support its operating business expenses. As a result, and as noted in the First Report, certain Developments Business costs have been paid for by Resorts in the past three years, which has negatively impacted the availability of cash to be used in the Resorts Business. Payment by Resort of Development Business expenses in conjunction with non-recurring costs such as the Hotel Arbitration legal costs has led to a backlog of aged payables.

We expect that if funding was provided to clear away these aged payables (some of which date back to 2021) and the cloud of uncertainty of Resorts receivership was lifted, this would restore confidence in the marketplace and lead to increased Resort membership sales, which would in turn enhance overall value of the Bear Mountain Resort assets leading up to the sales process.

2. Funding Repayment

Resort proposes various options for funding repayment:

a) **Recovery in the Hotel Arbitration:** Resort previously provided a detailed summary of the Hotel arbitration costs and the anticipated recovery in the Hotel Arbitration which is one option for repayment of the funding sought for Resort.

b) **Repayment of Loans/Payment of Membership Proceeds:** As noted in the progress update of DMCL dated February 19, 2025, subject to their final analysis of the intercompany loan accounts, the following amounts are <u>due to Resort</u> from:

Bear Mountain Legacy Homes LLP	$ 1,100,875
Ecoasis Developments LLP	$ 629,855
Ecoasis Developments LLP (Membership sales)	$ 5,340,000

Bear Mountain Legacy Homes LLP

In the Developments Report, the Receiver suggested that advancing a sales transaction of the Cypress Gates site in the near term could provide liquidity to Ecoasis. Accordingly, if the Cypress Gates site was sold as suggested by the Receiver, Bear Mountain Legacy Homes LLP could pay back funds owed to Resort which could be used as repayment of the funding request.

ECOASIS
INNOVATION DRIVEN LAND DEVELOPMENT
2050 COUNTRY CLUB WAY
VICTORIA BRITISH COLUMBIA
V9B 6R3 CANADA
ecoasis.com

Ecoasis Developments LLP

The Receiver is developing a sales and marketing plan that will potentially result in lands sales in late spring/early summer. As an alternative of a loan to Resort, Ecoasis Developments LLP, could repay amounts owed to Resort from these land sales.

Given the importance of the Resort amenities to the historic price premium achieved at Bear Mountain and to the overall value creation, it is reasonable to conclude that if funding was provided to Resort it would generate significant upside momentum to enter the sales process which would, in turn, garner the best value for the Bear Mountain Resort assets.

In conclusion, Resort respectfully requests the funding as detailed in Appendix “D” on the basis that the funding is in the best interests of the Resort and supports the overall business interests of the entities under receivership.

Appendix A – Progress update from DMCL dated February 19, 2025

Memorandum

To: Dan Matthews, Ecoasis Resort & Golf LLP ("Resort")

From: Kevin Isomura, CPA, CA Incorporated Partner DMCL LLP

Date: February 19, 2025

Subject: Progress report on financial accounting and tax compliance matters for Resort

---

A. Finalizing historical financial statements for at least FY24 (income statement, balance sheet and cash flow statement) with reconciled reporting of transactions between the Resorts Business and the Developments Business

i) The bank accounts are reconciled up to and including December 31, 2024. Credit card clearing accounts, deferred revenues, gift certificates payable, rain checks payable, credit book payable have been analyzed as at December 31, 2024.

We continue to work with Resort's management team to analyze and reconcile receivables, various liability accounts, capital leases payable and intercorporate balances between Resort, Bear Mountain Adventures Ltd., and Bear Mountain Legacy Homes LLP as at December 31, 2024. We are hoping to have this completed by February 28, 2025.

ii) Resort's and Development's intercompany accounts are reconciled for 2022, 2023 and as at December 31, 2024.

iii) Draft financial statements have previously been compiled for the fiscal years ending December 31, 2020 and 2021, but are still awaiting approval by the partners pending the resolution of certain litigation matters that require conclusion prior to financial statements being finalized.

iv) While significant progress has been made, draft financial statements for 2022, 2023, and year to date as at December 31, 2024 are likely several weeks away.

v) Martin Kim, CPA joined Resort as controller on February 3, 2025. Due to inclement weather in early February, Martin's onboarding and orientation was delayed by two days. DMCL and management have been in discussions with Martin in regard to his work duties and priorities. As we identified during our interview, Martin needs to and is familiarizing himself with the accounting software package, and has done on-line tutorials, and is working with DMCL staff on bank reconciliation procedures and recording of sales transactions from the Point of Sale system which is not integrated with the accounting software. Bank account reconciliations for January 2025 are in progress.

B. ***Keeping current and funding all statutory filings including GST, PST, BC EHT, and Worksafe BC***

Worksafe BC, Employer Health Tax, GST and PST filings are current and will remain current by the Resort's Controller.

WORKSAFE
Q4 return prepared and filed by Resort staff on February 7, 2025.

EHT
2024 To be prepared and filed by Resort staff by March 31, 2025.

GST
CRA issued statements of trust account examination covering payroll for the period January 1, 2023 – January 15, 2025 and GST for the period March 1, 2024 – September 18, 2024 and I am pleased to report that no adjustments were identified.

However, subsequent to the above-noted examination, a letter was issued by another CRA representative on January 27, 2025 indicating that $27,942.93 of input tax credits would be denied as a result of the September 18, 2024 Receivership listing outstanding accounts payable. These accounts relate to Developments and not Resort, and CRA incorrectly believes that Resort is in receivership. We will contact CRA and advise them of the error.

January 2025 – To be filed by due date of February 28, 2025.

PST
December 2024 –Filed by January 31, 2025.

C. ***Developing a financing plan to address current working capital needs and pending capital requirements***

In consultation with DMCL, Resort's management has drafted a plan to address working capital needs.

Management has estimated the amount of trade payables as at January 31, 2025 to be approximately $2,320,500 subject to completing the analysis of accounts referred to in A(i) above. Management is requesting $1,120,500 to retire certain payables plus $229,500 to fund operations for the period from February 1, 2025 – May 30, 2025. The requested funds for operations are due to a number of factors including:

- Shortfall of expected pre-paid golf and tennis dues;
- Unusual extended closure of the golf courses due to weather conditions which has impacted sales for January/February 2025;
- Anticipated revenue in Q4 from [redacted] golf membership sales of $85,000 that was not received, and
- Additional professional fees to bring accounting up to date.

Property taxes are to be paid from the normal course of operations as will the Light Speed advance.

We note that certain intercompany balances are owing to Resort from related entities as noted below, subject to final analysis of the intercompany:

1.	Bear Mountain Legacy Homes LLP	$1,100,875
2.	Ecoasis Developments LLP	$ 629,855
3.	Ecoasis Developments LLP (Membership sales)	$5,340,000

We also understand that Resort expects to recover Arbitration costs from the action with the Hotel.

None of the above receivables are accounted for in cash receipts, and it is expected that the receipt of these amounts will be used to retire the balance of accounts payables, and the interim funding requested above.

D. Preparing and maintaining a rolling 13-week cash flow forecast

Resort's Management has prepared a rolling 13-week cashflow forecast. We have reviewed the forecast with Resort management and while we cannot express an opinion, we believe the methodology is sound.

E. Preparing a robust FY25/26 integrated (balance sheet, income statement and cash-flow statement) financial forecast incorporating the Transition Plan, the Capex Plan and a strategy to manage aged payables

I understand Resort management is anxious to complete the financial deliverables, however, our ability to complete the work in a timely manner is dependent on the assistance of Resort's staff and management, who as you know have been working tirelessly and diligently to assist us.

While it is difficult to meet and provide estimates on deliverable dates, I note that it is not due to a lack of effort, but simply the volume of work. Management has made tremendous progress in assisting our team in addressing a number of outstanding issues including analysis of account balances, statutory filings, and hiring a controller. Our goal at this point is to finalize the analysis of the Dec 31, 2024 balance sheet accounts so that we can use the information to complete the three-way financial projection as quickly as possible.

If you require additional information, please contact the writer at 604 941-8266 or by email at Kisomura@dmcl.ca.

Appendix B – Community Fire Prevention Proposal

February 3rd, 2025

Quotation Pertaining to Bear Mountain Golf Course
Outbuildings Quote 20240620-00258

Thank you for allowing Community Fire Prevention Ltd a division of Onyx-Fire the opportunity to present this quotation for your review. Please find below our pricing and associated scope of work generally based on the drawings, addenda and specifications provided.

DRAWINGS & ADDENDA

Drawing Number	Last Drawing Date	Project Number	Addenda Number	Addenda date

SCOPE OF WORK

1.1 Tennis Bubble Shed Storage and Pergula - Stat X with FA panel option $17,790.00

1.1.1 ***Option Two for Tennis Bubble Sprinklers with 7500 Gallon Vertical Storage Tank - $60,000.00*** not included in pricing total.

1.2 Electrical C can Tennis Bubble - Stat X with FA panel $14,759.00

1.3 Add sprinklers off dry system to supply protection to C cans adjacent to greens building - $4150.00

1.4 Tilt Up Fertilizer Storage Shed - Stat X with FA Panel $24,800.00

- Excavating and Feeder installation from Greens building $14,500.00

- Sub panel installation in storage shed and lights - $3500.00

PRICING: The total cost to complete the scope of work is **$79,499.00** (applicable taxes extra).

Clarifications to the Scope of Work as noted above.

All areas to be made clear and accessible prior to commencement of work.

Quotation is based on work to be completed on a continuous basis.

Community Fire Prevention A Division of Onyx-Fire
1320 Kingsway Ave. #113, Port Coquitlam, BC V3C 6N
P: 604-944-9242 | F: 604-944-961
E: service@comfire.ca | www.comfire.ca

INCLUDED

2.1 Installation materials and labor to complete scope of work noted above.

2.2 NFPA Installation Compliance Letter.

2.3 One-year Limited Warranty.

2.4 As-built drawings

EXCLUDED

2.6 Upgrade and replacement of existing mains or branch lines

2.7 Fire extinguishers - up to 8

2.8 Engineers' sprinkler stamped drawings and hydraulic calculations

2.9 Scissor lift

2.10 Firestopping

2.11 Boat for installation

2.12 Engineers stamped as-built drawings - if required add $1000.00

2.13 Cut, cap, and make safe.

2.14 Building permits and insurance review fees.

2.15 Base building shut down fees, if any, charged by the property manager.

2.16 Correction and/or repair of existing deficiencies.

2.17 Re-routing existing piping to accommodate other trades unless clearly shown or itemized on drawings.

2.18 Underground fire main/city water connection.

2.19 Coring or sleeves.

2.20 Cutting, installation and patching of drywall.

2.21 Fire alarm work and shut down of fire alarm panel or monitoring put on bypass.

2.22 Tarping, hoarding, shoring, barricades, engineered scaffolding.

2.23 Window sprinkler system. Fire watch.

2.24 Trapeze hangers.

2.25 Painting and/or labeling of pipe.

2.26 Heat tracing and/or insulation.

2.27 Seismic Engineering

2.28 Fire pump.

2.29 All electrical wiring, power wiring, control wiring, supervisory wiring, and fire alarm wiring.

2.30 Phasing unless clearly indicated on plans and drawings.

2.31 Scanning and x-raying.

2.32 Freezing of pipe.

2.33 Temporary upright sprinkler protection.

2.34 Kitchen hood fire suppression systems, new, demolished or modified.

GENERAL NOTES AND SPECIFICATIONS

2.35 Quotation is based on Monday to Friday 07:00-15:30.

2.36 All overhead piping is to be connected with grooved or screwed fittings. No welding or hot work permits are included in this quotation.

2.37 Arrangements for site access and for sprinkler system impairment shall be the responsibility of the contractor and shall be co-coordinated before the scheduled project installation date. Extra charges may apply should delays be encountered due to the above-mentioned conditions.

2.38 Quotation assumes adequate city water supply to satisfy design criteria.

2.39 Quotation assumes initial demolition has been completed prior to new installation.

2.40 Quoted price applies to outline scope of work only. Any additional work or change order notices shall be quoted and submitted for approval before the work is performed.

2.41 No installation shall proceed without written authorization.

2.42 Quotation is based on consecutive workdays or nights unless a phased schedule has been provided during tender process.

2.43 Concealed cover plates are supplied in standard white or chrome. Custom colored plates are subject to a $1000.00 set-up fee plus the individual cost of the plate. Delivery is approximately 6-8 weeks.

2.44 Quotation valid for thirty (30) days and a 40 percent deposit draw will be taken upon PO issuance.

TERMS AND CONDITIONS OF SALE

3.1 Progress Payment(s) – project will be invoiced monthly based on the percentage of work completed.

3.2 All invoices including extras and/or change orders, will reflect a 10% holdback as per the Construction Lien Act, which states, in part:
"22 (1) Each payer upon a contract or subcontract under which a lien may arise shall retain a holdback equal to 10% of the price of the services or materials as they are actually supplied under the contract or subcontract until all liens that may be claimed against the holdback have expired as provided in part V, or have been satisfied, discharged or provided for under section 44 (payment into court)."

3.3 Payment of basic holdback as per the Construction Lien Act, which states:
"26 Each payer upon the contract or a subcontract may, without jeopardy, make payment of the holdback the payer is required to retain by section 22 (1) (basic holdback), so as to discharge all claims in respect of that holdback, where all liens that may be claimed against that holdback have expired as provided in Part V, or have been satisfied, discharged or provided for under section 44."

Expiry of Liens:
"31 (1) Unless preserved under section 34, the liens arising from the supply of services or materials to an improvement expire as provided in this section."
(2) …..the lien of a contractor,
(ii) the date the contract is completed or abandoned.
(3)…..the lien of any other person (subcontractor),
(ii) the date the contract is completed or abandoned.

3.4 Other Items:
a) We will submit our invoice for progress payment by the 25th of the month.
b) Close-out documentation (i.e. warranty, operating manuals, etc.) will be delivered in a timely manner upon completion of the installation.

c) All of the work will be completed as per plans and specifications unless otherwise noted and agreed to in writing.
d) Commencement of work on site without providing a signed copy of the P.O. constitutes acceptance of our Terms and Conditions.

3.5 Standard Payment Terms – Net 30 days unless otherwise approved by Community Fire in writing.

3.6 Two Percent interest charges may apply to all unpaid invoice(s) balance(s) beyond extended sales terms. OAC, upon acceptable credit check. Community Fire reserves the right to reduce and or eliminate open sales terms, for any/all unpaid monies owed.

3.7 All parts remain the property of Community Fire until the invoice is paid in full.

3.8 Where authorization to proceed has been acknowledged by the customer, no order/authorized quotation may be canceled on special or made-to-order goods, unless otherwise agreed to in writing by Community Fire. In the event of a cancellation by the customer, the customer shall within thirty (30) days of such cancellation, pay Community Fire a cancellation fee of 10%, plus all costs and expenses incurred by Community Fire prior to the receipt of the request for cancellation including, but not limited to, all commitments to its suppliers and subcontractors.

3.9 Acceptance by the customer is expressly limited to these terms and conditions. Any additional or different terms and conditions contained in the customer's purchase order or other communication shall not be effective or binding upon Community Fire unless specifically agreed to in writing by Community Fire. Community Fire objects to any such conditions, and the failure of Community Fire to object to specific provisions contained in any purchase order or other communication from the customer shall not be construed as a waiver of these terms and conditions nor an acceptance of any such provisions. Neither Community Fire's commencement of performance nor delivery shall be deemed or construed as acceptance of different terms and conditions. Community Fire objects to any such conditions, and the failure of Community Fire to object to specific provisions contained in any purchase order or other communication from the customer shall not be construed as a waiver of these terms and conditions nor an acceptance of any such provisions.

3.10 Pricing is based on the current steel market values. If there is a commodity price adjustment of more than 5% on the Bank of Canada index from the time of approval to installation, a pricing adjustment will be applied.

Note: The May 2018 Trade Tariffs imposed against Canada by the US, as well as the Trade Countermeasures being implemented by the Canadian Government are going to have an as of yet unquantified impact on the cost of many raw materials and products used in the Fire Protection and Life Safety Trade. While the quote as presented is valid on the date quoted, all price costs will have to be confirmed with manufacturers and suppliers before Community Fire can accept any authorizations to proceed on work with substantive parts costs. In the event of any cost change you will be provided with a new cost to review and approve before we proceed.

Thank you for the opportunity to provide a quotation for this project, we look forward to working with you. Should you have any questions or require further information, please do not hesitate to contact our office for assistance.

Regards,

COMMUNITY FIRE PREVENTION
a division of Onyx-Fire

Hayden Mowbray | Director
Community Fire Prevention, a division of **Onyx-Fire**
p: 604-944-9242 | c: 778-957-9241
e: haydenm@comfire.ca | w: www.comfire.ca
a: 113-1320 Kingsway Ave, Port Coquitlam, BC V3C 6P4

Authorization to Proceed _____ Purchase order Number _____ Date _____

Project

Project Bear Mountain Stat X Project Outbuildings

Designer Hayden Mowbray

Date 09/27/2023

Distributor

Community Fire Prevention Ltd
1320 Kingsway Ave Port Coquitlam BC V3C 6P4
Port Coquitlam
British Columbia
Canada
V3C6P4
Reference#

Customer

Bear Mountain Golf Course
1999 country club way
Langford
British Columbia
Canada
v9b6r3
Reference#

Totals

Device	Count
1000 g	8
1500 g	10
Total	18

Enclosure	Hazard Class	Enclosure
#1	CLASS B FLAMMABLE LIQUID	6,912.000 cu ft
#2	CLASS C Hazard Involving Class B Material (Light/Medium Hazards)	3,200.000 cu ft
#3	CLASS C Hazard Involving Class B Material (Light/Medium Hazards)	2,700.000 cu ft
#4	CLASS C Hazard Involving Class B Material (Light/Medium Hazards)	1,280.000 cu ft
Total		14,092.000 cu ft

Enclosure "Fertilizer Storage"

Device	Count
1500 g	10
Total	10

Hazard Class: CLASS B FLAMMABLE LIQUID
Required Density: 65 g/cu m
Required Mass: 12799 g
Actual Mass: 15000 g
Actual Density: 77 g/cu m

Length	Width	Height	Enclosure	Openings
24.000 ft	18.000 ft	16.000 ft	6,912.000 cu ft	0.000 sq ft

LR	LP	LH	K1	K2	K3
0.000	0.000	0.000	1.160	1.025	1.000

NO OPENING

Enclosure "Horticulture Office"

Device	Count
1000 g	8
Total	8

Hazard Class: CLASS C Hazard Involving Class B Material (Light/Medium Hazards)
Required Density: 56 g/cu m
Required Mass: 5108 g
Actual Mass: 8000 g
Actual Density: 88 g/cu m

Length	Width	Height	Enclosure	Openings
40.000 ft	10.000 ft	8.000 ft	3,200.000 cu ft	0.000 sq ft

LR	LP	LH	K1	K2	K3
0.000	0.000	0.000	1.000	1.025	1.000

NO OPENING

Enclosure "Bubble Purgula Overhang and Storage Shed"

NO DEVICES

Hazard Class: CLASS C Hazard Involving Class B Material (Light/Medium Hazards)

Required Density: 58 g/cu m

Required Mass: 4396 g

Actual Mass: 0 g

Actual Density: 0 g/cu m

Length	Width	Height	Enclosure	Openings
15.000 ft	15.000 ft	12.000 ft	2,700.000 cu ft	0.000 sq ft

LR	LP	LH	K1	K2	K3
0.000	0.000	0.000	1.020	1.025	1.000

NO OPENING

Enclosure "Electrical C can "

NO DEVICES

Hazard Class: CLASS C Hazard Involving Class B Material (Light/Medium Hazards)

Required Density: 56 g/cu m

Required Mass: 2043 g

Actual Mass: 0 g

Actual Density: 0 g/cu m

Length	Width	Height	Enclosure	Openings
20.000 ft	8.000 ft	8.000 ft	1,280.000 cu ft	0.000 sq ft

LR	LP	LH	K1	K2	K3
0.000	0.000	0.000	1.000	1.025	1.000

NO OPENING

This design calculation has been prepared by: Hayden Mowbray

Stat-X® EX
Aerosol Fire Suppression

Aerosol Fire Extinguishing Systems

Design, Installation, Operation, and Maintenance Manual for Use in ATEX/IEC Ex Zone 2 and Class I Division 2 Classified Areas

Version 1.0.3
March 28, 2022
Part Number: 19017
E495772

Fireaway
Fireaway Inc.
5852 Baker Road
Minnetonka, MN 55345
www.statx.com

TABLE OF CONTENTS

1.0 FORWARD

This manual is written for those who design, install, and maintain the Stat-X® EX aerosol fire suppression systems. It contains design, installation, operation, and maintenance information for these fire suppression systems for use as total flooding systems in Zone 2 and Class I Division 2 classified hazardous areas and unclassified hazardous areas.

IMPORTANT

Fireaway assumes no responsibility for application of any systems other than those addressed in this manual. The technical data in this manual is limited strictly for information purposes only. Fireaway believes this data to be accurate, but it is published and presented without any guarantee or warranty whatsoever, Fireaway disclaims any liability for any use that may be made of the data and information contained herein by any and all other parties.

The Stat-X aerosol fire suppression systems are to be designed, installed, inspected, maintained, and tested by qualified and trained personnel in accordance with the following:

- NFPA 2010, 70 and any other applicable NFPA/International Standards and local/national/harmonized regulations.
- All instructions, limitations, etc. contained in this manual.
- Storage, handling, and transportation shall be performed by qualified and trained personnel in accordance with US DOT requirements.

Questions concerning the information presented in this manual should be addressed to:

Fireaway Inc.
5852 Baker Road
Minnetonka, MN USA 55345
Phone: 952-935-9745
Fax: 952-935-9757
email: info@statx.com

2.0 INTRODUCTION

The Stat-X aerosol fire suppression systems are designed for total flooding applications in accordance with established design criteria. Application methods, design criteria, and limitations are contained within this manual. In any situation not specifically covered by this manual, the application and installation of the system must be in accordance with the appropriate and/or applicable standards. All installations must meet the requirements of the local authority having jurisdiction.

Stat-X fire suppression systems produce a highly effective, technologically advanced fire suppression agent with unique operational and flow characteristics. Since these systems are designed and installed in a manner different than other suppression systems with which the system designer may be familiar, the system designer must become thoroughly familiar with the design criteria contained in this manual in order to properly input design data and parameters. There are a number of limitations, which must be observed in entering parameters if accurate results are to be obtained.

Stat-X fire suppression systems combine an environmentally safe fire suppression agent, specially developed components, and highly effective detection devices for rapid agent application. The resulting timely suppression of fire reduces property damage and products of combustion to the lowest possible levels. These systems are electrically activated, are extremely compact, and totally eliminate the expensive pressure vessels, nozzles, and distribution piping associated with other fire suppression systems. Stat-X fire suppression systems offer significant weight and space savings. Generators are strategically placed throughout the hazard area and are designed to discharge in seven to thirty-six seconds, depending on the size of the generator.

The agent produced is a Potassium based aerosol with particle sizes primarily in the $\leq$ 2 micron size. The aerosol has the flow characteristics of a gas and has been determined to be non-toxic to humans when exposed for short periods at recommended design concentrations (see Appendix A).

3.0 SYSTEM DESCRIPTION

3.1 General

Stat-X systems are used to suppress fires in specific hazards or equipment located in enclosed areas and confined spaces where an electrically non-conductive agent is required and where low weight/space to extinguishing capacity is a factor. The fire-extinguishing agent is an ultra-fine aerosol which will hang in suspension for extended periods of time (up to one hour) providing excellent protection against re-flash, as well as, minimizing clean-up.

Stat-X systems are suitable for use as total flooding fire extinguishing systems in occupied and unoccupied areas. In areas where personnel may be present the system must employ a pre-discharge alarm, 30 second time delay, and provision for system isolation and manual only activation whenever personnel are in the protected area. The total flooding system is intended to be installed inside of areas classified as Zone 2 in accordance with ATEX/IEC Ex standards.

The same systems are also intended to be installed inside of areas classified as Class I Division 2 in accordance with UL and CSA standards. The system components are the same as the units filed under FWSA.EX15004 with one minor modification, the addition of a Zone 2 approved 90˚ elbow (3/4” NPT female x 3/4” NPT male).

They are intended to protect the following:

- Power Plants
- Turbine Enclosures
- Diesel Enclosures
- Compressor Enclosures
- Painting Applications and Storage
- Flammable Liquid Storage Areas
- Marine Engine Rooms*
- Pump Rooms
- Battery Rooms

*These applications are not part of the UL Listing under UL Standard 2775 but are covered under other applicable listings (American Bureau of Shipping, Marine and Coast Guard Agency, ECB, and others).

Stat-X systems are currently listed for the following classes of fire:

- Class A - Surface Fires
- Class B - Flammable Liquids
- Class C - Energized Electrical Equipment with A or B involvement

For hazards beyond the scope described above, the designer must consult with Fireaway and applicable standards on the suitability of the system for the protection of the hazard, the necessary design concentration, and personnel exposure effects from that concentration.

Stat-X systems are **not suitable** for the following hazards, or, where the following materials may be present:

- Class A materials that burn with deep-seated characteristics (wood fiber, cotton, etc.)
- Electrical equipment operating at over 40,000 V
- Metal Hydrides, Pyrophoric substances, and Chemical substances that smolder and burn without air
- Metal powders (magnesium, titanium, etc.)

3.2 Extinguishing Agent

The aerosol produced upon activation of the Stat-X system is composed of ultra-fine particles of Potassium salts with secondary inert gases. Potassium salts have long been recognized as one of the most effective fire suppression agents available. It suppresses fire by a combination of chemical and physical mechanisms similar to the Halons without any negative effect on the environment. Because of the aerosol's ultra-fine particle size (≤ 2 micron) there is a dramatic increase in the surface area interaction between the agent and the fire. Potassium based aerosol has been shown in numerous tests to be a highly effective alternative to other extinguishing agents.

Unlike gaseous agents the aerosol does not decompose in the presence of fire nor does it extinguish by oxygen deprivation. Stat-X is listed under the United States Environmental Agency (EPA) Significant New Alternatives Program (SNAP) for use as a total flooding agent in occupied and unoccupied areas. The aerosol is considered non-toxic to humans when applied in normal design concentrations necessary to extinguish most fires; however, there is a high obscuration factor and certain safety restrictions should be observed when applying and handling the generators. Exposure to the aerosol should be limited and unnecessary exposure to the particulate should be avoided. Exposure to the aerosol is generally of less concern than is exposure to the decomposition products of a fire.

Toxicity: Under the SNAP Program the US EPA conducted a risk screen process on the human health and environmental risks of the agent based on laboratory test data submitted by the manufacturer. The US EPA has ruled that the Stat-X agent is suitable for use in normally occupied spaces. **See Table 3.2.1: Stat-X Aerosol Physical Properties.**

While the components of the aerosol are not considered toxic at normal concentration levels, ingestion of the ultra-fine particulate may cause short-term discomfort and unnecessary exposure should be avoided. Tests have shown no long-term negative effects from exposure to the aerosol. In addition, the aerosol has a high obscuration factor as noted above. **In normally occupied and unoccupied spaces where personnel may be present Stat-X systems shall only be applied in conjunction with a 30 second time delay to ensure egress of personnel prior to system discharge when personnel are present in the protected volume. A system maintenance isolate switch shall also be provided that should be engaged during servicing of the system. When the isolate switch is engaged, the system shall only be activated by manual activation.**

Cleanliness: The ultra-fine aerosol discharge remains in suspension for an extended period of time and can be easily vented by a fan or air handling; system. Minor amounts of aerosol, which may have settled or agglomerated on the floor or other horizontal surfaces, can be vacuumed or wiped clean.

Other Safety Considerations: The aerosol discharged into the hazard area upon activation of the generator is relatively "cool". However, the aerosol stream as it leaves the generator is above 100°C for a very short distance from the outlet of the generator. Maximum temperatures are realized only in the last seconds of discharge.

Each model has a required installation clearance distance specified as its “C-Zone” (clearance zone). Steps must be taken to ensure generator placement so that it complies with this installation requirement. The generator housing is approximately 90°C immediately after discharge and care should be taken if handling the post-discharge generator prior to its cooling to ambient temperature. Generators must never be installed to discharge directly on walls or equipment being protected, as this will cause agglomeration.

Storage: The Stat-X aerosol generator is sealed with a non-permeable membrane and has been evaluated for temperature cycling (-40°C to + 54°C) and humidity (up to 95% relative humidity). Accelerated aging tests have shown the generator's charge maintains its viability for 15 years.

Usage in Explosive Atmospheres: The Stat-X aerosol generator is sealed with a non-permeable membrane and has been evaluated using the Ex ec (Gc) Zone 2 protection method in accordance with IEC 60079-0 7th Edition, EN IEC 60079-0:2018, IEC 60079-7, Edition 5.1, and EN IEC 60079-7:2015+A1:2018.

In accordance with IEC/EN 60079-0 the Stat-X aerosol generator is rated for:

- Ex ec IIC T6 Gc
- DEMKO 17 ATEX 1766X, Group II, Category 3, G
- IECEx UL 17.0036X

IEC 60079-7:2015 specifies requirements for the construction, testing and marking for Group II electrical equipment with type of protection, "e" intended for use in explosive gas atmospheres. This standard applies to electrical equipment where the rated voltage does not exceed 15 kV r.m.s. a.c. or d.c.

IEC 60079-0 (Ed. 7): specifies the general requirements for construction, testing and marking of electrical equipment and Ex Components intended for use in explosive atmospheres. Electrical equipment complying with this standard is intended for use in hazardous areas in which explosive gas atmospheres, caused by mixtures of air and gases, vapors or mists, exist under normal atmospheric conditions. The standard atmospheric conditions (relating to the explosion characteristics of the atmosphere) under which the electrical equipment can be operated from temperature -40 C to +54 C.

Stat-X aerosol generator complies with UL 121201 NONINCENDIVE ELECTRICAL EQUIPMENT FOR USE IN CLASS I AND II, DIVISION 2, AND CLASS III, DIVISIONS 1 AND 2 HAZARDOUS (CLASSIFIED) LOCATIONS – Issue Date 2017/09/15.

Stat-X aerosol generator complies with CSA C22.2 NO. 213 NONINCENDIVE ELECTRICAL EQUIPMENT FOR USE IN CLASS I AND II, DIVISION 2 AND CLASS III, DIVISIONS 1 AND 2 HAZARDOUS (CLASSIFIED) LOCATIONS – Edition 3 – 2017/09/15.

These units also comply with Article 501 of the National Electrical Code.

Per IECEx standard product marked to Ex ec IIC T6 Gc is certified as:

A. IEC/EN 60079-7 standard (Gas), Code Ex ec, Protection Concept: Non-sparking, Gas Zone 2
B. IEC/EN 60079-20 standard, Gas Group IIC
C. Temperature Class T6: maximum surface temperature of product in normal use: 85˚C
    a. Note: Product is safe for use in normal condition in ambient air mixed with Gas Group IIC, IIB and IIA gases with ignition temperature higher than 85˚C
D. Gc: equipment protection level Zone 2
E. Certification: IECEx UL 17.0036X

Per ATEX standard, product marked to ATEX Group II, Category 3, G is certified as:

A. Equipment Group II – for non-mining
B. Category 3- normal protection
C. G for Gas (Zone 2 for Category 3)
D. Certification: DEMKO 17 ATEX 1766X
E. Product EX Marking:

Temperature range: -40°F (-40°C) ≤ T_{amb} ≤ +130°F (54°C)

where T_{amb} = ambient temperature

IP rating: IP54

Per UL standard, product marked cULus Class I Division 2 Groups A, B, C, D in accordance with UL 121201, Issue date 2017/09/15.

Per CSA standard, product marked cULus Class I Division 2 Groups A, B, C, D in accordance with:

CSA C22.2 No. 213 Nonincendive Electrical Equipment for use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations

T6 marking is optional.

Special Condition for use:

Device is inert until activation is necessary in a fault (fire event) condition, involving the need to extinguish the fire.

Table 3.2.1: Stat-X Aerosol Physical Properties

Average Value @ 100 gram/m^3 Concentration

Gas Products (ppm)	Stat-X 15 minute TWA*	Automobile-Airbag Emission Standard 20 minute TWA*	NIOSH IDLH
NO_2	1.08	9.90	20.00
NO	0.97	50.10	100.00
NO_X = NO + NO_2	2.05	60.00	120.00
CO	84.20	445.00	1,200.00
CO_2	756.00	40,000.00	40,000.00
NH_3	58.30	151.50	300.00
Solid Particulate			**Percent**
K_2CO_3			55.2%
$KHCO_3$			8.2%
KNO_2			7.9%
K_2O			
Other Potassium Compounds			5.5%
NH_4HCO_3			23.2%
Average pH in solution = 8.6			
Particle Size Distribution			**Percent**
< 1μm			3%
< 2μm			76%
< 5μm			97%
> 5μm			3%
Operating and Storage Conditions			
Humidity			Up to 95% @ +54°C
Temperature			-40°C to +54°C
Useful Life			15 years

*TWA = Time Weighted Average

3.3 Component Descriptions

3.3.1 Stat-X Aerosol Generator Assemblies

Each Stat-X aerosol generator is comprised of an insulated stainless-steel housing containing the aerosol forming compound, initiator, insulating medium, and internal elements for oxidation and cooling of the aerosol stream prior to its discharge from the unit. The initiator utilizes a secure two-wire connector for electrical activation and a proprietary thermal detector for thermal activation. Each generator is sealed and utilizes a non-permeable membrane to maintain the internal integrity of the unit even in humid and high temperature environments. The Stat-X aerosol generators are protected under the following patents: In the USA - 6089326, 5865257, 6116348, 6264772, 5831209, 6042664: In Germany - 19634006, 19636725, 19638626, and 19638628.

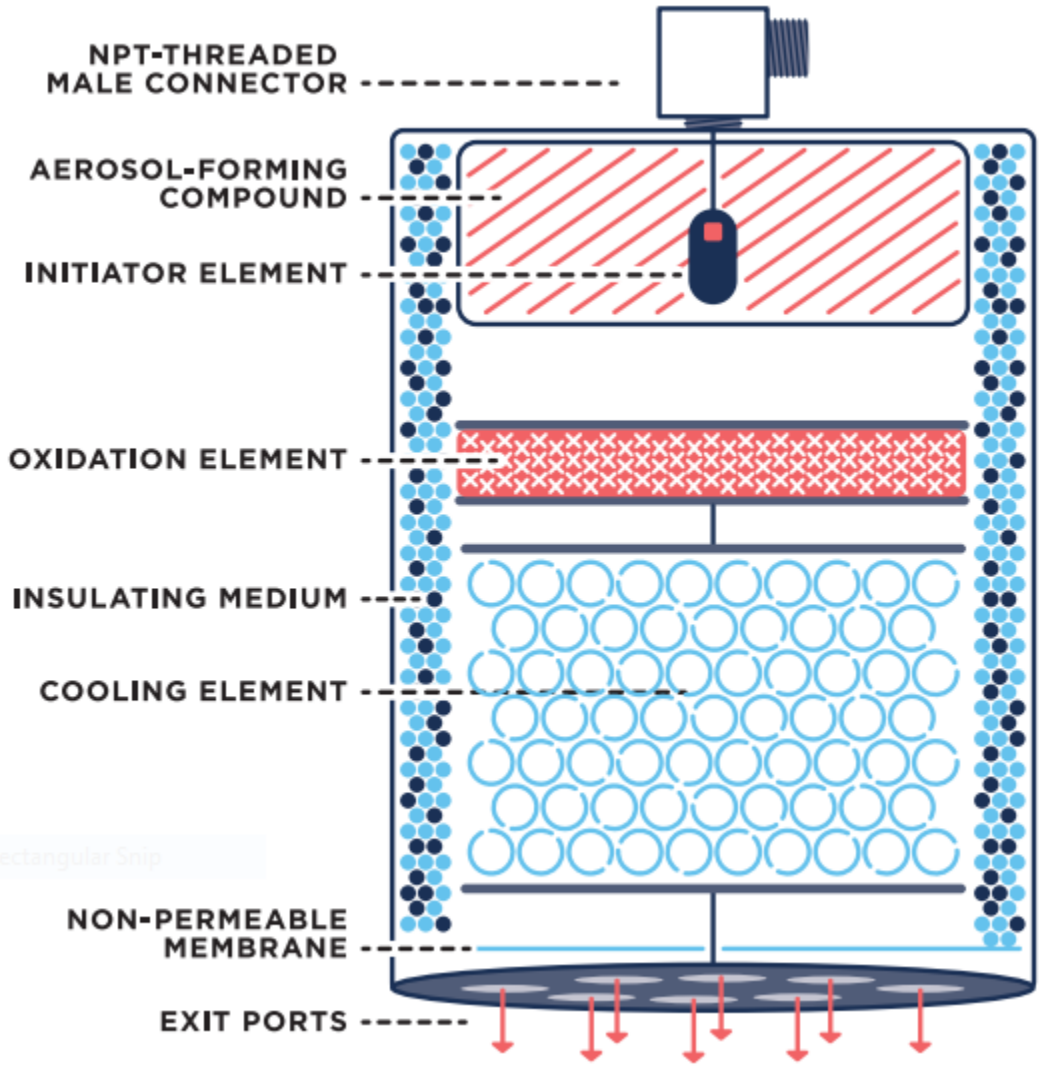


Illustration: Typical Stat-X Zone 2 Aerosol Generator Overview

Table 3.3.1.1: Stat-X Aerosol Generators for Zone 2 Use

Part Number	Capacity	Diameter	Length	Weight (approx.)
11880/11885*	30 grams	51 mm	125 mm	0.50 kg
11890/11895*	60 grams	51 mm	160 mm	0.59 kg
11900/11905*	60 grams	51 mm	183 mm	0.79 kg
11910/11915*	100 grams	76 mm	168 mm	1.14 kg
11920/11925*	250 grams	127 mm	183 mm	2.44 kg
11930/11935*	500 grams	127 mm	233 mm	3.14 kg
11940/11945*	1000 grams	203 mm	223 mm	5.64 kg
11950/11955*	1500 grams	203 mm	258 mm	7.04 kg
11960/11965*	2500 grams	203 mm	320 mm	9.24 kg

*Note**:** Products described as 11XX0 (left column) are constructed identically as the products described as 11XX5 (right column) except for material type of the attached Zone 2 class 90˚eblow fitting (brass vs stainless).

P/N# 11880/11890/11900/11910/11920/11930/11940/11950/11960 aerosol generators are factory fitted with part number 14821 nickel plated brass 3/4” NPT female to 3/4” NPT male 90˚ elbow. A metric M25 male thread is also available as an option.

P/N# 11885/11895/11905/11915/11925/11935/11945/11955/11965 aerosol generators are factory fitted with part number 14822 stainless 316SS 3/4” NPT female to 3/4” NPT male 90˚ elbow. A metric M25 male thread is also available as an option.

3.3.2 Initiation: Electrical

The initiator for the Stat-X aerosol generator consists of a two-wire connector for electrical actuation. The two-wire connector and initiation mechanism are secure and highly reliable initiating devices. Activation parameters of the initiator are:

- Resistance: 1.4 – 2.0 Ohms
- Minimum Parallel Circuit Firing Current: 0.5A each, for 0.050 Seconds
- Minimum Series Circuit Firing Current: 1.0A for 0.050 Seconds
- Specified Maximum Supervisory Current: ≤.005A.
- Operating Voltage: 12 V DC*
- See Appendix E for further information on compatible fire alarm control panels.

*The maximum rated operating voltage under the UL Listing is 12 VDC.

3.3.2.1 Control Panels and Accessories

Fire Alarm Control Panels must be compatible with the aerosol generators under this UL Listing for classified hazardous areas. Installation of these panels are intended in unclassified hazardous areas. All electrical items installed in classified hazardous areas shall be suitable for those areas.

3.3.3 Mounting Hardware and Ancillary Equipment

3.3.3.1 Generator Mounting Bracket

Stainless steel straps and brackets are used to mount the aerosol generator. Mounting Brackets (P/Ns 18001, 18005, 18010, 18015) are available for the 30 grams through 2500 gram generators, depending on the method of attachment.

3.3.3.2 Electric Remote Pull Box

An electric manual pull station listed by UL/ULC as compatible with the Control Panel and acceptable to the authority having jurisdiction may be used to operate the Stat-X aerosol generator system.

3.3.3.3 Time Delay

A minimum 30-second time delay shall be utilized in areas where personnel may be present areas to allow occupants of the area to egress prior to system activation. While the agent itself poses no significant health hazard to the occupants, occupants should leave the area before activation of the system to avoid any potential problems associated with obscuration or minor irritation from inhalation of the ultra-fine particulate.

3.3.3.4 System Isolate Switch

A system maintenance isolate switch Listed by UL/ULC as compatible with the Control Panel (located outside the protected area) is recommended (unless prohibited by local AHJ) in areas where personnel may be present while maintenance is performed on system components. **The operation of the system shall be manual only when personnel are present** (unless prohibited by local AHJ)**.** While the system isolate switch is active, the automatic activation of the system is inhibited; but the fire detection and alarm system shall continue to function. The system returns to full automatic control when the switch is reactivated. The operation of the system isolate switch shall electrically isolate and earth each conductor of the wiring to the generators and initiate a visual indicator of status at the Control Station.

3.3.3.3 Horn/Strobe Alarm

A horn/strobe alarm shall be UL/ULC Listed as compatible with the Control Panel and used in conjunction with the Time Delay to provide an audio and visual alert to personnel in the area that a system discharge is imminent and that the protected area must be evacuated.

4.0 SYSTEM DESIGN AND LIMITATIONS (Total Flooding)

4.1 General

System design is based on the applicable requirements of the National Fire Protection Association (NFPA) Standard 2010, manufacturer's design data, and the authority having jurisdiction.

4.2 Application

The following steps must be taken to design and calculate a Stat-X system:

- Determine how the area is used and if floor, ceiling, and walls are fire-proof.
- Determine the hazard's fire classification.
- Determine the appropriate design density based on fire classification.
- Determine the leakage potential of the hazard enclosure.
- Determine the geometrical dimensions of protected area (volume, total area, height).
    - (Protected equipment volume is not deducted from the total volume).
- Determine if any large obstructions exist in the hazard.
- Determine if additional agent will be required to compensate for leakage, or obstructions.

4.2.1 Calculate the total mass of aerosol required to protect the hazard.

The following describes the method for calculating required concentration by hand. It is intended to educate the user on the methodology to determine and enter required system parameters. Actual calculations can be more readily done using the system design calculator supplied with this manual. **For Manual Calculation See Appendix D.**

The required mass of aerosol required for a specific volume is calculated according to the following formula:

$$\mathbf{M = K_1 \bullet K_2 \bullet K_3 \bullet V \bullet q}$$

Where:

M – is the total mass of aerosol required to protect the hazard.
K_1 – is a ratio based on the non-uniformity of aerosol distribution according to the height of the protected enclosure.
K_2 – is the ratio based on the calculated leakage rate and leakage distribution for the protected volume.
K_3 – is the ratio based on specific parameters for cable tunnels.
V – is the total volume of the protected area in cubic meters.
q – is the design density of aerosol required to extinguish the hazard class.

Note: Calculated Final Application Density rates must be ≥ those shown in Table 4.2.1. For normally occupied spaces with K factors = 1, the US EPA lists the maximum application density q as 100 g/m3. All calculations per this manual shall be in <u>metric units</u>.

For hand calculation of M use as value of q*:

A. Class A hazard: 97 g/m3
B. Class B hazard: 55 g/m3
C. Class C hazard involving Class B material: 55 g/m3
D. Class C hazard involving Class A material: 97 g/m3

*Note: Total quantity of M, adjusted by K factors, must be equal to or exceed the quantity required to meet density levels listed in Table 4.2.1. Select number of devices to supply or exceed the calculated quantity of M.

4.2.2 Calculation of Facility Leakage Rate

Leakage rate is calculated according to the formula:

$$LR = \frac{\sum : A_{open}}{A_{total}}$$

Where:

LR – is leakage rate %
$\sum : A_{open}$ – is sum of the area of unclosed openings, (windows, doors, etc.)
A_{total} – is total surface area of the bounding structure, including floor and ceiling

4.2.3 Determination of Formula Value K_1.

Formula Value K_1 is determined according to the height of the protected enclosure as follows:

4.2.3.1 Determination of Formula Value K_1 when, LR ≤ 1%

K_1 = 1.00 when the height of the enclosure ≤ 3.5 meters.
K_1 = up to 1.16 when the height of the enclosure 3.51 – 5.0 meters.
K_1 = up to 1.26 when the height of the enclosure 5.1 – 8.0 meters.

Limiting Factors:

- LP not more than 0.04.
- **Consult Manufacturer for height of enclosure > 8.0m.**

4.2.3.2 Determination of Formula Value K_1 when LR is 1% - 2%

K_1 = 1.00 when the height of the enclosure ≤ 3.0 meters.
K_1 = up to 1.16 when the height of the enclosure 3.1 – 4.5 meters.
K_1 = up to 1.26 when the height of the enclosure 4.51 – 6.0 meters.

Limiting Factors:

- LP not more than 0.2.
- **Consult Manufacturer for LR > 2.0%.**
- **Consult manufacturer for height of enclosure > 6.0m.**

4.2.4 Calculation of Formula Value K_2.

Formula Value **K_2** is determined by the relationship between the leaking parameter (**LP**) and the distribution of leakage in the protected enclosure (**LH**) as outlined below. Entry of location and dimensions of unclosed openings into the ***SYSTEM CALCULATOR*** included with this manual will automatically generate the correct **K_2** value into the formula. **For Manual Calculation See Appendix E.**

4.2.4.1 Calculation of Facility Leakage Parameter

Leakage parameter is calculated according to the formula:

$$LP = \frac{\sum : A_{open}}{V} \; m^{-1}$$

Where:

LP is a value which characterizes the leakage of the protected enclosure as a ratio of the sum of the area of unclosed openings to the volume of the enclosure.

4.2.4.2 Calculation of Facility Leakage Distribution

Leakage distribution is calculated according to the formula:

$$LH = \frac{A_{upper}}{\sum A_{open}} \times 100\%$$

Where:

LH is a value expressed as a ratio of the area of constantly unclosed openings in the upper half of the protected enclosure (**A_{upper}**) to the sum of the area of constantly unclosed openings.

4.2.5 Calculation of Formula Value K_3.

- **K_3 =** 1.5 for cable structures.
- **K_3 =** 1.7 for cable structures where the longitudinal axis of the cable structure is situated at an angle > 45 degrees to the horizon (vertical, inclined cable collectors, tunnels, passages, and cable wells).
- **K_3 =** 1.0 for all other structures.

Protection of cable structures should be limited to volumes $\leq$ 3000 m^3 with a height restriction of $\leq$ 12 m. **LP** (leaking parameter) of the structure is not to exceed 0.01^{m-1}. **LP** is a value, which characterizes the leakage of the protected enclosure as a ratio of the sum of the area of unclosed openings to the volume of the enclosure and is determined as follows:

$$LP = \frac{\sum : A_{open}}{V}, \; m^{-1}$$

There may not be any automatic re-closing switches in the circuits of the cable structure being protected.

4.2.6 Calculate the number of aerosol generators required.

The following formula is used to calculate the number of aerosol generators required for the extinguishing system:

N = M/m

(When using generators of one size only)

Where:

N – is the number of generators required. If the value of N is fractional, it is rounded up to a whole number.
M – is the total mass of aerosol required.
M – is the mass charge of the individual aerosol generator

4.2.6.1 Area Coverage Review

Each Stat-X aerosol generator has been tested and listed with a unique "footprint" for area coverage **(See Table 4.2.4: Aerosol Discharge Stream Characteristics)**. Once the number of aerosol generators required to provide the necessary mass of aerosol has been determined, the area coverage of each unit selected must be evaluated to ensure the system falls within listed parameters. If not, additional units shall be provided to ensure the final system configuration conforms to the Stat-X listing.

4.2.6.2 Excess Pressure, ΔP Review

In general, very few enclosures are completely tight and excess pressure is not an issue at normal design concentrations. However, in extremely "tight" enclosures (LP=0) an evaluation of the structure should be made and it is recommended that louvered pressure venting be installed if deemed necessary. Venting should be sized to provide an effective open area during discharge that calculates to an LP=0.001. If venting is added, the design calculation must be recalculated including the vent open area to insure proper design density is maintained for the protected volume.

The chart below gives excess pressure ΔP information for each size of aerosol generator at LP =0.001 values. For reference a ΔP of 3kPa is the threshold for damage to glass area.

Maximum excess pressure values ΔP (kPa) in conditionally sealed enclosure (LP=0.001) at different design densities

Design Density g/m^3	100 250 ΔP, (kPa)	1000 ΔP, (kPa)	500 1500 ΔP, (kPa)	2500 ΔP, (kPa)
50	0.66	0.53	0.21	0.12
75	0.93	0.89	0.32	0.20
100	1.62	1.43	0.66	0.31
125	2.40	2.12	0.85	0.52

Minimum Application Density

Fire Class	Stat-X minimum application density grams/m^3
Class A	97.00
Class B	55.00
Class C - Energized Electrical	Determined by A or B involvement

4.2.7 Other Facility/System Considerations

4.2.7.1 Significant Obstructions/Agent Distribution

In cases where there is a large ratio of fixed equipment to total volume, or where the protected equipment is located in such a way as to present a barrier to the free flow and distribution of aerosol throughout the hazard area, the use of a larger number of smaller aerosol generators is preferred. This will allow for strategic placement of the aerosol generators and improved distribution characteristics throughout the area. **See Illustration 4.2.3: Installation with Significant Obstruction Present.**

4.2.7.2 Total Flooding

Total flooding in normally occupied and unoccupied areas where personnel may be present: Note: In total flooding installations in normally unoccupied spaces where personnel may be present, a 30 second time delay shall be installed to insure egress time prior to system discharge. In normally occupied and unoccupied areas, a system maintenance isolate switch shall be installed outside the hazard area to ensure that activation of the system is “manual only” when personnel are present.

4.2.7.3 Shutdown of Air Handling and Power Supply

Upon pre-discharge detection of a fire, the ventilation system for the protected volume must be shut-down to ensure the required application density is delivered and that the fire is not exacerbated by excessive air-flow. In addition, electrical power to protected equipment must be shut down. This eliminates the potential of re-ignition from a continuous short circuit.

4.2.8 Placement of Stat-X Aerosol Generators in the Hazard Area

4.2.8.1 Mounting

Stat-X aerosol generators are listed for both sidewall and center locations and may be mounted on walls, beams, constructions, and columns as long as the unit is securely fastened and is mounted in a position where it has an unobstructed discharge path and where its “C-zone” (required clearance zone) will not impact on personnel, equipment, and combustible materials located within the protected area. **See Table 4.2.4: Aerosol Discharge Stream Characteristics.** The generators must also be located with adequate clearance between structural materials and the generator housing. **See Table 4.2.5: Generator Housing Clearance.**

The information below is a general guide for tightening fasteners used in the **Stat-X** mounting brackets. Many variables can affect the torque tension relationship when securing fasteners, including position of the generators along with the general condition of the fastener threads.

Table 4.2.4: Aerosol Discharge Stream Characteristics
Installation Limitations

Model	Length of C – Zone (momentary peak temp >75°C)**	Installation Height Limitations† (meters/inches)	Maximum Area Coverage Limitation (square)	Maximum Area Coverage Limitation (rectangle)	Discharge Time (seconds)
30 gram	0.25 m/9.8”	0.5-1.22m /19.7-48.0”	1.200m x 1.200m /47.2” x 47.2”		7
60 gram	0.35 m/13.8”	0.5-2.00m /19.7-78.7”	1.700m x 1.700m /66.9” x 66.9”		10
60 gram (ME)	0.30 m/11.8”	0.5-2.00m /19.7-78.7”	1.700m x 1.700m /66.9” x 66.9”		10
100 gram	0.46 m/18.1”	0.5-2.50m /19.7-98.4”	2.184m x 2.184m /86.0” x 86.0”		12
250 gram	0.75 m/29.5”	0.5-2.75m /19.7-108.3”	3.454m x 3.454m /136.0” x 136.0”	2.450m x 4.880m/ 96.5” x 192.1”	12
500 gram	1.27 m/50.0”	0.5-3.50m /19.7-137.8”	4.880m x 4.880m /192.1” x 192.1”		23
1000 gram	2.30 m/90.6”	0.5-4.88m /19.7-192.1”	4.880m x 4.880m /192.1” x 192.1”		16
1500 gram	2.00 m/78.7”	0.5-4.88m /19.7-192.1”	4.880m x 4.880m /192.1” x 192.1”		23
2500 gram	2.70 m/106.3”	0.5- to 4.88m /19.7-192.1”	4.880m x 4.880m /192.1” x 192.1”		36

**The “C-Zone” is a distance where the momentary peak temperature of the discharge will not exceed 75°C. Generators must also be installed with as long a clear discharge path as possible to reduce possibility of agglomeration.

† 2500 should not generally be installed in volumes with a height < 3m. When multiple generators are installed in the same enclosure, they shall be installed on multiple levels (tiers) along the enclosure elevation with each level (tier) maintaining compliance with the installation height limitations and the maximum area coverage limitations.

Table 4.2.5: Generator Housing Clearance

Model	Required Clearance from Combustible and Structural Materials	
	mm	**inch**
30 gram	7	0.25
60 gram	7	0.25
100 gram	13	0.50
250 gram	13	0.50
500 gram	13	0.50
1000 gram	13	0.50
1500 gram	30	1.00
2500 gram	30	1.00

Note: Fittings (junction box, conduit) directly connected to the generator must be metallic only.

All torque recommendations are given in inch-pounds and are minimum torque values for UL/ULC Listing.

Bracket PN	Clamp Nut Torque	Bracket Pivot Bolt Torque
18001	20	N/A
18005	20	40
18010	30	80
18015	50	100

4.2.8.2 Mounting Height

In general, the aerosol generators should be mounted in rooms at or near ceiling height and angled to discharge down toward the floor at an angle to insure three-dimensional distribution of aerosol. Normal orientation from vertical is 15° - 30° for sidewall mounting and vertical for center mounting. In larger volumes (≥100m^3) utilizing the 1500E and 2500E the rotational angles should insure as long an unobstructed discharge path as possible. **The aerosol generators must be mounted in such a way as to have a clear discharge path and must not discharge onto walls or equipment as this will result in agglomeration and decreased effectiveness.** In order to ensure maximum distribution of aerosol throughout the hazard area, the maximum height of generator placement must be limited as indicated in **Table 4.2.4**. In facilities with walls higher than the heights given in **Table 4.2.4** aerosol generator systems for total flooding must be designed to place generators on multiple levels. When multiple generators are installed in the same enclosure, they shall be installed on multiple levels (tiers) along the enclosure elevation with each level (tier) maintaining compliance with the installation height limitations and the maximum area coverage limitations. This will insure complete and even distribution of aerosol throughout the hazard area. **See Illustration 4.2.4: Installation in a High Walled Facility for an example of a 2-tier installation.**

Generators used in underfloor applications should be mounted to discharge horizontally due the limited height of the volume. For the same reason, underfloor applications should generally utilize smaller units (500g or less).

4.2.8.3 Flow

Placement of the aerosol generators to ensure proper aerosol flow and distribution is extremely important. Generators should be spaced as evenly as possible around the hazard area and directionally positioned to promote a circular, three-dimensional flow pattern. **Aerosol generators must never be positioned to discharge directly at each other! This will cause agglomeration of the aerosol particulate, reducing the aerosol's extinguishing effectiveness. For the same reason, aerosol generators in total flood applications should also be positioned to ensure that the aerosol stream does not impinge directly on walls or the sides of equipment being protected**. **See Illustration 4.2.5: Typical Aerosol Generator Placement.**

4.2.9 Operating/Temperature Range

Stat-X electrical aerosol generators are listed to operate within a temperature range of -40°C to +54°C. The generators are sealed with a non-permeable membrane and have been evaluated for exposure to humidity (up to 95%) and cycled temperature (-40°C to +54°C).

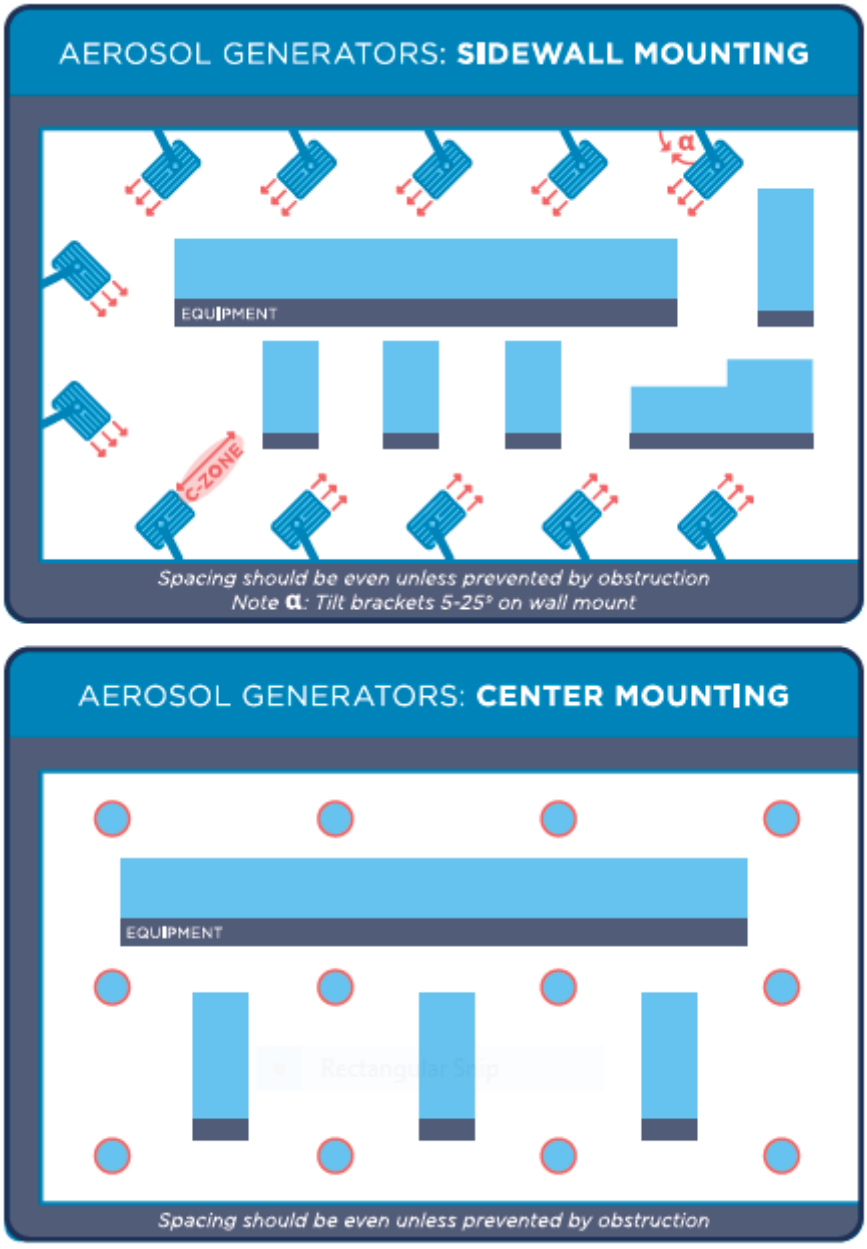


Illustration 4.2.3: Installation with Significant Obstruction Present

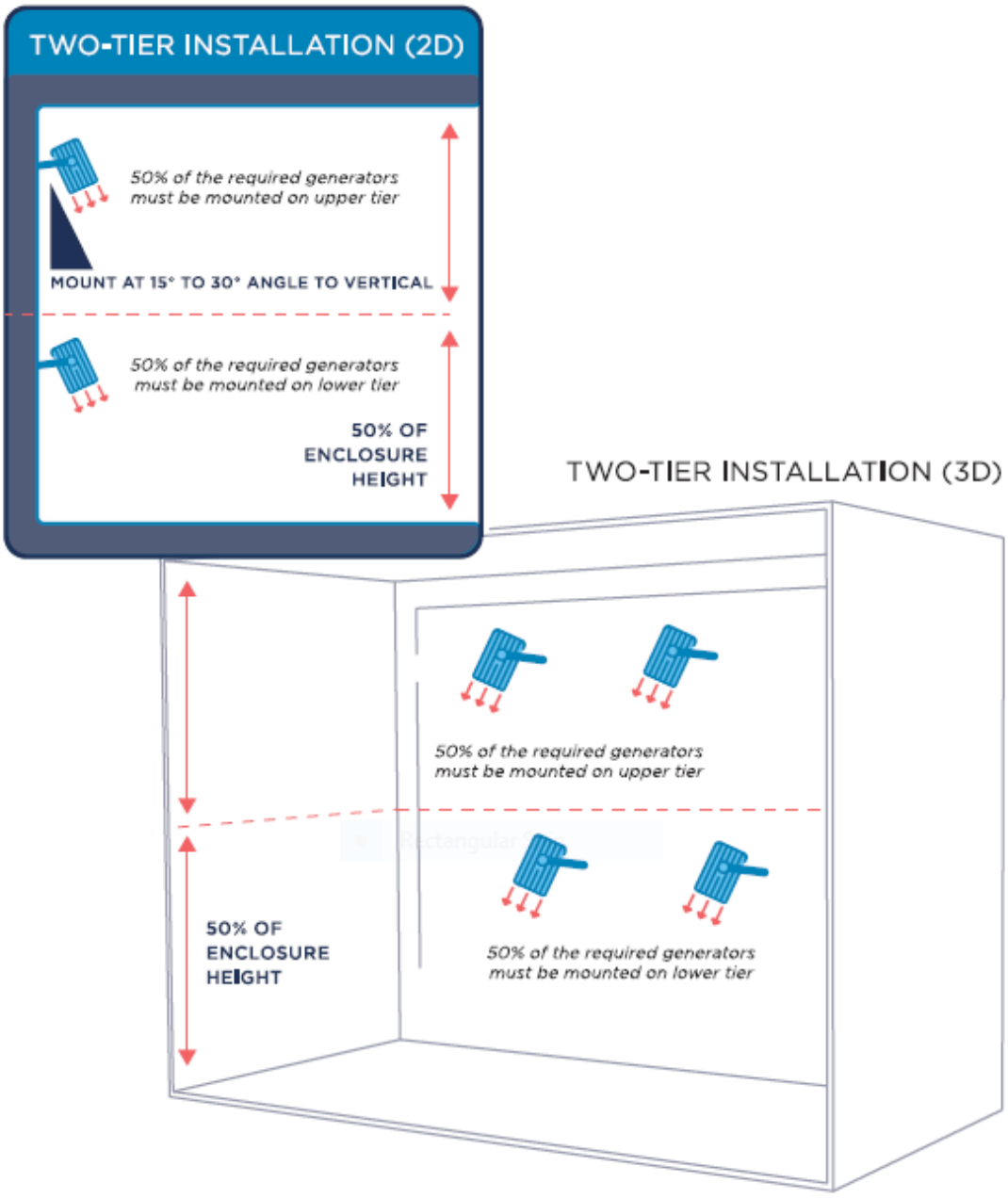


Illustration 4.2.4: Installation in a High Walled Facility
Example of a 2 Tier Installation

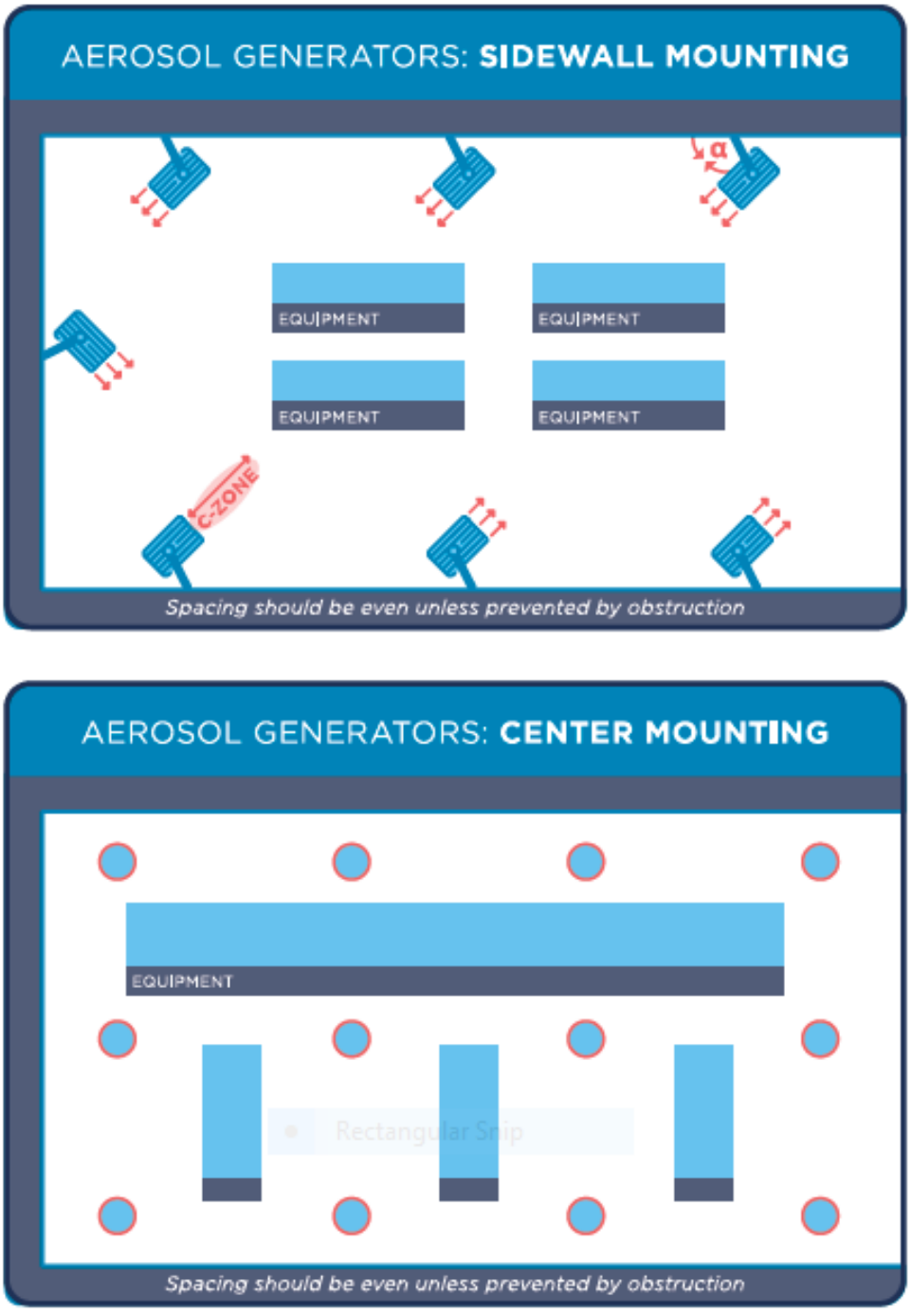


Illustration 4.2.5: Typical Aerosol Generator Placement

5.0 EQUIPMENT INSTALLATION

5.1 General

All Stat-X equipment must be installed to facilitate proper operation, inspection, testing, and any other maintenance as may be necessary. Equipment must not be subject to mechanical, chemical, or other damage, which could render the equipment inoperative.

Where the user or installer buys the components separately, and builds his own system, he will be responsible to ensure that the combination of barrier and hazardous area equipment is safe.

All Equipment, cable systems, mechanical conduit and fittings shall be listed/ approved/ certified for installation in Class I Division 2 and Zone 2 locations and comply as defined by the project or regulatory requirements, and where applicable:

A. requirements of the NFPA National Electrical Code, Articles 500, 501, 505, 510 through 516
B. the applicable IEC standards for the installation of Zone 2 Class components as specified in IEC/EN 60079-14
C. and to the contents of this section of the manual

WARNING

INSTALLATION OF STAT-X GENERATORS IN HAZARDOUS CLASSIFIED AREAS MUST ONLY BE CONDUCTED BY QUALIFIED INSTALLERS OF ELECTRICAL DEVICES IN SUCH AREAS AND IN ACCORDANCE WITH NATIONAL, STATE, AND LOCAL CODES & REGULATIONS. IMPROPER ELECTRICAL INSTALLATION OR SELECTION OR USE OF UNSUITABLE OR INCOMPATIBLE MATERIALS MAY LEAD TO LOSS OF INTEGRITY OF THE ELECTRICAL CONDUIT OR CABLING SYSTEM OR HARDWARE CONNECTED TO THE STAT-X GENERATOR RESULTING IN POTENTIAL INGRESS OF EXPLOSIVE GASES, COMPROMISING THE SAFETY OF THE CLASSIFIED HAZARDOUS AREA.

Specific Conditions of Use For ATEX/IECEx Installations:

- Provision shall be made to prevent the rated voltage being exceeded by the transient disturbances of more than 140% of the peak rated voltage
- Equipment is to be used in an area of not more than pollution degree 2

5.2 Wiring Systems

Cable systems and accessories should be installed, so far as is practicable, in positions that will prevent them being exposed to mechanical damage, to corrosion or chemical influences (for example solvents), to the effects of heat and to the effects of UV radiation. Where trunking, ducts, pipes, or trenches are used to accommodate cables, precautions shall be taken to prevent the passage of flammable gases, vapors, and liquids from one area to another and to prevent the collection of flammable gases, vapors, and liquids in trenches. Where circuits traverse a hazardous area in passing from one non-hazardous area to another, the wiring system in the hazardous area must be appropriate to the Equipment Protection Level (EPL) requirements for the route.

Openings in walls for cables and conduits between different hazardous areas and between hazardous and nonhazardous areas must be adequately sealed, for example by means of sand seals or mortar sealing to maintain the area classification where relevant. Where it becomes

necessary to join lengths of conduit, the joint(s), in addition to being mechanically, electrically and environmentally suitable for the situation, must be made in an enclosure with a type of protection appropriate to the EPL requirements for the location, e.g. Ex e junction box, or providing the joint is not subject to mechanical stress, be ‘epoxy’ filled, compound-filled or sleeved with heat-shrunk tubing or cold-shrunk tubing, in accordance with the manufacturer‘s instructions.

Conductor connections, with the exception of those in flameproof conduit systems, intrinsically safe circuits and energy-limited circuits, must be made only by means of compression connectors, secured screw connectors, welding or brazing. Soldering is permissible if the conductors being connected are held together by suitable mechanical means and then soldered, so there is no stress on the connection.

The hazardous area end of each unused core in multi-core cables shall either be connected to earth or be adequately insulated by means of terminations suitable for the type of protection. Insulation by tape alone is not permitted. Multi-stranded and, in particular, fine-stranded conductors, must be protected against separation of the strands, for example by means of cable lugs or core end sleeves, or by the type of terminal, but not by soldering alone. When using ferrules the correct crimping tool should be used. In general, only one conductor per terminal clamp is permitted. Some types of terminals are able to accommodate more than one conductor e.g. slot type. Alternatively, two wires in one ferrule is also regarded as one conductor.

Where aluminum is used as the conductor material, it must be used only with suitable connections and, with the exceptions of intrinsically safe and energy-limited installations, must have a cross-sectional area of at least 16 mm2. Where overhead wiring with uninsulated conductors provides power or communications services to equipment in a hazardous area, it must be terminated in a non-hazardous area and the service continued into the hazardous area with cable or conduit.

Cables used for fixed wiring in hazardous areas shall be appropriate for the ambient conditions in service. Cables must be sheathed with thermoplastic, thermosetting, or elastomeric material. They must be circular, compact, have extruded bedding and fillers, if any and must be non-hygroscopic, or mineral insulated metal sheathed, or special, e.g. flat cables with appropriate cable glands. For conduit systems are used national or other standards must be followed. Unused cable entries should be fitted with stopping plugs appropriate for the type of protection. Except for intrinsic safety, they should only be removed with the aid of a tool.

WARNING

STAT-X AEROSOL GENERATORS CONTAIN A FLAMMABLE SOLID CHARGE AND MUST ONLY BE HANDLED, INSTALLED, AND SERVICED WITH THE INSTRUCTIONS CONTAINED IN THIS SECTION. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD CAUSE A PREMATURE DISCHARGE RESULTING IN POTENTIAL INJURY.

5.3 Aerosol Generator Installation

The Stat-X aerosol generators should be located within the protected hazard area. The following installation instructions must be followed in the exact sequence outlined below to prevent accidental discharge, bodily injury, or property damage.

WARNING

TO PREVENT PERSONNEL INJURY, DE-ENERGIZE ALL ELECTRICAL CONNECTIONS PRIOR TO GENERATOR INSTALLATION.

5.3.1 Single Generator System

1. Position mounting bracket and securely fasten to wall, ceiling, or other support in a location and manner, which ensures the generator will not be subjected to accidental damage or movement.
2. Remove generator from shipping container and inspect integrity of the non-permeable membrane. Do not install if the membrane is ruptured in any way or if circuit is broken. Check igniter integrity with Ohmmeter. Do not install if reading is outside range of 1.4 to 2.0 ohms.
3. Securely attach generator to the mounting bracket with generator clamp taking care to insure the clamp is free of the initiator mechanism and that all bolts are securely tightened in place.
4. Position generator, via the bracket-mounting swivel, to allow for an unimpeded discharge upon activation. Care must be taken so that the generator does not directly discharge at close range at the wall, ceiling, horizontal, or vertical surfaces of the equipment within the hazard area.
5. Taking care to ensure that power is off, connect electrical lines to the initiator fitting at the top of the generator. As a minimum requirement, follow applicable installation rules for Zone 2 or Division 2 electrical equipment installation.

WARNING

TO PREVENT PERSONNEL INJURY, DE-ENERGIZE ALL ELECTRICAL CONNECTIONS PRIOR TO GENERATOR INSTALLATION. BE CAREFUL TO ENSURE THAT NO BODY PART IS PLACED DIRECTLY IN FRONT OF THE GENERATOR EXIT PORTS DURING INSTALLATION.

5.3.2 Multiple Generator System

1. Position mounting brackets and securely fasten to wall, ceiling, or other support in a location and manner which ensures the generators will not be subjected to accidental damage or movement.
2. Make sure mounting brackets are located in a manner to insure a circular flow pattern and maximum mixing of aerosol during discharge.
3. Remove generators from shipping container and inspect integrity of the non-permeable membrane. Do not install if the membrane is ruptured in any way or if circuit is broken. Check igniter integrity with Ohmmeter. Do not install if reading is outside range of 1.4 to 2.0 ohms.
4. Securely attach generators to the mounting brackets with generator clamps taking care to insure the clamps are free of the initiator mechanism and that all bolts are securely tightened in place.
5. Position generators, via the bracket-mounting swivel, to allow for unimpeded discharge upon activation. Care must be taken so that the generator does not directly discharge at close range on the wall, ceiling, or vertical surfaces of the equipment within the hazard area. Generators must be positioned to promote circular flow and mixing of aerosol from multiple generators. Aerosol generators must never be positioned to discharge directly at each other!

This will cause agglomeration of the aerosol particulate, reducing the aerosol's extinguishing effectiveness.

6. Generators may be wired individually back to a control device or connected in series on a loop. Activation current must be supplied to each generator as follows. Activation parameters of the initiator are:
   - Resistance: 1.4 – 2.0 Ohms
   - Minimum Parallel Circuit Firing Current: 0.5A each, for 0.050 Seconds.
   - Minimum Series Circuit Firing Current: 1.0 A for 0.050 Seconds.
   - Specified Maximum Test Current: $\leq$ 0.025A.
   - Specified Maximum Supervisory Current: $\leq$ 0.005A.
   - Operating Voltage: 12 – 24 V DC*.
   - Refer to Appendix E for further information on compatible UL/ULC Listed Control Panels.

   * The rated operating voltage for UL Listing is 24 V DC
7. Taking care to ensure that power is off, connect electrical lines to the initiator fitting at the top of the generator.

5.4 Post Installation Checkout

After the Stat-X generators have been installed and connected to the appropriate detection and/or control system perform the following inspection and tests.

1. Verify that generators of the correct size are installed per the installation drawings.
2. Verify that generator mounting brackets and clamps are properly installed and that all fittings are tight.
3. Verify that all electrical connections have been made and test for electrical continuity using an Ohmmeter (electrical only).
4. Verify that all generators are positioned properly. Check for obstructions in the path of the aerosol discharge stream. **Generators must be installed such that they cannot cause personnel injury upon activation. The aerosol discharge stream must not impinge at close range on walls, ceiling, or vertical surfaces of equipment!**
5. Manually Operated Electrical pull stations must be properly installed, readily accessible, and clearly identified.
6. Verify Time Delay functionality and integrity.
7. All acceptance testing shall be in accordance with this manual, any applicable standards, and the authority having jurisdiction.

6.0 OPERATION

6.1 General

A solid charge of the aerosol composition is contained within the sealed generator. Upon activation of the initiator, the charge begins a controlled burn producing an ultra-fine aerosol. The aerosol passes through an oxidation filter, where CO is converted to a minor amount of CO_2, and then through a cooling bed where the temperature of the aerosol is rapidly reduced before it escapes through the discharge ports of the generator at low pressure. Generator placement within the hazard area provides proper flow and distribution of the highly effective aerosol within the protected area.

6.2 Operating Procedures

6.2.1 Electrical Automatic Operation

Electrical automatic operation occurs upon activation of the detection circuit, initiating a voltage source from the Fire Alarm Panel to the generators. **In normally unoccupied areas where personnel may be present, a 30 second time delay shall be installed to insure egress time prior to system discharge. In normally occupied and unoccupied areas, a system maintenance isolate switch shall be installed outside the hazard area to ensure that activation of the system is "manual only" when personnel are present.** Personnel must evacuate the hazard area promptly upon hearing the pre-discharge alarm. Ensure no one enters the hazard area after discharge and call the fire department promptly.

6.2.2 Remote Electrical Manual Operation

Manual electrical operation is performed by manual release from a releasing device located outside the protected enclosure. Operate as follows:

1. Upon fire notification, leave the hazard area quickly.
2. Proceed to the appropriate remote manual/electrical pull station for the hazard.
3. Ensure all personnel have exited the protected enclosure
4. Operate manual pull station.
5. Allow no one to enter the hazard area. Call the fire department promptly.

6.2.3 System Isolate Switch

The automatic operation of the system shall be prevented by means of a system maintenance isolate switch (located outside the protected area) when personnel are present in the hazard area and maintenance is performed on system components. The operation of the system shall be manual only when personnel are present. While the system isolate switch is active the automatic activation of the system is inhibited but the fire detection and alarm system shall continue to function. The system shall return to full automatic control when the switch is reactivated.

The operation of the system maintenance isolate switch shall electrically isolate and earth each conductor of the wiring to the generators and initiate a visual indicator of status at the Control Station.

NOTE

The above instruction must be posted on display in the protected area.

6.3 Post Fire Operation

After discharge of a Stat-X fire suppression system, qualified fire suppression system maintenance personnel must perform post fire maintenance and system installation procedures outlined in this manual. Observe all warnings, especially those pertaining to the length of elapsed time before entering the hazard area.

WARNING

DO NOT ENTER A HAZARD AREA WITH AN OPEN FLAME OR LIGHTED CIGARETTE. THE POSSIBLE PRESENCE OF FLAMMABLE VAPORS MAY CAUSE RE-IGNITION OR EXPLOSION.

WARNING

ENSURE FIRE IS COMPLETELY EXTINGUISHED BEFORE VENTILATING AREA. BEFORE PERMITTING ANYONE TO ENTER THE HAZARD AREA, VENTILATE AREA THOROUGHLY OR USE SELF-CONTAINED BREATHING APPARATUS

6.4 Post Fire Maintenance

The following procedures must be followed in the exact sequence to maintain and re-commission a Stat-X suppression system:

1. After discharge, allow a minimum holding time of 10 minutes.
2. Always be sure to have backup portable extinguishers at hand for use in the unlikely event of re-ignition.
3. Vent the area thoroughly by operating the ventilation system, by fan extraction, or by opening doors and windows. To avoid unwanted inhalation of fire by-products and aerosol, a protective breathing apparatus or mask should be worn if it is necessary to enter prior to complete ventilation of the hazard volume.
4. Inspect the area to ensure the fire is completely extinguished and that there are no localized hot spots or other sources of re-ignition present.
5. Clean any minor amounts of residue, which have not been removed during ventilation, by thoroughly vacuuming, blowing, brushing, or washing away (with a water alcohol mixture) as appropriate. Check to make sure that there is no agglomeration due to discharge too close to equipment, walls etc. If any agglomeration exists it must be wiped or washed clean.
6. Important! Any residue which is not cleaned up following discharge can absorb moisture. A change in room temperature during a fire event or discharge can affect humidity and it is important to reduce the enclosure humidity as soon as possible following a discharge.
7. Remove spent generators, being sure to wear gloves or other hand protection. The generators will remain quite warm to the touch for a time after actuation.
8. Dispose of spent generators according to applicable federal, state, and local regulations.
9. Contact your Stat-X distributor immediately for replacement generators.

WARNING

BEFORE PERFORMING POST FIRE MAINTENANCE PROCEDURES, REFER TO THE SAFETY DATA SHEETS AND SAFETY BULLETINS IN THE APPENDIX AT THE BACK OF THIS MANUAL.

NOTE

Stat-X aerosol has been tested on a wide range of materials including structural, aviation composites, and materials commonly used in electronics, and circuit boards. In all cases it has been shown that Stat-X has no deleterious effect on the operating capability of equipment.

Due to the ultra-fine particle size and the method of generation, the particulate is quite buoyant and suspends in the gas/air mixture within the protected enclosure. Because of this “buoyant” effect the aerosol does not begin to “settle” for an extended period (up to an hour) and therefore is extremely easy to vent from the protected area. Only very minor amounts of particulate may be deposited on equipment and, generally, there is little need to do anything beyond extraction of the air within the protected volume through a fan or air handling system – followed by a blow down with compressed air. Any particulate deposited on horizontal surfaces will be ≤ 5µm and will not form a continuous layer. Large gaps will exist between particles - leaving no potential for electrical conductivity issues to develop.

As a precautionary measure, however, it is always important to inspect and clean the site thoroughly following a discharge. While the aerosol itself is quite “clean”, environmental factors are also a consideration. The unknown, and potentially harmful, by-products of an actual fire pose the biggest risk to sensitive equipment. Because unknown products from the fire itself may be present or because of unwanted environmental conditions, it is always recommended that the area be thoroughly cleaned to ensure that no unwanted products are present. For example, onsite maintenance and housekeeping may have been lax allowing accumulation of dirt in the enclosure. During discharge, any dirt within the enclosure will be blown around and then deposited as unwanted residue throughout the area.

Also, in rare cases, unit orientation may have been altered improperly or equipment may have been re-oriented within the protected enclosure resulting in an improper discharge directly onto a wall or equipment surface. This could result in the deposit of small, localized areas of highly concentrated agglomerated particulate on that surface. If left untended, an agglomerated mass may take on moisture and may cause non-progressive surface discoloration (copper, bronze) of unprotected metal surfaces. It is therefore, very important that any agglomerated particulate be cleaned up with a water/alcohol solution no later than 24 hours following a discharge.

7.0 MAINTENANCE

WARNING

Before performing maintenance procedures, refer to the safety data sheets and safety bulletins in the appendix at the back of this manual.

7.1 General

While Stat-X suppression systems require significantly less maintenance than other fire suppression systems which operate at pressure, a regular program of systematic maintenance must be established to insure continuous, proper operation of any fire suppression system. A periodic maintenance schedule must be followed and an inspection log maintained for ready reference. At a minimum, the log must record: (1) inspection interval, (2) inspection procedure performed, (3) maintenance performed, if any, as a result of inspection, and (4) the name of the responsible person performing the operation.

Regular servicing is required to maintain the safety of electrical systems in hazardous areas.

Some of the most important safety measures are:

- Carrying out work on live electrical systems and equipment is prohibited in hazardous areas. Work on intrinsically-safe circuits is a permissible exception.
- In hazardous areas, grounding or short-circuiting is only permissible if there is no danger of explosion.
- In the case of all work carried out in hazardous areas, there must be no possibility of ignitable sparks or excessively hot surfaces occurring that cause an explosion in conjunction with a potentially explosive atmosphere.
- Do not disconnect equipment unless power has been removed or the area is known to be non-hazardous.

7.2 Preventive Maintenance

Perform preventive maintenance per **Table 7.2: Preventive Maintenance/Replacement Schedule.**

Table 7.2: Preventive Maintenance/Replacement Schedule

Schedule	Requirement	Paragraph
Weekly	Check all Electrical Connections	7.3.1
	Visual inspection of Components	
Semi-Annual	Inspect/Test all system components	7.3.2
	Test electrical continuity	7.3.2.3
	Inspect bracketing & position of generators	7.3.2.4
15-Year	Remove from Service	7.3.3

7.3 Inspection Procedures

Inspections and maintenance shall comply with EN 60079-17 or the relevant sections of the National Electrical Code (or specified by the Authority Having Jurisdiction).

7.3.1 Weekly

1. Check all electrical connections to insure operation of the Stat-X suppression system in the event of a fire.
2. Make a general visual inspection of all aerosol generators for damaged or missing parts.
3. Make sure that the generators are not obstructed and that the required clearances have been met.

7.3.2 Semi-Annual

1. Make a general visual inspection of all aerosol generators for damaged or missing parts.
2. Ensure access to hazard areas, lines of egress, and manual pull stations are unobstructed and that there are no obstacles inhibiting the proper operation of the aerosol generators or distribution of the aerosol in the event of a fire.
3. Inspect Stat-X aerosol generators for physical damage, such as cracks, dents, distortion, or corrosion. If damage is found, replace generator as instructed in Section 6 of this manual.
4. Inspect mounting brackets, straps, and associated hardware for loose, damaged, or broken parts. Replace damaged parts and tighten all loose hardware.
5. Inspect all manual pull stations for cracks, broken or cracked glass plate, dirt or distortion. Inspect station for signs of physical damage, replacing if necessary.
6. Inspect all electrical connections and run electrical continuity tests using an Ohmmeter. Repair and replace as necessary.
7. Make sure that the generators are not obstructed and that the required clearances have been met.

7.3.3 Inspection schedule for Ex “e” installations

Grades of inspection

A. **Visual inspections** identify, without the use of access equipment or tools, those defects, such as missing bolts, which will be apparent to the eye.
B. **Close inspections** include those aspects covered by a visual inspection and, in addition, identifies those defects, such as loose bolts, which will be apparent only by the use of access equipment, for example steps, (where necessary), and tools. Close inspections do not normally require the enclosure to be opened or the equipment to be de-energized.
C. **Detailed inspections** include those aspects covered by a close inspection and, in addition, identifies those defects, such as loose terminations, which will only be apparent by opening the enclosure, and/or using, where necessary, tools and test equipment.

Check that:		Grade of Inspection		
A - Equipment		**Detailed**	**Close**	**Visual**
1	Equipment is appropriate to area classification (EPL or Zone)	*	*	*
2	Equipment group is correct	*	*	
3	Equipment temperature class is correct	*	*	
4	Equipment circuit identification is correct	*	*	*
5	Equipment circuit identification is available	*	*	*
6	Enclosure, glasses and glass-to-metal sealing gaskets and/or compounds are satisfactory	*	*	*
7	There are no unauthorized modifications	*		
8	There are no visible authorized modification		*	*
9	Both cable entry devices (direct and indirect) and blanking elements are of the correct type and are complete and tight			
	Physical check	*	*	
	Visual check			*
10	Not used			
11	Not used			
12	Lamp rating, type and position are correct	*		
13	Electrical connections are tight	*		
14	Condition of enclosure gaskets are satisfactory	*		
15	Enclosed-break and hermetically sealed devices are undamaged	*		
16	Restricted breathing enclosure is satisfactory	*		
17	Motor fans have sufficient clearance and/or covers	*		
18	Breathing and draining devices are satisfactory	*	*	
B - INSTALLATION		**Detailed**	**Close**	**Visual**
1	Type of cable is appropriate	*		
2	There is no obvious damage to cables	*	*	*
3	Sealing of trunking, ducts, pipes, and/or conduits is satisfactory	*	*	*
4	Not used			
5	Integrity of conduit system and interface with mixed system is maintained	*		
6	Earthing connections, including any supplementary earthing bonding connections are satisfactory (e.g. connections are tight and conductors are of sufficient cross-section)			
	Physical check	*		
	Visual check		*	*
7	Fault loop impedance or earthing resistance is satisfactory	*		
8	Insulation resistance is satisfactory	*		
9	Automatic electrical protective devices operate within permitted limits	*		
10	Automatic electrical protective devices are set correctly (auto-reset no possible)	*		
11	Special conditions of use (if applicable) are complied with	*		
12	Cables are not in use are correctly terminated	*		
13	Not used			
14	Variable voltage/frequency installation in accordance with documentation	*	*	
C - ENVIRONMENT		**Detailed**	**Close**	**Visual**
1	Apparatus is adequately protected against corrosion, weather, vibration and other adverse factors	*	*	*
2	No undue accumulation of dust and dirt	*	*	*
3	Electrical insulation is clean and dry	*		

7.4 Replacement/Removal from Service

The aerosol generators have an installed service life of fifteen years. They are to be replaced fifteen years from the date code in the lower right corner of the product label. The Date Code appears as follows, where the 2-digit numeric character represents the year and then the month of shipment from the factory:

21	**22**	**23**	**24**		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**

21 = 2021, 22 = 2022, 23 = 2023, etc.
A unit marked 21 12, for example, would have shipped in December 2021.

8.0 SYSTEM COMPONENTS

8.1 Aerosol Generator Assemblies

Model	Capacity	P/N
30 E (c/w brass elbow)	30 grams	11880
60 E (c/w brass elbow)	60 grams	11890
60 E (c/w brass elbow)	60 grams	11900
100 E (c/w brass elbow)	100 grams	11910
250 E (c/w brass elbow)	250 grams	11920
500 E (c/w brass elbow)	500 grams	11930
1000 E (c/w brass elbow)	1000 grams	11940
1500 E (c/w brass elbow)	1500 grams	11950
2500 E (c/w brass elbow)	2500 grams	11960
30 E (c/w stainless elbow)	30 grams	11885
60 E (c/w stainless elbow)	60 grams	11895
60 E (c/w stainless elbow)	60 grams	11905
100 E (c/w stainless elbow)	100 grams	11915
250 E (c/w stainless elbow)	250 grams	11925
500 E (c/w stainless elbow)	500 grams	11935
1000 E (c/w stainless elbow)	1000 grams	11945
1500 E (c/w stainless elbow)	1500 grams	11955
2500 E (c/w stainless elbow)	2500 grams	11965

8.2 Mounting Brackets

Model	P/N
30 gram, 60 gram SS	18001
100 gram Stainless SS	18005
250 gram, 500 gram SS	18010
1000 gram, 1500 gram, 2500 gram SS	18015

9.0 LIMITED WARRANTY STATEMENT

Fireaway represents that this product is free from defects in material and workmanship, and it will repair or replace any product or part thereof which proves to be defective in workmanship or material for a period of eighteen (18) months from the date of first shipment from our factory. Defective units should be returned shipment prepaid to the factory:

Fireaway Inc.
5852 Baker Road
Minnetonka, MN USA 55345

Fireaway will repair or replace and return shipping prepaid. Return or repair shall be the purchaser's sole remedy for defect.

9.1 Limitations of Liability

This warranty does not cover equipment damaged during shipment or by misuse, accident, or negligence, or which has been repaired or altered by others. Fireaway shall not under any circumstances be liable for special or consequential damages such as, but not limited to, damage or loss of property or equipment, loss of profits or revenue, cost of capital, cost of purchased or replacement goods, or claims by customers of the original purchaser. Remedies set forth herein to the original purchaser and all others shall not exceed the price of the equipment supplied.

This warranty is exclusively and expressly in lieu of all other warranties, whether expressed or implied, including warranty of merchantability or fitness.

APPENDIX A – SAFETY/INFORMATION BULLETINS

Stat-X fire suppression systems use flammable solid devices. Personnel responsible for fire suppression systems must be aware of the potential dangers associated with the improper handling, installation, or maintenance of this equipment.

Fire suppression system service personnel must be thoroughly trained in the proper handling, installation, and service of the Stat-X hardware and follow the instructions in this manual and in the Safety Bulletins contained in this Appendix. Fireaway has provided appropriate warnings and cautions throughout the text of this manual. These warnings and cautions are to be adhered to at all times. Failure to do so may result in potential injury to personnel.

Stat-X fire suppression system components described in this manual are also ATEX/IEC Ex certified for Zone 2 and Class I Division 2 classified areas. Proper handling, installation, and servicing of the hardware certified for use in classified hazardous areas and electrical connections are necessary to ensure the installed system is safe for use in such areas where potentially explosive gases may be present.

Safety Bulletin #1

Environmental and Health Issues for Stat-X aerosol generators

Environmental Issues

There are no environmental issues associated with the use of Stat-X aerosol generators. For the fire suppressant agent, both the Ozone Depletion Potential (ODP) and Global Warming Potential (GWP) are zero.

Toxicity and Health Issues

Aerosol generators do not present a health hazard in their benign state - as the constituent chemicals are pressed into a solid form that is extremely stable - even at elevated operating temperatures. There are no environmental or health hazards from the chemical in storage.

Unlike gaseous agents, the aerosol does not decompose in the presence of fire nor does it extinguish by oxygen deprivation. Stat-X suppresses fire (primarily) by chemical interference with the "Fire Propagation" radicals (OH, H, and O) that are essential elements in the expansion of the fire. Stat-X interacts rapidly with these free radicals within the fire zone – thus interrupting the on-going fire reaction.
The aerosol, itself, consists of solid and gas combustion products. The solid phase is composed of highly dispersed particles of salts and oxides of alkaline metals that present insignificant health hazards for humans at normal design concentrations. The gas phase may contain small amounts of carbon monoxide CO, carbon dioxide CO_2, nitrogen oxides NO_x, and ammonia NH_3. Production of these gases is minimal in the case of Stat-X due to its patented construction, chemical formulation, and its manufacture in the United States using only technical and reagent grade chemicals. In tests conducted by a certified, accredited testing facility in the United States, Stat-X generators were shown to produce gas levels several orders of magnitude less than the standard allowed for automobile airbag systems for passenger vehicles (See Figure 1).

Tests have shown no long-term negative effects from exposure to the aerosol. While the components of the aerosol are not considered toxic at normal concentration levels, ingestion of the ultra-fine particulate may cause short-term discomfort and unnecessary exposure should be avoided. Studies conducted to date, indicate that any potential toxicological issues with the aerosols in general are related to possible elevated levels of potentially harmful products that may be produced in the gas phase – such as, CO, NO_x, etc. - and not due to the influence of the solid particulate.[1,2] In the case of Stat-X, in particular, The effect is negligible due to the extremely low level of gas production (See Figure 1).

In tests conducted by VNIIPO (Russian State Fire Protection Institute), the aerosol was considered to have the same acute toxicity as Halon 1301[3]. The Toxicology Institute of the Public

[1] E.A. Smith, E.C. Kimmel, et al, "Toxological Evaluation of Exposure to Two Formulations of a Pyrotechnically-Generated Aerosol: Range Finding and Multiple Dose", HOTWC.96

[2] "Search of Halon Alternatives in Fire Extinguishing" Safety Problems During Emergency Situations, Issue 1-M, 1992, pages 73-79.

[3] *Andreev V.A., et al, "Replacement of Halon in Fire Extinguishing Systems", Proceedings of the Halon Alternatives Technical Working Conference, 1993.

Health and Medical Department of the Russian Federation and tests conducted by the Institute of Biophysics (Department of Public Health and Medicine Russian Federation), as well as others, have shown that the aerosol does not present a health hazard due to limited accidental exposure at normal design concentrations. Exposure to the aerosol is generally of less concern than is exposure to the decomposition products of a fire.

The United States Environmental Protection Agency (EPA) has reviewed the Stat-X aerosol fire suppression agent (listed as Powdered Aerosol D) on the basis of environmental and health risks and ruled it as an acceptable substitute for Total Flooding Agents. This review includes factors such as ozone depletion potential, global warming potential, toxicity, flammability, and exposure potential. Stat-X fire suppression agent is listed by the EPA on their Significant New Alternatives Policy (SNAP) list for use (without conditions) as a total flooding agent for normally occupied and unoccupied areas (confirmed under EPA Title 40 CFR 82, Vol. 81, No. 231, December 1, 2016).

Accidental exposures under five minutes are normally considered safe. Certain safety restrictions, however, should always be observed. Exposure to the aerosol should be avoided as ingestion of the ultra-fine particulate may cause short-term discomfort. The discharge of the aerosol also has a relatively high obscuration factor. As a result, the following system installation requirements must be observed.

System Installation Requirements

Stat-X total flood systems may be applied in normally occupied and unoccupied areas in conjunction with a 30 second time delay to ensure egress of personnel prior to system discharge and manual only activation (when system maintenance isolate switch is engaged) whenever personnel may be present in the protected volume.

Stat-X Aerosol Physical Properties
Average Values @ 100 gram/m^3 Concentration

Gas Products (ppm)	Stat-X 15 minute TWA*	Automobile-Airbag Emission Standard 20 minute TWA*	NIOSH IDLH
NO_2	1.08	9.90	20.00
NO	0.97	50.10	100.00
NO_X = NO + NO_2	2.05	60.00	120.00
CO	84.20	445.00	1,200.00
CO_2	756.00	40,000.00	40,000.00
NH_3	58.30	151.50	300.00
Solid Particulate			**Percent**
K_2CO_3			55.2%
$KHCO_3$			8.2%
KNO_2			7.9%
Other Potassium Compounds			5.5%
NH_4HCO_3			23.2%
pH in solution = 8.6			
Particle Size Distribution			**Percent**
< 1μm			3%
< 2μm			76%
< 5μm			97%
> 5μm			3%
Operating and Storage Conditions			
Humidity			Up to 95% @ +54°C
Temperature			- 40°C to + 54°C
Shelf Life			15 years

*TWA = Time Weighted Average

Figure 1.0

Safety Bulletin #2, February 18, 1999

Subject: Safe Handling Procedures for Aerosol Generators

Before handling Stat-X aerosol generators, all personnel must be thoroughly trained in the safe handling of the generators, as well as, in the proper procedures for installation, removal, shipping, and disposal.

READ, UNDERSTAND, and ALWAYS FOLLOW the operation and maintenance manuals, owner's manuals, service manuals, etc., that are provided with the individual systems.

The following safety procedures must be observed at all times:

Moving Generators: Generators should be shipped compactly in an upright position in the packaging provided. They must be properly secured in place and not allowed to roll around or be dropped from the tailgates of vehicles. **Dropped Generators are not to be installed.**

Rough Handling: Generators must not be dropped or permitted to strike violently against each other or other surfaces. **Dropped Generators are not to be installed.**

Storage: Containers must be stored standing upright where they are not exposed to extreme environmental conditions or are subject to being knocked over.

Safety Bulletin #3, February 18, 1999

Subject: Post Fire Disposal of Aerosol Generators

RECYCLING OF AEROSOL GENERATORS AFTER DISCHARGE:

In most cases the discharged generator can be disposed of in any landfill that handles industrial waste. However, local regulations must be researched and observed. Each discharged aerosol generator will contain the following material:

1. Stainless steel outer shell – all.
2. Mild steel cross members (100, 250, 500), spacer ring – all.
3. Stainless steel inner shell (30 – 2500), top and bottom plates, screens (all sizes), and cross members (1000, 1500, 2500)
4. Activated Alumina: CAS 1333-84-2 (Aluminum Oxide non-fibrous)

30 E	60 E	100E	250E	500E	1000E	1500E	2500E
30g	60g	100g	550g	970g	1670g	2350g	3600g

5. Fiberglass rope (ø1cm x 50cm).- 250 - 2500
6. Ceramic Paper < 15g (30, 60, 100).
7. Wire – 24gauge, PVC coated (< 1g)
8. Trace Chemicals: K_2CO_3 (water-soluble particulate “trapped” in unit during discharge).

Contact Fireaway if there are any questions relative to the above.

General Bulletin # 4

Extinguishing Mechanism

“Fire propagation” radicals (OH, H, and O) are essential elements in the propagation of the fire. Stat-X suppresses the fire (primarily) by chemical interference with these free radicals within the fire zone – thus interrupting the on-going fire reaction.

Potassium radicals (K) are the main active component of Stat-X aerosol. They are very active and react with these “propagation radicals” – much like the bromine radicals did in Halons. The chemical reaction may be represented as follows, for example:

$K + OH = KOH$
$KOH + H = K + H_2O$
$K + OH$, etc.

These reactions continuously consume the (OH) and (H) free radicals in the flame, depleting their population to form water vapor, while releasing again the potassium radical (K) to bond with other remaining free radicals in the flame.

In addition, the flame propagation radicals recombine on the surface area of the ultra-fine aerosol particulate to further interfere with flame propagation:

$O + H = OH$
$H + OH = H_2O$

These reactions continuously consume and deplete the flame free radicals (OH, H, and O) to form water vapor.

Aerosol Characteristics

Due to the ultra-fine particle size and the method of generation, the particulate is quite buoyant and suspends in the gas/air mixture within the protected enclosure for a period of time far longer than the system discharge time. Because of this “buoyant” effect the aerosol does not begin to “settle” for an extended period and, therefore, is extremely easy to vent from the protected area. If exhaust ventilation is not implemented or not activated after a 10-minute holding time, some particulates may be deposited on exposed surfaces within the space as agglomerated residue. Also in force ventilated enclosures, power and fan shutdown is recommended prior to activation of the aerosol system as a precautionary measure to avoid the fans from drawing in aerosol particulates (if undesired) and blowing the aerosol inside the equipment. In such cases, clean-up inside this equipment will be necessary due to surface residue. Furthermore, the aerosol particulates are water soluble and deliquescent, and can soak moisture from humidity in the air. It not removed or cleaned properly, problems related to moisture and dissolved or wet residue can lead to oxidation or corrosion of some unprotected metals including those in electronics. Follow asap manufacturer and local regulatory post-discharge and preventive maintenance recommendations after the aerosol is released.

It is good practice to inspect and clean the site thoroughly following a discharge. The unknown, and potentially harmful, by-products of an actual fire pose the biggest risk to sensitive equipment

and property within the protected space. Because unknown products from the fire itself may be present, it is always recommended that equipment be blown down with air, vacuumed or washed with water/vinegar solution following a discharge to ensure that no unwanted by-products from the fire itself or fire suppressant residue are present.

Unlike HFC's, which can break down and produce deleterious compounds such as hydrofluoric acid when exposed to the high heat of a fire, Stat-X does not break down when exposed to a fire and quickly extinguishes by means of chemical interference with the flame's free radicals. Stat-X has been approved by the United States Environmental Agency (EPA) and approved for use under the EPA's Significant New Alternatives Program (SNAP).[4]

Stat-X Aerosol Composition[5]

Stat-X aerosol consists of a gas (30%) and solid particulate (70%) mixture. Mean dimensions of aerosol particulate are in the range of 1-2 µm. The aerosol consists of the following, primarily, potassium compounds (% mass 90 seconds after discharge) and carrier gases:

Compound: (particulate)	**% Original Mass**
Particulate captured within generator housing during discharge/cooling	30.00
K_2CO_3	22.08
$KHCO_3$	3.280
KNO_2	3.160
Other potassium compounds	2.200
NH_4HCO_3	9.280
Compound: (gas carrier)	
N_2	21.93
H_2O	6.550
CO_2	1.361
CO	0.097
NH_3	0.041
NO	0.001
NO_2	0.002
HCN	0.006
Other	Trace
Total	**100.00**

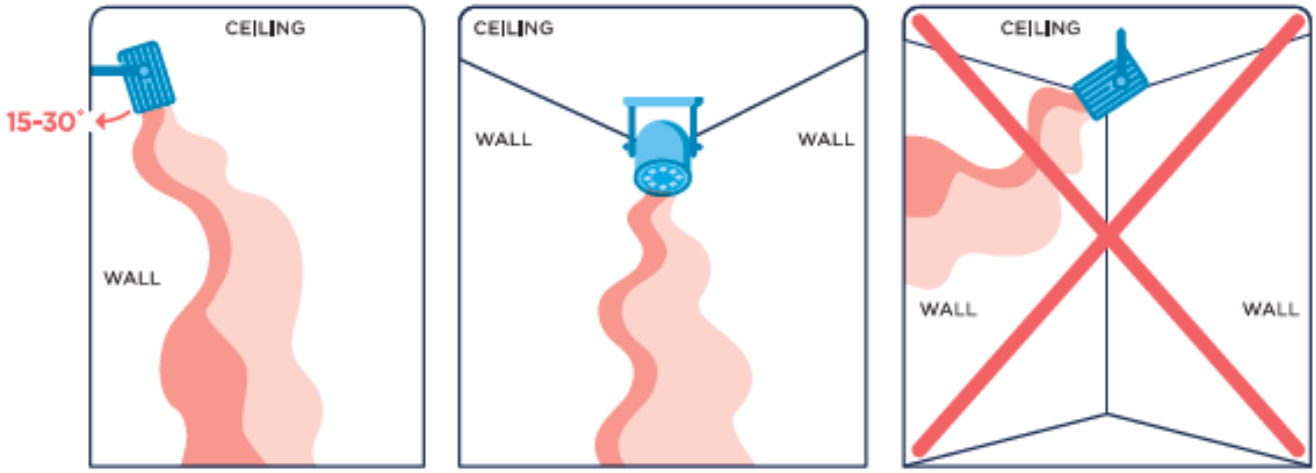
[4] Authorization letter from US EPA, 2004

[5] 100 ft^3 tank testing of Stat-X fire suppressant units, Talley Defense Systems, 1999

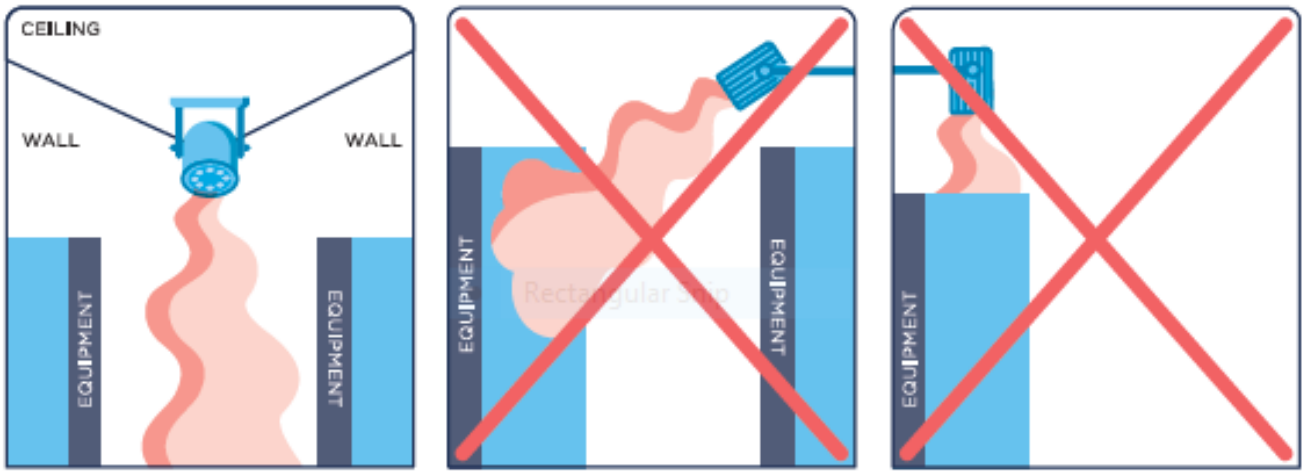
General Bulletin # 5

STAT-X INSTALLATION GUIDELINES:

Aerosol generators should normally be mounted near ceiling height and angled to discharge down (under floor excepted) toward the floor at an angle to ensure three-dimensional distribution of aerosol. Normal orientation from vertical is 15°-30°. See diagram below. In addition, the bracket angle on the flat wall can be angled 5-25° from the horizontal.



Generators must never be positioned to discharge directly at each other and must be mounted in such a way as to have an unobstructed discharge path, nor discharge at close range onto walls, ceiling, or equipment. Always check for obstructions in the path of the aerosol discharge stream. Generators must be installed such that they cannot cause personnel injury upon activation.



APPENDIX B – SHIPPING CLASSIFICATION

Stat-X generators have received the following shipping classification from the United States Department of Transportation:

1. For shipment by motor vehicle, rail, or cargo vessel: UN3268, Class 9, Proper Shipping Name: Safety Devices (check latest factory SDS if US DOT Special Permit is applicable)
2. For shipment by air (Cargo or Passenger): UN0432, Class 1.4S, Proper Shipping Name: Article, Pyrotechnic for Technical Purposes

Generators must be shipped as originally packaged by the manufacturer.

Generators packaged and shipped as Class 1.4S by aircraft shall have the following storage limitations:

Maximum weight/ single packaging on Passenger Aircraft	25 kgs
Maximum weight/ single packaging on Cargo Aircraft	100 kgs

Stat-X generators have received the following shipping classification from the Bundesanstalt für Materialforschung und –prüfung (BAM)

- For shipment by motor vehicle, rail, cargo vessel, and passenger aircraft: UN3268, Class 9, Proper Shipping Name: Safety Devices, electrically initiated
- Per BAM Notice D/BAM-1857/19 and in accordance with:
    - ADR / RID / IMDG – Code / Special Provision 280
    - IATA-DGR / Special Provision A115
    - ICAO-TI

Stat-X generators have been ruled by the United States BATF to be exempt from the reporting requirements of 18 U,S.C. Chapter 40 sections 842 and 843 and the implementing regulations.

APPENDIX C – SAFETY DATA SHEET

Please download the most up to date SDS sheets from www.statx.com or contact us at info@statx.com.

APPENDIX D – TABLE TO CALCULATE K_2

Leakage Parameter LP^{m-1}	K_2 value at parameter of leakage distribution according to the height of the protected enclosure LH%											
	0	5	10	20	30	40	50	60	70	80	90	100
0.000	1.025	1.025	1.025	1.025	1.025	1.025	1.025	1.025	1.025	1.025	1.025	1.025
0.001	1.028	1.031	1.037	1.049	1.062	1.075	1.087	1.089	1.089	1.074	1.057	1.046
0.002	1.032	1.037	1.048	1.073	1.098	1.122	1.146	1.150	1.150	1.122	1.088	1.066
0.003	1.035	1.042	1.060	1.097	1.133	1.169	1.203	1.208	1.208	1.168	1.119	1.086
0.004	1.038	1.048	1.071	1.120	1.167	1.214	1.258	1.265	1.265	1.213	1.149	1.106
0.005	1.033	1.053	1.082	1.143	1.201	1.258	1.312	1.320	1.320	1.257	1.178	1.125
0.006	1.045	1.059	1.094	1.166	1.234	1.301	1.363	1.373	1.373	1.299	1.207	1.144
0.007	1.048	1.064	1.105	1.188	1.266	1.343	1.413	1.424	1.424	1.340	1.235	1.163
0.008	1.051	1.070	1.116	1.210	1.298	1.384	1.462	1.473	1.473	1.380	1.262	1.181
0.009	1.054	1.075	1.127	1.232	1.329	1.423	1.508	1.521	1.521	1.419	1.289	1.200
0.010	1.057	1.080	1.136	1.253	1.359	1.462	1.554	1.568	1.568	1.457	1.315	1.217
0.011	1.060	1.086	1.149	1.275	1.390	1.500	1.598	1.612	1.612	1.493	1.341	1.235
0.012	1.064	1.092	1.160	1.296	1.419	1.536	1.641	1.656	1.656	1.529	1.366	1.252
0.013	1.067	1.097	1.170	1.316	1.448	1.572	1.682	1.698	1.698	1.563	1.391	1.269
0.014	1.070	1.103	1.181	1.337	1.476	1.607	1.722	1.739	1.739	1.597	1.415	1.280
0.015	1.075	1.108	1.192	1.357	1.504	1.641	1.761	1.778	1.778	1.630	1.439	1.303
0.016	1.076	1.134	1.202	1.377	1.531	1.675	1.799	1.817	1.817	1.662	1.462	1.319
0.017	1.079	1.119	1.213	1.396	1.558	1.707	1.836	1.855	1.855	1.693	1.485	1.335
0.018	1.083	1.124	1.223	1.416	1.585	1.739	1.872	1.891	1.891	1.724	1.508	1.351
0.019	1.086	1.130	1.234	1.435	1.610	1.770	1.907	1.926	1.926	1.754	1.530	1.366
0.020	1.089	1.135	1.244	1.454	1.636	1.800	1.941	1.961	1.961	1.783	1.552	1.382
0.021	1.092	1.140	1.254	1.473	1.661	1.830	1.974	1.994	1.994	1.811	1.573	1.399
0.022	1.095	1.146	1.264	1.491	1.685	1.859	2.006	2.027	2.027	1.839	1.594	1.412
0.023	1.098	1.151	1.275	1.510	1.709	1.888	2.038	2.058	2.058	1.866	1.614	1.427
0.024	1.101	1.156	1.285	1.528	1.733	1.915	2.068	2.089	2.089	1.892	1.634	1.442
0.025	1.104	1.161	1.295	1.546	1.756	1.993	2.098	2.119	2.119	1.918	1.654	1.456
0.026	1.107	1.167	1.305	1.563	1.779	1.969	2.127	2.149	2.149	1.943	1.674	1.470
0.027	1.111	1.172	1.315	1.581	1.802	1.995	2.156	2.177	2.177	1.968	1.693	1.484
0.028	1.114	1.177	1.324	1.598	1.824	2.021	2.183	2.205	2.205	1.992	1.712	1.498
0.029	1.117	1.182	1.334	1.615	1.846	2.046	2.210	2.232	2.232	2.016	1.730	1.511
0.030	1.120	1.188	1.344	1.632	1.867	2.071	2.237	2.258	2.258	2.039	1.748	1.524
0.031	1.123	1.193	1.354	1.648	1.888	2.095	2.263	2.285	2.285	2.061	1.766	1.538
0.032	1.126	1.198	1.363	1.665	1.909	2.118	2.288	2.310	2.310	2.083	1.784	1.551
0.033	1.129	1.203	1.373	1.681	1.929	2.141	2.313	2.335	2.335	2.105	1.801	1.564
0.034	1.132	1.208	1.382	1.679	1.990	2.164	2.337	2.359	2.359	2.126	1.818	1.577
0.035	1.135	1.213	1.392	1.713	1.969	2.186	2.360	2.382	2.382	2.147	1.834	1.589
0.036	1.138	1.218	1.401	1.729	1.989	2.208	2.383	2.405	2.405	2.167	1.851	1.602
0.037	1.141	1.223	1.410	1.745	2.008	2.229	2.406	2.428	2.428	2.187	1.867	1.614
0.038	1.144	1.229	1.420	1.760	2.027	2.250	2.428	2.450	2.450	2.207	1.883	1.625
0.039	1.147	1.234	1.429	1.775	2.045	2.271	2.449	2.472	2.472	2.226	1.899	1.638
0.040	1.150	1.239	1.438	1.790	2.064	2.291	2.470	2.493	2.493	2.245	1.914	1.649
0.050	1.185	1.261	1.497	1.883	2.217	2.459	2.638	2.672	2.672	2.417	2.050	1.742
0.060	1.208	1.294	1.550	1.983	2.327	2.600	2.792	2.833	2.833	2.544	2.167	1.817
0.070	1.226	1.318	1.617	2.075	2.458	2.733	2.942	2.992	2.992	2.698	2.268	1.878
0.080	1.263	1.356	1.667	2.175	2.577	2.892	3.100	3.159	3.159	2.843	2.391	1.975
0.090	1.294	1.393	1.733	2.292	2.708	3.058	3.294	3.358	3.358	3.000	2.525	2.066
0.100	1.319	1.438	1.781	2.358	2.808	3.168	3.418	3.462	3.462	3.107	2.614	2.138
0.110	1.351	1.468	1.854	2.454	2.932	3.300	3.556	3.597	3.597	3.225	2.713	2.228
0.120	1.382	1.504	1.923	2.556	3.049	3.423	3.683	3.721	3.721	3.334	2.804	2.298
0.130	1.413	1.540	1.988	2.653	3.160	3.535	3.798	3.834	3.834	3.435	2.888	2.363
0.140	1.444	1.577	2.048	2.745	3.265	3.638	3.901	3.937	3.937	3.526	2.963	2.423
0.150	1.476	1.612	2.103	2.833	3.363	3.732	3.992	4.028	4.028	3.608	3.031	2.475

Leakage Parameter LP^{m-1}	K_2 value at parameter of leakage distribution according to the height of the protected enclosure LH%											
	0	5	10	20	30	40	50	60	70	80	90	100
0.160	1.507	1.648	2.153	2.915	3.453	3.817	4.071	4.109	4.109	3.681	3.091	2.521
0.170	1.538	1.683	2.199	2.993	3.538	3.892	4.138	4.180	4.180	3.745	3.143	2.561
0.180	1.569	1.718	2.240	3.067	3.617	3.957	4.194	4.239	4.239	3.801	3.225	2.595
0.190	1.600	1.752	2.276	3.135	3.688	4.013	4.238	4,288	4.288	3.847	3.267	2.622
0.200	1.632	1.786	2.308	3.199	3.753	4.059	4.269	4.326	4.326	3.884	3.333	2.643

APPENDIX E – COMPATIBLE FIRE ALARM CONTROL PANELS

Manufacturer	Model
Potter Electric	PFC-4410RC
Potter Electric	PFC-6075R
Potter Electric	P-400R
Potter Electric	ARC-100
Notifier	RP-2002 / RP-2002E
Notifier	NFS-320 / NFS-320E
Notifier	NFS2-640 / NFS2-640E
Gamewell-FCI	GF506R
FireLite	MRP-2002 / MRP-2002E

Note: Subject to restrictions with regards to maximum voltage and current per 3.3.2

Stat-X® Aerosol Fire Suppression

Data Sheet

Electrically Operated Stat-X® Fire Suppression Generators for Ordinary Locations

Model	P/N	Aerosol Mass (g)	Weight (kg / lb)	Total Length (mm / in)	**Height** (mm / in)	Diameter (mm / in)	Discharge Time (sec)
15E	15090	15	0.2 / 0.44	127 / 5.0	24 / .95	34 / 1.33 (width)	4.0
30E *	15100	30	0.4 / 0.8	N / A	94 / 3.7	51 / 2.0	7.0
60E *	15110	60	0.5 / 1.1	N / A	130 / 5.1	51 / 2.0	10.0
60ME *	15111	60	0.5 / 1.2	N / A	154 / 6 .1	51 / 2.0	10.0
100E *	15120	100	0.9 / 2.0	N / A	137 / 5.4	76 / 3.0	12.0
250E *	15130	250	2.5 / 5.6	N / A	152 / 6.0	127 / 5.0	12.0
500E *	15140	500	3.4 / 7.6	N / A	203 / 8.0	127 / 5.0	23.0
1000E *	15150	1000	7.1 / 15.7	N / A	191 / 7.5	203 / 8.0	16.0
1500E *	15160	1500	8.6 / 19.0	N / A	233 / 9.2	203 / 8.0	23.0
2500E *	15170	2500	11.3 / 24.9	N / A	292 / 11.5	203 / 8.0	36.0

Notes:
- Weights listed are median values with a range of +/- 10% for 2”/3” diameter models and +/- 5% for 5”/8” diameter models.
- Lengths listed include the entire length of the generator including the ¾” threaded coupling.
- Discharge times listed are approximate.

*UL Listed

Electrical Requirements:
- Initiation current 0.5 amp when wired in parallel and 1.0 amp when wired in series. The releasing circuit pulse for the Potter PFC 4410RC panel is 50 milliseconds.
- Supervisory current on the release circuit cannot exceed 0.005 amp.

Dangerous Goods Transportation Classification:
For transporting by public highway, rail, marine vessel, or cargo aircraft only: Special Permit DOT-SP 20600 and BAM D/BAM-1857/19 authorizes transport as: UN3268 Safety Devices 9.
For shipment by air (cargo or passenger): International Air Transport Association (IATA) regulations authorize transport as: UN0432 Articles pyrotechnic 1.4S.

Operation/Storage Parameters:
Temperature -40° C to +54° C (-40° F to 130°F)
Relative Humidity up to 98% at +35° C (+95° F)
IP rating: 55 (except the 15E)

Shipping Limitations:
Ground: Placards required for any shipment > 1001 lb as UN0432 1.4S
Max Net Quantity / package – Cargo Air 100 kg (220 lb)
Max Net Quantity / package – Passenger Air 25 kg (55 lb)

Fireaway Inc.
5852 Baker Road, Minnetonka, MN 55345 U.S.A.
Tel: 952-935-9745
Fax: 952-935-9757

Document number: 19075
04/2024

Product Guide Specification

Specifier Notes: This product guide specification is written according to the Construction Specifications Institute (CSI) 3-Part Format as described in *The Project Resource Manual-CSI Manual of Practice*. The section must be carefully reviewed and edited by the Architect or Engineer to meet the requirements of the project and local building code. Coordinate this section with other specification sections and the Drawings. Delete all "Specifier Notes" when editing this section.

Section numbers and titles are from *MasterFormat* 2004 Edition, with numbers from *MasterFormat* 1995 in parentheses. Delete version not required.

SECTION 21 20 00 (13900)

FIXED AEROSOL FIRE-EXTINGUISHING SYSTEM

PART 1 - GENERAL

1. SUMMARY

Section includes fire-extinguishing systems comprised of fixed condensed aerosol agent generators interconnected with agent release instrumentation and control for fire-suppression systems.

2. RELATED SECTIONS

Section 26 05 00 – Common Work Results for Electrical applies to electrical work specified in this section.

3. REQUIRED WORK THAT IS TO PROVIDED BY OTHERS

A. 110 VAC dedicated power circuit to the fire suppression control panel-Elec. contractor

B. Interface wiring from the fire suppression system to the buildings fire alarm systems-Elec. contractor

C. Fire dampers, operators, and interface wiring to the fire suppression system (if req.)-Mech. contractor

D. Interface wiring from the fire suppression system to the HVAC equipment serving the protected space for power shutdown- Elec. contractor

E. Interface wiring from the fire suppression system to process or computer equipment for power shutdown Elec. contractor

F. Providing and installing a means to ventilate the aerosol agent after a discharge if required- Mech. and Elec. contractors

4. REFERENCES

A. National Fire Protection Association (NFPA)
   1. NFPA 70 National Electrical Code (NEC).
   2. NFPA 72 National Fire Alarm and Signaling Code.
   3. NFPA 101 Life Safety Code.
   4. NFPA 2010 The Standard for Fixed Aerosol Fire-Extinguishing Systems

B. Underwriters Laboratories (UL)
   1. UL 268 Smoke Detectors for Fire Alarm Systems
   2. UL 464 Audible Signal Appliances
   3. UL 864 Control Units and Accessories for Fire Alarm Systems
   4. UL 1481 Power Supplies for Fire Protective Signaling Systems
   5. UL 1638 Visual Signaling Appliances
   6. UL 2775 Fixed Condensed Aerosol Extinguishing System Units

C. National Institute for Certification of Engineering Technologies (NICET)
   1. NICET 1016-2 Program Detail Manual, Special Hazards Suppression Systems

D. United States Environmental Protection Agency (EPA)
   1. EPA 59FR13044 Halon Substitutes Under Significant New Alternative Policy (SNAP)

E. All separate requirements of the Authority Having Jurisdiction (AHJ).

5. DEFINITIONS

A. *Condensed Aerosol Agent*. An extinguishing medium consisting of finely divided solid particles, generally less than 10 microns in diameter, and gaseous matter, generated by the exothermic oxidation of a solid aerosol-forming component.

B. *Electrical Initiators (E-match).* Encapsulated bridge-wire device fitted at top of aerosol generator which, when electrically energized, initiates the exothermic oxidation of the solid aerosol-forming component, producing the condensed aerosol agent fire suppressant.

C. *Fixed Aerosol Fire-Extinguishing System*. A special hazard fire protection system employing one or more condensed aerosol generators interconnected with and actuated by an agent release fire alarm system for the purpose of total flooding a protected space with potassium-based aerosol fire suppression agent.

D. *Aerosol Generator.* In condensed aerosol systems, a device for creating a fire extinguishing medium by means of exothermic oxidation.

E. *Agent Release Fire Alarm System.* A protected premises fire alarm system that is part of a fire suppression system and/or which provides control inputs to a fire suppression system related to the fire suppression system's actuation and sequence of operations and outputs for other signaling and notification.

F. *Transient Protector for Releasing Device (PN 3005014).* Device placed in releasing circuit before each e-match to protect against high voltage transient signals, such as lightning, that may cause the e-match to energize and accidentally initiate aerosol generator operation.

G. *AHJ.* Authority having jurisdiction.

6. SYSTEM DESCRIPTION

A. Design, furnish, install, connect, and test an agent release fire alarm and fixed aerosol fire-extinguishing system ready for operation. This shall include, but is not limited to:
   1. condensed aerosol agent generators and hardware
   2. agent release electrical initiators and wiring
   3. agent release control panel and batteries
   4. detection and alarm initiating devices
   5. alarm notification appliances
   6. lock-out and abort switches
   7. mounting hardware and wiring
   8. auxiliary power supply, control devices and annunciators (as needed)
   9. system user signage and documentation

B. The fire-extinguishing system shall comply with requirements of NFPA 2010 and NFPA 72 except as modified and supplemented by this specification. System field wiring shall be supervised either electrically or by software-directed polling of field devices. Electrical installations shall comply with NFPA 70 and local code requirements.

C. The fire-extinguishing system shall be manufactured by an ISO 9001 certified company and system and components shall be Underwriters Laboratories, Inc. listed under the appropriate UL standard given in Part 1.3 of this specification.

D. The contractor designing and furnishing the fixed aerosol fire-extinguishing system and components shall be an authorized engineered system distributor of the supplying manufacturer. A NICET certified technician (minimum Level II) shall be employed on site to guide the final check-out and to ensure system integrity regardless of the contractor performing installation, connection, or testing for commissioning.

E. Cross-zone operation. When a fire alarm condition is detected and reported by two system initiating devices which are cross-zoned these functions shall immediately occur:
   1. A programmed delay timer (typically 30 seconds) shall be started.
   2. Warning audible circuits shall sound.
   3. Electronic equipment in the hazard area requiring emergency power off (EPO) per NFPA 75 shall de-energize circuitry fans, area ventilation shall be shutdown, and dampers closed as required.
   4. If abort is activated, the timer shall stop (or extend delay). Manual release shall override abort.
   5. At completion of the delay timeout, the aerosol generator electrical initiators shall be activated.
   6. Aerosol agent shall flood the protected area at design concentration with a minimum holding time of 10 minutes.

F. Basic circuitry performance.
   1. Initiation Device Circuits (IDC) shall be wired Class B (NFPA Style B).
   2. Notification Appliance Circuits (NAC) shall be wired Class A (NFPA Style Z).
   3. Releasing circuits shall be wired to supervise the aerosol generator electrical initiators
   4. A single ground or open on any initiating device circuit or notification appliance circuit shall not cause system malfunction, loss of operating power or the ability to report an alarm.

7. SUBMITTALS

A. Comply with Section 01 33 00 – Submittal Procedures.

B. Pre-construction Submittals:
1. All references to manufacturer's model numbers and other pertinent information herein is intended to establish minimum standards of performance, function and quality. Equivalent compatible UL-listed equipment from other manufacturers may be substituted for the specified equipment as long as the minimum standards are met. For equipment other than that specified, the contractor shall supply proof that such substitute equipment equals or exceeds the features, functions, performance, and quality of the specified equipment. Control/releasing panel manufacturers design or operation documents shall reference compatibility with the condensed aerosol system devices.
2. Include sufficient information, clearly presented, to determine compliance with the Specifications and Drawings in accordance with NFPA 2010, section 7.1.
3. Product data sheets shall be provided with printed logo or trademark shall of:
   a. only one manufacturer for all the condensed aerosol fire suppression equipment
   b. only one manufacturer for all the agent release fire alarm system
4. Compatibility documentation shall be provided showing the agent release fire alarm system is UL-listed and compatible with the fixed aerosol fire-extinguishing equipment
5. LEED Credit EA-4: Fire suppression agent shall be listed as a substitute for ozone-depleting chemicals under the EPA Significant New Alternatives Policy (SNAP) program. The condensed fire suppressant shall be Powdered Aerosol D as described in the EPA SNAP list.

C. Equipment Submittals:
1. Cover page shall give project name and address, Engineered Systems Distributor name and contact information, installing contractor’s name and contact information (if different), equipment submittal date and revision level.
2. Scope of Work narrative including the sequence of operation for the fixed aerosol fire-extinguishing system shall describe:
   a. Automatic or manual actuation
   b. Control panel
   c. Generator actuation
   d. Notification appliance
   e. Coordination with other building components and systems
3. Bill of material for the system shall include the part number, item description, and total quantity required for each system component or supplied material.
4. System design data shall provide battery and supplemental NAC circuit calculations as well as agent design concentration calculations for the protected special hazard volume.

D. Shop Drawings: NFPA2010
1. Cover page shall give project name and address, Engineered Systems Distributor name and contact information, installing contractor’s name and contact information (if different), shop drawing package date and revision level.
2. Shop drawings shall have title blocks with project name and address, drawing name, scale and sheet number, drawing date and revision.
3. Information on all drawings shall be clearly presented, and include manufacturer's part numbers, power requirements and ratings, equipment layout, device arrangement, complete wiring point-to-point diagrams, and conduit layouts. Auxiliary control devices and annunciators and floor plans shall be included as needed Hardcopy of calculation results from the condensed aerosol manufacturer’s software system design program shall be included.

E. Certifications. The fire suppression system contractor shall obtain any required local or state contractors licenses for this project as well as any required licenses for their installation technicians as required by state the project is located in and or the AHJ. The fire suppression system contractor shall also provide evidence of, technician NICET Level II certification and shall be an authorized distributor of the fire suppression system equipment manufacturer at time of equipment submittals.

F. Permits- The fire suppression system contractor shall provide the necessary permits that are required for the installation of the fire suppression system.

G. Operation and Maintenance Manuals. A complete as-built instruction and maintenance manual as well as the manufacturer's owner's manual shall be provided within 14 days after acceptance. Operation and maintenance manual shall be similar to information in Equipment Submittals, but revised to reflect changes made for final acceptance.

H. Close-out Submittals. Project record drawings and final system program files shall be provided within 14 days after acceptance. Project record drawings shall be similar to Shop Drawings, but revised to reflect changes made for final acceptance.

8. QUALITY ASSURANCE

A. Codes and Standards. System installation shall comply with the following NFPA codes and standards:
   1. NFPA 70
   2. NFPA 72
   3. NFPA 101
   4. NFPA 2010
   5. UL 2775
   6. EPA 59FR13044
   7. MIL-STD-810G

B. Equipment, Programming, and Installation Supervision.
   1. Services of an Authorized Fireaway Distributor shall be provided for furnishing all equipment, hazard volume agent design concentration, system programming, and installation supervision.
   2. The Engineered Systems Distributor shall provide proof of factory training within 14 calendar days of award of the contract.

9. DELIVERY, STORAGE AND HANDLING

A. Delivery. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer. Ensure transportation of materials, packaging signage, and documentation comply with domestic and international regulatory requirements.

B. Storage. Store materials in clean, dry area indoors in accordance with manufacturer's instructions and Material Safety Data Sheet (MSDS) or Safety Data Sheet according to Regulation (SDSR).For any opened packaging for materials being placed back into storage, verify the permanent date code marking on the aerosol generator to ensure that the shelf life has not expired.

C. Handling. Protect materials from damage, avoid dropping generators or subjecting to shock, electric currents, static discharge, excessive heat and extended periods of storage at temperatures greater than 149º F (65º C) or as specified in the MSDS/SDSR applicable to the material.

10. COORDINATION

Coordinate the work in this section with the work of other sections, including sprinkler systems as specified in Section 21 10 00, electronic detection and alarms as specified in Section 28 30 00, and HVAC systems as specified in Section 23 00 00.

11. WARRANTY

Warranty for aerosol fire suppression equipment is 12 months from date of installation. Warranty for agent release fire suppression system control panel and devices is also 12 months from installation.

PART 2 - PRODUCTS

1. GENERAL EQUIPMENT AND MATERIALS

A. All equipment and components shall be new, and the manufacturer's current model. System equipment and devices shall be tested and listed by Underwriters Laboratories for use as part of a fire-extinguishing system and meeting the National Fire Alarm and Signaling Code (NFPA 72).

B. All equipment and components shall be installed in strict adherence with manufacturers' Design, Installation, Operation and Maintenance manual instructions, agent design concentration calculation programs, and published technical bulletins.

C. All equipment shall be attached to wall, ceiling and floor structures and shall be located as required by the manufacturer’s instructions and held firmly in place using fasteners and supports adequate to support the required load.

D. All equipment must be available through the manufacturer’s authorized Engineered System Distributors and can be installed independent of the manufacturer.

2. FIXED AEROSOL FIRE-EXTINGUISHING SYSTEM

A. Manufacturer
   1. The fixed aerosol fire-extinguishing system shall consist of Stat-X brand models by Fireaway Inc., 5852 Baker Road, Minnetonka, Minnesota 55345. Phone (952) 935-9745. Fax (952) 935-9757. Website: www.statx.com
   2. References to manufacturer’s model numbers and other information are intended to establish minimum standards for performance, function, and quality. Equivalent equipment from Fireaway Inc. may be substituted for the specified equipment, as long as minimum standards are met. No other manufacturers other than Fireaway Inc. will be considered for supplying the fixed aerosol fire-extinguishing system on this project.

B. Condensed aerosol agent generators shall be Stat-X “E” (Electrical) Series. The units shall be listed to UL category FWSA and ULC category FWSAC.
   1. Agent container.
      a. Generator housing shall consist of exterior and interior stainless steel cylindrical shells separated by insulating materials.
      b. Exterior finish shall be brushed stainless steel, salt-spray resistant, and certified to MIL-STD-810G for extreme environments.
      c. Top of housing shall be stainless steel and incorporate a ¾” NPT fitting for direct connection to releasing circuit conduit.
      d. Bottom of housing shall be stainless steel, sealed with a non-permeable hermetic sealed membrane, and shall incorporate a mechanical means to insure membrane rupture upon activation.

2. Condensed aerosol agent.
   a. Aerosol agent generated shall be potassium based with 97% of particle sizes less than 5 microns.
   b. Agent shall have zero ozone depletion potential (ODP), no atmospheric life (ALT) and negligible global warming potential (GWP) under EPA 59FR13044 (SNAP program).
3. Electrical initiators.
   a. The Initiator element shall be of the encapsulated electric match type, integrated into the generator and incorporate a two-wire conductor for connection to the agent release control panel output circuit.
   b. Device operating voltage is 12-24 VDC and supervisory current shall be ≤ 5 mA. Activation current shall be at least 1A for initiators connected in series or 0.5A for each parallel connected initiator.
   c. Transient protection device shall be wired with each initiator, and shall be UL listed to Category SZWT2 and UOXX2.
4. Mounting hardware. Generators shall be mounted by means of stainless steel brackets and fasteners that allow for vertical and horizontal adjustment, or of the fixed L-bracket type.

C. Wiring of multiple generators. Generators may be wired individually to the control panel's agent release circuit or connected in series on a loop.

3. FIRE SUPPRESSION SYSTEM CONTROL PANEL

A. Manufacturer.
   1. The agent release control panel and peripherals shall be manufactured by Potter.
   2. References to manufacturer's model numbers and other information are intended to establish minimum standards for performance, function, and quality. Equivalent agent release from other fire suppression system control panel manufacturers may be substituted for the specified equipment, as long as minimum standards are met, and are verified to be UL-cross listed for automatic release of Stat-X aerosol generators. No other manufacturers other than Fireaway Inc. will be considered for supplying the fixed aerosol fire-extinguishing system on this project.

B. Fire Suppression Control Panel. The control panel shall be a Potter PFC-4410RC model that is UL listed and FM approved. Basic functions to be performed shall include:
   1. Supervise and monitor all initiating device circuits, alarm notification circuits, and agent release circuit for trouble and alarm conditions.
   2. Detect the operation of any initiating device circuit and the location of the alarm condition.
   3. Operate all notification appliances and release devices as designed.
   4. Visually and audibly annunciate any trouble, supervisory or alarm condition on the panel display.
   5. System Capacity. The control panel shall include four initiating device circuits (IDC), two supervisory circuits, two NAC circuits, two release circuits, and trouble, alarm, and supervisory relays for interface to the buildings fire alarm or monitoring system.
      a. IDCs can be configured as conventional two-wire smoke detector circuits, as well as any dry contact input device including abort switches, manual release stations, heat detectors, and smoke detectors
      b. The control panel shall have two supervised notification appliance circuits (NACs).
      c. The control panel shall have two dedicated release circuits that are supervised.
      d. The panel shall include alarm, trouble, and supervisory dry contact relays for interface to the buildings fire alarm or monitoring system.
      e. On-board power supply shall be capable of delivering 2.5 amps of max power to the output circuits.

6. Control Panel Safeguards.
   a. Battery/Earth fault supervision shall be provided.
   b. Adjustable pre discharge timer shall be available, 00 to 60 seconds.

7. Programming and System Commissioning. The FSCP shall have a configuration option which allows the user to program the FSCP with one of four factory preprogrammed templates or one custom template which can be programmed by the user.
8. Batteries.
   a. Shall be 12 volt, Gell-Cell type (2 required).
   b. Battery shall have sufficient capacity to power the fire alarm system for not less than 24 hours plus 5 minutes of alarm upon a normal AC power failure.
   c. The batteries are to be completely maintenance free. No liquids are required. Fluid level checks refilling, spills and leakage shall not be required.

C. Detection and alarm initiating devices

The contractor shall design the fire detection system and select appropriate and prescribed fire detection devices in accordance with regulatory requirements and the applicable NFPA standards for the application, and for the fire hazards associated with the application.

1. Conventional Photoelectric Area Smoke Detectors.
   a. Smoke detectors shall be listed to Underwriters Laboratories UL 268 for Fire Protection Signaling Systems.
   b. The detector shall be a photoelectric type
2. Automatic Conventional Heat Detectors.
   a. Mechanical heat detectors shall be listed to Underwriters Laboratories UL 521 for Heat Detectors for Fire Protective Signaling Systems.
   b. The detector shall be either a single-circuit or a dual-circuit type, normally open. The detector shall be rated for activation at either 135°F or 200°F, and shall activate by means of a fixed temperature thermal sensor, or a combination fixed temperature/rate-of-rise thermal sensor.
   c. The rate-of-rise element shall be activated by a rapid rise in temperature, approximately 15°F (8.3°C) per minute.
3. Linear Heat Detection Cable.
   a. Linear heat detection cable shall consist of a fixed temperature sensing element comprised of two electrical current carrying wires separated by a heat sensitive insulation material.
   b. The detection cable shall detect the specified temperature anywhere along the detector length.
   c. The detection cable shall be constructed by spiral wrapping the two conductors with a protective mylar tape wrapped in protective outer coverings of cotton braid, PVC, or weather resistant Nylon.
   d. The initiating circuits shall be capable of intrinsically safe service.
4. Air Sampling Smoke Detector.
   a. Detector shall be aspirated laser-based mass light scattering type capable of detecting a wide range of smoke particle types and size.
   b. Detector shall allow programming of smoke threshold alarm levels, time delays, faults, including airflow, detector, power, filter and network.
   c. Monitoring contamination of the detector filter shall be employed to automatically notify when maintenance is needed.
   d. Detector(s) shall contain programmable relays for alarm and fault conditions.
   e. Air sampling smoke detectors shall be capable of communicating to various manufacturers' fire alarm or suppression control panel by relay connectivity or through a UL listed high level interface.
   f. Sampling pipe and fittings shall be orange ¾" chlorinated polyvinyl chloride (CPVC) pipe.

g. Pipe shall be UL listed as an accessory for plenum use as per UL1887 standard. Mechanical pipe fasteners and hangers shall be approved for use with the CPVC pipe material.

5. Manual Release Stations.
   a. Manual release stations shall be UL listed with the fire suppression system control panel
   b. Manual release stations shall be non-coded and an operated station shall automatically condition itself so as to be visually detected as activated. Station cannot be restored to normal after activation except by use of a key or hex.
6. Abort Stations
   a. Abort Stations shall include a momentary ("dead-man") switch that may be manually held in to cause abort of the release process.

D. Alarm notification appliances,

1. Horns, Strobes, and Horn/Strobes.
   a. Horn/strobes and strobes shall be listed to UL 1971 and shall be approved for fire protective service.
   b. Outdoor horns, strobes and horn/strobes shall be listed for outdoor use by UL.

4. WIRING AND ELECTRICAL HARDWARE

A. Wire and wiring
1. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system. Wiring installations shall comply with NFPA 70 and 72, regulatory, and customer specific installation policies.
2. Number and size of conductors shall be as recommended by the fire suppression system control panel manufacturer, but not less than 18 AWG (1.02 mm) for Initiating device circuits and 14 AWG (1.63 mm) for notification appliance circuits.
3. The fire alarm cable shall have a fire resistance rating suitable for the installation as indicated in NEC 760 (e.g., FPLR).
4. All fire suppression system wiring shall be new and shall be in accordance with local, state and national codes (e.g., NEC Article 760) and as recommended by the manufacturer of the fire suppression system control panel.
5. All field wiring shall be electrically supervised for open circuits and ground faults.
6. All circuits shall be provided with transient suppression devices and the system shall be designed to permit simultaneous operation of all circuits without interference or signal loss.
7. The fire suppression system control panel shall be connected to a separate dedicated branch circuit, maximum 20 amperes. This circuit shall be labeled at the main power distribution panel as FIRE SUPPRESSION SYSTEM. Fire suppression control panel primary power wiring shall be 12 AWG.
8. The control panel cabinet shall be grounded securely to a cold water pipe or grounding rod.

B. Conduit, boxes and cabinets
1. Conduit shall be in accordance with the National Electrical Code (NEC), and state and local requirements.
2. All initiating and releasing device wiring shall be installed in a minimum of raceway as required by NFPA 2010. The wiring for this system may need to be installed in EMT based on the project requirements. When conduit is required, wiring for 24 volt DC control, alarm notification, emergency communication and similar power-limited auxiliary functions may be run in the same conduit as initiating and signaling line circuits if approved by the fire suppression control panel manufacturer.

3. When required, conduit shall be 3/4 inch (19.1 mm) minimum and shall not enter the fire alarm control panel, or any remote equipment back boxes, except where entry is specified by manufacturer.
4. All cabinets, terminal and junction boxes shall be UL listed for their purpose.

5. SYSTEM USER SIGNAGE

A. All manual operating devices shall be identified as to the hazard area they protect and system abort switch shall be clearly recognizable for the purpose intended.

B. Warning and instructions signs shall be provided at the entrance to and inside the protected area.

PART 3 - EXECUTION

1. INSTALLATION:

A. Fixed aerosol fire-extinguishing system
1. Aerosol generators shall be of the type listed for intended purposes and shall be placed within the protected area in compliance with listed limitations with regard to spacing, floor coverage, thermal clearances, and alignment.
2. The type of aerosol generators selected, their number, and their placement shall be such that the application design concentration will be established in all parts of the protected space.
3. Agent shall not directly impinge on any loose objects, shelves, cabinet tops, or other surfaces, or on areas where personnel could be found in the protected space.
4. Calculations shall be performed with the Fireaway Stat-X Designer Program and in accordance with the UL listed Design, Installation, Operation, and Maintenance manual. All examined unclosable openings in the protected enclosure shall be included in the design calculations and identified in the plan drawings.

B. Agent release fire alarm system
1. Installation shall be in accordance with the NEC, NFPA 72, NFPA 2010, local and state codes, as shown on the drawings, and as recommended by the major equipment manufacturer.
2. Fire detectors shall not be installed prior to the system programming and test period. If construction is ongoing during this period, measures shall be taken to protect smoke detectors from contamination and physical damage.
3. A transient protection for releasing device of the type listed shall be connected to each aerosol generator to protect against high voltage transient signals and unwanted system discharge.
4. Per NFPA 2010, occupiable spaces shall include a “lock-out” device. A supervised disconnect switch shall be installed interrupting the releasing circuits to the aerosol system to prevent unwanted system discharge during maintenance. Abort switches are optional and shall be considered in applications where the end user or AHJ require this safety feature in addition to the releasing system pre-discharge delay and notification appliance alarms.

C. Before energizing the cables and wires, check for correct connections and test for short circuits, ground faults, continuity, and insulation.

2. TESTS

A. Provide the service of a competent, factory-trained engineer or technician authorized by the manufacturer of the fire alarm equipment to technically supervise and participate during all of the adjustments and tests for the system.

B. Preliminary functional tests.
   1. If system is connected to an alarm-receiving office, notify the office that a test is to be conducted and that fire service response is not desired.
   2. Notify all concerned personnel at facility that a test is to be conducted and instruct them as to sequence of operation.
   3. Comply with manufacturer's procedures as described in the manual. Note all warnings and safety requirements highlighted in the manufacturer's owner's manual, applicable building regulations, and end user's policies.
   4. Prior to installing each aerosol generator to the releasing circuit, using a multi-meter, verify that each (unconnected) aerosol generator initiator resistance is between 1.4ς to 2.0ς. Replace the generator if the initiator resistance is outside this range.
   5. Conduct a visual inspection of all installed aerosol equipment and verify compliance with the plans with regards to location, orientation, clearance and agent discharge path design requirements, and any room general arrangement installation changes that can affect the fire extinguishing system performance.
   6. Confirm each aerosol and all associated equipment is securely fastened to prevent vertical or lateral movement during system discharge. Use non-permanent thread locking products on the bracket fasteners for installations subject to vibration.
   7. Disable each aerosol generator so that activation of the release circuit will not release agent during fire detection system tests, and then reconnect the release circuit with a functional test device in lieu of each generator. The test device can be a quick response fuse and fuse holder, an indicating lamp, or an electrical test match to simulate the aerosol generator initiator element or releasing circuit loop. There is no NFPA 2010 requirement for actual discharge tests for commissioning of the fire extinguishing system.
   8. Confirm each detector for response, check for end of line resistors and polarity of all polarized devices, and check all supervised circuits for trouble response.
   9. Following the reset and reestablishing normal operating condition of the fire detection system, ensure that the releasing circuit is safely in stand-by mode, before reconnecting the aerosol generators to the releasing circuit. Check at the FACP that the releasing circuit is clear of any trouble or fault condition.

C. Complete system functional tests.
   1. Each of the alarm, trouble, and fault conditions that the system is required to detect should be introduced on the system. Verify the proper receipt and that the releasing circuits will activate.
   2. Operate detection initiating circuit(s) and verify all alarm and notification appliance functions occur according to design specification.
   3. Check installation and supervision of the fire detection devices to ascertain that they will function as specified.
   4. Operate manual release and verify all manual release functions occur according to design specification.
   5. Operate abort switch circuit (if supplied) and verify abort functions occur according to design functions.
   6. Check audibility of tone and visibility of strobe light at all alarm notification devices.
   7. Confirm that visual and audible supervisory signals are received and annunciated at the control panel and, if supplied, each remote annunciator.
   8. Conduct tests to verify trouble indications for common mode failures, such as alternating current power failure.
   9. Conduct tests to verify remote monitoring operations if applicable.
   10. Confirm that all auxiliary functions such as door and vent closers, alarm-displaying devices, air-handling shutdown, and power shutdown operate in accordance with design specifications.

   11. Verify integration with other building systems interlocked with the fire protection systems as required in the plans and specifications.

3. FINAL INSPECTION:

A. At the final inspection a factory trained technician shall demonstrate that the systems function properly in every respect.

B. At successful conclusion of all functional testing, return system to its fully operational condition.

4. INSTRUCTION:

A. Provide instruction as required to the building personnel. "Hands-on" demonstrations of the operation of all system components and the entire system shall be provided.

B. An as-built instruction manual that includes a full sequence of operation, a set of drawings and calculations should be maintained on site.

C. The building personnel should also retain a copy of the aerosol fire extinguishing system owner's manual. Instruct building personnel on safety and operational procedures as described in the owner's manual. Review with building personnel the post-extinguishing system discharge and recovery procedures.

END OF SECTION # #

ELECTRICAL UNITS

SPECIFICATION DETAILS:

Agent Container. The generator housing shall be constructed of exterior and interior stainless steel shells separated by an insulating material. Top and bottom of housing shall be stainless steel and (for electrically activated units) incorporate a ¾" NPT fitting to enable direct connection to conduit. Housing shall be sealed with a non-permeable membrane and shall incorporate a mechanical means to insure rupture of the membrane upon activation. Housing shall be non-pressurized prior to system activation.

Finish. Brushed stainless steel. Units shall have passed salt spray corrosion testing per UL Standard 2127 as part of their listing.

Aerosol Agent. Aerosol generated shall be potassium based and manufacturer shall provide fifteen (15) minute time weighted average data from an independent United States laboratory demonstrating that the aerosol does not produce (at normal design concentrations) harmful levels of CO, CO2, and NOx based on NIOSH standards. Agent shall have no ozone depletion potential and no global warming potential. Agent shall be listed by the US EPA under the SNAP program.

Listing. Aerosol generators shall be listed by Underwriter's Laboratories (UL) to UL Subject 2775 covering Fixed Condensed Aerosol Systems per NFPA 2010 and shall be cross listed with UL approved panel. Aerosol generators shall also be listed by ULC, CSIRO/ActivFire and ECB.

System. Extinguishing system shall be accomplished by means of distributed generating devices to insure distribution of extinguishing aerosol throughout the protected volume. Devices shall be capable of being supervised.

Mounting. Generator devices shall be mounted by means of stainless steel UL Listed bracketing that allows for directional adjustment through both vertical and horizontal plane.

Fireaway Inc.
5852 Baker Road, Minnetonka, MN 55345 U.S.A.
Tel: 952-935-9745
Fax: 952-935-9757

Stat-X® Aerosol Fire Suppression

Electric Generator

Owner's Manual

Version 1.2.5
August 2021
P/N 19001

Fireaway Inc. 5852 Baker Road • Minnetonka,MN 55345

INTRODUCTION

Thank you for your purchase of a Stat-X® aerosol fire suppression product. This brief manual is designed to provide you with a general understanding of the product, as well as, general information on installation, operational, and maintenance parameters. It is not a detailed Design, Installation, Operation, and Maintenance Manual. A detailed manual may be obtained by contacting the manufacturer:

Fireaway Inc.
5852 Baker Road
Minnetonka, MN 55345
U.S.A.
www.statx.com

Stat-X systems and generators are to be installed and periodically inspected by trained personnel ONLY. No modifications are to be made to the installed system without consulting a qualified system designer. The system is made up of units tested within limitations contained in the detailed Design, Installation, Operation, and Maintenance Manual. The system designer must be consulted whenever changes are planned for the system or the protected area. An authorized installer or system designer must be consulted after the system has discharged.

SYSTEM DESCRIPTION

General

Stat-X systems combine an environmentally safe fire suppression agent, specially developed components, and fire detection devices for rapid agent application. The resulting timely suppression of fire may reduce property, facility, and equipment damage. These systems are electrically operated, are compact, and eliminate expensive pressure vessels, nozzles, and distribution piping associated with other gas and water based fire suppression systems. The Stat-X aerosol agent is extremely effective when compared to alternative agents and aerosol generators are strategically placed throughout the hazard area offering significant weight and space savings over conventional systems. Stat-X systems are designed for total flooding applications in accordance with established design criteria. All installations must meet the requirements of the local authority having jurisdiction.

A single or connected group of Stat-X electrically operated units (or generators) are used to suppress Class A (surface), Class B, and Class C fires in specific hazard areas, facilities, or within equipment located in enclosed areas and confined spaces where low weight/space to extinguishing capacity is a factor.

The fire-extinguishing agent is an ultra-fine aerosol, which hangs in suspension for extended periods of time (for at least 10 minutes) providing excellent protection against re-flash, with minimal clean up.

Stat-X systems and generators are suitable for use in normally occupied and unoccupied spaces. In areas where personnel may be present the system shall employ a pre-discharge alarm and 30 second time delay prior to activation. Provision for system isolation for system maintenance shall be provided when personnel may be in the protected area.

They are intended to protect the following typical applications:

- Electrical Cabinets and Rooms
- Generator Rooms
- Glove Boxes
- Telecommunications Facilities
- Flammable Liquid Storage Areas
- Process Control Rooms
- Storage Vaults
- Marine Engine Rooms*
- Gas Turbine Enclosure
- High Value Mobile Equipment*
- Power Plants
- High Value Industrial Equipment Areas

*Not part of the UL Listing under UL Subject 2775 but are covered under other applicable listings (American Bureau of Shipping, Marine and Coast Guard Agency, ECB, and others)

Stat-X generators are not suitable for the following hazards; or, where the following materials may be present:

- Materials, which burn with deep-seated characteristics (wood, fiber, cotton, etc.)

- Electrical equipment operating at over 40,000 V
- Metal hydrides, pyrophoric substances, and chemical substances that smolder and burn without air
- Metal powders (magnesium, titanium, etc.)
- Environments which require devices specifically listed/labeled for installation inside rated hazardous areas (explosive atmospheres).*

*Stat-X products suitable for use in classified hazardous areas are listed separately under UL File No. E495772.

Extinguishing Agent

The aerosol produced upon activation of a Stat-X generator suppresses fire by a combination of chemical and physical mechanisms similar to the Halons without negative effect on the environment. Because of the aerosol's ultra-fine particle size (≤2 micron) there is a dramatic increase in the surface area interaction between the agent and the fire.

Unlike gaseous agents the aerosol does not decompose in the presence of fire nor does it extinguish by oxygen deprivation. The aerosol is considered non-toxic to humans when applied in normal design concentrations necessary to extinguish most fires; however, certain safety restrictions should be observed when applying and handling the generators. Exposure to the aerosol should be limited and unnecessary exposure to the particulate should be avoided. Exposure to the aerosol is generally less concerning than exposure to the decomposition products of a fire.

Toxicity: Tests conducted by Charles River Laboratories (Tranent, Scotland) as well as others have shown that the aerosol does not present a health hazard due to limited accidental exposure at normal design concentrations. Exposures under five minutes are normally considered safe.

While the components of the aerosol are not considered toxic at normal concentration levels, ingestion of the ultra-fine particulate may cause short-term discomfort and unnecessary exposure should be avoided. Tests have shown no long-term negative effects from exposure to the aerosol. In addition, the aerosol has a high obscuration factor. US EPA has approved Stat-X for use as a total flooding system for normally occupied spaces.

NOTE

STAT-X SYSTEMS SHALL ONLY BE APPLIED IN AREAS WHERE PERSONNEL MAY BE PRESENT IN CONJUNCTION WITH A 30-SECOND TIME DELAY TO ENSURE EGRESS OF PERSONNEL PRIOR TO SYSTEM DISCHARGE. A SYSTEM MAINTENANCE ISOLATE SWITCH SHOULD BE INSTALLED IN NORMALLY OCCUPIED AREAS.

Residue and Cleaning: The ultra-fine aerosol discharge remains in suspension for an extended period and can be vented by a fan or air handling system. Aerosol residue, which may have settled on the floor, equipment, or other surfaces, can be vacuumed or wiped clean with a water & acetic acid solution (e.g. vinegar). Settled and agglomerated particulates following an aerosol discharge is initially deliquescent in spaces with high humidity and is soluble in water.

Other Safety Considerations: The aerosol discharged into the hazard area upon activation of the generator is relatively "cool." However, the aerosol stream as it leaves the generator is above 100°C for a short distance from the outlet of the generator. Maximum temperatures are realized only in the last seconds of discharge. Each model has a required installation clearance distance specified as its "C-Zone." Steps must be taken to ensure generator placement so that it complies with this installation requirement. The generator housing is approximately 90°C immediately after discharge and care should be taken if handling the post-discharge generator prior to its cooling to ambient temperature.

Generators must never be installed to discharge directly on walls or equipment being protected, as this will cause agglomeration.

Storage: Each Stat-X aerosol generator is sealed with a non-permeable membrane and is unaffected by fluctuations in temperature and humidity. Accelerated aging tests have shown the generator's charge maintains its viability for more than 15 years under conditions ranging from - 40°C to + 54°C and cycled relative humidity levels up to 95%.

INSTALLATION

Facility Considerations

Significant Obstructions/Agent Distribution: In cases where there is a large ratio of fixed equipment to total volume, or where the protected equipment is located in such a way as to present a barrier to the free flow and distribution of aerosol throughout the hazard area, the use of a larger number of smaller aerosol generators may be more suitable. This will allow for strategic placement of the aerosol generators and improved distribution characteristics throughout the protected area.

Mounting: Stat-X aerosol generators are listed for both sidewall and ceiling locations and may be mounted on walls, beams, constructions, and columns, as long as the unit is securely bolted to the support structure and is mounted in a position where its "C-zone" (clearance zone where momentary peak temperature of the discharge will not exceed 75°C) will not impact on personnel, facilities, equipment or combustible materials located within the protected area. Housing clearance is required spacing of generator from combustibles and structural materials.

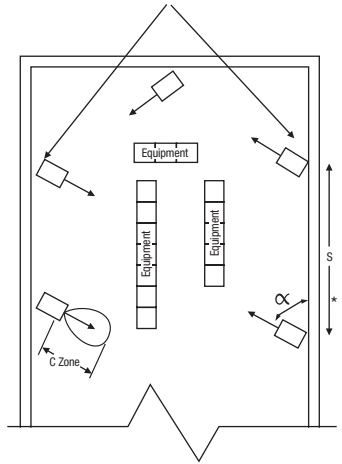
Aerosol Stream Characteristics			
Model	**C - Zone**	**Height Max.**	**Housing Clearance**
30E	0.25m/9.8"	0.5 to 1.22 m/19.7-48.0"	7mm/0.25"
60E	0.35m/13.8"	0.5 to 2.00 m/19.7-78.7"	7mm/0.25"
60ME	0.30m/11.8"	0.5 to 2.00m/19.7-78.7"	7mm/0.25"
100E	0.46m/18.1"	0.5 to 2.50 m/19.7-98.4"	13mm/0.50"
250E	0.75m/29.5"	0.5 to 2.75 m/19.7-108.3"	13mm/0.50"
500E	1.27m/50.0"	0.5 to 3.50 m/19.7-137.8"	13mm/0.50"
1000E	2.30m/90.6"	0.5 to 4.88 m/19.7-192.1"	13mm/0.50"
1500E	2.00m/78.7"	0.5 to 4.88 m/19.7-192.1"	30mm/1.00"
2500E	2.70m106.3"	0.5 to 4.88 m/19.7-192.1"	30mm/1.00"

Mounting Height: In general, the aerosol generators should be mounted at or near ceiling height and angled toward the floor at an angle to ensure three-dimensional distribution of aerosol and an unobstructed discharge path. (15° - 30° for sidewall mounting). To ensure maximum distribution of aerosol throughout the hazard area, the maximum height of generator placement from the floor must be limited as indicated above. Underfloor applications should be mounted horizontally.

Flow: Placement of the aerosol generators to ensure proper aerosol flow and distribution is extremely important as each generator functions as a flow nozzle. **Aerosol generators must never be positioned to discharge directly at each other!** This will cause agglomeration of the aerosol particulate, reducing the aerosol's extinguishing effectiveness. **For the same reason, aerosol generators must be positioned to ensure that the aerosol stream does not impinge directly on walls or the sides of equipment being protected.**

Typical Placement

Aerosol Generators



*Spacing "S" should be even unless prevented by obstruction.

Operating/Temperature Range: Stat-X aerosol generators are listed to operate within a temperature range of -40°C to +54°C/-40ºF to 129.2ºF. Generators are sealed with a non-permeable membrane and are unaffected by fluctuations in humidity and temperature.

EQUIPMENT INSTALLATION

General. All Stat-X generators must be installed to facilitate proper operation, inspection, testing, and any other maintenance as may be necessary. Equipment must not be subject to mechanical, chemical, or other damage, which could render the unit inoperative. Equipment must be installed in accordance with all applicable standards and the contents of this section of the manual.

WARNING

AEROSOL GENERATORS CONTAIN A FLAMMABLE SOLID AND MUST ONLY BE HANDLED, INSTALLED, AND SERVICED BY A TRAINED TECHNICIAN USING THE INSTRUCTIONS CONTAINED IN THIS SECTION. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD CAUSE A PREMATURE DISCHARGE AND/OR POTENTIAL INJURY.

Aerosol Generator Installation. The Stat-X aerosol generators should normally be located within the protected hazard area. The following installation instructions must be followed in the exact sequence outlined below to prevent accidental discharge, bodily injury, or property damage.

WARNING

TO PREVENT PERSONAL INJURY, DE-ENERGIZE ALL ELECTRICAL CONNECTIONS PRIOR TO GENERATOR INSTALLATION.

Single Generator System:

1. Position mounting bracket and securely fasten to wall, ceiling, or other supporting structure in a location and manner, which ensures the generator will not be subjected to accidental damage or movement.

2. Remove generator from shipping container and inspect integrity of the non-permeable membrane and generator. Do not install if the membrane is ruptured in any way or if the housing has been damaged in shipment. Verify igniter integrity with Ohmmeter. Do not install if reading > 2 ohms.

3. Securely attach generator to the mounting bracket with generator clamp taking care to ensure the clamp is free of the initiator mechanism and that all bolts are securely tightened.

4. Position generator, via the bracket-mounting swivel, to allow for an unimpeded discharge upon activation. Care must be taken so that the generator does not directly discharge at close range at the wall, ceiling, or vertical surfaces of the equipment within the hazard area.

5. Taking care to ensure that power is off, connect electrical lines to the initiator fitting at the top of the generator.

NOTE

THE INTERFACE BETWEEN THE GENERATOR AND THE FIRE ALARM CONTROL PANEL MAY REQUIRE ADDITIONAL ELECTRICAL DEVICES TO MEET LISTING COMPATIBILITY REQUIREMENTS. CONSULT FIRE ALARM CONTROL PANEL MANUAL FOR ANY LISTED SPECIAL FIELD DEVICES THAT MAY BE REQUIRED AS PART OF THE RELEASING CIRCUIT (E.G. EMATCH PROTECTION DEVICE, P/N 3005014).

WARNING

DE-ENERGIZE ALL ELECTRICAL CONNECTIONS PRIOR TO GENERATOR INSTALLATION. BE CAREFUL TO ENSURE THAT NO BODY PART IS PLACED DIRECTLY IN FRONT OF THE GENERATOR'S EXIT PORTS DURING INSTALLATION.

Multiple Generator System:

1. Position mounting brackets and securely fasten to wall, ceiling, or other supporting structure in a location and manner, which ensures the generators will not be subjected to accidental damage or movement.

2. Make sure mounting brackets are located in a manner to ensure a circular flow pattern and maximum dispersal and mixing of aerosol and air during discharge.

3. Remove generator from shipping container and inspect integrity of the non-permeable membrane and generator. Do not install if the membrane is ruptured or punctured in any way or if the housing has been damaged in shipment. Verify igniter integrity with ohmmeter. Do not install if reading is outside a range of 1.4 – 2.0 ohms.

4. Securely attach generators to the mounting brackets with generator clamps taking care to ensure the clamps are free of the initiator mechanism and that all bolts are securely tightened. **Aerosol gases discharged from the generator will add thrust loading on the clamps. It is essential that the fasteners are secure.**

5. Position generators, via the bracket-mounting swivel, to allow for unimpeded discharge upon activation. Care must be taken so that the generator does not directly discharge at close range on the wall, ceiling, or vertical surfaces of equipment within the hazard area. Generators must be positioned to promote circular flow and mixing of aerosol from multiple generators. Aerosol generators must never be positioned to discharge directly at each other! This will cause agglomeration of the aerosol particulate, reducing the aerosol's extinguishing effectiveness. The aerosol system is designed to flood the protected space when the generators are positioned in a balanced arrangement. It is not required for the generators to be aimed at specific hazards as local application streaming devices.

6. Generators can be wired in series or parallel to a releasing control panel. Activation current must be supplied to each generator as follows:

Activation parameters of the initiator are:

- Resistance: 1.4 – 2.0 Ohms
- Minimum parallel circuit firing current: 0.5A for 0.050 seconds.
- Minimum series circuit firing current: 1.0A for 0.050 seconds.
- Specified maximum test current: ≤0.025A.
- Specified maximum supervisory current: ≤.005A.

7. Install releasing control panel, detection, and ancillary devices per the directions contained in the manual supplied. Wiring is to be installed to local code requirements.

8. Once the electrical components of the system have been installed and tested, ensure power is off and then connect electrical lines to the initiator fitting at the top of the generator.

Post Installation Checkout: After the Stat-X generators have been installed and connected to the appropriate detection and/or control system perform the following inspection and tests.

1. Verify generators of the correct size are installed per the installation drawings.

2. Verify generator mounting brackets and clamps are properly installed and that all fittings and fasteners are tight.

3. Verify electrical connections have been made and test for electrical continuity using an ohmmeter.

4. Verify generators are positioned properly. Check for obstructions in the path of the aerosol discharge stream. Generators must be installed such that they cannot cause personnel injury upon activation. The aerosol discharge stream must not impinge at close range on walls, ceiling, or equipment.

5. Manual/electrical release stations must be properly installed, readily accessible, and clearly identified.

6. Verify time delay functionality and integrity.

7. All acceptance testing shall be in accordance with this manual, any applicable standards, and the authority having jurisdiction.

OPERATION

General. A solid charge of the aerosol composition is contained within the sealed generator. Upon activation of the initiator, the charge begins a controlled burn producing an ultra-fine aerosol. The aerosol passes through an oxidation filter, where CO is converted to minor amounts of CO_2, and then through a cooling bed where the temperature of the aerosol is rapidly reduced before it escapes through the discharge ports of the generator at low pressure. Generator placement within the hazard area provides proper flow and distribution of the aerosol within the protected area.

Operating Procedures

Electrical Automatic Operation: Electrical automatic operation occurs upon activation of the detection circuit, initiating a voltage source from the fire alarm control panel to the generators.

In areas where personnel may be present, a 30 second time delay is required to ensure egress time prior to system discharge. In normally occupied areas, a system maintenance isolate switch shall be installed outside the hazard area to ensure that activation of the system is "manual only" during maintenance of the system.

Personnel must evacuate the hazard area promptly upon hearing the pre-discharge alarm. Ensure no one enters the hazard area after discharge and call the fire department promptly.

NOTE

THE ABOVE INSTRUCTIONS MUST BE POSTED ON DISPLAY IN THE PROTECTED AREA.

Remote Electrical Manual Operation: Manual electrical operation is performed by manual release from a releasing device located outside the protected enclosure. Operate as follows:

1. Upon fire notification, leave the hazard area quickly

2. Proceed to the appropriate remote manual/electrical release station for the hazard.

3. Ensure all personnel have left the protected enclosure.

4. Operate manual pull station.

5. Allow no one to enter the hazard area. Call the fire department promptly.

Maintenance System Isolate Switch: Unless prohibited by the local authority having jurisdiction, the automatic operation of the system shall be prevented by means of a system isolate switch (lockout located outside the protected area) during maintenance when personnel are present. The operation of the system shall be manual only during maintenance operations on the fire detection system or on the generators. While the system isolate switch is active the automatic activation of the system is inhibited but the fire detection and alarm system shall continue to function. The system shall return to full automatic control when the switch is reactivated. An abort switch may be installed to allow personnel to delay the automatic operation of the system.

Post Discharge Operation: After discharge of a Stat-X fire suppression system, qualified fire suppression system maintenance personnel must perform post discharge maintenance and system installation procedures outlined in this manual. Observe all warnings, especially those pertaining to the length of elapsed time before entering the hazard area.

WARNING

DO NOT ENTER A HAZARD AREA WITH AN OPEN FLAME OR LIGHTED CIGARETTE. THE POSSIBLE PRESENCE OF FLAMMABLE VAPORS MAY CAUSE RE-IGNITION OR EXPLOSION.

WARNING

WHILE MAINTAINING ENCLOSURE INTEGRITY, ENSURE FIRE IS COMPLETELY EXTINGUISHED PRIOR TO VENTILATING AREA. BEFORE PERMITTING ANYONE TO ENTER THE HAZARD AREA, VENTILATE AREA THOROUGHLY OR USE SELF-CONTAINED BREATHING APPARATUS.

Post Fire Operation: The following procedures must be followed in the exact sequence to maintain and re-commission Stat-X generators as part of a suppression system:

1. After discharge, allow a minimum holding time of ten (10) minutes

2. Always be sure to have backup portable extinguishers at hand for use in the event of re-ignition.

3. Vent area thoroughly by operating the ventilation system, by fan extraction, or by opening doors and windows. Avoid opening doors leading to other occupied rooms. To avoid unwanted inhalation of fire by-products and aerosol, a protective breathing apparatus or mask should be worn if it is necessary to enter prior to complete ventilation of the hazard volume.

4. Inspect the area to ensure the fire is completely extinguished and that there are no localized hot spots or other sources of re-ignition present.

5. Clean residue which have not been removed during ventilation, by thoroughly vacuuming, blowing, brushing, or washing away (with a water and 3.5% vinegar or similar acetic acid solution) as appropriate. Check to make sure that there is no agglomeration due to discharge too close to equipment, walls etc. If any agglomeration exists it must be wiped or

washed clean. Consult Stat-X Safety Data Sheet for safety information.

6. **Important! Any residue which is not cleaned up shortly following discharge can absorb moisture in air.** A change in room temperature during a fire event or discharge can affect humidity and it is important to reduce the enclosure humidity as soon as possible following discharge.

7. Remove spent generators, being sure to wear gloves or other hand protection. The generators will remain quite warm to the touch for a time after actuation.

8. Dispose of spent generators per applicable federal, state, and local regulations

9. Contact your Stat-X distributor immediately for replacement generators. Replacement and commissioning should only be undertaken by trained personnel

NOTE
WARNING
Before performing post fire maintenance procedures refer to the Stat-X Safety Data Sheet.

MAINTENANCE

General: To ensure proper operation of your fire suppression system, a systematic maintenance program is required. A periodic maintenance schedule must be instituted including an inspection log maintained for reference. The log should, at a minimum, record: (1) inspection interval, (2) inspection procedure performed, (3) maintenance performed, if any, because of inspection, and (4) the name of the responsible person performing the operation.

Preventive Maintenance. Fireaway suggests that a preventive maintenance program require, at a minimum, the following schedule:

Type of Survey: Weekly/Six Month/On 15th year Inspection Steps	Date: Yes	No	N.A.
Perform a general visual inspection of all aerosol generators for damaged or missing parts. Examine each device for a puncture in the aluminum foil seal at orifice plate. Replace generator if foil is punctured or ripped.			
Verify at the control panel for any fault or trouble indication with regards to the panel output releasing circuit(s). If there is an indicated releasing circuit fault, verify electrical signal connection from panel to each aerosol generator electrical initiator. Test using a multi-meter, the line resistance of the releasing circuit signal line. Replace aerosol generator if each electrical initiator resistance exceeds operational range of 1.4Ω to 2.0Ω.			
Inspect aerosol generators for physical damage that is not superficial, such as cracks, dents, distortion, or corrosion. If damage is found, replace generator as instructed in the owner's manual.			
Verify mounting brackets and straps, tightness of mounting hardware, and generator alignment are properly secured. Tighten all loose hardware or replace damaged parts.			
Ensure paths of emergency egress from protected area is not impeded by an aerosol discharge as well as unobstructed access to manual pull stations and abort devices (where installed). Ensure there are no obstacles inhibiting the proper operation of the aerosol generators or distribution of aerosol in the event of fire.			
Ensure automatic dampers (where fitted) are functional. Verify leakage areas identified during the original system design have not been modified.			
Follow specific recommended manufacturer maintenance and test procedure for the fire detection/control system and fire detection devices, and per local codes.			
The aerosol generators have an installed service life of fifteen (15) years. Replace each generator fifteen (15) years from the marked date code in the lower right corner of the product label.			

N.A.: Not Applicable

Inspection Procedures

Weekly

1. Check all electrical connections to ensure operation of the Stat-X generators in the event of a fire. If connected to a fire alarm control panel, check the panel status.

2. Make a general visual inspection of all aerosol generators for damaged or missing parts, and visually inspect that generator mounting is secure.

Every Six Months

1. Ensure access to hazard areas, lines of egress, and manual release stations are unobstructed and that there are no obstacles inhibiting the proper operation of the aerosol generators or distribution of the aerosol in the event of a fire.

2. Inspect Stat-X aerosol generators for physical damage, such as cracks, dents, distortion, or corrosion. If damage is found, replace generator as instructed in the installation section of this manual.

3. Inspect mounting brackets, clamps, and associated hardware for loose, damaged, or broken parts. Replace damaged parts and tighten all loose hardware.

4. Inspect all manual release stations for damage, dirt, or distortion. Inspect station for signs of physical damage, replace if necessary.

5. Inspect all electrical connections and run electrical continuity tests using an ohmmeter. Repair and replace as necessary.

6. Replacement: The aerosol generators have an installed service life of fifteen (15) years. Generators are to be replaced fifteen years from the date code in the lower right corner of the product label as follows, the 2-digit numeric represents the year and then the month of shipment from the factory:

21	22	23	24	1	2	3	4	5	6	7	8	9	10	11	12

21 = 2021, 22 = 2022, etc. A unit marked 21 12, for example, would have shipped in December of 2021.

RECYCLING OF AEROSOL GENERATORS AFTER DISCHARGE:

In most cases the discharged generator can be disposed of in any landfill that handles industrial waste. However, local regulations must be researched and observed.

Each discharged aerosol generator will contain the following material:

1. Stainless steel outer shell – all

2. Mild steel cross members (30E, 60E, 100E, 250E, 500E)

3. Mild steel spacer ring - all

4. Stainless steel inner shell, top and bottom plates, screens (all sizes), and cross members (1000E, 1500E, 2500E)

5. Activated Alumina: CAS 1333-84-2 (Aluminum Oxide non-fibrous)

30E	60E	100E	250E	500E	1000E	1500E	2500E
20g	40g	100g	550g	970g	1670g	2350g	3600g

1. Fiberglass rope (ø1cm x 50cm).

2. Ceramic Paper < 150g.

3. Wire – 24gauge, PVC coated (< 1g)

4. Trace chemicals: K2CO3 (water-soluble particulate "trapped" in unit during discharge).

Un-discharged generators taken out of service should be returned to your local authorized distributor for replacement and re-cycling.

LIMITED WARRANTY STATEMENT

Fireaway represents this product is free from defects in material and workmanship, and it will repair or replace any product or part thereof which proves to be defective in workmanship or material for a period of eighteen (18) months from the date of first shipment from our factory. Defective units should be returned shipment prepaid to the factory.

Fireaway Inc. will repair or replace and return shipping prepaid. Return or repair shall be the purchaser's sole remedy for defect.

Limitations of Liability

This warranty does not cover equipment damaged during shipment or by misuse, accident, or negligence, or which has been repaired or altered by others. Fireaway Inc. shall not under any circumstances be liable for special or consequential damages such as, but not limited to, damage or loss of property or equipment, loss of profits or revenue, cost of capital, cost of purchased or replacement goods, or claims by customers of the original purchaser. Remedies set forth herein to the original purchaser and all others shall not exceed the price of the equipment supplied.

This warranty is exclusively and expressly in lieu of all other warranties, whether expressed or implied, including warranty of merchantability or fitness.

A DETAILED MANUAL MAY BE OBTAINED BY CONTACTING THE MANUFACTURER.

Stat-X products are manufactured in the USA, and sold worldwide (excluding the Federation of Russian States) exclusively by Fireaway Inc. under license from R-Amtech International.

IMPORTANT NOTE

Shutdown of Air Handling and Power Supply

Upon pre-discharge detection of a fire, the ventilation system for the protected volume must be shut-down to ensure the required application density is delivered and that the fire is not exacerbated by excessive air-flow. In addition, electrical power to protected equipment must be shut down. This eliminates the potential of re-ignition from a continuous short circuit.

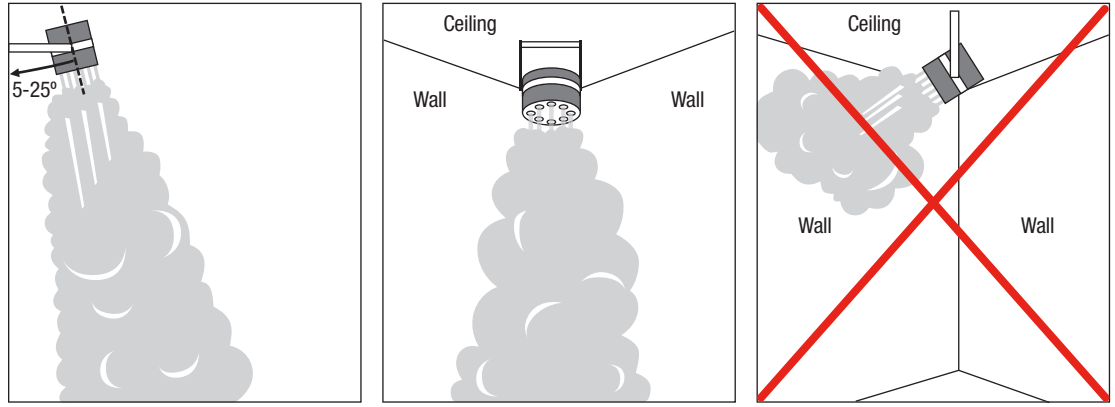
Questions concerning the information presented in this manual may be addressed to your authorized distributor or:

Fireaway Inc.
5852 Baker Road
Minnetonka, MN 55345
U.S.A.

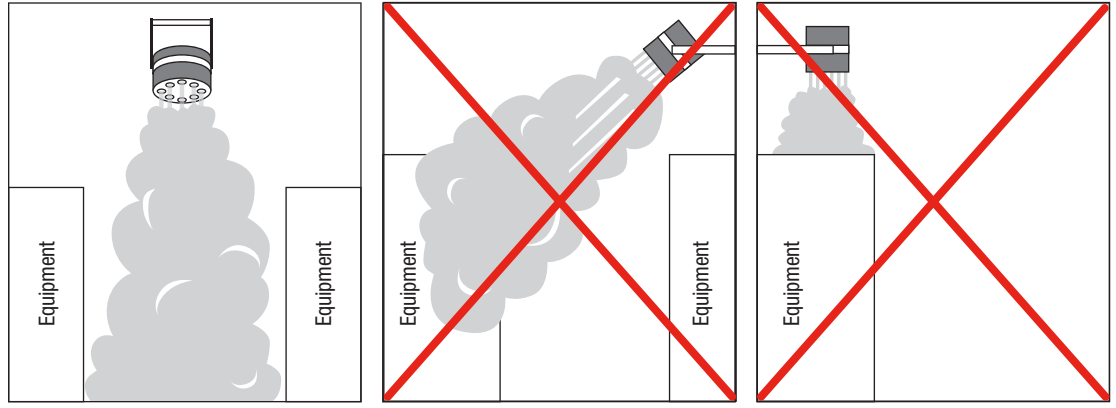
Tel: 952-935-9745
Fax: 952-935-9757
www.statx.com

Stat-X Installation Guidelines:

Aerosol generators should normally be mounted near ceiling height and angled to discharge down (under floor excepted) toward the floor at an angle to ensure three-dimensional distribution of aerosol. Normal orientation from vertical is 15° - 30°.



Generators must never be positioned to discharge directly at each other and must be mounted in such a way as to have an unobstructed discharge path, nor discharge at close range onto walls, ceiling, or equipment. Always check for obstructions in the path of the aerosol discharge stream. Generators must be installed such that they cannot cause personnel injury upon activation.



5852 Baker Road
Minnetonka, MN 55345
U.S.A.

Tel: 952-935-9745
Fax: 952-935-9757
www.statx.com

Stat-X® Aerosol Fire Suppression

Post Discharge Clean-up and System Re-Commissioning

Guide

Version 6
September 2019
P/N 19006.6

Fireaway Inc. 5852 Baker Road • Minnetonka, MN 55345

AS WITH ANY FIRE SUPPRESSION PRODUCT, CLEANING OF RESIDUE AND RE-COMMISSIONING OF FACILITIES AND EQUIPMENT WILL VARY DEPENDING UPON FACTORS EXISTING BEFORE, DURING AND AFTER DISCHARGE.

WARNING

DO NOT ENTER HAZARD SPACE WITH AN OPEN FLAME OR LIGHTED CIGARETTE.

THE POSSIBLE PRESENCE OF FLAMMABLE VAPORS MAY CAUSE RE-IGNITION OR EXPLOSION.

ENSURE FIRE IS COMPLETELY EXTINGUISHED PRIOR TO VENTILATING THE HAZARD SPACE.

VENTILATE THOROUGHLY OR USE SELF-CONTAINED BREATHING APPARATUS BEFORE ENTERING.

RECOMMENDED PROCEDURE

Note: See AREAS WITH SENSITIVE ELECTRONIC EQUIPMENT for important additional information.

These procedures must be followed in sequence to successfully re-commission a Stat-X® suppression system.

1. After discharge, allow a minimum agent holding time of 10 minutes before ventilating the hazard space.

2. Always have backup portable fire extinguishers on hand for use in the unlikely event of fire re-ignition.

3. Ventilate the hazard area thoroughly by forced ventilation or by opening doors and windows. For best results, smoke ejectors or exhaust blowers fitted with non-collapsible extraction ducting should direct the air outside.

Note: If incoming fresh air is high in humidity, dehumidification is recommended after space is vented. Agent residue not cleaned up following discharge can absorb humidity and may create a surface film or cause surface metal discoloration.

4. If it is necessary to enter the hazard area prior to completing the ventilation, wear suitable respiratory protection conforming to relevant OSHA requirements (including 29 CFR 1910, subpart L, section 1910.160) to avoid unwanted inhalation of fire by-products and aerosol fire suppression agent.

5. Inspect that all fire is extinguished and there are no localized hot spots or other sources of re-ignition present.

6. Any minor amounts of agent residue not removed during ventilation should be thoroughly vacuumed, blown, brushed, or washed away using an acetic acid – water solution of approximately 3.5% (by volume)*. Residue should be removed within 24 hours if possible.

7. Occasionally agent may agglomerate onto equipment or surfaces near the aerosol generator discharge ports. Inspect for agent build-up and clean per Step 6 above as soon as possible.

WARNING

DO NOT TOUCH AEROSOL GENERATORS WITHIN 15 MINUTES AFTER END OF DISCHARGE. THE GENERATOR METAL SURFACES MAY BE HOT ENOUGH TO CAUSE INJURY TO UNPROTECTED SKIN.

8. Spent aerosol generators will remain quite hot to the touch for a time after discharge. They can be removed wearing suitable hand protection and by following your facility's maintenance and cleanup procedures.

9. Dispose of spent generators according to applicable federal, state, local, and your facility's requirements.

10. Contact your authorized Stat-X® distributor for system re-commissioning and replacement aerosol generators. The US DOT has classified packaged aerosol generators as dangerous goods. Consult Stat-X SDS sheets for further handling and safety information.

Important: Systems must be inspected, replaced, and re-commissioned by a trained and authorized Stat-X fire suppression distributor.

GENERAL GUIDELINES

Generally, fire by-products can be unknown, potentially harmful, and pose the biggest risk to equipment, facilities, and personnel. Stat-X agent itself is extremely effective. To clean most spaces other than electronic equipment there is little

need to do more than ventilate and vacuum the area. Still, any signs of accumulated fire by-product or agent residue should be washed from bare metal or slight surface discoloration may occur. This includes blades and casings of fan units. Also, if housekeeping was lax existing dirt may have blown around and been re-deposited during discharge or ventilation. A thorough inspection and cleaning of the hazard space is the best way to ensure no unwanted residue remains. Small amounts of particulate may be deposited during discharge and may stain walls and floor surfaces.

Note: The aerosol fire suppressant solid particulates contains potassium, an alkali salt. Initially following a discharge, settled particulates are highly deliquescent and will attract moisture in the air. This can cause surfaces covered by residue to become temporarily moist or wet at a high pH level until the particulates dry due to evaporation. Certain metals susceptible to corrosion such as unprotected copper, aluminum, or bronze may experience accelerated surface oxidation or discoloration.

AREAS WITH SENSITIVE ELECTRONIC EQUIPMENT

Recovery activities should begin immediately after system discharge and the area is secured from fire re-ignition. This will help protect electronic assets from possible damage due to fire by-products or oxidation by aerosol agent reaction with ambient moisture. According to the *Disaster Recovery Journal*, restoration process carried out by recovery specialists can successfully restore electronic equipment to a pre-loss condition in the majority of cases.

Systems requiring emergency power off (EPO) capability per NFPA® 75 should de-energize circuitry cooling fans during discharge to minimize driving agent or fire by-product particulates onto sensitive electronic surfaces. After securing the area from possible re-ignition, fire service or safety personnel should place smoke ejector fans to the outside of the building with exhaust ducting positioned into the hazard space as recommended by NFPA's "Ladder Company Fireground Operation" guide. Ventilating fans should not be placed inside the space since they will only blow dirt, dust, or residue around causing general contamination. Introduction of humidity by opening windows or doors should be avoided. After ventilating the space, use of auxiliary dehumidifiers to reduce humidity levels as much as possible and to avoid unconditioned outside air ingress with excessive humidity is recommended until the area is cleaned. Since many fire by-product and Stat-X agent particulates are 1-2 microns in size or more, use of a HEPA grade vacuum cleaner during recovery will have good success removing particulates 0.3 microns and larger and is recommended.

Procedures used to cleanse electronic assemblies are similar to those used in the original manufacturing cycle. Specialists disassemble equipment only to the level of accessing contaminated surfaces, and then apply cleaning processes that remove contamination to levels of MIL-P-28809. Because Stat-X aerosol agent residue is water soluble, follow this procedure:

1. Wipe with hot deionized or distilled water and approximately 3.5% acetic acid solution (by volume)*
2. Let stand for a couple of minutes
3. Rinse with hot deionized or distilled water or wipe with clean wet cloth/towel
4. Wipe again with hot deionized or distilled water & dishwater soap solution
5. Rinse with hot deionized or distilled water or wipe with clean wet cloth/towel
6. Wipe with dry cloth

For best results, cleansing activity should take place as soon as possible.

*Cleaning grade acetic acid is typically 5%-6% acetic acid solution by volume. Please check product information. To achieve ~3.5% solution, follow directions below:

Starting Solution (by vol)	Steps	Resulting Solution
5%	Mix 70% starting solution with 30% water	3.5%
6%	Mix 60% starting solution with 40% water	3.6%

5852 Baker Road
Minnetonka, MN 55345
U.S.A.

Tel: 952-935-9745
Fax: 952-935-9757
www.statx.com

9/01/2022

MR. Anthony Gee
Fireaway LLC.
5852 Baker Rd
Minnetonka, MN
United States

Our Reference: File EX15004 Project 4789624039

Subject: Confirmation of 15 Year Useful Life

Dear Mr. Gee:

This letter is to provide confirmation that the Stat-X model generators currently Listed by UL have been evaluated for a 15 year useful life under the subject project. The design and installation manual and product labels were revised under this project to reflect the 15 year useful life.

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

If you have any questions, please do not hesitate to contact us.

Very truly yours,

Kevin Holly
Engineer Staff
3019BFPD
Tel: 847-664-3494
kevin.hollyjr@us.ul.com

CERTIFICATE OF COMPLIANCE

Certificate Number	20180301-E495772
Report Reference	E495772-20180227
Issue Date	2018-MARCH-01

Issued to: FIREAWAY INC
5852 BAKER RD
MINNETONKA MN 55345-5903

This is to certify that representative samples of FIXED CONDENSED AEROSOL EXTINGUISHING SYSTEM UNITS FOR USE IN HAZARDOUS LOCATIONS

For Models Refer Addendum Page

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 121201 and CAN/CSA C22.2 No. 213-17 - NONINCENDIVE ELECTRICAL EQUIPMENT FOR USE IN CLASS I AND II, DIVISION 2, AND CLASS III, DIVISIONS 1 AND 2 HAZARDOUS (CLASSIFIED) LOCATIONS

Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's Certification and Follow-Up Service.

Look for the UL Certification Mark on the product.

Bruce Mahrenholz, Director North American Certification Program

UL LLC

CERTIFICATE OF COMPLIANCE

Certificate Number 20180301-E495772
Report Reference E495772-20180227
Issue Date 2018-MARCH-01

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

Models;

USL, CNL Fire extinguishing units for use in Hazardous Locations, Class I, Division 2, Groups A, B, C, and D.

Model	Part No.
Stat-X condensed aerosol generator, Model 30 E (w/ brass elbow)	11880
Stat-X condensed aerosol generator, Model 60 E (w/ brass elbow)	11890
Stat-X condensed aerosol generator, Model 60 E (w/ brass elbow)	11900
Stat-X condensed aerosol generator, Model 100 E (w/ brass elbow)	11910
Stat-X condensed aerosol generator, Model 250 E (w/ brass elbow)	11920
Stat-X condensed aerosol generator, Model 500 E (w/ brass elbow)	11930
Stat-X condensed aerosol generator, Model 1000 E (w/ brass elbow)	11940
Stat-X condensed aerosol generator, Model 1500 E (w/ brass elbow)	11950
Stat-X condensed aerosol generator, Model 2500 E (w/ brass elbow)	11960
Stat-X condensed aerosol generator, Model 30 E (w/ stainless elbow)	11885
Stat-X condensed aerosol generator, Model 60 E (w/ stainless elbow)	11895
Stat-X condensed aerosol generator, Model 60 E (w/ stainless elbow)	11905
Stat-X condensed aerosol generator, Model 100 E (w/ stainless elbow)	11915
Stat-X condensed aerosol generator, Model 250 E (w/ stainless elbow)	11925
Stat-X condensed aerosol generator, Model 500 E (w/ stainless elbow)	11935
Stat-X condensed aerosol generator, Model 1000 E (w/ stainless elbow)	11945
Stat-X condensed aerosol generator, Model 1500 E (w/ stainless elbow)	11955
Stat-X condensed aerosol generator, Model 2500 E (w/ stainless elbow)	11965

Bruce Mahrenholz, Director North American Certification Program

UL LLC

CERTIFICATE OF COMPLIANCE

Certificate Number	EX15004
Report Reference	EX15004-20081114
Date	2023-February-07
Issued to:	FIREAWAY INC 5852 BAKER RD MINNETONKA MN, 55345-5903 US
This is to certify that representative samples of	FIXED CONDENSED AEROSOL EXTINGUISHING SYSTEM UNITS See Addendum Page for Product Designation(s). Have been evaluated by UL in accordance with the Standard(s) indicated on this Certificate.
Standard(s) for Safety:	ANSI/CAN/UL/ULC 2775, Fixed Condensed Aerosol Extinguishing System Units
Additional Information:	See the UL Online Certifications Directory at https://iq.ulprospector.com for additional information

This Certificate of Compliance indicates that representative samples of the product described in the certification report have met the requirements for UL certification. It does not provide authorization to apply the UL Mark. Only the Authorization Page that references the Follow-Up Services Procedure for ongoing surveillance provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

Deborah Jennings-Conner

Deborah Jennings-Conner, VP Regulatory Services

UL LLC

CERTIFICATE OF COMPLIANCE

Certificate Number EX15004
Report Reference EX15004-20081114
Date 2023-February-07

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements

Stat-X and Salgrom-X Series Aerosol-generating Extinguishing System Units.

Description	Part No.
Stat-X Condensed Aerosol Generator, Model 30E	15100
Stat-X Condensed Aerosol Generator, Model 60E	15110
Stat-X Condensed Aerosol Generator, Model 60ME	15111
Stat-X Condensed Aerosol Generator, Model 100E	15120
Stat-X Condensed Aerosol Generator, Model 250E	15130
Stat-X Condensed Aerosol Generator, Model 500E	15140
Stat-X Condensed Aerosol Generator, Model 1000E	15150
Stat-X Condensed Aerosol Generator, Model 1500E	15160
Stat-X Condensed Aerosol Generator, Model 2500E	15170
Salgrom-X Condensed Aerosol Generator, Model G30	11700
Salgrom-X Condensed Aerosol Generator, Model G60	11705
Salgrom-X Condensed Aerosol Generator, Model GM60	11600
Salgrom-X Condensed Aerosol Generator, Model G100	11740

Deborah Jennings-Conner

Deborah Jennings-Conner, VP Regulatory Services

UL LLC

CERTIFICATE OF COMPLIANCE

Certificate Number EX15004
Report Reference EX15004-20081114
Date 2023-February-07

Salgrom Condensed Aerosol Generator, Model G250	11710
Salgrom-X Condensed Aerosol Generator, Model G500	11690
Salgrom-X Condensed Aerosol Generator, Model G1000	11770
Salgrom-X Condensed Aerosol Generator, Model G1500	11800
Salgrom-X Condensed Aerosol Generator, Model G2500	11850
Mounting bracket, for Models G30, G60, 30E, 60E, 60ME and GM60	18001
Mounting bracket, for Models G100 and 100E	18005
Mounting bracket, for Models G250, G500, 250E and 500E	18010
Mounting bracket, for Models G1000, G1500, G2500, 1000E, 1500E, and 2500E	18015

Stat-X Design, Installation, Operation and Maintenance Manual, dated August 2021, Version 1.3.7	19000
Stat-X Owner's Manual, dated August 2021, Version 1.2.5	19001
Salgrom-X Design, Installation, Operation and Maintenance Manual, dated January, 2023 Version 1.0.0	19036
Salgrom-X Owner's Manual, dated September, 2022 Version 1.0.0	19037

For Class A surface burning and Class B and C category hazards; not for use in Hazardous (Classified) locations.
Temperature range -40 to 54°C.

Deborah Jennings-Conner

Deborah Jennings-Conner, VP Regulatory Services

UL LLC

Appendix C – Resorts 13 Week Cash Flow Forecast

Ecoasis Resort and Golf LLP
Cash Flow Forecast
For the period February 1, 2025 to May 30, 2025

Week			Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	
Week ending	**Notes**		7-Feb	14-Feb	21-Feb	28-Feb	7-Mar	14-Mar	21-Mar	28-Mar	4-Apr	11-Apr	18-Apr	25-Apr	2-May	9-May	16-May	23-May	30-May	Total
Opening Cash Balance	1	384,953																		
Outstanding Checks	2	(8,154)																		
Total Opening Cash	3	376,800																		
REVENUE- CASH RECEIPTS																				
GMEA Real Estate Initiation Fees																				
Initiation Fee Golf- Sales	4		-	-	2,000	55,000	3,000	5,000		45,000	-	46,000	59,500	21,000	-	45,000	46,000	1,500	42,000	371,000
Initiation Fee Golf- Monthly	5		5,300	-	-	-	5,850	-	-	-	-	6,750	-	-	-	8,050	-	-	-	25,950
Initiation Fee Tennis- Sales	6		1,000	-	-	1,000	-	-	4,000	5,000	-	-	4,000	4,000	-	-	4,000	-	-	23,000
Initiation Fee Tennis- Monthly	7		760	-	-	-	760	-	-	-	-	760	-	-	-	760	-	-	-	3,040
Transfer Fees- GMEA Golf	8		-	-	-	6,000	-	-	6,000	6,000	-	-	-	-	6,000	-	-	-	-	24,000
Dues Golf-Monthly Acct Payment	9		125,975	-	-	-	94,274	-	-	-	-	99,438	-	-	-	102,445	-	-	-	422,131
Dues Tennis-Monthly Acct Payment	10		16,763	-	-	-	17,559	-	-	-	-	18,355	-	-	-	18,952	-	-	-	71,629
Daily Sales Not On Account	11		4,450	4,230	6,378	8,518	43,038	43,038	43,038	43,038	70,395	70,395	70,395	70,395	70,395	119,106	119,106	119,106	121,606	1,026,628
Daily Sales Paid by Account Payment	12		7,317	-	-	-	11,281	-	-	-	-	62,915	-	-	-	66,640	-	-	-	148,153
Pepsi Rebate	13		-	-	-	-	-	-	-	-	-	-	-	-	4,500	-	-	-	-	4,500
Cash/Check Account Payments/Event Deposits	14			10,088	-	2,000	-	2,000	-	2,000	-	-	-	-	-	-	-	-	-	16,088
GST Collected	15		564	341	585	3,711	8,802	2,980	5,230	5,530	4,353	12,918	7,528	5,603	4,653	16,045	9,784	7,359	7,509	103,495
PST Collected	16		297	14	76	76	1,587	1,587	1,587	1,587	2,376	2,376	2,376	2,376	2,376	3,673	3,673	3,673	3,673	33,387
Funding Request	17							1,350,000												1,350,000
Total Cash Receipt	18		162,428	14,673	9,040	76,305	186,151	1,404,605	59,855	108,155	77,124	319,907	143,799	103,374	87,924	380,670	182,563	131,638	174,788	3,623,002
EXPENSES																				
Operating Expenses																				-
Payroll	19		-	88,598	-	121,071	-	145,397	-	145,397	-	176,738	-	176,738	-	208,944	-	208,944	-	1,271,827
Inventory Purchases	20		-	2,700	-	500	4,800	11,193	11,193	11,193	31,041	24,492	13,761	13,761	13,761	7,143	6,712	14,959	6,712	173,919
Operating Expenses Paid	21		10,341	36,511	25,844	32,199	68,087	43,121	36,800	32,104	120,827	46,150	38,749	61,006	145,952	36,427	39,226	21,064	59,507	853,917
DMCL Accounting Fees (non recurring)	22			4,214	4,214	4,214	4,214	4,214	4,214	4,214	-	-	-	-	-	-	-	-	-	29,500
Total Operating Expenses			10,341	132,024	30,058	157,985	77,101	203,925	52,207	192,908	151,868	247,380	52,510	251,505	159,713	252,515	45,938	244,967	66,218	2,329,163
Advance Re-Payment		Opening Balance																		
Lightspeed Advance (13% of Daily Sales Pro Shop Only)	23	184,956	579	550	772	1,051	4,549	4,549	4,549	4,549	7,743	7,743	7,743	7,743	7,743	13,448	13,448	13,448	13,773	
Total Re-Payment			579	550	772	1,051	4,549	4,549	4,549	4,549	7,743	7,743	7,743	7,743	7,743	13,448	13,448	13,448	13,773	113,980
Remittance																				-
GST Paid (ITC)	24		-	1,293	1,221	1,586	2,934	2,824	2,503	2,242	7,060	3,076	2,467	3,583	7,226	1,668	2,085	1,592	3,133	46,494
GST Remittance / (Refund) -2025	25			3,500		1,101				12,039				14,216					29,645	60,501
PST Remittance-2025	26			850		464				6,348				9,506					17,070	34,237
EHT Remittance-2025	27																			
Work Safe Remittance-2025	28																			
Aged A/P																				
Paid Aged A/P		Aged Opening Balance																		
Aged A/P Operations-Jan31	29	246,101	20,300	-	-	14,000	-	86,337	-	-	4,468	-	-	-	4,468	-	-	-	-	
Un Released Check-Jan31	30	471,016	-	13,436	-	-	-	270,000	-	-	-	-	-	-	-	-	-	-	-	
Aged A/P Non-Recurring	31	1,195,520	-	-	-	-	-	390,500	-	-	-	-	-	-	-	-	-	-	-	
Total A/P Paid		1,912,637	20,300	13,436	-	14,000	-	746,837	-	-	4,468	-	-	-	4,468	-	-	-	-	803,509
		Aged Opening Balance																		
GST Aged		185,513	-	-	-	-	-	185,513	-	-	-	-	-	-	-	-	-	-	-	
PST Aged		121,220	-	-	-	-	-	121,220	-	-	-	-	-	-	-	-	-	-	-	
EHT Aged		66,930	-	-	-	-	-	66,930	-	-	-	-	-	-	-	-	-	-	-	
Work Safe		34,200	36,764	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Aged Remittance	32	407,863	36,764	-	-	-	-	373,663	-	-	-	-	-	-	-	-	-	-	-	410,427
Total Aged A/P	33	2,320,500	57,064	13,436	-	14,000	-	1,120,500	-	-	4,468	-	-	-	4,468	-	-	-	-	1,213,936
Net Cash Flow (Deficit) 2025	34		94,444	(136,980)	(23,012)	(99,881)	101,567	72,807	596	(109,932)	(94,014)	61,707	81,080	(183,178)	(91,225)	113,040	121,093	(128,368)	44,949	(175,309)
Cash Continuity-With Aged A/P																				
Opening Cash Balance			376,800	471,244	334,264	311,252	211,370	312,938	385,744	386,340	276,409	182,394	244,102	325,182	142,003	50,778	163,818	284,911	156,542	376,800
Net Cash Flow (deficit)			94,444	(136,980)	(23,012)	(99,881)	101,567	72,807	596	(109,932)	(94,014)	61,707	81,080	(183,178)	(91,225)	113,040	121,093	(128,368)	44,949	(175,309)
Ending Cash Balance	35		**471,244**	**334,264**	**311,252**	**211,370**	**312,938**	**385,744**	**386,340**	**276,409**	**182,394**	**244,102**	**325,182**	**142,003**	**50,778**	**163,818**	**284,911**	**156,542**	**201,491**	**201,491**

Notes

1 Bank account balance as of January 31st

2 Balance of released checks not cleared

3 Final opening bank balance January 31st

*2025 & 2026 pre paid dues reflected in bank balance

4 New golf membership initiation sales. Non GMEA

5 Golf initiation fees billed the previous month and auto paid on account 1st week of the month

6 New tennis membership initiation sales

7 Tennis initiation fees billed the previous month & auto paid monthly on accounts 1st week of the month

8 GMEA transfer fees paid

9 Golf dues billed the previous month and auto paid on account 1st week of the month

10 Tennis dues billed the previous month and auto paid on account 1st week of the month

11 Daily sales not charged to an account. Sales processed at time of purchase via POS.

12 Daily sales billed the previous month and auto paid on account 1st week of the month

13 Pepsi rebate check payment

14 Cash/Check account payments and event deposits not reflected in sales

15 GST collected by sales

16 PST collected by sales

17 Funding request realized

18 Total cash receipts realized in the period

19 Budgeted Payroll: Wages + 18% burden included (includes lesson commissions)

18% To account for the following G/L accounts:

7100 Employment Insurance

7105 CPP

7110 Workers Compensation

7115 Medical Insurance (MSP)

7116 Employer Health Tax

7120 Life Insurance and AD&D

7125 Extended Health & Dental

7132 Budgeted Burden

7135 Vacation Pay - Hourly

7136 Vacation Pay - Salary

7140 Stat in Lieu Pay

20 Total payments for inventory purchases for pro shop and F&B

21 Total of all other operating expense purchase payments due to be paid within period

22 DMCL Accounting Fees that are a non recurring expense outside of normalized accounting yearly needs

23 Lightspeed advance and repayment based on 13% of Card present Pro Shop POS transactions only

24 ITC paid on expenses

25 Monthly GST remittances

26 Monthly PST remittances

27 EHT remittance are accounted for in payroll refer to note #19

28 Worksafe remittance are accounted for in payroll refer to note #19

29 Aged A/P for standard operational expense: Opening balance & payments

30 Value of aged A/P checks not released: Opening balance & payments

32 Total aged remittance

33 Total Aged A/P Opening balance and payments

34 Net cash flow for 2025 operations for that period

35 Cash continuity with 2025, with aged A/P payments made

Appendix D – Accounts Payable/Other Liabilities and Funding Request

ACCOUNTS PAYABLE			
TYPE	**AMOUNT (JAN 31, 2025)**	**FUNDING REQUEST**	**NOTES**
Unreleased cheques			
Subtotal	$ 471,016	$ 270,000	Note 1
Operating Payable			
[redacted]	$ 12,016		
	$ 781		
	$ 49		
	$ 7,920		
	$ (1,956)		
	$ 218		
	$ 53,550		
	$ 5,967		
	$ 3,082	$ 3,082	
	$ 3,775	$ 3,775	
	$ (13)		
	$ 57,385	$ 37,385	
	$ (3,510)		
	$ 615		
	$ 17		
	$ 236		
	$ 28,097		
	$ 69,342	$ 37,000	
	$ 267		
	$ 3,118	$ 3,118	
	$ 15		
	$ 494		
	$ 4,422	$ 1,977	
	$ 214		
SubTotal	$ 246,101	$ 86,337	Note 2
Non-Recurring Payables			
[redacted]			
Mair Jensen Blair (Arbitr	$ 28,533	$ 20,500	
Landscapes Unlimited (2	$ 147,932	$ 45,000	
SubTotal	$ [redacted]		Note 3
Statutory Payables			
EHT	$ 66,930	$ 66,930	
PST	$ 121,220	$ 121,220	
GST	$ 185,513	$ 185,513	
WCB	$ 34,200		Note 4
SubTotal	$ 407,863	$ 373,663	Note 5
Cashflow		$ [redacted]	Note 6
TOTAL	$ [redacted]		

OTHER LIABILITIES		
TYPE	**AMOUNT**	**NOTES**
Property Taxes 2024		
Subtotal	$ 185,563	Note 1
Light Speed Advance		
Subtotal	$ 184,956	Note 2
TOTAL	**$ 370,519**	

Note 1: Property Taxes will be accounted for in 2025 cashflow

Note 2: Repayment of Light Speed Advance is accounted for in 2025 cashflow

Note 1: Resort is requesting funding of $270,000 of the $471,015 in unreleased cheques. Resort is working with vendors to establish payment plans for the balance.

Note 2: Resort is requesting funding of $86,337 of the $246,101 in operating payables. Some of the remaining payables are automatic withdrawals and are recognized in the 13 week cashflow. For the balance Resort is working with vendors to establish payment plans.

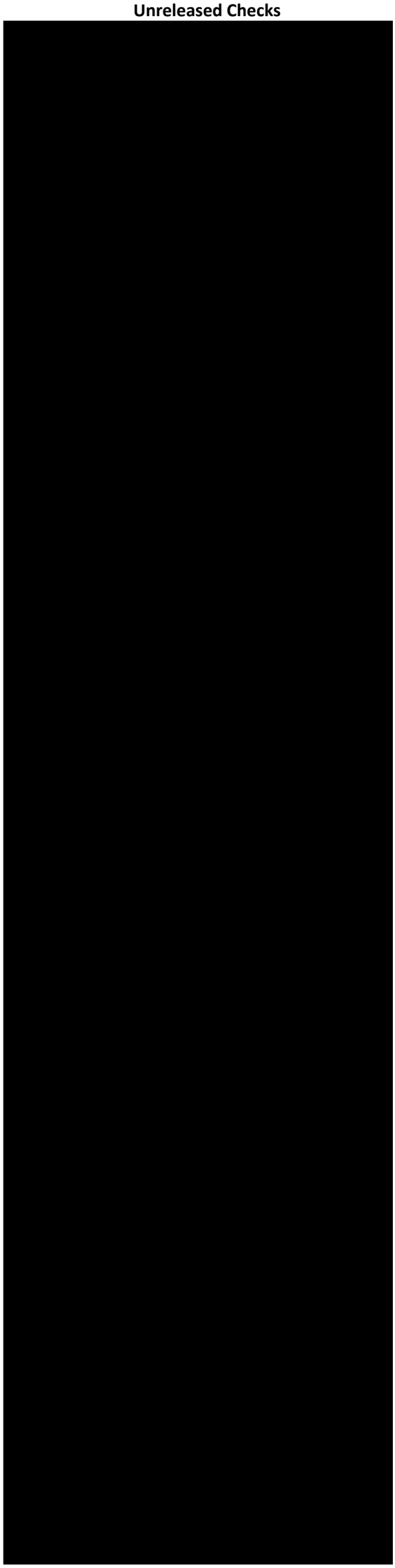
[redacted]

Note 4: WCB amount has been paid In February 2025.

Note 5: Resort is requesting funding for the full balance of Statutory Payables. The WCB amount has been paid.

Note 6: Resort is requesting funding of $229,500 for cashflow operations during the slower winter months. Further detail in Resort Progress update of February 18, 2025. The requesting funding includes additional non-recurring accounting fees of $29,500 to fulfill financial deliverables.

Unreleased Checks



Appendix D

Resorts 17-Week Cash Flow Forecast for Period February 1, 2025 to May 30, 2025

Appendix C – 13 Week Cash Flow Forecast

Ecoasis Resort and Golf LLP Cash Flow Forecast
For the period February 1, 2025 to May 30, 2025

Week				Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	
Week ending	**Notes**			7-Feb	14-Feb	21-Feb	28-Feb	7-Mar	14-Mar	21-Mar	28-Mar	4-Apr	11-Apr	18-Apr	25-Apr	2-May	9-May	16-May	23-May	30-May	Total
Opening Cash Balance	1		384,953																		
Outstanding Checks	2	-8,154																			
Total Opening Cash	3		376,800																		
REVENUE- CASH RECEIPTS																					
GMEA Real Estate Initiation Fees																					
Initiation Fee Golf- Sales	4			0.00	0.00	2000.00	55000.00	3000.00	5000.00		45000.00	0.00	46000.00	59500.00	21000.00	0.00	45000.00	46000.00	1500.00	42000.00	371000.00
Initiation Fee Golf- Monthly	5			5300.00	0.00	0.00	0.00	5850.00	0.00	0.00	0.00	0.00	6750.00	0.00	0.00	0.00	8050.00	0.00	0.00	0.00	25950.00
Initiation Fee Tennis- Sales	6			1000.00	0.00	0.00	1000.00	0.00	0.00	4000.00	5000.00	0.00	0.00	4000.00	4000.00	0.00	0.00	4000.00	0.00	0.00	23000.00
Initiation Fee Tennis- Monthly	7			760.00	0.00	0.00	0.00	760.00	0.00	0.00	0.00	0.00	760.00	0.00	0.00	0.00	760.00	0.00	0.00	0.00	3040.00
Transfer Fees- GMEA Golf	8			0.00	0.00	0.00	6000.00	0.00	0.00	6000.00	6000.00	0.00	0.00	0.00	0.00	6000.00	0.00	0.00	0.00	0.00	24000.00
Dues Golf-Monthly Acct Payment	9			125975.00	0.00	0.00	0.00	94274.00	0.00	0.00	0.00	0.00	99438.00	0.00	0.00	0.00	102445.00	0.00	0.00	0.00	422131.00
Dues Tennis-Monthly Acct Payment	10			16763.00	0.00	0.00	0.00	17559.00	0.00	0.00	0.00	0.00	18355.00	0.00	0.00	0.00	18952.00	0.00	0.00	0.00	71629.00
Daily Sales Not On Account	11			4450.00	4230.00	6378.00	8518.00	43038.00	43038.00	43038.00	43038.00	70395.00	70395.00	70395.00	70395.00	70395.00	119106.00	119106.00	119106.00	121606.00	1026628.00
Daily Sales Paid by Account Payment	12			7317.00	0.00	0.00	0.00	11281.00	0.00	0.00	0.00	0.00	62915.00	0.00	0.00	0.00	66640.00	0.00	0.00	0.00	148153.00
Pepsi Rebate	13			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4500.00	0.00	0.00	0.00	0.00	4500.00
Cash/Check Account Payments/Event Deposits	14				10088.00	0.00	2000.00	0.00	2000.00	0.00	2000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16088.00
GST Collected	15			564.00	341.00	585.00	3711.00	8802.00	2980.00	5230.00	5530.00	4353.00	12918.00	7528.00	5603.00	4653.00	16045.00	9784.00	7359.00	7509.00	103495.00
PST Collected	16			297.00	14.00	76.00	76.00	1587.00	1587.00	1587.00	1587.00	2376.00	2376.00	2376.00	2376.00	2376.00	3673.00	3673.00	3673.00	3673.00	33387.00
Funding Request	17								1350000.00												1350000.00
Total Cash Receipt	18			162428.00	14673.00	9040.00	76305.00	186151.00	1404605.00	59855.00	108155.00	77124.00	319907.00	143799.00	103374.00	87924.00	380670.00	182563.00	131638.00	174788.00	3623002.00
EXPENSES																					
Operating Expenses																					-
Payroll	19			0.00	88598.00	0.00	121071.00	0.00	145397.00	0.00	145397.00	0.00	176738.00	0.00	176738.00	0.00	208944.00	0.00	208944.00	0.00	1271827.00
Inventory Purchases	20			0.00	2700.00	0.00	500.00	4800.00	11193.00	11193.00	11193.00	31041.00	24492.00	13761.00	13761.00	13761.00	7143.00	6712.00	14959.00	6712.00	173919.00
Operating Expenses Paid	21			10341.00	36511.00	25844.00	32199.00	68087.00	43121.00	36800.00	32104.00	120827.00	46150.00	38749.00	61006.00	145952.00	36427.00	39226.00	21064.00	59507.00	853917.00
DMCL Accounting Fees (non recurring)	22				4214.00	4214.00	4214.00	4214.00	4214.00	4214.00	4214.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29500.00
Total Operating Expenses				10341.00	132024.00	30058.00	157985.00	77101.00	203925.00	52207.00	192908.00	151868.00	247380.00	52510.00	251505.00	159713.00	252515.00	45938.00	244967.00	66218.00	2329163.00
Advance Re-Payment		Opening Balance																			
Lightspeed Advance (13% of Daily Sales Pro Shop Only)	23		184,956	579.00	550.00	772.00	1051.00	4549.00	4549.00	4549.00	4549.00	7743.00	7743.00	7743.00	7743.00	7743.00	13448.00	13448.00	13448.00	13773.00	
Total Re-Payment				579.00	550.00	772.00	1051.00	4549.00	4549.00	4549.00	4549.00	7743.00	7743.00	7743.00	7743.00	7743.00	13448.00	13448.00	13448.00	13773.00	113980.00
Remittance																					-
GST Paid (ITC)	24			0.00	1293.00	1221.00	1586.00	2934.00	2824.00	2503.00	2242.00	7060.00	3076.00	2467.00	3583.00	7226.00	1668.00	2085.00	1592.00	3133.00	46494.00
GST Remittance / (Refund) -2025	25				3500.00		1101.00				12039.00				14216.00					29645.00	60501.00
PST Remittance-2025	26				850.00		464.00				6348.00				9506.00					17070.00	34237.00
EHT Remittance-2025	27																				
Work Safe Remittance-2025	28																				
Aged A/P																					
Paid Aged A/P		Aged Opening Balance																			
Aged A/P Operations-Jan31	29		246,101	20300.00	-	-	14000.00	-	86337.00	-	-	4468.00	-	-	-	4468.00	-	-	-	-	
Un Released Check-Jan31	30		471,016	-	13436.00	-	-	-	270000.00	-	-	-	-	-	-	-	-	-	-	-	
Aged A/P Non-Recurring	31		1,195,520	-	-	-	-	-	390500.00	-	-	-	-	-	-	-	-	-	-	-	
Total A/P Paid			1,912,637	20300.00	13436.00	0.00	14000.00	0.00	746837.00	0.00	0.00	4468.00	0.00	0.00	0.00	4468.00	0.00	0.00	0.00	0.00	803509.00
		Aged Opening Balance																			
GST Aged			185,513	-	-	-	-	-	185513.00	-	-	-	-	-	-	-	-	-	-	-	
PST Aged			121,220	-	-	-	-	-	121220.00	-	-	-	-	-	-	-	-	-	-	-	
EHT Aged			66,930	-	-	-	-	-	66930.00	-	-	-	-	-	-	-	-	-	-	-	
Work Safe			34,200	36764.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Aged Remittance	32		407,863	36764.00	0.00	0.00	0.00	0.00	373663.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	410427.00
Total Aged A/P	33		2,320,500	57064.00	13436.00	-	14000.00	-	1120500.00	-	-	4468.00	-	-	-	4468.00	-	-	-	-	1213936.00
Net Cash Flow (Deficit) 2025	34			94444.00	-136980.00	-23012.00	-99881.00	101567.00	72807.00	596.00	-109932.00	-94014.00	61707.00	81080.00	-183178.00	-91225.00	113040.00	121093.00	-128368.00	44949.00	-175309.00
Cash Continuity-With Aged A/P																					
Opening Cash Balance				376800.00	471244.00	334264.00	311252.00	211370.00	312938.00	385744.00	386340.00	276409.00	182394.00	244102.00	325182.00	142003.00	50778.00	163818.00	284911.00	156542.00	376800.00
Net Cash Flow (deficit)				94444.00	-136980.00	-23012.00	-99881.00	101567.00	72807.00	596.00	-109932.00		61707.00	81080.00	-183178.00	-91225.00	113040.00	121093.00	-128368.00	44949.00	-175309.00
Ending Cash Balance	35																				

471,244	**334,264**	**311,252**	**211,370**	**312,938**	**385,744**	**386,340**	**276,409**	**182,394**	**244,102**		**325,182**	**142,003**	**50,778**	**163,818**	**284,911**	**156,542**	**201,491**			**201,491**	

Notes

1 Bank account balance as of January 31st

2 Balance of released checks not cleared

3 Final opening bank balance January 31st

*2025 & 2026 pre paid dues reflected in bank balance

4 New golf membership initiation sales. Non GMEA

5 Golf initiation fees billed the previous month and auto paid on account 1st week of the month

6 New tennis membership initiation sales

7 Tennis initiation fees billed the previous month & auto paid monthly on accounts 1st week of the month

8 GMEA transfer fees paid

9 Golf dues billed the previous month and auto paid on account 1st week of the month

10 Tennis dues billed the previous month and auto paid on account 1st week of the month

11 Daily sales not charged to an account. Sales processed at time of purchase via POS.

12 Daily sales billed the previous month and auto paid on account 1st week of the month

13 Pepsi rebate check payment

14 Cash/Check account payments and event deposits not reflected in sales

15 GST collected by sales

16 PST collected by sales

17 Funding request realized

18 Total cash receipts realized in the period

19 Budgeted Payroll: Wages + 18% burden included (includes lesson commissions) 18% To account for the following G/L accounts:

7100 Employment Insurance

7105 CPP

7110 Workers Compensation 7115 Medical Insurance (MSP) 7116 Employer Health Tax 7120 Life Insurance and AD&D 7125 Extended Health & Dental 7132 Budgeted Burden

7135 Vacation Pay - Hourly 7136 Vacation Pay - Salary 7140 Stat in Lieu Pay

20 Total payments for inventory purchases for pro shop and F&B

21 Total of all other operating expense purchase payments due to be paid within period

22 DMCL Accounting Fees that are a non recurring expense outside of normalized accounting yearly needs

23 Lightspeed advance and repayment based on 13% of Card present Pro Shop POS transactions only

24 ITC paid on expenses

25 Monthly GST remittances

26 Monthly PST remittances

27 EHT remittance are accounted for in payroll refer to note #19

28 Worksafe remittance are accounted for in payroll refer to note #19

29 Aged A/P for standard operational expense: Opening balance & payments

30 Value of aged A/P checks not released: Opening balance & payments

[redacted]

32 Total aged remittance

33 Total Aged A/P Opening balance and payments

34 Net cash flow for 2025 operations for that period

35 Cash continuity with 2025, with aged A/P payments made

Appendix E

Resorts 2025 to 2028 Forecasts

[redacted]